

# 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

- Integrated amplifier
- Good long-term stability, high shock and vibration immunity
- Good reproducibility
- As retrofitting, easy to install
- For use in extreme outdoor applications (IP67, optional IP69K)



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.  $\leq 1.0\%$ . 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 calibrate via control signals. The overall accuracy achieved depends on the installation situation, but is better than 2 % of F.S..

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.

The strain transducers fulfil the electromagnetic compatibility (EMC) requirements of EN 61326.

### Measuring range

Strain from 0 ... 200  $\mu\epsilon$ , up to max. 0 ... 1,000  $\mu\epsilon$

## 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 deformation as the component. The tensile and compressive 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.

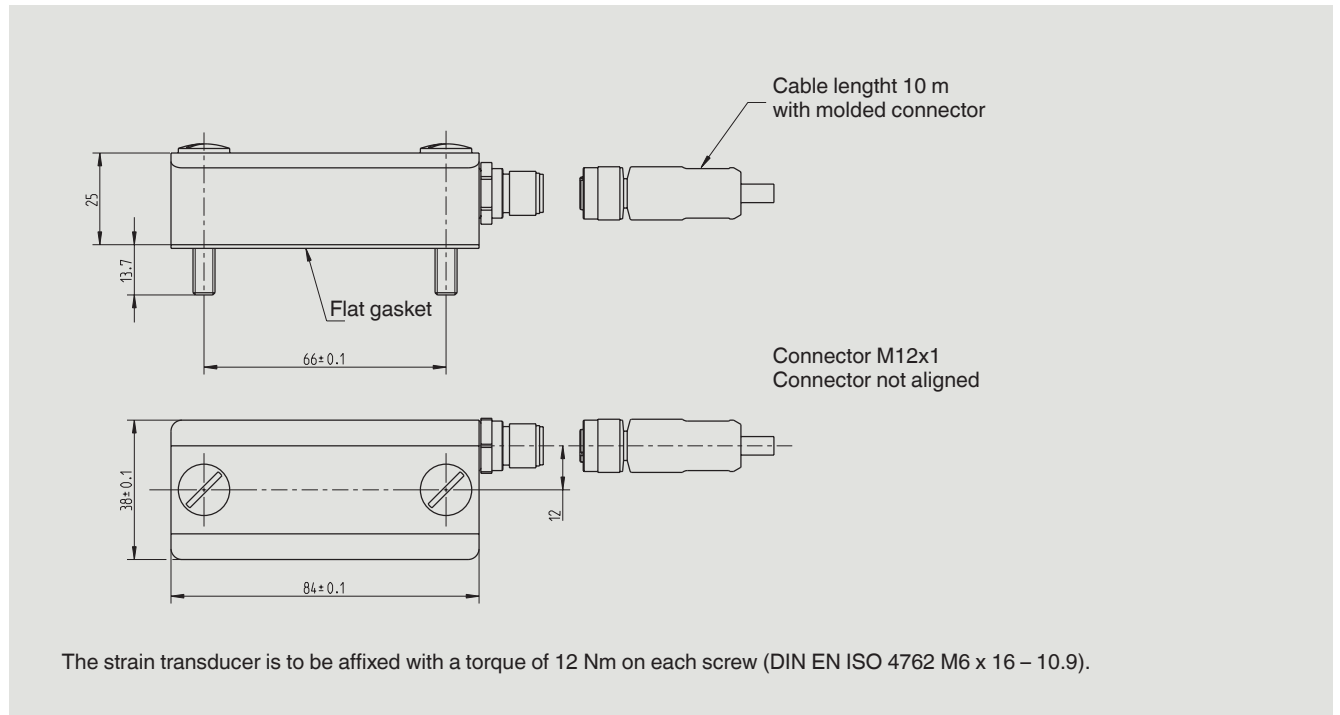
Matching of the temperature coefficient (TC) of the output signal to the applied component, as well as adjustment of the limit frequency, is possible through factory pre-programming.

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

Model F9302	
<b>Measuring range B</b>	0 ... ±200 µe, 0 ... ±500 µe, ... ±1,000 µe
<b>Relative linearity error <math>d_{lin}</math></b>	≤ 1% of F.S. *
<b>Relative repeatability error in:</b> ■ unchanged mounting position $b_{rg}$ ■ different mounting positions $b_{rv}$	0.5 % of F.S.
<b>Nominal temperature <math>B_{T, nom}</math></b>	-20 ... +80 °C
<b>Operating temperature <math>B_{T, G}</math></b>	-40 ... +80 °C, permanently laid cable -25 ... +80 °C, moving cable
<b>Storage temperature range <math>B_{T, S}</math></b>	-40 ... +85 °C
<b>Temperature effect on</b> ■ characteristic value TKc ■ zero signal TKo	Typ. ±0.3 % of F.S./10 K * Typ. ±0.1 % of F.S./10 K *
<b>Vibration resistance</b>	20 g, 100 h, 50...150 Hz in accordance with DIN EN 60068-2-6
<b>Protection type</b>	IP67 (optional IP69K) in accordance with EN/IEC 60529
<b>Noise emission</b>	In accordance with DIN EN 55011
<b>Noise immunity</b>	In accordance with DIN EN 61326-1/DIN EN 61326-2-3
<b>Electrical protection</b>	Reverse voltage, overvoltage and short circuit protection
<b>Weight in g</b>	200
<b>Oberflächenbeschaffenheit</b>	Minimum requirement: evenness 0.05 mm/surface roughness Ra=16
<b>Schraubenanzugsmoment M6</b>	12 Nm
<b>Analogue output</b> ■ Output signal (characteristic value) C ■ Supply voltage ■ Current consumption ■ Burden ■ Limit frequency ■ Electrical connection	4 ... 20 mA DC 10 ... 30 V Max. 25 mA > 10 kΩ < 2 kHz (-3 dB) Circular connection, M12 x 1, 4-pin

\* Dependent on surface material, Measuring element of 1.4542 stainless steel of F.S. = of Full Scale

## Dimensions in mm



## Electrical connection

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

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