

FL 101

Strain gauge application set



Learning objectives/experiments

- fundamentals of electrical resistance strain gauges
- preparation of the measuring point
- selection of a suitable strain gauge
- attaching, wiring up and configuring strain gauges on mechanically stressed components
- protection of the strain gauge measuring point against external influences
- interpretation of measured values (theoretical)

Description

- complete equipment for application of strain gauges with wiring and connecting of strain gauges
- supporting the development of strain gauge measuring techniques

Measurement using strain gauges is the most important method of measuring mechanical strain. In this measuring method mechanical quantities are measured electrically.

Strain gauge measurement is a relatively simple technique in practice, as it offers a high resolution and can be employed directly at the point of interest. A strain gauge is not a complete measuring instrument however. It is only rendered usable by the user, after being installed. The quality of measurement depends not only on the strain gauge itself, but also essentially on the

application method and how it is executed. Strain gauges are highly reliable provided users have the skills and theoretical knowledge enabling them to use such highly sensitive sensor elements correctly.

The application set FL 101 provides all the necessary tools and aids to learn the fundamentals of strain gauges installation.

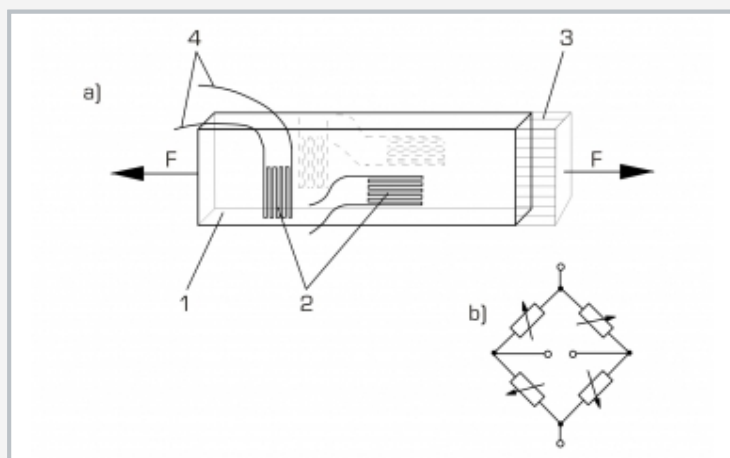
For the measurements to work without error, components are first subjected to thorough preparation before the strain gauges are attached. Special adhesives ensure total transfer of component deformations to the strain gauge. The strain gauge is also protected by suitable coverings against external influences, such as damp and mechanical damage, by suitable coverings.

The supplied package includes wiring to connect the strain gauges in bridge configurations. The wires are attached to the strain gauges using a supplied soldering bit and soldering terminals.

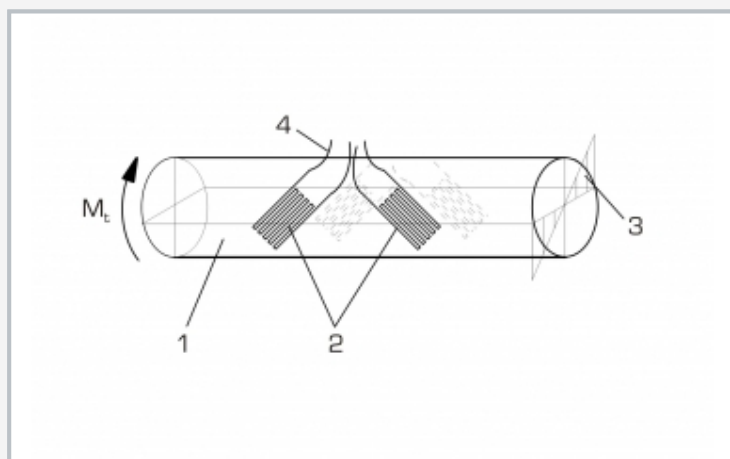
The instructional material (text book, exercise script and video) provides a multimedia introduction to the installation and configuration of strain gauges and on interpretation of measured values.

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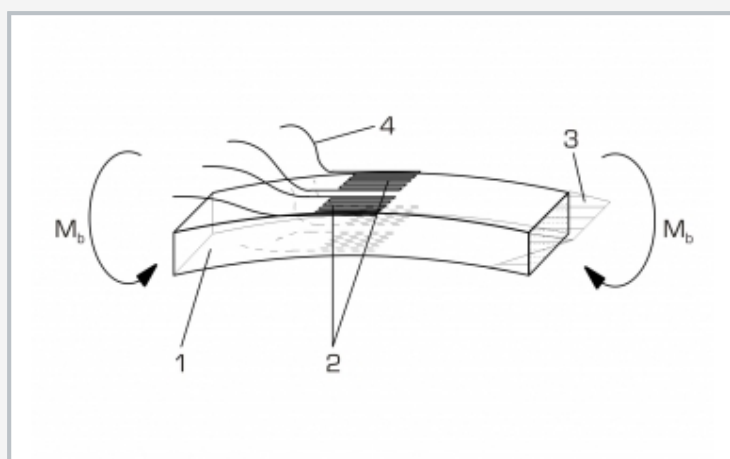
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a) arrangement of strain gauges on tension bar, b) configuration of strain gauges; 1 tension bar, 2 strain gauge, 3 distribution of stress, 4 wiring; F applied force



Arrangement of strain gauges on torsion bar: 1 round bar, 2 strain gauge, 3 distribution of stress, 4 wiring; M_t torque



Arrangement of strain gauges on bending bar: 1 bar, 2 strain gauge, 3 distribution of stress, 4 wiring; M_b bending moment

Specification

- [1] complete set of components for application of strain gauges
- [2] strain gauges with single measuring grids, parallel measuring grids and measuring grids at $90^\circ / 45^\circ$ angles
- [3] strain gauges for steel or aluminium components
- [4] all necessary tools, adhesives and other aids included in the set
- [5] lockable carrying case
- [6] learning package with text book, exercise script and video
- [7] cable and connectors to connect the applied strain gauges to the optional available measuring amplifier FL 151

Technical data

Strain gauge: 350 Ohm

- 10 strain gauges, single measuring grids, for St
- 10 strain gauges, parallel measuring grids, for St
- 10 strain gauges, 90° measuring grids, for St
- 10 strain gauges, 45° measuring grids, for St
- 10 strain gauges, single measuring grids, for Al

Soldering bit: 16W

Ribbon cable: 6x 0,14mm²

Magnifying glass: 6-times magnification

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 470x360x170mm

Weight: approx. 8kg

Scope of delivery

- 1 carrying case
- 1 set of strain gauges
- 1 application set complete (solvent, cleaning agent, special strain gauge adhesive, adhesive strips, coverings)
- 1 set of pincers
- 2 scissors
- 1 set of application tools
- 1 set of cutting tools
- 1 soldering bit, soldering terminals
- 1 set of accessories (measuring tools, magnifying glass, cable, abrasive cloth, pencil, rubber eraser)
- 1 strain gauge learning package (text book, exercise script, video) in German or English
- 8 6-pole connectors for connection to FL 151
- 5m cable for connection to FL 151

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Optional accessories

020.30009	WP 300.09	Laboratory trolley
021.15100	FL 151	Multi-channel measuring amplifier