GLÖTZL Baumeßtechnik

Fibre Optical Strain Transducer

Type: FOS D 250
Art. No.: 101.01

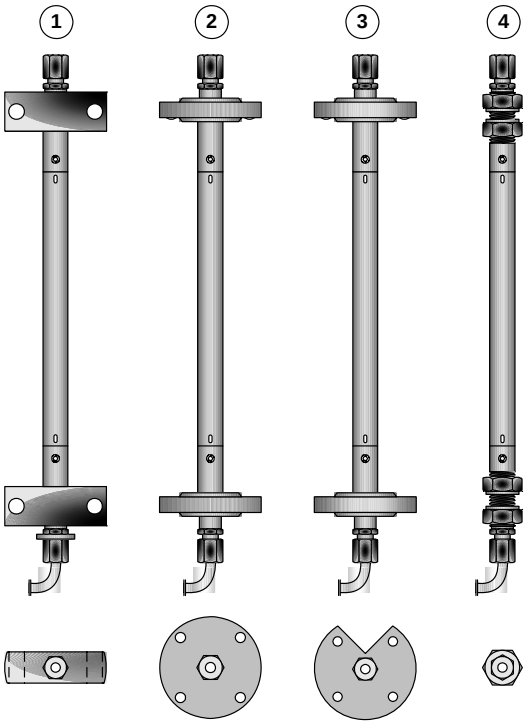
Description

The fibre optical strain transducer has especially been developed for the sensible application in explosion-protected areas for long-term measurement of steel- and concrete expansions.

The sensor itself consists of a fibre optic Bragg grating, a structural element which is mostly used in optical telecommunications.

The term Bragg grating means a large number of small reflection layers which are written into a monomode glass fibre by ultraviolet laser light with constant period length and thus are forming a grating.

The thus produced optical gratings are giving a wave length-encoded signal in dependence of their expansion or of temperature of grating area.



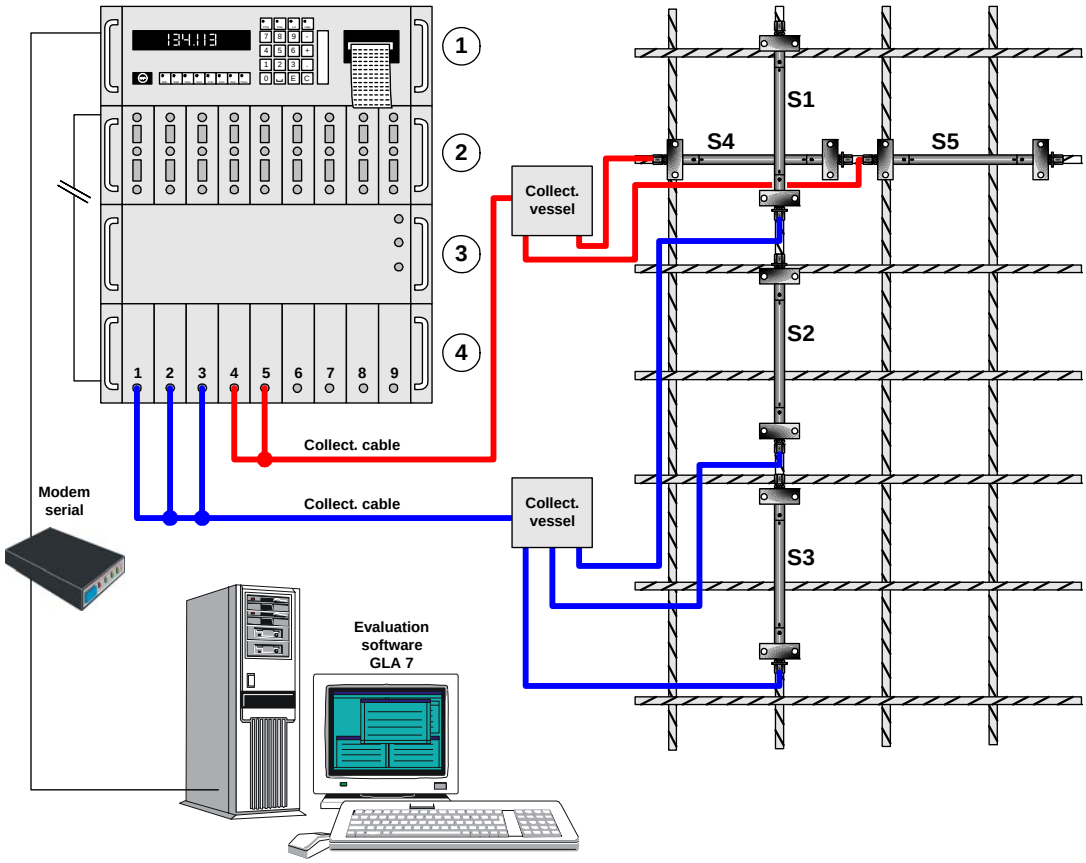
Application

This transducer is mainly used in installation locations in a big distance (possible cable length up to 1,000 m) at barrages, hydraulic structures, galleries and shaft extensions, furthermore at power stations in minings in explosion-protected areas and concrete constructions, e.g. piles and supporting walls.

Installation is easy and uncomplicated as for conventional systems. Its robust construction – an obligation for the Glötzl measuring instruments – and its bending insensitivity enables an application nearly everywhere.Typical application ranges are concrete- and steel expansion measurements, also in concrete with coarse additives. Thus, the sensors can be placed into the body directly with the backfill and be attached at the existing reinforcement with the drill-holes in the anchor disks by means of binding wire.

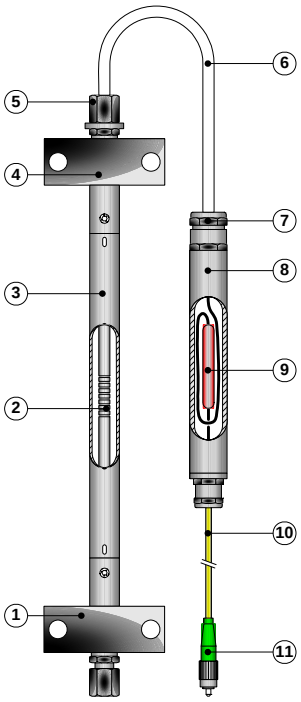
The long-term control can be of decisive importance if a sensor should be used for a probable operating time of more than 20 years. In this case, corrosion-resistant materials and passive measuring elements are an aboslute prerequisite for such a job. Furthermore, this sensor can not be influenced by electromagnetic background radiation.

Model 1 with heavy dowel plates for subsequent attachment at outside construcctions
Model 2 for concrete strain measurement inside of backfilled cavities
Model 3 along reinforcement rods
Model 4 the free version for assemblage at individual mounting plates according to clients' request, e.g. welding plates, rope clamps and angle holders



The data recording unit consists of an automatic measuring device of type MFA for the control of up to 999 measuring points, an electrical and optical change-over manifold and of the core component, an AWE monitor station with analog or optional digital measuring output which is also available as 2-channel measuring device. The control and data storage is done by the automatic measuring device MFA. It can easily be read out and programmed by remote control via an analog- or ISDN modem of a personal computer.

For evaluation and programming of the measuring device we recommend our Windows software GLA 7 on the base of an up-to-date SQL data bank with a lot of possibilities of display and visualisation of your project and the data recorded with it.



Schematic assemblage:

1. Assembling holder head piece acc. to client's request
2. Optical monomode glass fibre with Bragg grating
3. Casing of stainless steel
4. Assembling holder base acc. to client's request
5. Cable screwing
6. PE protective tube
7. PG protective screwing
8. Watertight protective sleeve for Spice connection
9. Fibre connection with watertight sealed SILGEL filling
10. Standard cable length up to 1000 m without reinforcement
11. Angular cut plug for minimum damping loss

Technical data:

Basic length:	250 mm (approx. 290 mm total length)
Model:	Stainless steel
Operating temperature:	-30 °C up to approx. 80 °C
Measuring range:	0 up to 0.5 mm elongation over basic length (upsetting adjustable by prestressing of up to 80% within measuring range)
Resolution:	0.02 % VE
Measuring accuracy:	0.2 % VE
Temperature sensitivity:	< 0.05 % VE individually determined

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