HIGH TEMPERATURE FIBER SENSORS

UP TO +150ºC

Fiber displacement sensor OSD measures tension and compression.

SENSORS SPECIFICATION	OSD-540
Sensor material	D16T
Size, mm	250 x 180 x 60
Method of attachment	Screw connection
Connecting size	M10
Installation base size, mm	200 ± 0.7
Resonance wavelength, nm	1510 ÷ 1590
Displacement measuring range, mm	± 2.5
Resolution, μm	1
Accuracy in the entire range, μm	± 20
Temperature compensation	Yes
Temperature measuring range, ºC	- 70 ÷ +150
Force corresponding to maximum measurable deformation, kg	7.5

Main advantages of fiber optic sensors (FOS)

- non-inductive (protection from external electromagnetic fields and interference) – due to the optical frequency range, and dielectric properties of fiber optics materials;
- high sensitivity;
- high reliability and reproducibility of measurements – due to the use of spectral measurement methods;
- wide dynamic range of measurements - due to high spectral brightness of modern radiation sources and high sensitivity of existing photodetectors;
- small dimensions of sensitive elements - due to the small diameter of the fiber itself (~ 100 μm);
- light weight of sensitive elements, as a consequence of small dimensions;
- high chemical and corrosion resistance – materials of fiber optics can be selected in such way to ensure the absence of chemical interaction with a chemically aggressive medium;
- high thermal resistance - due to the ability of optical fibers to maintain their optical and mechanical characteristics at temperatures of 600 °C and above for a long time;
- high radiation resistance – fibers are able to maintain operability at absorbed radiation doses of 1 MGy and higher;
- electrical insulation strength – for example the voltage of electric breakdown of quartz glass is ~ 10 kV / mm (20°C) and ~ 2,5 kW / mm (500°C);
- high elasticity - due to the high values of the elasticity modulus and the tensile strength (for quartz glass ~ 76 GPa and ~ 10 GPa, respectively);
- high fire safety - due to the absence of electrical currents and heated areas in the construction of sensing elements;
- multipoint and distributed measurements;
- remote measurements - low losses in optical fibers;
- possibility of integration into structural elements of mechanisms, units and structures - without deterioration of their mechanical characteristics;
- short response time of sensitive elements (1 ms and better), limited by the reaction time of the structural elements, not by fibers.