

12.1010 MUST DEFORMATION SENSOR

Fiber Bragg Grating (FBG)



GENERAL DESCRIPTION

The FBG deformation sensors are transducers that transform a static or dynamic distance variation into a change in reflected wavelength of a pre-stressed Fiber Bragg Grating that can be measured with SMARTTEC Reading Units.

TECHNICAL DESCRIPTION

The sensor is composed of an active and a passive part. The active part contains the measurement fiber and measures the deformations between its two ends, transforming it into a wavelength shift of the Fiber Bragg Grating. The passive part is insensitive to deformations and is used to connect the sensor to the Reading Unit. In the passive part of the sensor, it is possible to install a loose Fiber Bragg Grating for temperature sensing and compensation.

The sensors are available in single-ended, double-ended and chained configuration. It is possible to connect up to 7 full-range temperature compensated sensors. The sensors are terminated with E2000-APC connectors or on user's specifications.

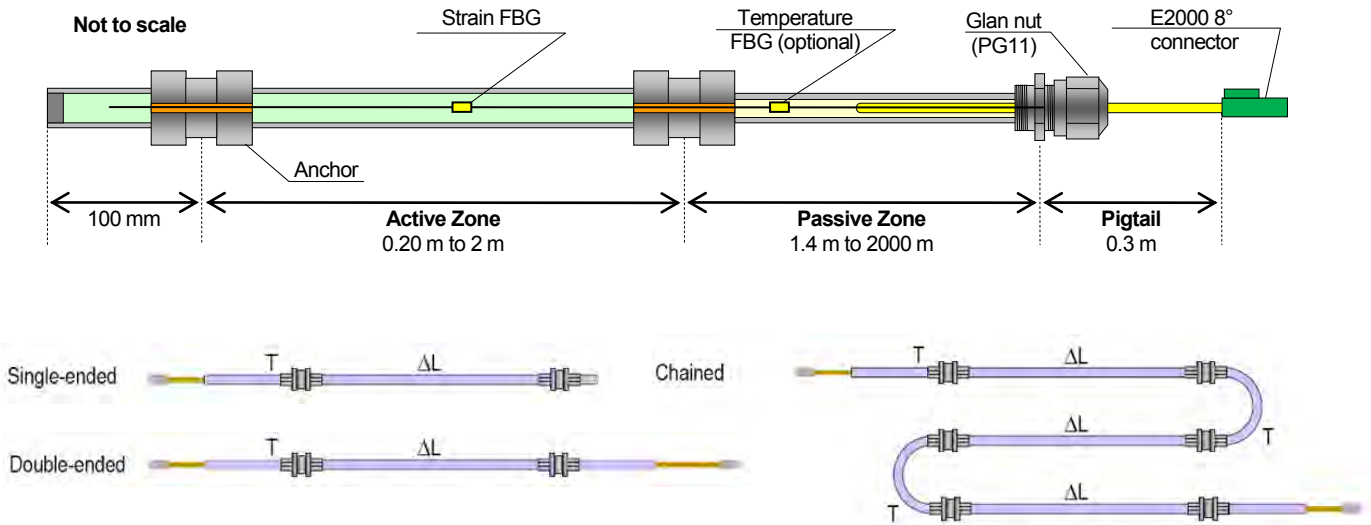
The sensors can be quickly and easily installed without affecting the construction schedule. They can be directly embedded in concrete and mortars, or surface mounted.



FEATURES

- High resolution
- Static and dynamic measurements
- Long Gauge-length
- Embeddable in concrete or surface mountable
- Temperature compensation
- Available in single-ended, double-ended and chained configurations
- Insensitive to corrosion
- Immune to electromagnetic fields
- Easy to install
- Long lifetime
- Waterproof

SENSOR CONFIGURATION



TECHNICAL CHARACTERISTICS

Length of active zone (measurement basis)	20 cm to 2m
Length of passive zone (connecting cable)	1 to 200 m (longer distances available on request)
Pre-tensioning of the measurement fiber	0.5% of the length of active zone (others on special request)
Connecting cable protection options (see Fiber Optic cable datasheet 40.1020 for details)	Standard cable: Gray (for embedding or surface mounting in normal conditions) Stainless steel reinforced cable: Black (recommended in harsh conditions) Simple unprotected cable: Yellow (only for laboratory conditions)
Measurement range	Strain: 0.5 % in shortening, 0.75 % in elongation -2500 $\mu\epsilon$ to +3000 $\mu\epsilon$ (for chain configuration) Temperature: -40 °C to +80 °C
Strain resolution / accuracy	0,2 $\mu\epsilon$ / 2 $\mu\epsilon$ (using SMARTEC Reading Units)
Optical connectors	E-2000 AC (8°)
Temperature measurement range	-40 °C to +80 °C
Operating temperature	Passive zone: -40 °C to +80 °C Standard active zone: -50 °C to +110 °C Special active zone (upon request): -50 °C to +170 °C
Waterproof	5 bars (15 bars with extra protection on anchoring points)

ORDERING INFORMATION

- Active Length, Cable length, FBG Wavelength, Temperature compensation (Yes/No), Single/Double Ended, Cable type