T420 / FBG Displacement Sensor to 30mm

Description

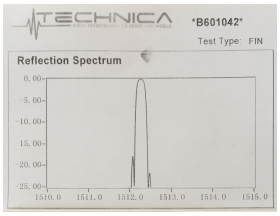
The T420 is a Single-Mode Fiber (SM) based Fiber Bragg Grating (FBG) based Packaged Displacement Sensor for use in environments from -20°C to +60°C.

Available in a wide range of optical specifications. Packaged to eliminate influences from the ambient environment. Ready for direct mounting steel construction exhibiting excellent wavelength to displacement linearity. Calibration service available upon request. The full-scale (FS) accuracy and precision specifications take into account any hysteresis, non-linearities, and the repeatability of the sensor. The T420 sensor handling and installation is fast, easy and intuitive. Delivers the advantages inherent to FBG based sensors. Immune to lightning and electromagnetic interference (EMI). Rugged construction.

T420 series Displacement Sensors are fabricated using licensed and proprietary state-of-the-art laser manufacturing technologies and product designs. The sensor packaging described herein represents the most popular configuration and can be customized.

Manufactured and sold by Technica under International Licenses from United Technologies Corporation, Inc and Sylex Corporation.

Key Features



Displacement and temperature linearity. The unibody T420 design for both displacement and temperature measurements uses precision made FBGs written into the fibers' core for producing a transducer configuration of high linearity, resolution, accuracy, and precision. SLSR & BW options.

Absolute temperature sensor included. The T420 displacement sensor includes an actual second absolute FBG temperature sensor embedded in its construction and serving as both precise temperature compensator and as an independent absolute temperature sensor.

Zero displacement level is adjustable during installation. Field adjustable range between -15mm to +15mm and 0 to 30mm to the application requirements.

Ready for multiplexing in star architecture. Well suited for projects that include the need to monitor displacement at more than one location, using the same monitoring instrument channel. Provided as single connectorized sensors or in ready to install star networks of various lengths and with a flexible number of sensors.

Multiple installation options. The T420's brackets are typically installed using welding, mounting screws, or by chemical (glue) bonding. Sensors have M6x0.5 & M16x1.5 threads for mounting.

Low cost and field proven. For demanding projects that require both low cost per sensing point and stable operation for long-term. Extensively used in projects measuring dilations, soil and other materials settlements, rock movement and crack monitoring, and as borehole extensometers, since 2012.

Parameter	Specifications
Wavelengths and Tolerance	1459 to 1621 nm, +/-0.5 nm; 980, 1060, 1310 nm, other
Reflection BW (FWHM)	0.1 nm to 2.0 nm; other opt.
Reflectivity %	75% (1% to 99% available)
SLSR	15 dB; other options
Displacement Range	0-30mm, or as -15 to +15mm
Displacement Accuracy	<0.5% FS (<0.3% FS typical)
Displacement Precision	<0.3% FS (<0.2% FS typical)
Temperature Compensation	Integrated within the sensor
Temperature Accuracy	<1°C (for -20°C to +60°C range)
Ingress Protection Rating	IP67
Sensor Pigtail (Length, DIA)	1 m and 3mm, other options
Cable Bend Radius	30 mm Static, 40mm Dynamic
Optical Connector	FC/APC, or custom
Housing Material	Stainless Steel SS316L
Dimensions (Length, DIA)	346.5mm, 18mm
Weight	430g
Mounting Methods	Welding, Screws, or Glue

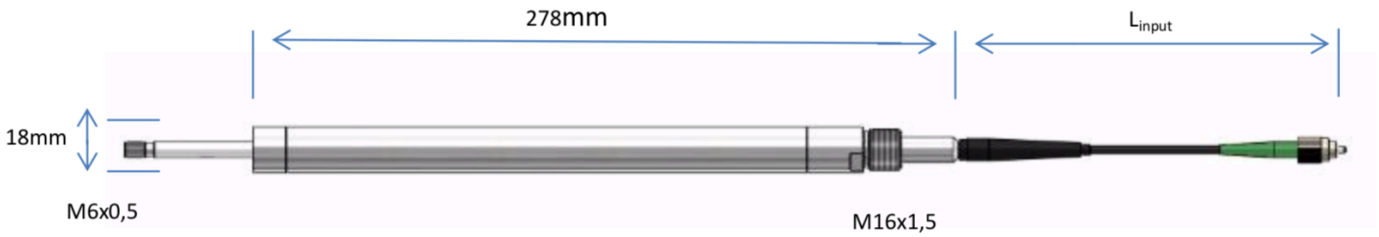
Applications in Civil Engineering, Geotechnical , Energy, Industrial, and Research

Technica undertakes a rigorous development process before products release. The company is also firmly committed to continuous improvements after release to insure performance to the highest standards, hence, specifications are subject to update without notice.

Technica Optical Components / 3657 Peachtree Rd, Suite 10A, Atlanta, 30319, USA, info@technicasa.com, www.technicasa.com

T420 / FBG Displacement Sensor to 30mm

The T420 Displacement Sensor consists of a stainless steel sensor housing and an extension rod:



Welding is the primary recommended method for achieving a long term stable bond between the monitored structure and the T420 brackets. It takes 5-10 minutes.

Tools: (1) TS900 or equivalent welder, (2) FBG interrogator, (3) Custom Mounting Brackets (not included with sensor due to many possible designs, depending on the circumstances of each target installation in the field.

Surface preparation for welding: Regardless of the installation method, it is advisable and in some cases even necessary to properly treat the surface to which the sensor should be applied. This process includes mechanical cleaning of the surface using abrasive materials and removing any paint, rust, debris or similar imperfection from the surface. Chemical treatment of the surface is advice 20min before the installation to avoid of creation of oxide layers on the mechanical treated surface. We recommended cleaning with Loctite 7061 or 7063.

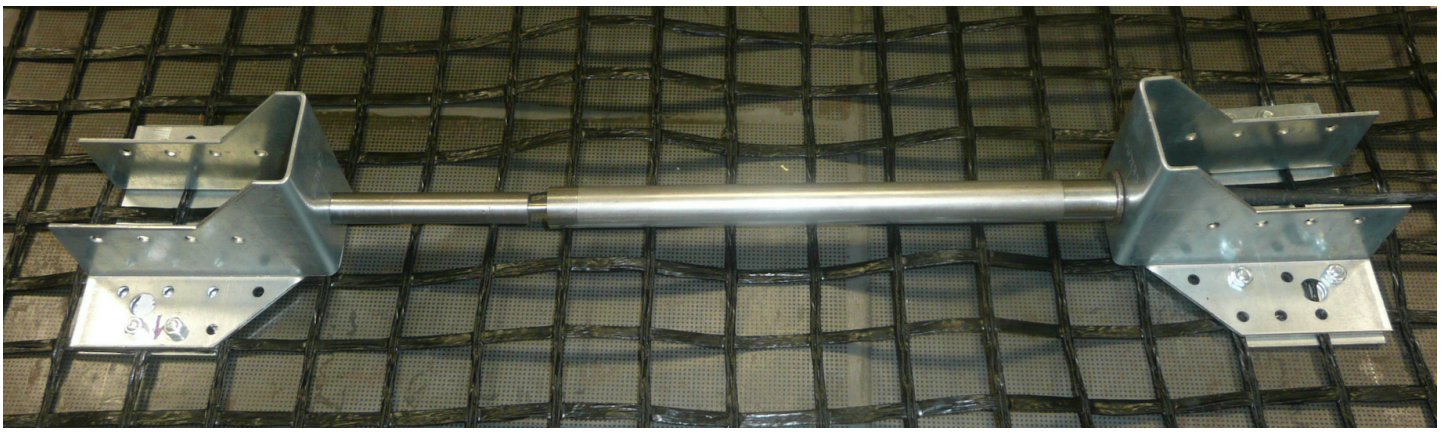
Installation Tips: Avoid extending the rod over the maximum range. Avoid exposing the sensor to temperatures above the maximum operating range of the sensor. Avoid sharp bends and high tensile strength (pull-force) on the input cable to prevent damage to the sensor.

Welding of the sensor to the surface: Direct welding of the custom mounting brackets made for the T420 is the recommended installation method for achieving a long-term stable bond.

Alternative mechanical installation (screwing):
Use two standard M8 metric screws (one at each side). These screws are not supplied with the sensor. This method could be applicable to concrete walls, to other materials, to metal structures (if spot welding is not allowed).

Alternative chemical installation (glue bonding):
Use an adhesive that bonds the T420 brackets with the measured surface. The glue is not supplied with the sensor. The selection of the glue highly depends on the material of the surface and environmental conditions. Special curing procedures such as elevated temperature, pressure or air humidity may be required when using such adhesives.

Mounting the T420 into its custom brackets:
It is recommended that the T420 sensor's housing is first installed into the custom bracket. Then, the extension rod bracket is to be installed. It is recommended that an FBG interrogator is then used to verify the success of the installation.



Technica undertakes a rigorous development process before products release. The company is also firmly committed to continuous improvements after release to insure performance to the highest standards, hence, specifications are subject to update without notice.

Technica Optical Components / 3657 Peachtree Rd, Suite 10A, Atlanta, 30319, USA, info@technicasa.com, www.technicasa.com