

DATA SHEET

FS63LTS Laboratory Temperature Sensor

SPECIAL FEATURES

- Easy and straightforward installation
- Selectable calibration type
- Configurable wavelengths, cable lengths and connector types



DESCRIPTION

The Laboratory Temperature Sensor is a Fiber Bragg Grating (FBG) based sensor designed to be used in laboratory applications. With a small diameter this sensor can be used in applications where space is a limitation. It can be used as a temperature sensor for accurate and reliable temperature measurements, as well as an element for temperature compensation of braided cable strain sensors.

The FS63LTS is based on the newLight® technology developed by HBK FiberSensing. newLight sensors employ high strength fiber coatings ensuring robustness, increased sensitivity, and higher measurement accuracy. HBK FiberSensing offers innovative sensor

designs compatible with standard telecommunication fibers. This eases network design and significantly reduces installation time and cost, even when a large number of sensors are multiplexed on the same fiber, sometimes kilometers apart. The technology is completely passive - fitting explosive environments -, self-referenced - providing measurement long term stability -, and compatible with most interrogators in the market.

Combine this with other strain and temperature sensors from HBK FiberSensing with braided cables by using the configurator K-FS76BRD.

BENEFITS AND APPLICATIONS

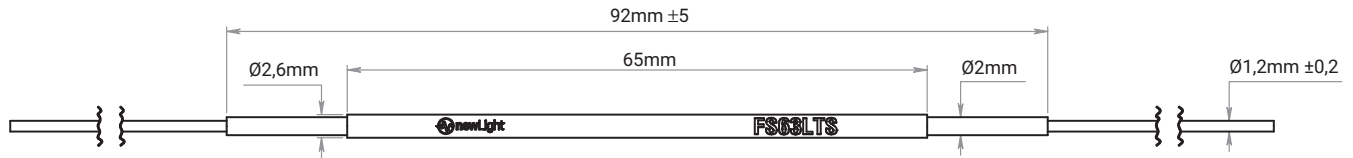
Sensor design

- Extended temperature measurements
- Fitting tight spaces due to small diameter
- To be used as temperature sensor or for temperature compensation
- Rated for laboratory applications, but also fitting outdoor installation with appropriate protection

Fiber Bragg grating technology

- No drift, absolute referenced measurements
- Immune to electro-magnetic and radio frequency interferences
- Passive technology fitting applications in explosive areas
- Reduced cable requirements with intrinsic multiplexing capability
- Long distances between sensors and the interrogators attainable
- Combinable with other FBG sensor types on the same fiber and same interrogator

DIMENSIONS



SPECIFICATIONS

| Sensor | | |
|---|-----------|--|
| Sensitivity ¹⁾ | pm/°C | 30 |
| Temperature compensation factor ²⁾ | (µm/m)/°C | 20 |
| Resolution ³⁾ | °C | 0.02 |
| Maximum calibration error ⁴⁾ | °C | ±0.5 |
| Measurement range | °C | -40 ... +100 |
| Storage temperature ⁵⁾ | °C | -20 ... +80 |
| Operation humidity | % | ≤100 |
| Storage humidity | % | < 95 |
| Sensor bend radius | mm | Cannot be bent |
| Attachment method | n.a. | Glue or tie |
| Dimensions | mm | Ø 2.6±0.5 x 65±0.5 |
| Weight ⁶⁾ | g | 8 |
| Main materials ⁷⁾ | n.a. | Stainless steel, ormocer® |
| Bragg wavelengths | Nm | 1500 ... 1600 (±0.5) |
| Fiber type | n.a. | SMF-28 compatible |
| Fiber cladding and coating diameter | µm | 125/195 |
| FWHM, reflectivity and side lobe suppression | n.a. | ≤ 0.3 nm, 21±4%, > 10 dB |
| Inputs / Outputs | | |
| Cable type | n.a. | Ø 1 mm braided (fiber glass, silicone varnish) |
| Cable bend radius ⁸⁾ | mm | > 16 |
| Cable length ⁹⁾ | m | 0.5 ... 6 |
| Connectors | n.a. | FC/APC, SC/APC or NC (No Connectors) |

¹⁾ Considering an FBG with 1550 nm wavelength. Typical first order.

²⁾ Temperature Compensation Factor (TCF) is the apparent induced strain on the temperature caused by a 1°C change. This value can be used for compensation of strain sensors.

³⁾ For 0.5 pm resolution in wavelength measurement, as found in FS22SI interrogator.

⁴⁾ To achieve absolute measurements as presented in this data sheet, an interrogator with an accuracy of at least ±2 pm is required. Typical traceability uncertainty of ±0.7°C.

⁵⁾ Limited by the connectors areas.

⁶⁾ With 2 m cable each side and no connectors.

⁷⁾ The full composition of the sensor including cable, complies with RoHS, REACH, Conflict Minerals and fire propagation prevention directives.

⁸⁾ Induced loss due to one complete turn around a mandrel lower than 0.05 dB.

⁹⁾ For cables longer than 2 m, a splice is included at 2 m from the sensor protected with dielectric shrinking tube (Ø3x60 mm). Specified cable length is ensured on delivery. A margin of up to 10 cm can be present. For different cable lengths or splice position please contact HBK FiberSensing.

ORDERING INFORMATION

| Configurable Item K-FS63LTS – 1 2 - 3 - 4 - 5 6 | | Standard item ¹⁰⁾ |
|--|---|------------------------------|
| Options | | 1-FS63LTS-1515 |
| 1 | 0 - No calibrator; 1 - Standard Calibration | 1-FS63LTS-1525 |
| 2 | NC - No connector; FC - FC/APC; SC - SC/APC | 1-FS63LTS-1535 |
| 3 | 0.5 m ≤ Cable length ≤ 6 m @0.5 m steps | 1-FS63LTS-1545 |
| 4 | 1515 nm ≤ Wavelength ¹¹⁾ ≤ 1595 nm @10 nm steps | 1-FS63LTS-1555 |
| 5 | 0.5 m ≤ Cable Length ≤ 6 m @0.5 m steps | 1-FS63LTS-1565 |
| 6 | NC - No connector; FC - FC/APC; SC - SC/APC | 1-FS63LTS-1575 |
| | | 1-FS63LTS-1585 |
| | | 1-FS63LTS-1595 |

¹⁰⁾ Standard Items correspond to a configuration: Standard calibration, armor cable with 2 m length to each side terminated with FC/APC connectors. Wavelengths from 1515 nm to 1595 nm spaced at 10 nm.

¹¹⁾ For different wavelengths please contact HBK FiberSensing.

HBK FiberSensing S.A.

Via José Régio, 256 · 4485-860 Vilar do Pinheiro · Portugal

Phone: +351 229 613 010 · Fax: +351 229 613 020

www.hbkworld.com · info.fs@hbkworl.com

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