



FS62 - Athermal Strain Sensor

Optical Athermal Strain Sensor

The **FS62 - Athermal Strain Sensor** is a Fiber Bragg Grating (FBG) based sensor with an innovative proprietary design that ensures **athermal operation of the strain gauge** by cancelling the intrinsic fiber optic thermal sensitivity (standard option).

The measurement of temperature for the compensation of cross-sensitivity is, therefore, not necessary. This **benefits large scale system design and overall performance**.

The **FS62 - Athermal Strain Sensor** can be designed to be bonded onto different structures or components made of several material.

Fiber optic technology
Insensitivity to temperature
Thermal compensation for thermo-optic effects on the sensor
High resolution
Long-term reliability

Characteristics

- **Intrinsic athermal design**
Possible adjustment to further compensate for the thermal expansion of a given structure, thereby enabling stress and load-induced strain components to be measured.
- **Completely passive**
Inherent immunity to all electromagnetic effects (EMI, RFI, sparks, etc.) and safe operation in hazardous environments.
- **High multiplexing capability**
Connection of a large number of sensors to a single optical fiber, reducing network and installation complexity.
- **Remote sensing**
Large distance between sensors and interrogator (several kilometers).
- **Compatible with most interrogator**
Provided with calibration sheet, allowing easy and accurate configuration.
- **Self-referenced**
Based on the measurement of an absolute parameter - the Bragg wavelength - independent of power fluctuations.

Applications

HBM FiberSensing Athermal Strain Sensors can be used for several strain measuring applications. They are particularly suited for structural health monitoring in large structures (SHM).

- Aeronautics
- Civil Engineering
- Industry
- R&D

Accessories

The implementation of complex sensing networks in large structures is made simpler with FiberSensing accessories. These include cables especially designed to resist harsh environments as in civil engineering, not only during construction, but also during the lifetime of the structure (humidity, corrosion, etc.). For the installation of HBM FiberSensing.

Quality

All HBM FiberSensing's processes are strictly controlled from development to production. Each product is subjected to high standard performance and endurance tests, individually calibrated and checked before shipping.

HBM FiberSensing, S.A. concentrates all optical sensing activity of HBM and is an ISO 9001:2008 certified company.



Specifications

Sensor	
Sensitivity ¹	626 $\mu\text{m}/\text{m}/\text{nm}$
K-factor	1.03
Measurement range	$\pm 1500 \mu\text{m}/\text{m}$
Gauge length	23 mm
Resolution ²	0.6 $\mu\text{m}/\text{m}$
Optical	
Central wavelength	1500 to 1600 nm
Spectral width (FWHM)	< 0.2 nm
Reflectivity	> 65%
Side lobe suppression	> 10 dB
Inputs/Outputs	
Cable type	\varnothing 0.9 mm laboratory (hytel)
Cable length	2 m each side (± 5 cm)
Connectors	FC/APC SC/APC NC (No Connectors)
Environmental	
Operation temperature	-20 to 80 °C
Temp. cross sensitivity	< 2 ($\mu\text{m}/\text{m}$) /°C
Mechanical	
Materials	Aluminum, polyimide, polycarbonate and vinyl
Dimensions	32 x 10 x 0.8 mm
Weight	1 g

¹ Typical values.

² For 1 pm resolution in wavelength measurement, as found in FS22SI interrogator.

Ordering Information

FS62 – Athermal Strain Sensors

P/N

K-FS62 15 **bb** 102 **d**

WAVELENGTH

N - 1503.3 nm
O - 1509.7 nm
K - 1516.1 nm
L - 1522.5 nm
A - 1528.9 nm
B - 1535.1 nm
C - 1541.5 nm
D - 1547.9 nm
E - 1554.3 nm
F - 1560.8 nm
G - 1567.2 nm
H - 1573.8 nm
I - 1580.2 nm
J - 1586.6 nm

CONNECTIONS

10 – No connectors
11 – Optical Connector FC/APC
13 – Optical Connector SC/APC