

DATA SHEET

FS62PSS

Patch Strain Sensor

SPECIAL FEATURES

- High strain and high fatigue resistance
- Straightforward installation
- Configurable wavelengths, cable lengths and connector types



DESCRIPTION

The Patch Strain Sensor is a Fiber Bragg Grating (FBG) based sensor designed to be easily glued to surfaces. It operates as a smart encapsulation of an FBG turning it into a robust solution for a straightforward and uncomplicated installation even for unexperienced users.

The FS62PSS is based on the newLight® technology developed by HBK FiberSensing newLight sensors employ high strength fiber coatings ensuring increased strain ranges, enhanced fatigue resistance 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 cable by using the configurator K-FS76BRD.

BENEFITS AND APPLICATIONS

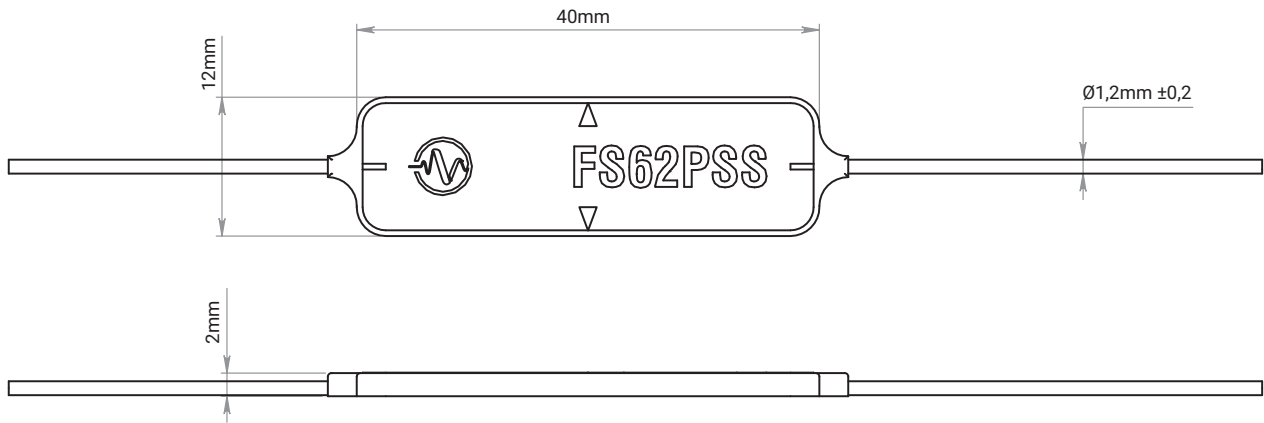
Sensor design

- Fitting new materials with high strain measurement range and high fatigue resistance
- Extended operating temperature range
- Suited for measuring on curved surfaces
- 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		
k-factor	n.a.	0.79±0.03
Sensitivity ¹⁾	pm/(µm/m)	1.2
Resolution ²⁾	µm/m	0.5
Measurement range	µm/m [%]	±20000 [2]
Gauge length	mm	36
Transverse sensitivity	%	0
Operation temperature	°C	-40 ... +100
Storage temperature ³⁾	°C	-20 ... +80
Operation and storage humidity	%	< 95
Temperature cross sensitivity ⁴⁾	(µm/m)/°C	6.5±1
Fatigue ⁵⁾	# cycles	$\epsilon_w = \pm 1000 \mu\text{m/m}$ and $\Delta\epsilon_m \leq 30 \mu\text{m/m}$ >>10 ⁷ (aborted after 10 ⁷ load cycles)
Sensor bend radius	mm	> 25
Attachment method	n.a.	Glue (Z70, X60, X280 ⁶⁾)
Dimensions	mm	40±0.5 x 12±0.5 x 2±0.5
Weight ⁷⁾	g	5
Main materials ⁹⁾	n.a.	Modified acrylic resin, plastic material potting, vinyl, ormocer®
Bragg wavelengths	nm	1500 ... 1600 (±1)
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, 20±3%, > 10 dB

Inputs / Outputs		
Cable type	n.a.	Ø 1 mm braided (fiber glass, silicone varnish)
Cable bend radius ⁸⁾	mm	> 16
Cable length ¹⁰⁾	m	0.5 ... 6
Connectors	n.a.	FC/APC, SC/APC or NC (No Connectors)

- 1) Typical. Considering an FBG with 1550 nm wavelength.
- 2) For 0.5 pm resolution in wavelength measurement, as found in FS22SI interrogator.
- 3) Limited by the connectors areas.
- 4) Temperature Cross Sensitivity (TCS) is the thermal strain induced by a 1 °C change in temperature.
- 5) At 23°C when using Z70 adhesive. Achieved number of load cycles with Alternating strain ϵ_w and variation of zero point $\Delta\epsilon_m$. The achievable number of load cycles is dependent on quality of installation and fatigue life of component under investigation.
- 6) Contact pressure when using X280 with optical strain gauge: 1 N/cm².
- 7) With 2 m cable each side and no connectors.
- 8) Induced loss due to one complete turn around a mandrel lower than 0.05 dB
- 9) The full composition of the sensor including cable, complies with RoHS, REACH, Conflict Minerals and fire propagation prevention directives.
- 10) 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		Standard item ¹¹⁾
K-FS62PSS – 1 2 – 3 – 4 5		
Options		1-FS62PSS-1510
1	NC - No connector; FC - FC/APC; SC - SC/APC	1-FS62PSS-1520
2	0.5 m ≤ Cable length ≤ 6 m @0.5 m steps	1-FS62PSS-1530
3	1510 nm ≤ Wavelength ¹²⁾ ≤ 1590 nm @10 nm steps	1-FS62PSS-1540
4	0.5 m ≤ Cable Length ≤ 6 m @0.5 m steps	1-FS62PSS-1550
5	NC - No connector; FC - FC/APC; SC - SC/APC	1-FS62PSS-1560
		1-FS62PSS-1570
		1-FS62PSS-1580
		1-FS62PSS-1590

- 11) Standard Items correspond to a configuration: Braided cable with 2 m length to each side terminated with FC/APC connectors. Wavelengths from 1510 nm to 1590 nm spaced at 10 nm.
- 12) For different wavelengths please contact HBK FiberSensing.

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