

DATA SHEET

FS62PSR

Patch Strain Rosette

SPECIAL FEATURES

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



DESCRIPTION

The Patch Strain Rosette is a Fiber Bragg Grating (FBG) based sensor designed to be easily glued to surfaces. It has three FBG at 0°/60°/120° embedded on the same substrate turning it into a robust solution for a straight-forward and uncomplicated installation even for unexperienced users.

The FS62PSR 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. Please contact HBK FiberSensing for support.

BENEFITS AND APPLICATION

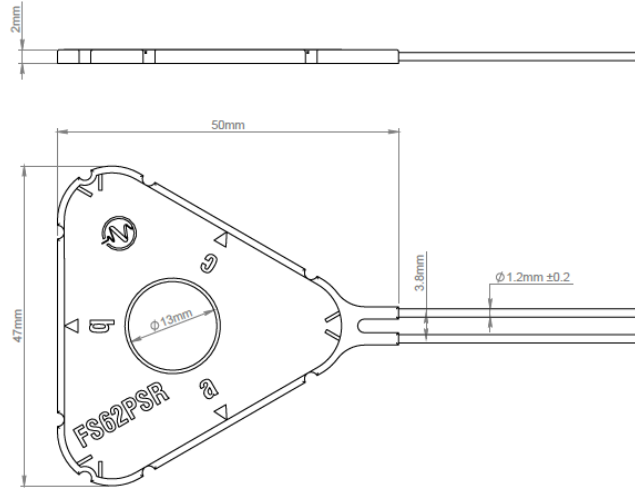
Sensor design

- Bi-dimensional stress analysis with 0°/60°/120° rosette strain measurement
- 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 per FBG	n.a.	0.79±0.03
Sensitivity ¹⁾	pm/(µm/m)	1.2
Resolution ²⁾	µm/m	0.5
Measurement range ³⁾	µm/m [%]	±10000 [1]
Gauge length	mm	36
Transverse sensitivity ⁴⁾	%	0
Operation temperature	°C	-40 ... +100
Storage temperature ⁵⁾	°C	-20 ... +80
Operation and storage humidity	%	< 95
Temperature cross sensitivity ⁶⁾	(µm/m)/°C	7.6±1
Insertion loss ⁷⁾	dB	0.3
Fatigue ⁸⁾	# Cycles	εw= ±1000µm/m and Δεm≤30 µm/m >>10 ⁷ (aborted after 10 ⁷ load cycles)
Sensor bend radius	mm	> 25
Attachment method	n.a.	Glue (Z70, X60, X280 ⁹⁾)
Dimensions	mm	47±1 x 50±1 x 2±0.5
Weight ¹⁰⁾	g	11
Main materials ¹¹⁾	n.a.	Modified acrylic resin, plastic material potting, vinyl and 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, 21±4%, > 10 dB

1) Typical per FBG. Considering an FBG with 1550 nm wavelength.

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

3) Maximum elongation per FBG. To ensure that signals from the same rosettes do not overlap at high strain measurements, care must be taken on the wavelength selection. Standard wavelength options for high strain are 1510/1530/1550 nm or 1550/1570/1590 nm.

4) Per FBG. As per VDI/VDE/GESA 2635. A tolerance cannot be given as the transverse sensitivity is 0.

5) Limited by the connectors area.

6) Temperature Cross Sensitivity (TCS) is the thermal strain induced by a 1°C change in temperature on each FBG.

7) Typical value. Without connectors and dual splice to standard telecom fiber (ITU-T G.652.D).

8) At 23°C when using Z70 adhesive. Achieved number of load cycles with alternating strain εw and variation of zero point Δεm. The achievable number of load cycles is dependent on quality of installation and fatigue life of component under investigation.

9) Contact pressure when using X280 with optical strain gauge: 1 N/cm².

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

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

Inputs/Outputs		
Cable type	n.a.	Ø1 mm braided (fiber glass, silicone varnish)
Cable bend radius ¹²⁾	mm	>16
Cable length ¹³⁾	m	0.5 ... 6
Connectors	n.a.	FC/APC, SC/APC or NC (No Connectors)

¹²⁾ Induced loss due to one complete turnaround a mandrel lower than 0.05 dB.

¹³⁾ 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 ¹⁴⁾	
K-FS62PSR-1-2-3-4-5			
Options		1-FS62PSR-3505	
1	NC - No connector; FC - FC/APC; SC - SC/APC	1-FS62PSR-3520	
2	0.5 m ≤ Cable length ≤ 6 m @0.5 m steps	1-FS62PSR-3535	
3	1505 nm ≤ Wavelengths ¹⁵⁾ ≤ 1590 nm	1-FS62PSR-3550	
4	0.5 m ≤ Cable Length ≤ 6 m @0.5 m steps	1-FS62PSR-3565	
5	NC - No connector; FC - FC/APC; SC - SC/APC	1-FS62PSR-3580	

¹⁴⁾ Standard Items correspond to the configuration: Braided cable with 2 m length to each side terminated with FC/APC connectors. Wavelengths trios starting at the defined wavelength, spaced at 5 nm (e.g. 1-FS62PSR-3535 has 1535/1540/1545 nm).

¹⁵⁾ Available wavelength trios are 1505/1510/1515 nm, 1520/1525/1530 nm, 1535/1540/1545 nm, 1550/1555/1560 nm, 1565/1570/1575 nm, 1580/1585/1590 nm, 1510/1530/1550 nm and 1550/1570/1590 nm. For different wavelengths please contact HBK FiberSensing.

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