

DATA SHEET

FS62WSR

Weldable Strain Rosette

Aramid or Armor cable

SPECIAL FEATURES

- Spot welding installation
- Robust design
- Configurable wavelengths, cable lengths and connector types



DESCRIPTION

The Weldable Strain Rosette is a Fiber Bragg Grating (FBG) based sensor designed to be spot welded to metallic surfaces using a low power welding machine. It has three FBG at 0°/60°/120° on a weldable substrate turning it into a robust and resistant solution for usage in demanding environments as seen in many field applications.

The FS62WSR 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 aramid or armored cable, assembled from factory. Please contact HBK FiberSensing for support.

BENEFITS AND APPLICATION

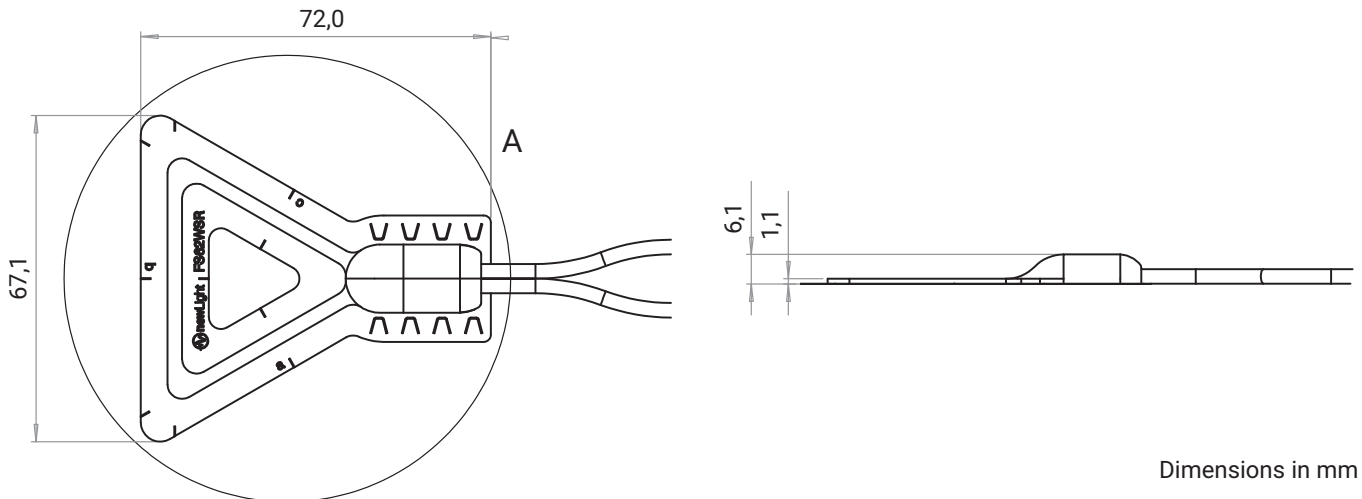
Sensor design

- Bi-dimensional stress analysis with 0°/60°/120° rosette strain measurement
- Easy installation by spot-welding with immediate measurements after installation
- Suited for measuring on curved surfaces
- Validated resistance to shock
- Appropriate for usage on outdoor and offshore applications
- Fitting applications like structural health monitoring of large structures like bridges, pipelines, ship hulls, monopiles

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



Dimensions in mm

SPECIFICATIONS

Sensor		
k-factor	n.a.	0.76±0.02
Sensitivity ¹⁾	pm/(μm/m)	1.2
Resolution ²⁾	μm/m	0.5
Measurement range ³⁾	μm/m (%)	±2000 (0.2)
Gauge length	mm	36
Operation and storage temperature	°C	-20 ... +80 ⁴⁾
Operation and storage humidity	%	< 95
Temperature cross sensitivity ⁵⁾	(μm/m)/°C	6.6 ±1
Insertion loss ⁶⁾	dB	0.2
Sensor bend radius	mm	> 400
Substrate thickness	mm	0.1
Attachment method	n.a.	Spot welding ⁷⁾
Dimensions	mm	72.0±1 x 67.1±1 x 6.1±0.5
Weight ⁸⁾	g	Aramid: 31, Armor: 62
Main materials ⁹⁾	n.a.	Stainless steel, epoxy and ormocer®
Bragg wavelengths	nm	1500 ... 1600 (±1)
Fiber type	μm	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. 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 Fiber Bragg Grating. 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) Above 60 °C creep values above 0.5% may be observed. Technical Note is available for further details.

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

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

7) Required spot welding machine with low power, 20 to 70 V, 26 to 80 Ws.

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

9) 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.	Ø 3 mm aramid (hytel, Kevlar® and LSZH) or Ø 3 mm armor (hytel, stainless steel spiral, Kevlar®, stainless steel mesh and LDPE)
Cable bend radius ¹⁰⁾	mm	>30
Cable length ¹¹⁾	m	0.5 ... 20
Connectors	n.a.	FC/APC, SC/APC or NC (No Connectors)

¹⁰⁾ Induced loss due to one complete turn around a mandrel lower than 0.05 dB.

¹¹⁾ For cables longer than 2 m, a splice with polyimide protection is included at 2 m from the sensor protected with dielectric shrinking tube (Ø8x150 mm). Specified cable length is ensured on delivery. A margin of up to 10 cm can be present. Extension cables are delivered with acrylate coated fiber. For different cable lengths or splice position please contact HBK FiberSensing.

ORDERING INFORMATION

Configurable Item		Standard item ¹²⁾
K-FS62WSR -1 -2 -3 -4 -5 -6		
Options		1-FS62WSR-ARM/3505
1	ARD - Aramid Cable, ARM - Armor cable	1-FS62WSR-ARM/3520
1	NC - No connector; FC - FC/APC; SC - SC/APC	1-FS62WSR-ARM/3535
2	0.5 m ≤ Cable Length ≤ 20 m @0.5 m steps	1-FS62WSR-ARM/3550
3	1505 nm ≤ 3 Wavelengths ¹³⁾ ≤ 1590 nm	1-FS62WSR-ARM/3565
4	0.5 m ≤ Cable Length ≤ 20 m @0.5 m steps	1-FS62WSR-ARM/3580
5	NC - No connector; FC - FC/APC; SC - SC/APC	

¹²⁾ Standard Items correspond to a configuration: Armor 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-FS62WSR-3535 has 1535/1540/1545 nm).

¹³⁾ 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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