

## DATA SHEET

# FS65ACC Accelerometer

## SPECIAL FEATURES

- Robust design
- In series integration
- Configurable wavelengths, cable lengths and connector types



## DESCRIPTION

The single axis Accelerometer is a Fiber Bragg Grating (FBG) based sensor designed to measure acceleration at different frequencies from 0 to 50 Hz.

The FS65ACC 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.

The accelerometer can be used in a large range of monitoring applications, including measuring load induced vibration of civil structures. Connect two or three accelerometers at orthogonal directions for bi- or tri-axial acceleration measurements. Contact HBK FiberSensing for custom service of preassembling the sensors in such way and connected via splices.

## BENEFITS AND APPLICATIONS

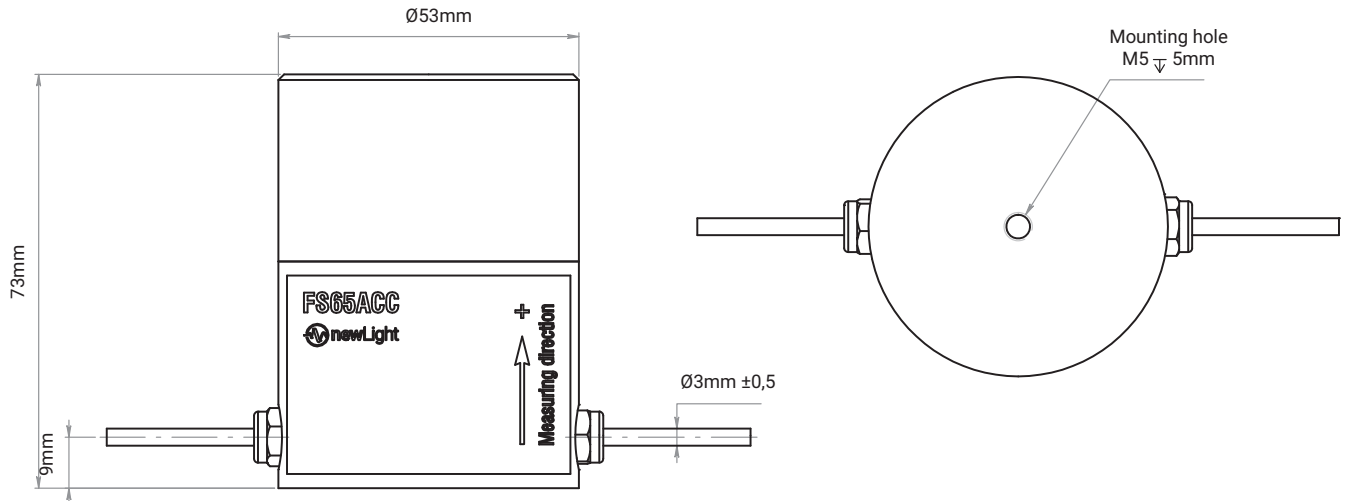
### Sensor design

- In series installation with lead in and lead out fibers
- Possibility to assemble with other accelerometers for bi or tri-axial measurements
- Suited for outdoor applications
- Linear sensitivity at full operation range

### 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 <sup>1)</sup>	pm/g	59
Calibration factor <sup>1)</sup>	g/nm	17
Resolution (time based measurement) <sup>2)</sup>	mg	17
Resolution (frequency based measurement) <sup>3)</sup>	mg	1
Measurement range	g	$\pm 10$
Frequency range	Hz	0 ... 50
Resonance frequency	Hz	430
Flatness	%	<2
Transverse sensitivity	%	<0.1
Maximum calibration error <sup>5)</sup>	g	$\pm 0.1$
Operation and storage temperature	$^{\circ}\text{C}$	-20 ... +80
Temperature cross sensitivity <sup>6)</sup>	$\text{g}/^{\circ}\text{C}$	0.4
Degree of protection <sup>7)</sup>	n.a.	IP65
Attachment method <sup>8)</sup>	n.a.	Bolted (M5)
Dimensions	mm	$\varnothing 53 \times 73$
Weight <sup>9)</sup>	g	338
Main materials <sup>10)</sup>	n.a.	Aluminum, stainless steel, ormocer®
Bragg wavelengths	nm	1500 ... 1600 ( $\pm 0.5$ )
Fiber type	n.a.	SMF-28 compatible
Fiber cladding and coating diameter	$\mu\text{m}$	125/195
FWHM, reflectivity and side lobe suppression	n.a.	$\leq 0.3 \text{ nm}$ , $21 \pm 4\%$ , $> 10 \text{ dB}$
Inputs / Outputs		
Cable type	n.a.	$\varnothing 3 \text{ mm}$ armor (Hytel, stainless steel spiral, Kevlar® stainless steel mesh and LDPE)
Cable bend radius <sup>11)</sup>	mm	> 30
Cable length <sup>12)</sup>	m	0 ... 20
Connectors	n.a.	FC/APC, SC/APC or NC (No Connectors)

## ORDERING INFORMATION

Configurable Item		Standard item <sup>13)</sup>
K-FS65ACC – 1 2 – 3 – 4 5		
<b>Options</b>		1-FS65ACC-10/1530
<b>1</b>	<b>NC</b> - No connector; <b>FC</b> - FC/APC; <b>SC</b> - SC/APC	1-FS65ACC-10/1540
<b>2</b>	0.5 m ≤ <b>Cable length</b> ≤ 20m @0.5 m steps	1-FS65ACC-10/1550
<b>3</b>	1510 nm ≤ <b>Wavelength</b> <sup>14)</sup> ≤ 1590 nm @10 nm steps	1-FS65ACC-10/1560
<b>4</b>	0.5 m ≤ <b>Cable Length</b> ≤ 20 m @0.5 m steps	1-FS65ACC-10/1570
<b>5</b>	<b>NC</b> - No connector; <b>FC</b> - FC/APC; <b>SC</b> - SC/APC	

- 1) Typical values. Value measured at 35 Hz.
- 2) For 1 pm resolution in wavelength measurement, as found in FS22DI interrogator.
- 3) Dynamic signals obtained with FFT analysis using an FS22DI interrogator for wavelength measurement. For further details refer to HBK FiberSensing technical notes.
- 4) Typical values.
- 5) Calibrated at 35 Hz. Typical traceability uncertainty of ±0.4 g<sub>(0-pk)</sub>.
- 6) Typical value. Temperature Cross Sensitivity (TCS) is the apparent acceleration induced by a 1 °C change in temperature.
- 7) DIN EN 60529.
- 8) Anchors and screws not included.
- 9) With 2 m cable each side and no connectors.
- 10) The full composition of the sensor including cable, complies with RoHS, REACH, Conflict Minerals and fire propagation prevention directives.
- 11) Induced loss due to one complete turn around a mandrel lower than 0.05 dB.
- 12) For cables longer than 2 m, a splice (Ø8x150 mm) is included at 2 m from the sensor. 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.
- 13) Standard Items correspond to a configuration: 2 m length cable to each side terminated with FC/APC connectors. Wavelengths from 1530 nm to 1570 nm spaced at 10 nm.
- 14) For different wavelengths please contact HBK FiberSensing.

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 They are not to be understood as a guarantee of quality or durability.