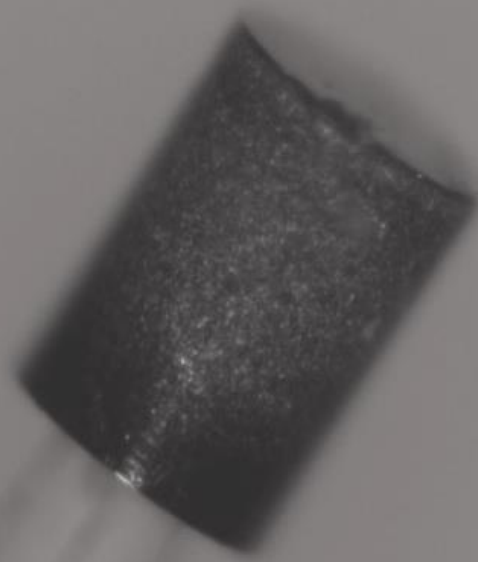


DATASHEET

PRESSURE SENSORS





Applications

Optics11 pressure sensors have a large range of possible applications, including:

- ▀ Medical applications
- ▀ Surface wing pressure distributions
- ▀ Condition monitoring
- ▀ Oil and gas exploration
- ▀ Civil engineering
- ▀ Acoustic measurements
- ▀ High EMI or RFI areas

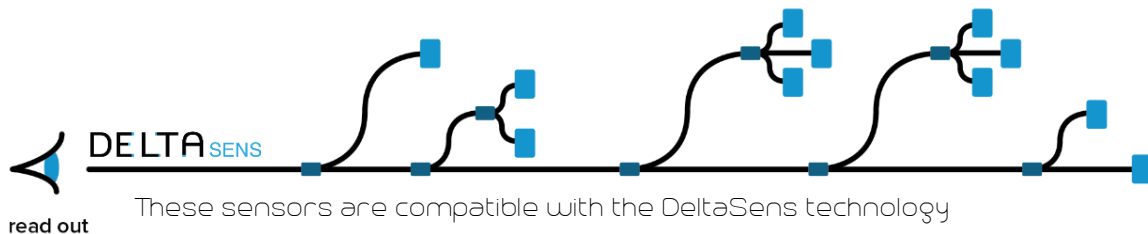
Description

This miniature pressure sensor is based on optical fiber technology and is therefore completely passive and extremely small. The sensing principle is based on Fabry-Perot interferometry, which enables the highest sensitivity and smallest dimensions on the market.

Optical fiber sensors have proven to be of value in many industrial applications. This is mainly due to their intrinsic benefits such as ability to provide reliable data in liquid environments, strong EMI fields, extreme temperatures and remote operation without requirement of additional electronic equipment at the sensing location.

As the Fabry-Pérot is the most sensitive optical transducer on the market, our current pressure transducer can detect pressure variations down to the μbar level. Connecting several sensors in a network is possible by using our unique patented readout technology (DeltaSens). Using this technology, it even allows to integrate different sensor types to your measurement system, like temperature or acceleration.

Sensors with different pressure range are available upon request.



Main characteristics

- ▀ *All-optical fiber based sensor*
Inherent immunity to all electromagnetic effects (EMI, RFI, sparks, etc.), intrinsic safety, and operable in liquids and extreme temperatures.
- ▀ *High multiplexing capability*
Connection of a large number of sensors to a single optical fiber, reducing network and installation complexity.
- ▀ *Small dimensions and low weight*
The sensors are packaged in small robust housings with low weight minimizing the impact on the structure.
- ▀ *Remote sensing*
Up to kilometers between sensors and interrogator

Optics11 Series Pressure sensors

Performance		
Absolute pressure range ¹	0.8 - 1.4 bar	1 mbar-5 bar ²
Sensitivity ³	1100 nm/bar	130 nm/bar ²
Output noise density ⁴	0.9 $\mu\text{bar}/\sqrt{\text{Hz}}$	7.7 $\mu\text{bar}/\sqrt{\text{Hz}}$ ²
Nominal sensitivity	Scalable analog output, +/-10 V @ FS	
Acquisition frequency ⁵	DC to 17 kHz	
Dynamic range	120 dB	
Non-linearity ⁶	< 0.1%, see graph below	
Environmental		
Operating temperature ⁷	-40 to 70 °C	
Physical		
Dimensions and weight ⁸	See drawing below	
Cable length	User specified, default 2 m (+/-10 cm)	
Optical		
Visibility	90%	
Operation wavelength	C & L Band	
Fiber type	SMF	
Connector	FC/APC default	
Cable bend radius	≥ 5 mm	
Cable jacket options	0.9mm PVC / 3mm PVC / without jacket	

¹ Different pressure ranges can be offered, kindly contact Optics11.

² By design.

³ Measured sensitivity at ambient temperature using Optics11 DeltaSens interrogator.

⁴ Based on Optics11 DeltaSens noise floor.

⁵ Optics11 DeltaSens sampling frequency.

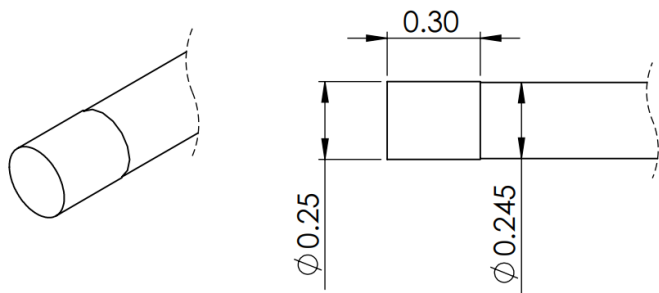
⁶ Measured by Optics11 DeltaSens at ambient temperature.

⁷ Temperature compensation required, which can be offered

⁸ Excluding fiber optic cable.

Housing options

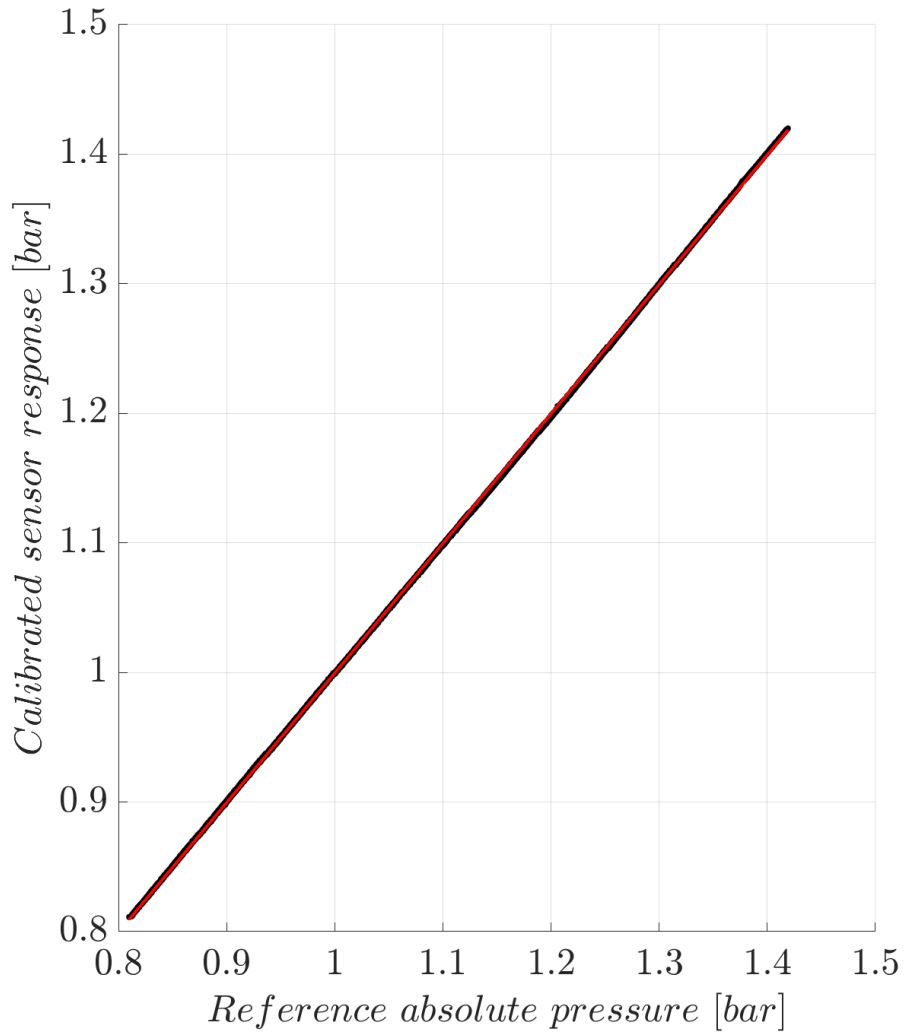
- Silicon nitride / <1 grams



* All dimensions in mm

Graphs
Non-linearity

Typical nonlinearity : 0.007% at 25 Hz acquisition rate



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