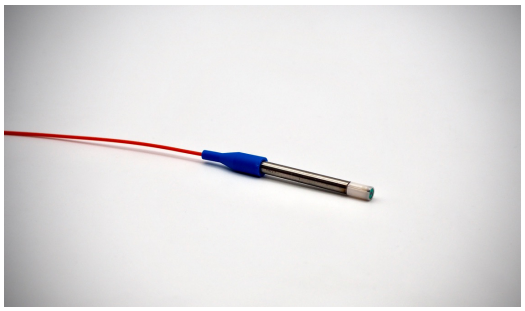
Fiber optic dynamic pressure sensors Alpheus400

Standard version 3.2mm (1.6mm)



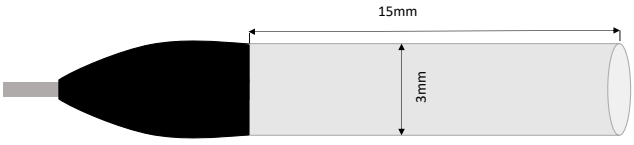
DESCRIPTION

This sensor has been designed to be used in harsh environment with high sensitivity and high frequency. This sensor is fully calibrated for sensitivity and frequency bandwidth

Thanks to its small size, it makes possible the study of acoustic waves at high frequency in pipes

Typical applications:

- Turbine analysis (Compressor stall analysis)
- Non-destructive testing
- High voltage measurements (Overhead line, electrical transformer)
- Arc or HF welding process
- Measurements in ATEX environments



Acoustic

Transducer type	Silicon Nitride membrane
Operational Mode	Differential (front-vented)
Natural frequency	>400kHz
Frequency range	100Hz-400kHz
Maximal dynamic pressure	3 Bar (3.10^5 Pa) (≈203dB SPL)
Maximal static pressure	Not limited. May change frequency response
Self-noise	90dB SPL (BW: 1Hz, over full bandwidth). ~0.01mBar
Damage threshold	>5 Bar (≈210dB SPL)
Sensitivity	1µV/Pa (0.1V/Bar)
Polar pattern	Omnidirectional
Sound field optimization	Pressure-field
Calibration	Calibrated at factory. Adapter available

General

Pressure Media	Any gas / water
Rated Optical Excitation	150 µW @1310nm
Fiber type	Multimode 50/125 OM2
Sensor head dimensions	3.2 mm (2.5mm possible) x 10 mm (1.6mm available)
Sensor head weight	0.5 gram
Fiber cable length	Standard 2 meters.

Environmental

Operating Temperature Range	-40° C to 350° C
Peak short-term	420° C
Temperature influence	<1% of response sensitivity
Environmental humidity	100% RH
EMI/RFI	Full immunity. No influence

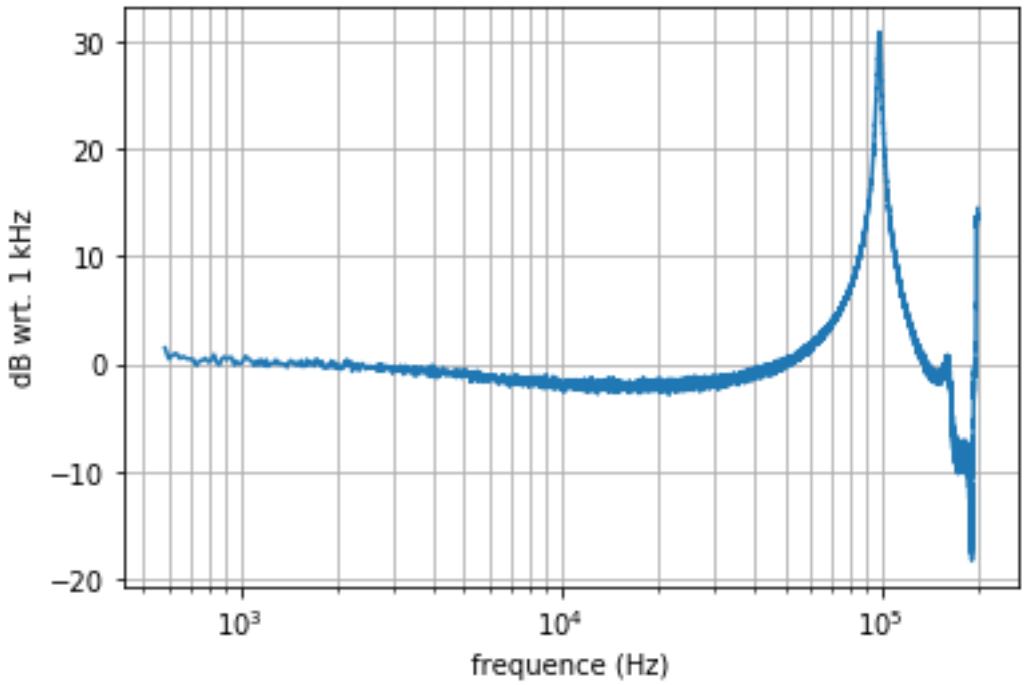


Figure 1- Frequency response measured with electrostatic actuator method

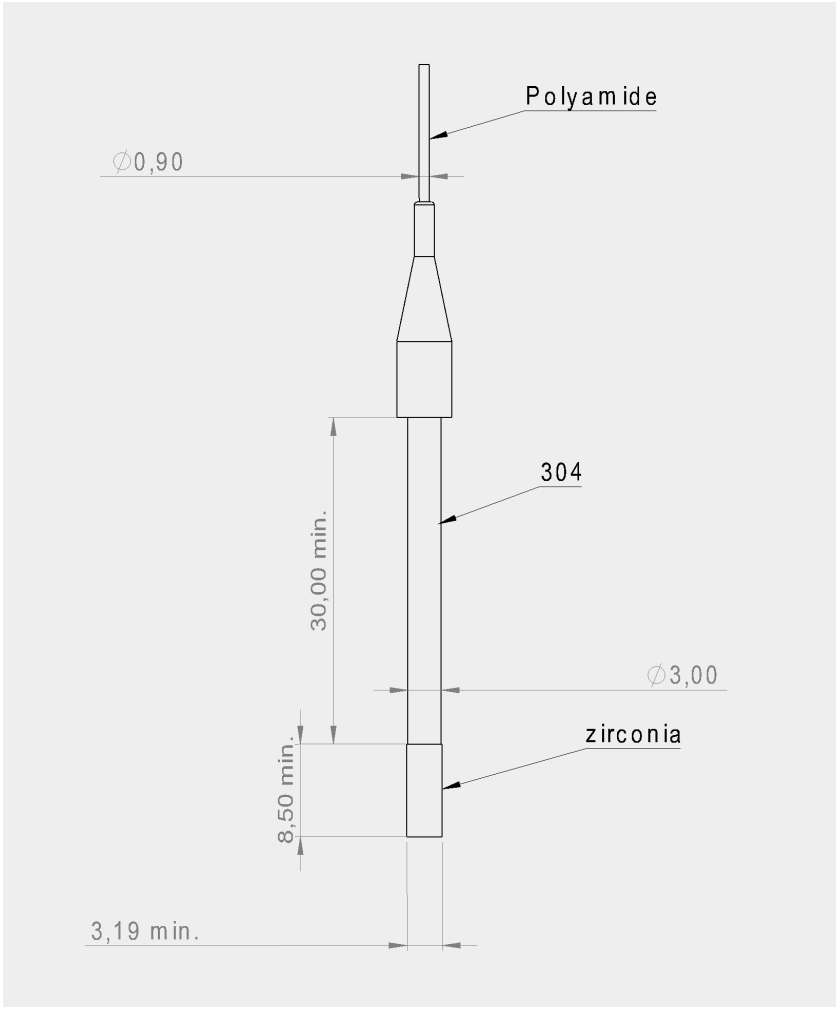


Figure 2 - Mechanical drawing