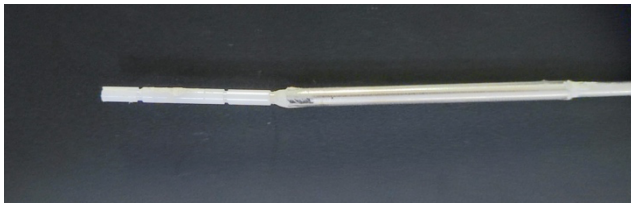
# Fiber optic dynamic pressure sensors Alpheus400

## High Temperature 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** | 110dB SPL (BW: 1Hz, over full bandwidth). ~0.06mBar |
| **Damage threshold** | >5 Bar (≈210dB SPL) |
| **Sensitivity** | 1.5µV/Pa (50mV/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** | Saphir 200µm |
| **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 800° C |
| **Peak short-term** | 850° C |
| **Temperature influence** | <1% of response sensitivity |
| **Environmental humidity** | 100% RH |
| **EMI/RFI** | Full immunity. No influence |

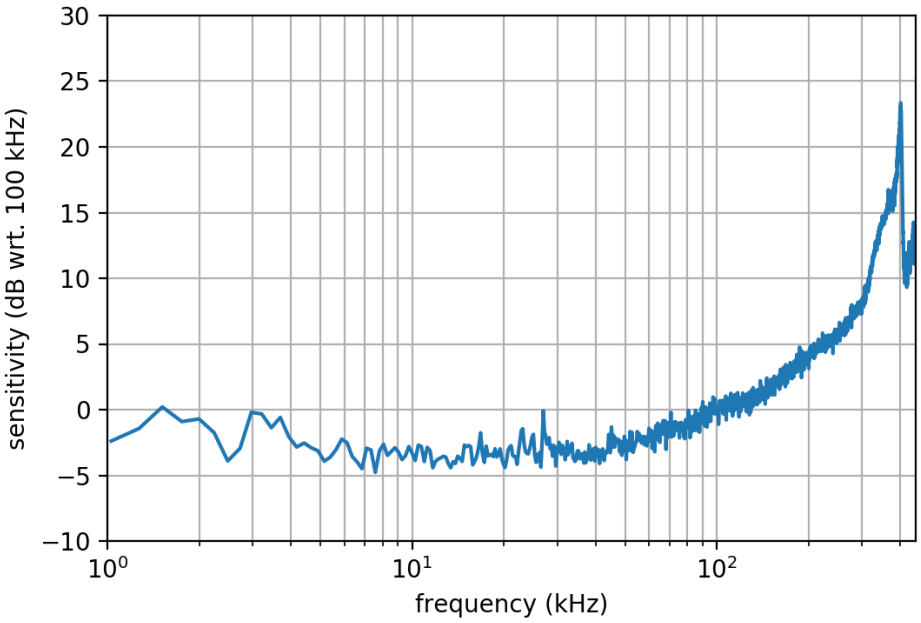



*Figure 1- Frequency response measured with electrostatic actuator method*

# Dimensions

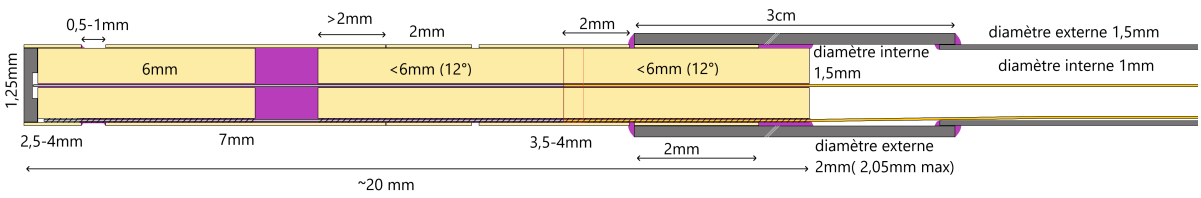



*Figure 2 - Mechanical drawing*