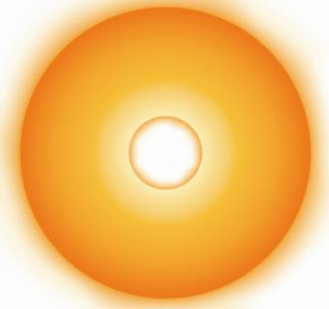


Multi-Measurand System

Combined Pressure and Temperature Measurement



OXSENSIS

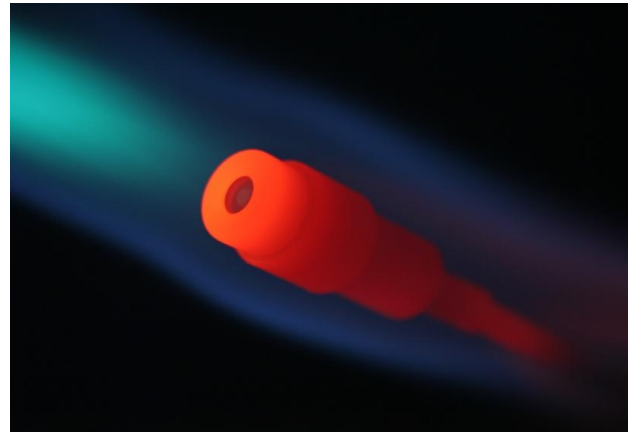
PRODUCT FEATURES

- Extreme temperature operation in excess of 1000°C
- Simultaneous measurement of dynamic pressure, absolute pressure and temperature
- Dynamic pressure resolution of 2×10^{-5} of full scale pressure
- Absolute pressure accuracy 2%
- Temperature accuracy of $\pm 3^\circ\text{C}$
- Operates in harsh environments including high vibration and aggressive chemical atmosphere
- Immune to EMI
- Suitable for use in explosive atmospheres
- Closer proximity to combustion events allows a large bandwidth to be reliably monitored and earlier detection of dynamic events
- Enables combustion event characterisation and input to advanced control system

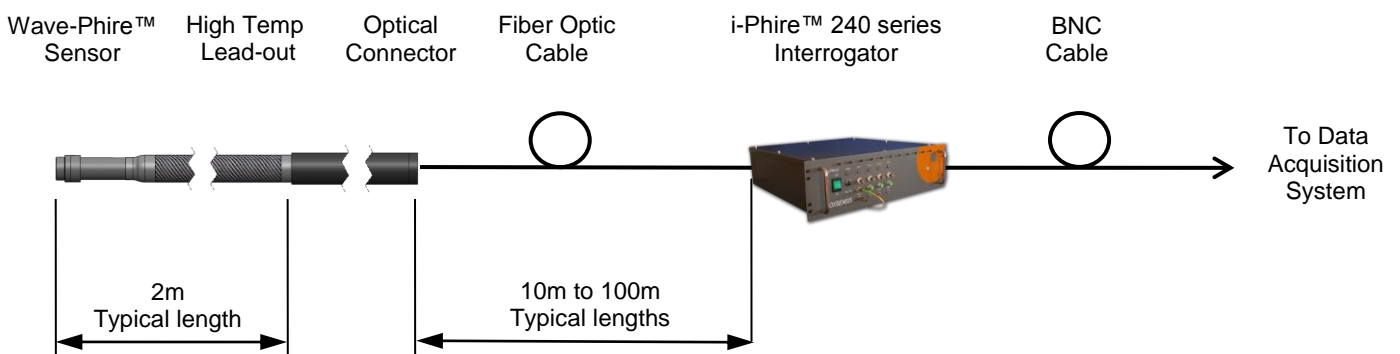
OVERVIEW

The Multi-Measurand System comprises the Wave-Phire™ transducer and the i-Phire™ 240 interrogator. The Wave-Phire™ incorporates a micro-machined sapphire sensor head packaged with a high temperature fibre-optic lead-out to form a unique sensor configuration.

The properties of the Wave-Phire™ make it attractive for harsh environments such as gas turbines and other combustion applications. It can be deployed for continuous combustion dynamic monitoring or as a design development tool.



COMPLETE SENSING SYSTEM



SYSTEM SPECIFICATIONS

Sensor Operating Environment

- Full scale pressure ranges: 1 - 25 bar absolute
Other values available per customer request
- Overload Capacity: > 3 times full scale pressure
- Operating Temperature Range:
 - -40 to 750°C (continuous use)
 - -40 to 1000°C (R&D use)
- Humidity: 0-100% RH
- ATEX Compliant: Class I, Division 2
- Acceleration Sensitivity: <0.69 mbar/g
- Sensor immune to EMI

Interrogator Operating Environment

- System Outputs:
 - Dynamic Pressure: 0 to ±10 V
1Hz – 20 kHz
 - Absolute Pressure: 0 to 10 V
DC – 20 kHz
 - Sensor Temperature: 0 to 10 V
DC – 100 Hz
- CE Marked and RoHS compliant
- Power Supply Requirements - Single phase AC supply:
 - Voltage 100-240 V ± 10%
 - Frequency 50-60 Hz ± 10%
 - Current ≤ 2 A

Pressure Performance

- Measurement Range: Up to full scale
- Dynamic Output Resolution: 2×10^{-5} of full scale
- Dynamic Output Combined Uncertainty: 5%
- Absolute Output Accuracy: 2% of full scale

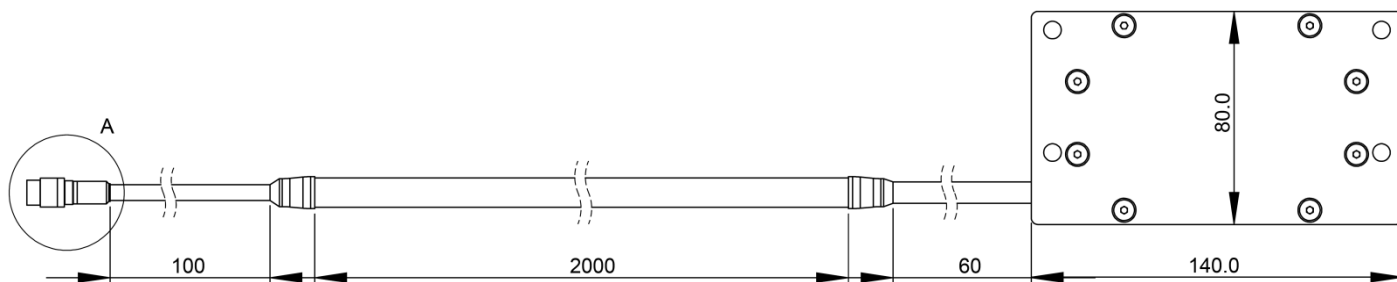
Sensor Temperature Performance

- Calibrated Range: Continuous use range
- Accuracy: ±3°C

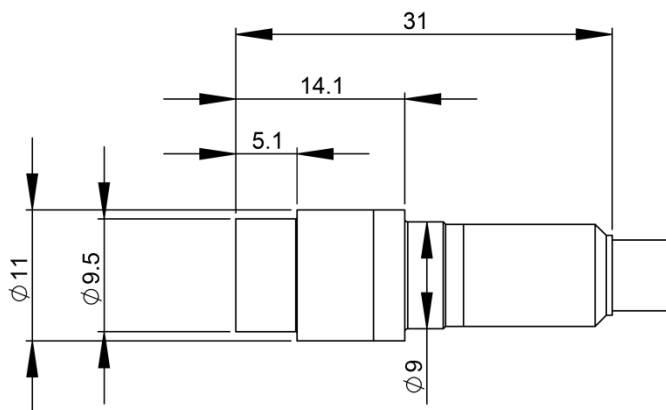
TEMPERATURE CAPABILITY

Location (Refer to mechanical drawing)	Maximum Temperature (°C)
Sensor Front Face	1000
Rear of Mounting Surface	750
Optical Connector Housing	85

MECHANICAL TRANSDUCER DRAWING



The conduit lengths shown are default values, other lengths can be discussed when ordering

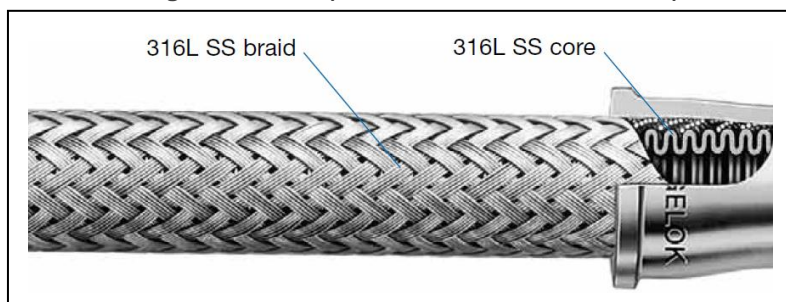


Detail A

TYPICAL INTEGRAL CABLE SPECIFICATIONS

- Temperature Range: -40 to +600°C
- Bend Radius: 50 mm minimum
- Final Outer ϕ : 12 mm
- Available Lengths: typically 2 m

Image of Conduit (over-braided convoluted tube)



Note: Sensor conduit construction is application specific to be discussed when ordering, typical shown above.

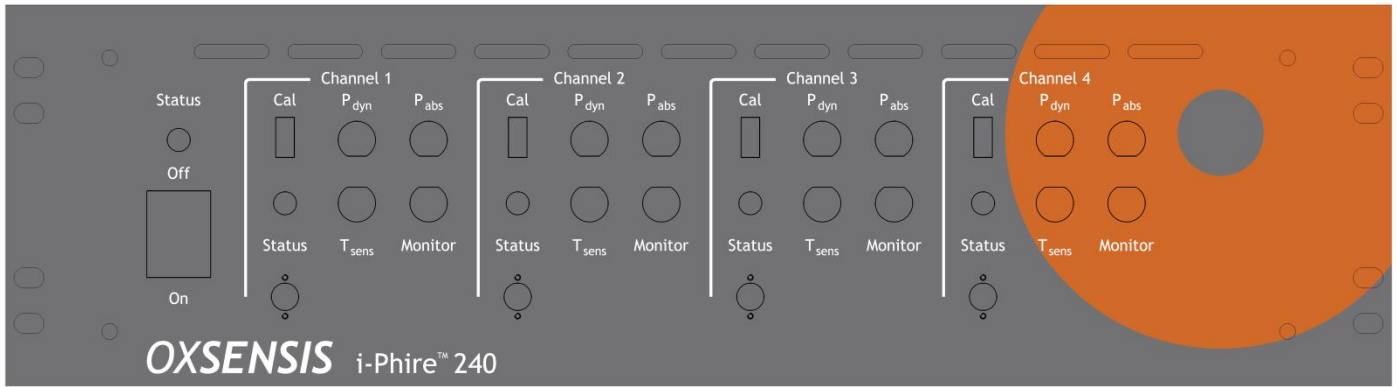
OPTICAL CONNECTOR

- FC/APC Connector
- Temperature Range: -45 to +85°C
- Rated for 500 mating cycles

Image of optical connector



INTERROGATOR FRONT PANEL LAYOUT

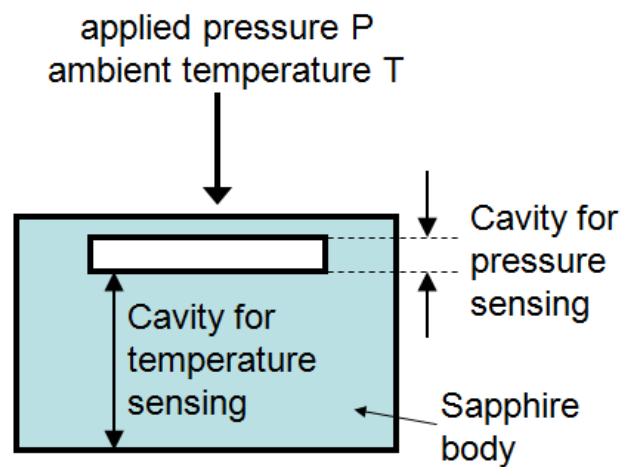


PRINCIPLE OF OPERATION

The sensor system measures the size of an optical cavity which varies with applied pressure due to movement of the pressure diaphragm. A second cavity which only varies with temperature is measured to provide a temperature reading which is also used to correct for any temperature cross-sensitivity of the pressure measurement.

The cavity sizes are determined in the interrogator using optical interferometry which provides high accuracy and reliability.

The interrogator signal processing module uses the temperature and raw pressure measurements to provide separate outputs for absolute pressure (“P_{abs}”) and dynamic pressure (“P_{dyn}”) alongside the sensor temperature (“T_{sens}”) output. A fourth configurable output (“Monitor”) is provided for diagnostic purposes.



Schematic diagram of sensing element



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As part of Oxsensis' commitment to ongoing improvements of our products, Oxsensis reserve the right to modify specifications without prior notification.