

PRESSURE TRANSDUCER

LOW RANGE SERIES (PTL)



Optical pressure transducers provide high-quality measurements in harsh environments not suitable for electrical equivalents. The Fibos PTL models are low pressure range (up to 1,000 psi) transducers capable of achieving $\pm 0.25\%$ FSO measurement uncertainty. Temperature compensation is performed by means of an optical temperature sensor within the transducer. Standard geometries are shown in the configuration table. Material substitutions, custom dimensions, and alternative cable lengths can be provided upon request.

Fibos optical pressure transducers meet PiMS™ (Pi-FBG Measurement Standard). To achieve the performance specifications presented, a signal conditioner that utilizes the PiMS™ technique is required.

APPLICATIONS

Ideal for industrial applications, the PTL pressure transducer can be conveniently inserted into a threaded or compression fitting for mounting in a liquid or gaseous medium. Leverage the benefits of optical measurements to collect better quality data in applications requiring electromagnetic immunity, long transmission distance, high-voltage isolation, and/or intrinsic safety. Typical applications include:

- Oil pressure in wet transformers
- Petrochemical facilities (i.e. refineries)
- Hydraulic reactors
- Food and beverage production

PERFORMANCE

Transducer Operating Range ¹	-50 to 150°C
Gauge Pressure Range	0–100 psi/0–500 psi/0–1,000 psi
Proof Pressure	200 psi/1,000 psi/2,000 psi
Dynamic Response	DC to 5 kHz
Pressure Measurement Uncertainty – Static Temperature	$\pm 0.25\%$ Full Scale Output (FSO)
Pressure Measurement Uncertainty – Dynamic Temperature ²	$\pm 1\%$ FSO
Pressure Resolution	0.01% FSO
Temperature Absolute Uncertainty ^{3,4}	$\pm 0.5^\circ\text{C}$
Temperature Relative Uncertainty ^{3,5}	$\pm 0.2^\circ\text{C}$
Temperature Resolution	0.01°C
Optical Sensor Specifications	PiMS™ Compliant

¹ As designed. Laboratory tested between 0 to 150°C

² Uncertainty increases during dynamic temperature due to compensation technique

³ Measurement uncertainty includes error of signal conditioner (PiMS™ compliant)

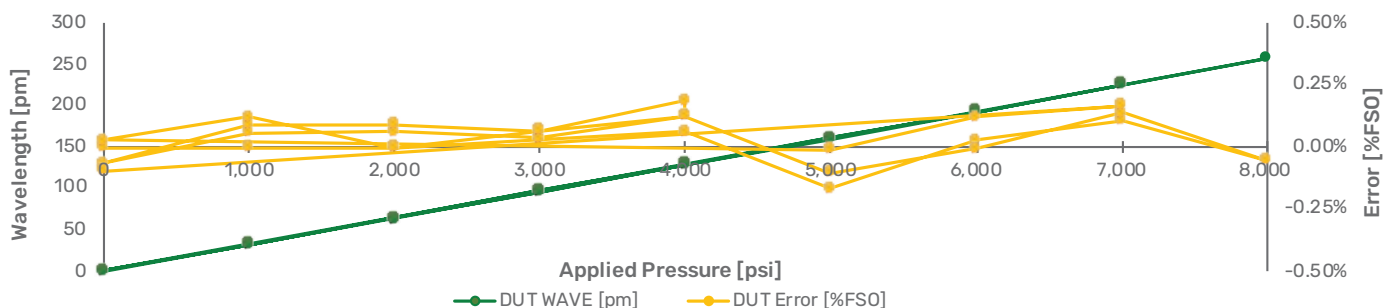
⁴ Uncertainty possible due to interchanging signal conditioners

⁵ Uncertainty possible during continuous operation with signal condition in stable ambient conditions

ENVIRONMENTAL

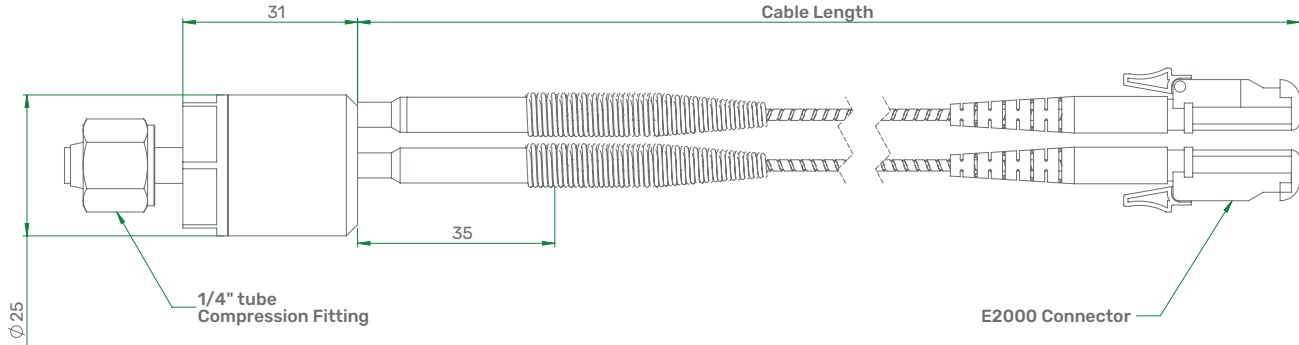
Pressure Medium	Air/Water/Oil
Cable Temperature (OFNP Cable)	-40 to 70°C
Cable Temperature (Stainless Steel Cable)	-60 to 150°C
Minimum Cable Bend Radius	16 mm
Optical Connector	E2000/APC
Fiber Type	SMF28 compatible

Continued product improvement necessitates that Fibos reserve the right to modify these specifications without notice. With continuous improvement, extensive testing, and conservative specifications, Fibos ensures product reliability expected within the industry.



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Reference drawing provided for model #PTL-SBAA-SC1E2



MODEL PART NUMBER TABLE

PTL - - - - - - - -

1 2 3 4 5 6 7 8

1. Temperature Range

S – Standard (-50 to 150°C)

2. Pressure Port

A – 1/8" Compression
B – 1/4" Compression
C – 1/8" NPT
D – 1/4" NPT
X – Custom

3. Pressure Range

A – 0 to 100 psi
B – 0 to 500 psi
C – 0 to 1,000 psi
X – Custom

4. Calibration Type

A – Commercial
B – Dynamic pressure
X – Custom

5. Cable Jacket

N – OFNP
S – Stainless steel coil
X – Custom

6. Cable Outer Diameter

A – 0.9 mm
B – 2.0 mm
C – 2.3 mm
X – Custom

7. Cable Length

1 – 2.5 m
X – Custom

8. Connector Type

E2 – E2000/APC

TYPICAL CALIBRATION DATA (PTL-SBAA-SC1E2 USED FOR REFERENCE)

Typical Pressure Calibration of Pressure Sensor

Set Temperature [°C]	Calibration Pressure [psi]	Reference Sensor [psi]	Pressure Sensor Wavelength [nm]
25	0	0	1550.1110
25	100	100	1549.9960
25	200	200	1549.8934
25	300	300	1549.7850
25	400	400	1549.6920
25	500	500	1549.6220

Typical Temperature Calibration of Pressure and Temperature Sensor

Set Pressure [psi]	Calibration Temperature [°C]	Pressure Sensor Wavelength [nm]	Temperature Sensor Wavelength [nm]
0	-50	1548.461	1548.350
0	-20	1549.121	1549.010
0	0	1549.561	1549.450
0	25	1550.111	1550.000
0	50	1550.661	1550.550
0	75	1551.211	1551.100

Typical Calibration Coefficients

Coefficient	Pressure	Temperature	Compensated Pressure
a0	5.1901E+12	-7.0430E+04	5.1901E+12
a1	-1.0046E+10	4.5455E+01	-1.0046E+10
a2	6.4811E+06	1.3216E-09	6.4811E+06
a3	-1.3938E+03	-2.8422E-13	-1.3938E+03

Notes:

- Calibration can be performed via comparison between the device under test and a traceable reference sensor. A programmable pressure calibrator and stirred liquid bath is used to exercise the device under test through its calibrated range.
- Fibos can provide commercial calibration with metrological traceability to the SI from -20°C to 100°C and 0 to 10,000 psi. Calibration certificates from accredited calibration laboratories can be provided upon request.
- Calibration data is provided with every sensor produced. This information can be used with a PIMS™ signal conditioner to achieve the specifications listed on the previous page.

About us

Developers of a unique optical point sensing platform that can be utilized in a variety of industrial applications.

We design, manufacture and support customers of the optical platform from our headquarters in Toronto, Canada.

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