

# STRAIN GAUGE

## STRAIN GAUGE SERIES (SG)

-  **±0.25% FSO Uncertainty**
-  **Electrical Isolation**
-  **Intrinsically Safe**
-  **EMI & Radiation Immune**

Optical strain gauges offer an alternative method to collect high-quality strain measurements within harsh environments that are not suitable for resistive strain gauges. The Fibos SG models provide a mounting base for the optical fiber to ease the assembly process in field. Metallic or non-metallic base materials can be selected depending on the target operating environment. Standard geometries are available, as shown in the configuration table. Material substitutions, mounting dimensions, and alternative cable lengths can be provided upon request.

Fibos optical strain gauges 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 measurements in confined spaces, a key feature of an optical strain gauge is that it can be used in high voltage and high electromagnetic areas with long transmission distances without signal integrity issues. Typical applications include:

- Structural health monitoring
  - Bridge, tunnel, and other infrastructure monitoring
- Automotive research and development
  - High voltage location strain measurements (i.e. battery packs, bus bars)
  - Electric motor vibration measurements (i.e. bearing vibration)
- Power equipment monitoring

### PERFORMANCE

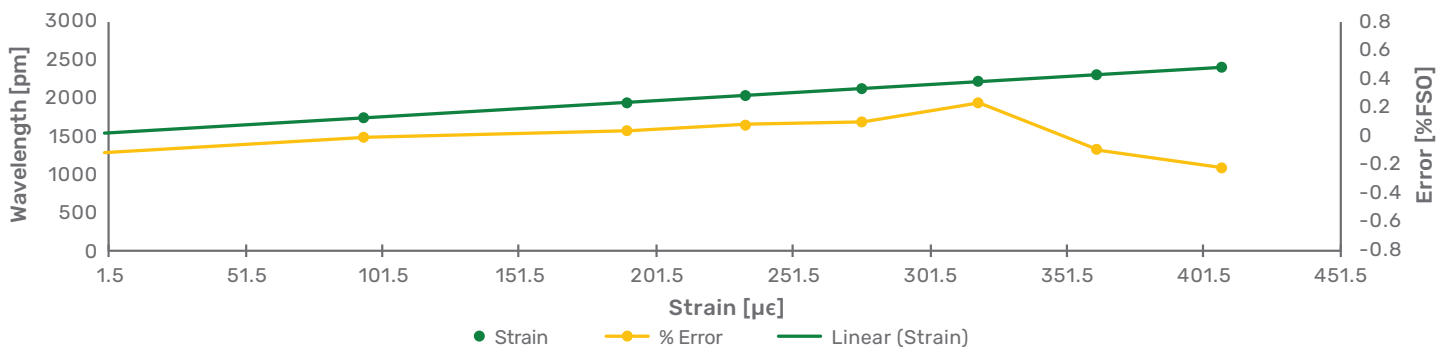
Sensor Operating Range <sup>1</sup>	-50 to 150°C
Strain Range	-1000µε to +1000µε
Dynamic Response	DC to 5kHz
Strain Measurement Uncertainty (Uncalibrated) <sup>2</sup>	±2% Full Scale Output (FSO)
Strain Measurement Uncertainty (Calibrated) <sup>3,4,5</sup>	±0.25% FSO
Strain Resolution	0.01% FSO
Strain Sensitivity	0.26pm/µε
Optical Sensor Specifications	PiMS™ Compliant

<sup>1</sup> As designed. Laboratory tested between 0 to 150°C  
<sup>2</sup> Based on calibration data of previous test specimen. Units ship uncalibrated  
<sup>3</sup> Measurement uncertainty includes error of signal conditioner (PiMS™ compliant)  
<sup>4</sup> Uncertainty possible due to interchanging signal conditioners  
<sup>5</sup> Uncertainty possible during continuous operation with signal condition in stable ambient conditions

### ENVIRONMENTAL

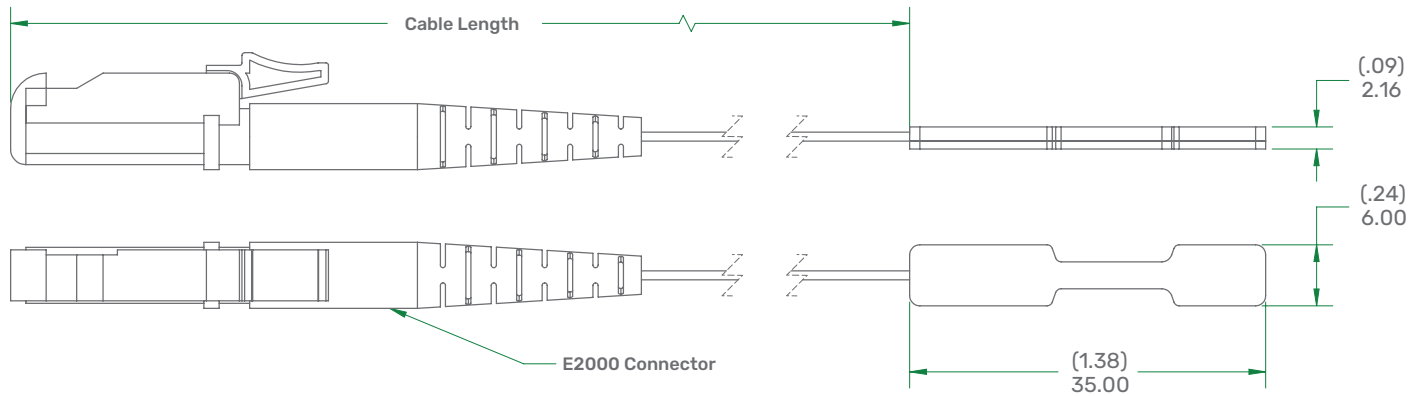
Substrate Materials	Metal, plastic, ceramic
Cable Temperature (OFNP Cable)	-40 to 70°C
Cable Temperature (Stainless Steel Cable)	-60 to 150°C
Minimum Cable Bend Radius	16 mm
Optical Connector	E2000/APC
Fiber Type	SMF28 compatible

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.



# STRAIN GAUGE STRAIN GAUGE SERIES (SG)

## Reference drawing provided for model #SG-SSBA-NA1E2



## MODEL PART NUMBER TABLE

**SG -** \_\_\_\_\_ - \_\_\_\_\_  
 1 2 3 4 5 6 7 8

### 1. Temperature Range

**S** – Standard (-50 to 150°C)

### 2. Carrier Material

**S** – Stainless steel  
**I** – Invar  
**P** – Plastic  
**A** – None  
**X** – Custom

### 3. Temperature Compensation

**A** – Yes  
**B** – No

### 4. Class Type

**A** – Adhesive mount  
**W** – Weldable  
**E** – Embedded

### 5. Cable Jacket

**N** – OFNP  
**S** – Stainless steel coil  
**Z** – No jacket  
**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  
**2** – 5.0 m  
**X** – Custom

### 8. Connector Type

**E2** – E2000/APC

## TYPICAL CALIBRATION DATA

Reference Gauge Strain [ $\mu\epsilon$ ]	Fibos Gauge Wavelength [nm]
0	1.541
167	1.745
335	1.949
411	2.041
485	2.130
559	2.223
636	2.310
715	2.404
638	2.305
563	2.216
490	2.124
414	2.030
340	1.939
169	1.744
0	1.541

### Notes:

1. Calibration can be performed via comparison between the device under test and a traceable reference sensor. Calibration above was conducted with a foil strain gauge mounted onto the same constant strain beam.
2. Calibration data is not provided for the strain gauge, as in application calibration will be required once bonded onto the device under test. Utilizing a PiMS™ signal conditioner, calibration data can be collected 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.

V1.0-101519

37 Kodiak Crescent, Unit 11  
 Toronto, ON M3J 3E5

1-888-207-9754  
 info@fibos.ca

 **fibos.ca**