

# Displacement Gage | os5000



## Description

**The os5000 is an FBG based displacement gage designed for measuring small changes of less 12 mm in civil and geotechnical structures.**

Based on fiber Bragg grating (FBG) technology, the os5000 is specifically designed to measure displacement between two gage points on a specimen surface. The gage design is flexible enough to allow for easy attachment to various substrates, making measurements on metal, concrete and other surfaces straightforward. The FBG sensors that comprise the os5000 gage are located within the rugged hard-coat anodized aluminum enclosure which shields them from the elements and allows for installations in harsh environments.

This gage can be used alone or in series as a part of an FBG sensor array (which may include strain and temperature gages, accelerometers and other displacement gages). Cabling for such arrays is much less expensive and cumbersome than comparable electronic gage networks. Cables can be joined directly inside the enclosure, eliminating the need for separate junction boxes. The os5000 delivers the many advantages inherent to all FBG based sensors, including EMI immunity - something vibrating wire gages cannot offer.

With each gage, Micron Optics provides a Sensor Information Sheet listing the gage factor and calibration coefficients needed to convert wavelength information into engineering units. Micron Optics' ENLIGHT Sensing Software provides a utility to calculate and then record, display and transmit data for large networks of sensors. Installation, qualification, mechanical drawings

and other sensor information is available at: [http://  
http://www.micronoptics.com/support\\_downloads/  
Sensors/](http://http://www.micronoptics.com/support_downloads/Sensors/).



## Key Features

- Up to 12 mm measurement range** using a 1 mm stainless steel cable
- Rugged aluminum enclosure** suitable for outdoor installations, IP67 rating
- Qualified** to same rigorous standards used for comparable electronic gages
- Internal protection** of connectors/splices
- Supports multiplexing** of multiple gages on one fiber
- Fully temperature compensated** over entire operating range
- Fast response time**, stable measurements, high resolution
- Designed for simple installation** in a variety of applications



## Deployments

- Structures** (bridges, dams, tunnels, mines, buildings, oil platforms)
- Energy** (wind turbines, oil wells, pipelines, nuclear reactors, generators)
- Transportation** (railways, trains, roadways, specialty vehicles, cranes)
- Marine vessels** (hull, deck, cargo containers)
- Aerospace** (airframes, composite structures, wind tunnels, static and dynamic tests).

# Displacement Gage | os5000



## Performance Properties<sup>1</sup>

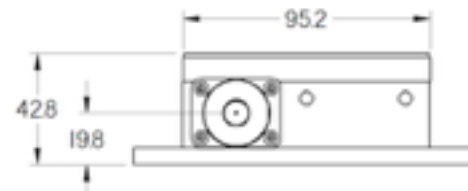
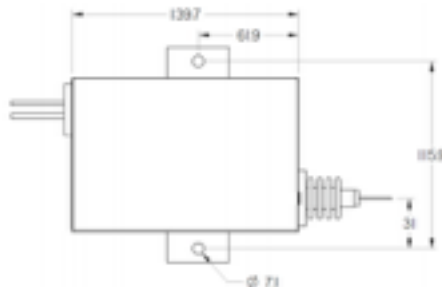
|                             | os5000  |
|-----------------------------|---|
| Measurement Range           | 0 - 12 mm   |
| Resolution <sup>2</sup>     | 0.02% F.S.  |
| Linearity <sup>2</sup>      | 0.026 mm (.22% F.S.) steady-state                   |
| Operating Temperature Range | -40 to 80°C   |
| Environmental Ingress       | Suitable for wet, high humidity environments (IP67) |
| Fatigue Life <sup>3</sup>   | >50x10 <sup>6</sup> cycles @ 30% F.S.               |

## Physical Properties

|                       |                                       |
|-----------------------|---------------------------------------|
| Dimensions            | See Diagram Below, m                  |
| Weight                | 954 g                                 |
| Construction          | Anodized Aluminum                     |
| Lead Cable Length     | Customer Specified                    |
| Lead Cable Type       | oc1110, 3 mm Tactical Buffered Cable  |
| Mounting <sup>4</sup> | Supplied Mounting Plate (see drawing) |

## Optical Properties

|                                       |   |
|---------------------------------------|---|
| Peak Reflectivity (R <sub>max</sub> ) | > 70%   |
| FWHM (- 3 dB point)                   | 0.25 nm (± .05 nm)                            |
| Isolation                             | > 15 dB (@ ± 0.4 nm around center wavelength) |



## Ordering Information

os5000-www/1xx

|            |   |
|------------|---|
| <b>www</b> | Wavelengths (+/- 1.5 nm)<br>Standard -<br>1515/1520, 1526/1531, 1537/1542,<br>1548/1533, 1559/1564, 1570/1575,<br>1581/1586<br>Bandwidth allocation requires an<br>additional +/- 3nm |
| <b>1xx</b> | Length and Termination<br>1 Standard length is 1 m<br>FC FC/APC Connector<br>FS Fusion Splice   |

## Ordering Information Example

os5000-1548/1553-1FC

## Notes

- <sup>1</sup> Beta product. For more details see [http://www.micronoptics.com/products/product\\_designations/](http://www.micronoptics.com/products/product_designations/).
- <sup>2</sup> Full scale, room temperature, measured on calibrated displacement stage using Micron Optics m130
- <sup>3</sup> Drift pass criteria < 0.8% FS
- <sup>4</sup> See [http://www.micronoptics.com/support\\_downloads/](http://www.micronoptics.com/support_downloads/) for mechanical drawings and installation details for the os5000 accessories.