

Displacement Gage | os5500



Description

The os5500 is an FBG based displacement gage designed for measuring changes of up to 450 mm in civil and geotechnical structures.

Based on fiber Bragg grating (FBG) technology, the os5500 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 os5500 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 os5500 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://www.micronoptics.com/support_downloads/Sensors/.



Key Features

- Up to 450mm measurement range** using a 1 mm stainless steel cable
- Rugged aluminum enclosure** suitable for outdoor installations, IP65 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).

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Performance Properties¹

	os5500
Displacement Measurement Range ²	150 mm, 300 mm, or 450 mm
Resolution ³	0.02% F.S.
Linearity ³	< 0.4% F.S.
Repeatability ³	± 0.05% F.S.
Operating Temperature Range	-40 to 80°C
Environmental Ingress ⁴	IP65
Fatigue Life (Tested to)	16x 10 ⁶ cycles at 63 mm stroke
Temperature Dependence	0.006%/ °C F.S.

Physical Properties

Dimensions (mm)	190 L x 175 W x 90 H
Weight	< 3.1 kg
Material	Hardcoat anodized aluminum
Wire Pull-Cable Length	2 m with 6 mm loop termination
Fiber Optic Connection	Internal to gage, accepts cables between 3 to 7 mm diameter
Fastening Method ⁵	Bolt-on, two 8.8 mm dia. holes

Optical Properties

Peak Reflectivity (R _{max})	> 70%
FWHM (- 3 dB point)	0.25 nm (± .05 nm; apodized grating)
Isolation	> 15 dB (@ ± 0.4 nm around center wavelength)

Ordering Information

os5500-rrr-*www*/www-1xx

rrr Range
 150 150 mm
 300 300 mm
 450 450 mm

www Wavelengths (+/- 1.5 nm)
 Standard -
 1521/1523, 1536/1538, 1551/1553,
 1566/1568, 1581/1583
 Bandwidth allocation requires an
 additional -6 and +7 nm

1xx Length and Termination
 1 Standard length is 1 m
 FC FC/APC Connector
 FS Fusion Splice

Ordering Information Example

os5500-300-1521/1523-1FS

Notes

- ¹ Beta product. For more details see http://www.micronoptics.com/products/product_designations/.
- ² Does not include overtravel. For the 150 mm, 300 mm, and 450 mm options overtravel is 310 mm, 160 mm and 10 mm respectively
- ³ Full scale at room temperature, measured on a calibrated displacement stage using a Micron Optics sm130
- ⁴ Based on nominal performance
- ⁵ See http://www.micronoptics.com/support_downloads/Sensors/ for mechanical drawings and installation details for the os5500 and accessories
- ⁶ Add wavelength tolerance of ±1.5 nm. See the Sensor Information Sheet for more detailed requirements