

Non-metallic Temperature Sensor | os4300

Applications

- Continuous lifetime health monitoring of bridges, dams, buildings, tunnels, ships, aircraft, trains, and other complex structures.
- Core building block for fiber optic transducers for strain, temperature, displacement, pressure, and acceleration.
- Measurement of absolute temperature on a structure's surface.
- Measurement of relative temperature for compensation of strain measurements.

Features

- Fast response time.
- Qualified to same rigorous standards used for comparable electronic gages.
- Cable integrated with sensor package for fiber protection and strain relief.
- Non metallic construction.
- Fast, simple, repeatable installation.
- Connector protection fittings available for harsh environments.
- Armored fiber cable and rugged sensor package.
- Several package options for field and laboratory applications.
- Calibrated for high absolute accuracy.
- Double ended design supports multiplexing of many sensors on one fiber.
- Micron Optics' patented micro opto-mechanical technology.

Description

The os4300 Non-metallic Temperature Sensor is a family of gages designed to make fiber handling easy and sensor installation fast and repeatable. It is based on fiber Bragg grating (FBG) technology. The os4300's body is a sealed, alumina ceramic tube that protects the FBG. Since there are no epoxies holding the fiber to the tube, long term stability is ensured by design.

Three packaging options provide for installation that mimics that of conventional thermocouples with armored cables and protected connectors, and small sensors that provide the user with both installation flexibility and sub second response.

In side by side comparisons with conventional thermocouples, the os4300 is equally accurate, while providing for much faster response, wider operating range, no calibration, and less noise. The os4300 temperature sensor is qualified for use in harsh environments and delivers the many advantages inherent to all FBG based sensors.

This sensor can be used alone or in series as part of an FBG sensor array. Installation and cabling for such arrays is much less expensive and cumbersome than comparable electronic gage networks.



os4310 - Single Ended & Double Ended Sensors



os4330 - Non-metallic Epoxy Mount



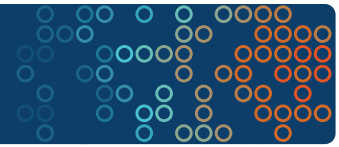
os4350 - Armored Cable, Flange Mount



Connector Protection Fitting

With each sensor, 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 and other sensor information is available at: http://www.micronoptics.com/support_downloads/Sensors/.

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Specifications ^B 1

	os4310 Non-metallic	os4330 Non-metallic Epoxy Mount	os4350 Armored Cable, Flange Mount
Thermal Properties			
Operating Temperature Range	-40 to 120°C (-40 to 250°C for Single Ended version)		
Temperature Sensitivity	~10pm/°C (±1.7pm/ °C)		
Cable Temperature Range	-40 to 250° C (FC/APC Connectors: -40 to 80°C)		
Response Time ²	0.7 seconds	4.6 seconds	4.2 seconds
Standard Calibration ³ (Included)	1.0°C Long Term Accuracy ⁴ 0.6°C Short-Term Accuracy, Typical ⁵		
Premium Calibration ³ (Optional)	0.5°C Long Term Accuracy ⁴ 0.2°C Short Term Accuracy, Typical ⁵		

Physical Properties			
Dimensions (L x W x H) ⁶	18.8 x 3.2 x 3.2 mm	31.8 x 7.6 x 7.6 mm	31.5 x 15.0 x 7.6 mm
Weight (including cable)	2.6 g	4.3 g	38 g
Housing Material	Alumina	Alumina	Anodized Aluminum
Cable Length	1 m (± 10 cm)		
Fiber Type	SMF28-Compatible		
Cable Bend Radius	≥ 17 mm		
Cable Type	1 mm Fiberglass Braid	1 mm Fiberglass Braid	3mm Armored Cable
FC/APC Connectors	Optional	Optional	Both connector and protection fittings optional
Fastening Methods ⁶	Bond Strain Reliefs only	Epoxy type	#6 Self Drilling Screws or Epoxy

Optical Properties	
Peak Reflectivity (Rmax)	> 70%
FWHM (-3 dB point)	0.25 nm (± .05 nm)
Isolation	> 15 dB (@ ± 0.4 nm around center wavelength)
Notes:	
1. Denotes Beta product. For more details see www.micronoptics.com/product_designation.php .	
2. Time to reach 63% of total temperature drop in water (100°C).	
3. Absolute accuracy of sensor is dependent on capability of interrogation instrument.	
4. Based on 120°C soak for 1,000 hours.	
5. Four (4) thermal cycles from min to max temperature. Max. accuracy error ±0.4°C without data averaging.	
6. See http://www.micronoptics.com/support_downloads/Sensors/ for sensor drawings and installation details.	

Ordering Information	os43aa-wwww-1xx-1yy-z		(Example: os4330-1560-1FC-1FC-P)	
aa: Model	wwww:	1xx: Cable 1, Length & Connector	1yy: Cable 2, Length & Connector	z: Calibration Method
10 Non-metallic	Wavelength (±1nm)	1 1 m Standard, Cable Length	1 1 m Standard, Cable Length	S Standard
30 Non-metallic, Epoxy Mount	Standard: 1512 to 1588nm in 4nm intervals	UT Underterminated	00 Single Ended Sensor (available only for os4310)	P Premium
50 Armored Cable, Flange Mount (available only with FC option)	Extended: 1460 to 1620nm	FC FC/APC Connector	UT Underterminated	
		PF FC/APC Connector with Protection Fitting	FC FC/APC Connector	
			PF FC/APC Connector with Protection Fitting	



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