

Temperature Probe | os4200

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.
- 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.
- Capable of measuring from -200 to +275 degrees C.
- Micron Optics' patented micro opto-mechanical technology.

Description

The os4200 Temperature Probe 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 os4200's body is a sealed, stainless steel tube that protects the FBG. Since there are no epoxies holding the fiber to the tube, long term stability is ensured by design.

Options include packages that operate like conventional thermocouples with armored cables and protected connectors, and small probes that provide the user with both installation flexibility and sub-second response time.



os4210 - Temperature Probe



os4230 - Ruggedized Probe



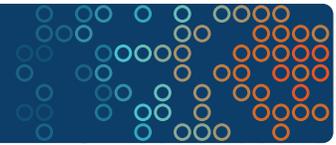
os4280 - Ruggedized Probe w/ Thermocouple Head



Connector Protection Fitting

In side by side comparisons with conventional thermocouples, the os4200 is equally sensitive and accurate, while providing for much faster response, wider operating range, no calibration, and less noise. The os4200 Temperature Probe 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 at the end of an FBG sensor array. Installation and cabling for such arrays is much less expensive and cumbersome than comparable electronic gage networks.

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Specifications ^B 1

	os4210 Temperature Probe	os4230 Ruggedized Probe	os4280 Ruggedized Probe w/ Thermocouple Head
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Thermal Properties

Operating Temperature Range	-40 to 120°C, -200 to 275°C available		
Temperature Sensitivity	~10pm/°C (±1.7pm/°C)		
Cable Temperature Range	-40 to 250° C (FC/APC Connectors: -40 to 80°C)		
Response Time ²	0.3 seconds	1.5 seconds	8.5 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

Probe (Diameter x Length)	1.07 x 27.1 mm	4.76 x 142.9 mm	6.35 x 137.9 mm
Weight (including cable)	1.3 g	30 g	411 g
Housing Material	304 Stainless Steel	316 SS Probe w/Armored Cable	316 SS - Probe /Aluminum Thermocouple Head
Cable Length	1 m (± 10 cm)		
Fiber Type	SMF28-Compatible		
Cable Bend Radius	≥ 17 mm		
Cable Type	0.9 mm Fiberglass Braid	3mm Armored Cable	
FC/APC Connector	Optional	Both Connector and Protection Fittings optional	
Fastening Methods ⁶	Insertion or Bond	3/16" Compression Fitting	1/4" Compression Fitting

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 275°C soak for 1,100 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

os42aa-wwww-1xx-y-zz

(Example: os4230-1560-1FC-S-SR)

aa: Model	www: Wavelength (±1nm)	1xx: Cable 1, Length & Connector	y: Calibration Method	zz: Calibration Range
10 Sensor Probe	Standard: 1512 to 1588nm in 4nm intervals.	1 1 m Standard, Cable Length	S Standard	SR Standard Range, -40 to 120°C
30 Ruggedized Metallic Probe	Extended: 1460 to 1620nm	UT Underterminated	P Premium	HR High Range, 20 to 275°C
80 Ruggedized Probe		FC FC/APC Connector		ER Extended Range, -70 to 275°C
Thermocouple Head		PF FC/APC Connector with Protection Fitting		LR Low Range, -200 to 20°C



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