

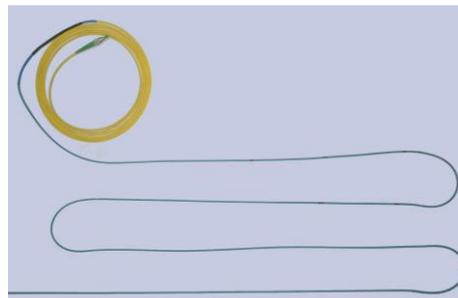
- **FBG temperature sensors**
- **Zero power, EMI immune, intrinsically safe**
- **Broad operating temperature range**
- **Highly stable**
- **Multi-km signal integrity**
- **Numerous package options to suit application**
- **Available as multiple sensor arrays**



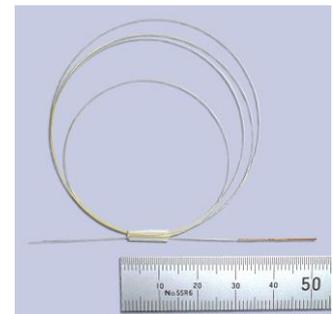
Isolated coupon package



Rugged loose tube package



Loose tube multi-point temperature sensing array



Composite embedment package

Smart Fibres FBG Temperature Sensors operates by one of two methods:

- Loose tube, whereby the FBG is isolated from external strain by a tubular housing, and wavelength variations due to the thermo-optic coefficient of the FBG are measured
- Isolated coupon, whereby the FBG measures the expansion of a coupon of material, isolated from external strain, and wavelength variations due to the coupon thermal expansion plus the thermo-optic coefficient of the FBG are measured

The loose tube construction benefits from smaller sensor packaging and greater installation flexibility. The isolated coupon construction benefits from greater measurement sensitivity. For a truly, miniature temperature sensor, for example to embed within a composite, a terminal FBG can be housed within a polyimide capillary of typ 400 μm diameter.

SmartTemp Specifications (typ):

	Unit	Loose Tube	Isolated Coupon	
			Steel	Aluminium
Sensor Construction		Steel or polymer tubing with sensing fibre loose inside	Metallic housing with sensing fibre bonded to metallic coupon inside	
Temperature sensitivity (typ) [†]	$\mu\text{m}/^\circ\text{C}$	11	11 plus 1.2*coupon CTE = ~24	= ~40
Measurement resolution (typ) [†]	$^\circ\text{C}$	0.05	0.02	0.01
Measurement accuracy (typ) [†] (with perfect calibration)	$^\circ\text{C}$	0.1	0.04	0.025
Measurement range [‡]	$^\circ\text{C}$	-220 to +200	-220 to +200	
Fibre type		Single Mode SMF-28, 9/125 μm		
Typical FBG Type *		CWL 1510 – 1590 nm, FWHM ≤ 0.7 nm R>70%, Apodised profile, SLSR >15dB		
Sensor dimensions (typ.)		Tubing 2 to 4 mm OD Length to suit application	Housing 8*8*60 mm Cable 2 to 4 mm OD	
Cable and connections		To suit application		

* Alternative CWL or spectral profile on request

[†] Decreased temperature sensitivity below -170 $^\circ\text{C}$

[‡] with 0.5 μm resolution / 1 μm accuracy interrogator. In practice accuracy may be limited by reference measurement.

All specifications are correct at the time of writing and may change without notice.

Certain specifications may be speculative or untested - please contact us to confirm the specification meets with your requirements.

FBG temperature sensors are also available in our SmartPatch, SmartFBG and SmartWeld constructions.