



TSENS-FL

FIBER OPTIC TEMPERATURE FLUORESCENCE SENSOR

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Engineered to deliver precise, stable, and electrically immune temperature measurements in environments where conventional sensors cannot operate reliably.

» Product Summary

TSENS-FL is a fluorescence-based fiber optic temperature sensor developed for precise, long-term temperature monitoring in electrically demanding environments, with primary application in dry-type transformers. The sensor employs fluorescence lifetime measurement technology, where temperature is derived from the decay characteristics of a fluorescent material at the probe tip. This measurement principle ensures high stability, repeatability, and accuracy over time, independent of signal amplitude or external electrical influences.

Unlike conventional electrical temperature sensors, TSENS-FL is completely passive at the sensing point and contains no conductive elements. This makes it inherently immune to electromagnetic interference, partial discharge activity, and high electric fields commonly present in transformer windings, high-voltage equipment, and power electronic systems. As a result, TSENS-FL provides true hotspot temperature measurement directly at critical locations, enabling more reliable assessment of thermal stress, insulation aging, and operational margins.

The probe is engineered with a compact 2 mm sensing tip and a high-strength 200 μm optical fiber, allowing installation in confined spaces without compromising mechanical robustness. The PTFE-sheathed fiber cable provides excellent resistance to chemicals, moisture, and mechanical wear, ensuring reliable operation in air, oil, water, and harsh industrial environments. Designed for seamless integration with Rugged Monitoring's monitoring and analytics platforms, TSENS-FL forms a reliable foundation for continuous thermal monitoring and condition-based asset management.

» Features

- Fluorescence lifetime-based temperature measurement
- Electrically passive and immune to EMI, PD, and HV fields
- Compact 2 mm probe for embedded or retrofit installations
- High mechanical strength optical fiber with PTFE sheathing
- Suitable for long-term continuous monitoring

» Applications



Dry-type transformers



High-voltage electrical equipment



Industrial processes requiring electrically isolated temperature measurements

» Benefits

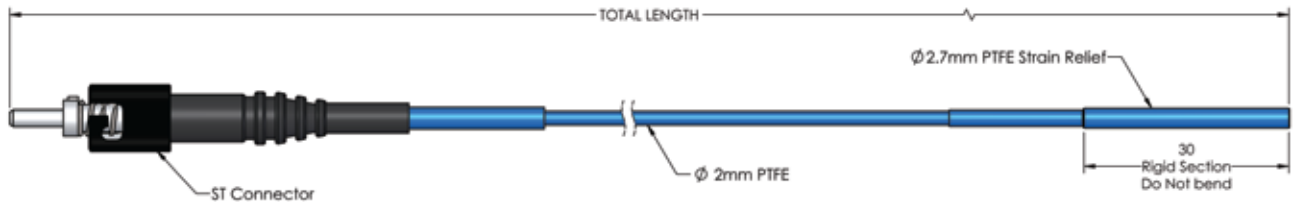
- Accurate assessment of thermal stress and insulation aging
- Eliminate errors caused by EMI or electrical interference
- Improves asset reliability and operational safety
- Supports condition-based maintenance and life-extension strategies

» Technical Specifications

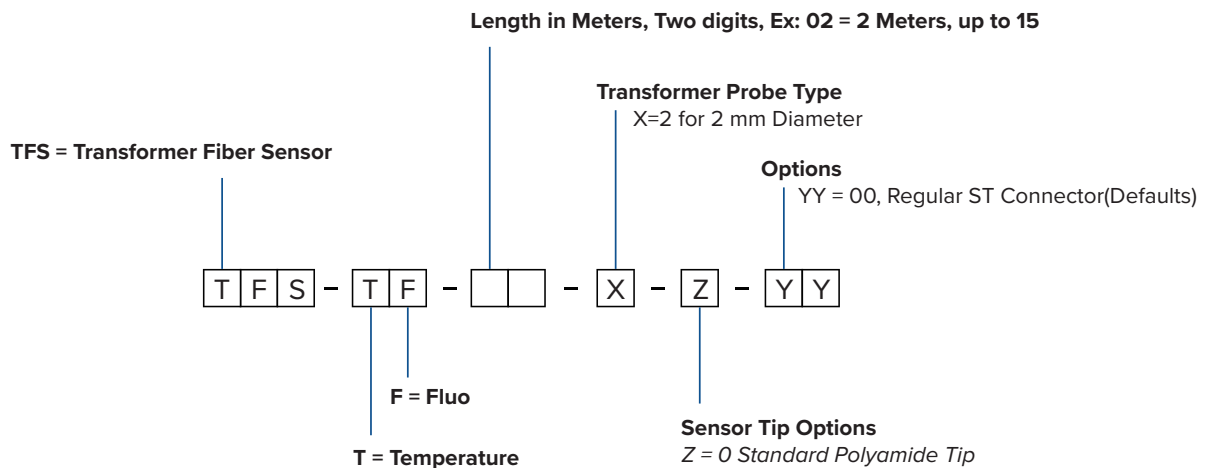
Temperature Range	-40 °C to +250 °C
Repeatability	± 0.1 °C
Accuracy temperature	± 1.0 °C or 1%*
Response Time	3.8 seconds
Probe Outer Diameter	2 mm
Tip Diameter	2.7 mm
Sheathing Material	PTFE
Tip Material	Polyamide tube
Maximum Probe Length	15 m
Connector	Stainless alloy ST with metallic ferrules

* Whichever is greater

» Product Drawing



» Ordering Code



CERTIFICATIONS



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