RUGGED MONITORING

MONITORING SIMPLIFIED

TSENS-FL

FIBER OPTIC TEMPERATURE FLUORESCENCE SENSOR

RUGGED | ROBUST | RELIABLE

TSENS-FL

FIBER OPTIC TEMPERATURE FLUORESCENCE SENSOR

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

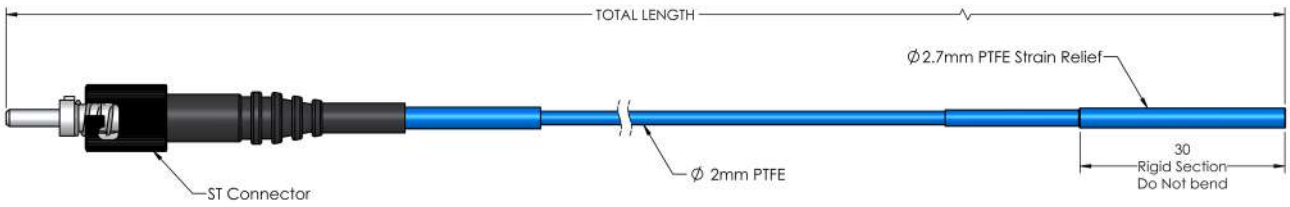
Benefits

- Accurate assessment of thermalstress 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 absolute temperature	± 0.8 °C
Accuracy relative temperature	± 0.2 °C
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 ferules

Product Drawing



Ordering Code

Length in Meters, Two digits, Ex: 02 = 2 Meters, up to 15 m

Transformer Probe Type
X=2 for 2 mm Diameter

Options
YY = 00, Regular ST Connector(Defaults)

TFS = Transformer Fiber Sensor

T F S – T F – □ □ – X – Z – Y Y

F = Fluo

T = Temperature

Sensor Tip Options
Z = 0 Standard Polyamide Tip

CERTIFICATIONS

ISO 9001:2015 ISO 14001:2015 ISO 45001:2018

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