

Fiber Optic FP Temperature Sensor



Article Overview

Fabry-Pérot (FP) fiber optic sensors measure temperature by detecting spectral shifts in an optical cavity, offering high sensitivity, compact size, and immunity to electromagnetic interference.

Working Principle

FP fiber optic temperature sensors operate using a Fabry-Pérot interferometer, where light reflects between two parallel surfaces forming a cavity. Temperature changes alter the cavity length or refractive index, causing measurable shifts in the interference fringes. These shifts are then converted into temperature readings, enabling precise monitoring in various environments .

Types of FP Cavities

- **Ultraviolet Glue-Filled FP Cavity:** A hollow capillary fiber is filled with UV glue and fusion-spliced to a single-mode fiber. This design provides high sensitivity (up to 1.174 nm/°C) in the 30–60°C range, is pressure-insensitive, and suitable for marine and environmental monitoring .
- **Air-Filled FP Cavity:** Constructed by splicing a fused-silica tube with single-mode and side-hole fibers, allowing pressure-controlled spectral shifts. This system achieves high-resolution temperature measurements ($\pm 0.32^\circ\text{C}$) and can operate up to 800°C, with excellent stability under thermal cycling .
- **Sapphire FP Cavity:** Designed for ultra-high temperatures ($>1000^\circ\text{C}$), using a sapphire cavity mounted on an alumina tube. It maintains stability within $\pm 1^\circ\text{C}$ at 1100°C and can resolve temperature changes below 0.5°C at 1300°C, making it ideal for industrial and nuclear applications

Article Content

Sep 09, 2025

Fiber Optic Temperature Sensors: Types, Working & Applications

Fiber optic temperature sensors offer superior performance compared to these techniques, thanks to their numerous benefits. This

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ONSENSA Innovations | Fiber Optic Temperature Sensing & Partial ...

Leading developer of fiber optic temperature sensing and partial discharge monitoring solutions for switchgear, data centers, energy,

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What are Fiber Optic Temperature Sensors and their Uses?

Fiber optic temperature sensors used in the proactive monitoring of electrical assets has an increasing demand.

Aug 14, 2025

Fiber temperature sensor based on Fabry-Pérot cavity generating

A fiber temperature sensor consisting of two cascaded reflective film-fiber-reflective film Fabry-Pérot (FP) cavities is

Oct 17, 2025

FOTEMP TS Series Fiber Optic Temperature Probes

High precision FOTEMP TS fiber optic temperature probes are for operating environments where conventional electronic-based

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Temperature Measurement Using Optical Fiber

It is a single point contact temperature measurement system. A Fluorescent sensor is formed at the tip of the Optical Fiber. The other

Oct 11, 2025

Fiber Optic Temperature Sensor System Using Air-Filled Fabry ...

We report a high-resolution fiber optic temperature sensor system based on an air-filled Fabry-Pérot (FP) cavity,

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Optical Fiber Temperature Sensing Probe Based on F-P Cavity for

This article highlights the advantages of optical fiber sensors, such as their resistance to electromagnetic

Mar 31, 2026

Fiber optic temperature sensor, Type C, 1 mm tip, 6' long

Type C sensors are used with Fiber Optic Temperature Modules that activate the sensor with a red light.

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In-Depth Overview of Fiber Optic Temperature Sensors

A fiber optic temperature sensor is a temperature measurement device that uses optical fibers as the sensing medium. Unlike

Jan 29, 2026

Fiber Optic Temperature Sensor Using Dual Air

We present an approach for high temperature measurement using a pair of fiber-optic Fabry-Pérot (FP) cavities filled

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High-Sensitivity Temperature Sensor Based on Fiber

In this paper, we propose a high-sensitivity fiber-optic temperature sensor based on the UV glue-filled

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Performance of a fiber-optic temperature sensor from -200 to 1050°C

A reflectively monitored Fabry-Perot temperature sensor is characterized over a 1250°C temperature range. Dielectric mirrors for the

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Fiber optic temperature sensors | Althen Sensors

Fiber optic temperature sensors use the physical properties of optical fibers to accurately detect temperature changes. They offer

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Fiber Optic Temperature Sensor DTSX

The DTSX fiber optic temperature sensor, which uses optical fiber for the temperature sensor, quickly

Nov 15, 2025

High Sensitivity Optical Fiber FP Interferometer based on Vernier ...

A temperature sensor based on fiber Fabry Perot interferometer (FPI) is proposed and demonstrated, which is composed of hollow

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Fiber Optic Temperature Sensing: Revolutionizing Monitoring

However, traditional temperature sensors often have limitations, hindering the ability to obtain a comprehensive understanding of

Apr 23, 2026

Fiber optic sensors

Fiber optic temperature measurement systems Fiber optic sensors Our fiber optic sensors use a Gallium

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Liquid crystal-embedded fiber optic fabry perot temperature sensor ...

As a result, a liquid crystal optical fiber sensor with the structure of FBG-FP based on the Vernier effect can be utilized

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FISO Fiber Optic Temperature Sensors

FISO's Fiber Optic Temperature Sensors provide accurate, stable, and repeatable measurements. These measurements are based

Dec 01, 2025

High sensitivity fiber optic temperature sensor composed of two ...

A high-sensitive fiber-optic Fabry-Perot sensor with parallel polymer-air cavities based on Vernier effect for

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Fiber Optic Probe | Sensing Solutions

MKS fiber optic temperature sensor probes are designed to offer industry leading accuracy, repeatability, and reliability for a wide

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Fiber Optic Temperature Sensing and Measurement

Measure temperature with fiber optic sensors for high-resolution distributed and multipoint monitoring in batteries, processes, and

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Fiber Optic Temperature Sensor Working Principle: A Complete

Fiber optic temperature sensors are now a key measurement solution in industries that demand high accuracy, safety,

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PTFE Coated Fiber Optic Temperature Sensor | Omega

The FOS-Series fiber optic sensors are designed to be reliable and work for a wide range of applications. Fiber optic

Feb 23, 2026

Fiber optic temperature sensor, type C, 1 mm OD, 7"

Type C sensors are used with Fiber Optic Temperature Modules that activate the sensor with a red light.

Contact Us

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