

Article Overview

A typical U-shaped fiber optic sensor has a fiber length of 1 meter, a bending radius of 25 mm, and an effective detection distance of 12 mm.

Key Physical Specifications

- o Fiber Length: Most U-shaped fiber optic sensors, such as the ATO slotted type, come with a 1-meter fiber .
- o Bending Radius: The minimum bending radius is typically R25 (25 mm), allowing the fiber to form a U-shape without damaging the core .
- o Detection Distance: The effective detection distance for standard industrial U-shaped sensors is around 12 mm, suitable for precise object detection in production lines, chemical, and textile industries .
- o Material: The sensor body is often made of aviation aluminum, and the fiber cores are imported for high light conductivity and bending resistance .
- o Installation: U-shaped sensors integrate the beam-emitting and beam-receiving parts, eliminating the need for beam axis alignment, which simplifies installation in compact or high-temperature environments .

Specialized Variants

- o High-Sensitivity SPR Sensors: U-shaped optical fiber sensors coated with indium tin oxide (ITO) are designed for surface plasmon resonance applications. While their exact physical dimensions may vary, the U-shaped structure is optimized for evanescent wave interaction, enhancing sensitivity without significantly altering the fiber length or bending radius .
- o High-Temperature Applications: Some U-shaped fiber heads, like Panasonic's FT-PK40H1, are designed to withstand temperatures up to 100°C, with compact U-shaped configurations that facilitate installation in harsh environments .

Summary

In general, a standard U-shaped fiber optic sensor has a 1-meter fiber, a 25 mm bending radius, and a 12 mm detection distance, with a robust construction suitable for industrial applications. Variants exist for high-sensitivity or high-temperature environments, but the U-shaped design consistently allows easy installation and precise detection.

A Fiber Optic Shape Sensor (FOSS) can be defined as fiber optic cable with multiple cores and embedded strain

Dimensions of U-shaped fiber optic sensor

This study presents a new design and implementation of U-shaped fiber optics. The basic geometric parameters of U

In this paper, a U-shaped SPR sensor coated with GeS nanosheets on the basis of a conventional gold film is

This review compares materials for fiber optics fabrication, focused on polymers for fibers in sensing applications.

Novel S-shaped optical fiber geometry is explored and its sensing potential is compared with U-bend geometry. Evanescent wave

FU-58U, Fiber Unit Thrubeam type in FS-N40 series by KEYENCE America.

The refractive index (RI) sensitivity of a localized surface plasmon resonance (LSPR)-based fiber-optic probes is

This paper is the second part of a review on U-shaped FOSs and discusses the sensing mechanisms, applications, possible

A wide range of geometrical deformations of fiber optic sensors (FOSs) have been explored to improve their performance. In

Lu₂O₃/h-BN Modified U-Shaped Fiber Optic SPR Sensor With Improved Sensitivity Abstract: Rapid and incredibly sensitive analyte

In this article, we aim to put forward a simple, cost-effective, compact, and high-performance optical fiber biosensor

Noticeably, U-shaped fiber optic LSPR cytosensing showed an acceptable reproducibility, satisfactory anti-interference

Principles of sensing mechanisms for U-shape polymer fiber sensors are discussed. Possible applications of U-shape

These include core diameter, length, jacket type, temperature range, flexibility and a diverse number of sensing tip styles. If you have

Fiber optic sensor is an excellent industrial detection component with an effective

Dimensions of U-shaped fiber optic sensor

Photonic crystal fibre-optic sensors with large-aperture cladding and U-shaped detection channels are simple in

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