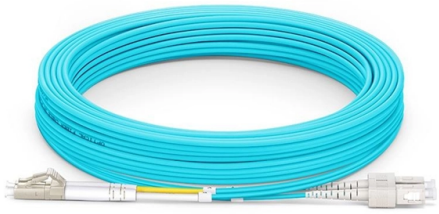
Fiber Optic Displacement Sensor Series



Overview

Standard single channel units include amplifier and sensor tip with 914 mm (3 Feet) long fiberoptic cable, require +12 VDC input power, and provide 0 to +5 volt analog output with DC - 20 KHz bandwidth.

Key Takeaways

Fiber optic displacement sensors are non-contact, high-precision devices available in multiple series, including D and RC models, designed for industrial, aerospace, and research applications.

Overview of Sensor Series

Philtec Fiber Optic Sensors offer configurable systems for precision measurement in demanding environments such as aerospace, vacuum, cryogenic, and industrial applications. They are non-contact sensors that use optical signals, providing immunity to electromagnetic interference and high-voltage environments. Sensors are available in two main optical configurations: D Model (Reflectance Dependent): Ideal for single-axis motion on constant surfaces, such as actuators, pistons, and valves.

These sensors are optimized for micro-vibration testing and extremely fast dynamic operations up to 1 MHz along the probe axis.

R

C Model (Reflectance Compensated): Designed for multi-axis or varying reflectance targets, including rotating or laterally moving surfaces. These sensors accurately measure target positions even with changing surface reflectivity.

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Key Features

Measurement Range: Depending on the model, ranges can vary from 10 mm to several meters using specialized probe heads and FBG (Fiber Bragg Grating) technology. Temperature and Environmental Tolerance: Validated operation from cryogenic liquids to 400°C, with options for vacuum and high-pressure environments. Signal Output: Available with 0-5V analog voltage terminals or high-resolution RS232/USB digital modules.

Probe Options: Engineered probe shapes, right-angle sheathing, sapphire window assemblies, and focused or collimated beams for long-distance or small-target measurements. Durability: Fiber optic cables are flexible, semi-crush-proof, and resistant to fatigue, twisting, and pulling. Some models include Kevlar or PTFE reinforcement for high tensile strength.

Applications

Fiber optic displacement sensors are widely used in: Aerospace and Defense: Structural monitoring of aircraft in-flight and on-ground, rotor blade clearance measurements, and vibration analysis. Civil Engineering: Monitoring concrete structures, bridges, and smart structures for long-term reliability. Industrial and Research: Cryogenic systems, vacuum chambers, high-speed motion analysis, and precision laboratory measurements.

Structural Health Monitoring (SHM): FBG-based sensors provide temperature compensation and rugged performance for long-term monitoring. Additional Series and OptionsFS61DSP Series: Uses dual FBGs for linear displacement measurement with temperature compensation, suitable for structural monitoring. OS1200 FBG Array: Polyimide-coated fiber with multiple FBGs for distributed sensing, allowing integration with strain, temperature, and displacement measurements.

Custom Configurations: Philtec offers interactive engineering questionnaires to configure sensors based on target surface movement, optics orientation, and environmental requirements. Fiber optic displacement sensor series provide high-speed, precise, and reliable measurement solutions for applications where traditional electrical sensors may fail due to electromagnetic interference, extreme temperatures, or vacuum conditions.

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Article Content

Fiber Optic Displacement Sensors

Standard single channel units include amplifier and sensor tip with 914 mm (3 Feet) long fiberoptic cable, require +12 VDC input power, and provide 0 to +5 volt analog output with DC - 20 KHz bandwidth.

Fiber optic displacement sensor (LVDT), transducer and probe

Fiber optic linear displacement sensor is ideal for real-time monitoring of civil engineering structures, structural monitoring of aircraft, both in-flight and on-ground, smart structures instrumentations,

Fiber Optic Displacement Sensors

Measure linear displacement with FBG technology. These rugged sensors enable temperature compensation and are ideal for SHM.

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Review of Fiber Optic Displacement Sensors

This article reviews specifically the advanced fiber optic displacement sensing techniques that have been developed in the past two decades.

Products

Philtec designs and manufactures precision fiber optic displacement sensors for non-contact measurement in demanding industrial and research environments.

Fiber Optic Displacement Sensors

The MTI 2100 Fotonic Sensor represents the pinnacle of precision measurement technology, embodying advanced fiber optic sensing capabilities. This state-of-the-art sensor is engineered to deliver proper

FS61DSP: Optical Displacement Sensor | HBM

The sensor uses two FBGs in a push-pull configuration for effective temperature compensation. It can be used in a large range of monitoring applications, like

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Fiber Optic Displacement Sensors and Their Applications

displacement, pressure, temperature and electric field. Recently, high precision fiber displacement sensors have received significant attention for applications ranging from industrial to medical fields

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Fiber Unit FU series This is a series of fiber optic sensor heads designed to be connected to a fiber optic sensor amplifier. The FU Series offers a wide variety of

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Abstract A method is reported for reconstructing the amplitude–frequency characteristic (AFC) of the distributed fiber optic sensor (FOS) built into a polymer composite material (PCM),

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