



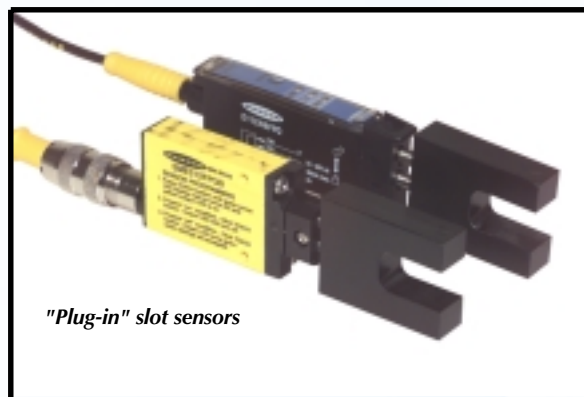
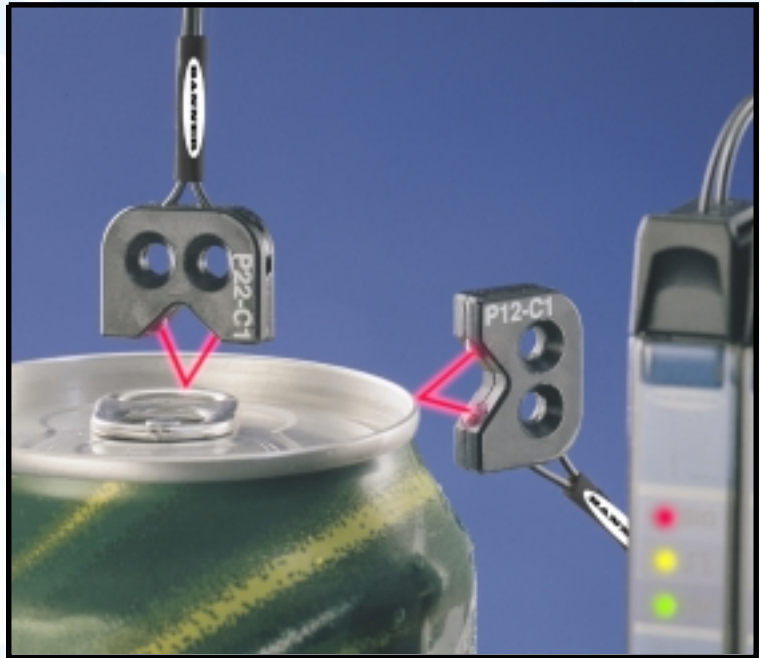
Banner Fiber Optic Update

Issue FO102

Convergent Beam Fibers

Standard bifurcated fiber optic cables depend on the consistency of light reflected from the target for repeatability in any sensing application. This can be problematic if, for example, the target's surface finish and/or color varies, thus causing variable levels of light to be returned to the sensor. This problem is alleviated by the new Banner P12-C1 and P22-C1 convergent beam fibers. These fibers use a lensed, mechanical-convergent optical configuration to provide a very tightly-defined response band at a distance of 3 mm from the face of the sensing head, where the fiber is most sensitive to light returned from the target.

Outside this band, response falls off sharply, enabling the fiber to ignore a background, even if that background is more reflective than the target. Typical applications for these fibers include silicon wafer sensing, wafer cassette presence detection, near-field product detection, and PC board detection. For more information, request or download data sheet p/n 51099 from Banner at <http://www.banner.com/beam>.



"Plug-in" slot sensors

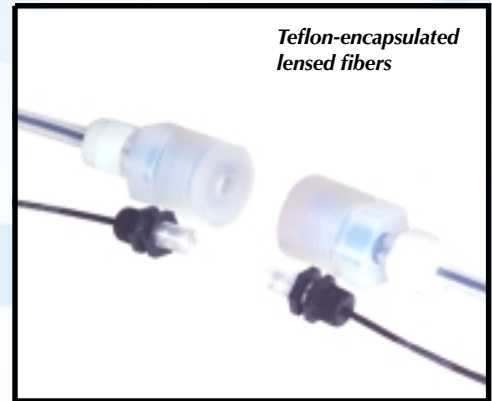
"Plug-in" Slot Fibers

Models PDIS4TM12 and PDIS4T4M12 are dual individual fiber optics used for edge-guiding or label sensing applications where control of a moving web is necessary. Housings are plastic, with a 12 mm (0.47") wide slot to accommodate the 1.0 mm diameter effective opposed light beam. The terminations are designed to plug directly into D12/D11 or MINI-BEAM plastic fiber optic sensors (respectively).

Fiber Optics for Special Sensing Environments

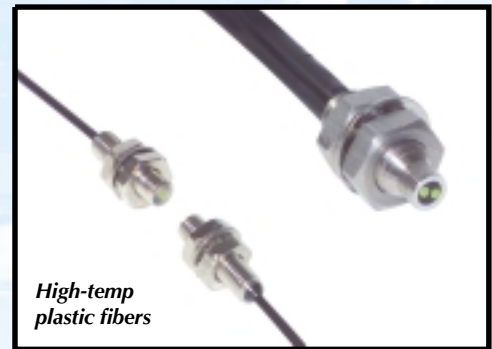
Teflon-encapsulated Lensed Fibers

Banner manufactures a complete line of Teflon®-encapsulated plastic fiber assemblies for use in extremely harsh sensing environments such as strong acids, solvents, and other chemicals. Model PIL46UMT (shown) is an L08FP lens assembly coupled with 2 m (6') of 1.0 mm (0.040") plastic fiber cable which has been specially modified with Teflon compression fittings and an optically transmissive Teflon window to enable long-range fiber optic sensing in harsh environments.



High-temperature Plastic Fiber Optics

Standard plastic fiber optics have an operating temperature range of -30° to +70°C (-20° to +158°F). Banner "HT1" fibers employ a polycarbonate core material and a tougher cross-linked polyethylene jacket material to withstand continuous temperatures of 125°C (257°F). Models are available in core sizes of 1.0 mm (0.040") and 0.5 mm (0.020") with a wide array of end tip styles.





Optical Feedthroughs for Non-contact Sensing in High-vacuum Environments

Vacuum Feedthrough (VFT) Fiber Optic Assemblies

Banner offers a line of vacuum fiber optic feedthroughs and vacuum-compatible fiber optic cables which enable photoelectric sensing in vacuum chambers. The sensor can be either mounted to the feedthrough on the ambient side of the enclosure or connected to the feedthrough on the ambient side via a pair of fiber optic cables. *Standard* and *Mini* style feedthroughs require special fiber optic adaptors, while *Micro* style feedthroughs can accept standard glass or plastic fiber cables, and require no adaptors.

Specifications for High-vacuum Feedthrough Assemblies

Construction: Feedthroughs are constructed of 300 series stainless steel. Models with "A" suffix in their model number are constructed of 6061-T6 aluminum. Feedthrough material is borosilicate glass. Micro style feedthroughs employ special vacuum-compatible epoxy. Sensor fittings and fiber optic adapters are constructed of stainless steel and glass. The glass of the sensor fittings is epoxy-bonded to the stainless steel shroud.

Operating Temperature: -60° to +180°C (-76° to +356°F) for Standard and Mini style; -45° to +120°C (-49° to +248°F) for Micro style.

Sealing Method: Viton® or Teflon® encapsulated o-ring.

Seal Integrity: Ambient atmosphere against 10⁻⁹ torr.

Standard Style Feedthroughs

Compatible with OMNI-BEAM, MULTI-BEAM, MAXI-BEAM, Q45, VALU-BEAM; direct connect.

- VFT-2.7MTS Dual port, stainless steel construction, Teflon o-ring.
- VFT-SF.16TS 0.16" diameter clad glass rod for direct connection to sensors. Sold in pairs.
- VFT-FA-2.7TS Fiber optic adapter for cable connection to sensors. Sold in pairs.

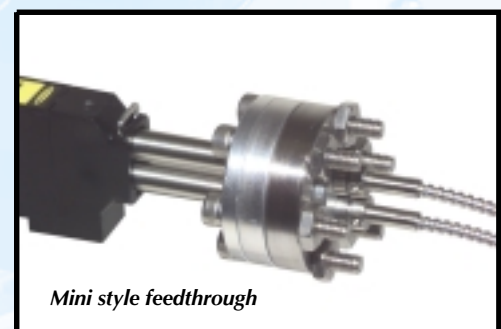


Standard style feedthrough

Mini Style Feedthroughs

Compatible with MINI-BEAM and D12; direct connect.

- VFT-1.3MVSA Dual port, aluminum construction, Viton o-ring.
- VFT-SF-.13VS 0.13" diameter clad glass rod for direct connection to sensors. Sold in pairs.
- VFT-FA-1.3VS Fiber optic adapter for cable connection to sensors. Sold in pairs.
- VFT-1.3MTS Dual port, stainless steel construction, Teflon o-ring.
- VFT-1.3MTS-1 Single port, stainless steel construction, Teflon o-ring.
- VFT-SF-.13TS 0.13" diameter clad glass rod for direct connection to sensors. Sold in pairs.
- VFT-FA-1.3 Fiber optic adapter for cable connection to sensors. Sold in pairs.

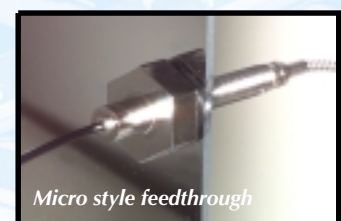


Mini style feedthrough

Micro Style Feedthroughs

Compatible with all fiber optic sensors, glass and plastic.

- VFT-M8MVS Single port, M8x1, stainless steel construction, Viton o-ring.
- PIF66UM.52M.19D Plastic fibers for cable connection to sensors. Sold in pairs.



Micro style feedthrough

Teflon® is a registered trademark of DuPont Co.
Viton® is a registered trademark of DuPont Dow
Conflat® is a trademark of Varian Vacuum Technologies

Direct connection of Standard and Mini style VFTs is accomplished with special clad glass sensor fittings, sized appropriately for each model. Banner OMNI-BEAM, MAXI-BEAM, MULTI-BEAM, Q45, and VALU-BEAM sensors mount directly onto model VFT-2.7MTS using VFT-SF.16TS sensor fittings (see Figure 1). Model VFT-1.3MVSA offers direct mounting for Banner MINI-BEAM and D12 sensors using VFT-SF.13VS fittings (see Figure 2). Micro style feedthrough VFT-M8MVS, which is used in pairs, has a threaded M8 x 1 body which requires connection of ambient side fiber optic cables (see Figure 3). Direct connection to a sensor is not an option with this model.

All Standard and Mini feedthrough models are designed to couple to Conflat® flange assemblies, based on the diameter of the circular flange (70 mm / 2.7" O.D. for standard style and 34 mm / 1.3" O.D. for Mini style). Micro style feedthroughs do not require a bulkhead flange. The feedthrough simply mounts through an appropriately-sized through-hole in the vacuum chamber wall.

Vacuum feedthroughs are ideal for applications such as analog edge-guiding of webs for lamination or precision coating in the adhesive and magnetic tape industries. Other typical uses are part presence detection in semiconductor processing, and evacuated liquid level sensing in photographic film manufacturing, in addition to many other applications.

Model VFT-2.7MTS (Standard) offers maximum fiber optic sensing range by accommodating the largest fiber optic bundles (4.0 mm / 0.156"). Model VFT-1.3MVSA (Mini) uses fibers with bundle diameters up to 3.2 mm / 0.125". Micro feedthrough model VFT-M8MVS can accept up to 3.2 mm bundles.

Fiber optic cables used with vacuum feedthroughs are modified for use in vacuum environments, and carry the letters "MVF" in their model number suffix. These fibers are constructed without epoxy, and contain no materials that can outgas. Materials used include stainless steel, OFHC copper (instead of brass), and borosilicate glass.

Banner vacuum fiber optic feedthroughs are supplied with mounting bolts and o-ring seal (Teflon® encapsulated or Viton®). Sensor fittings and fiber optic adapters are sold separately, in pairs. Contact the factory for more information.

Figure 1. Standard Style

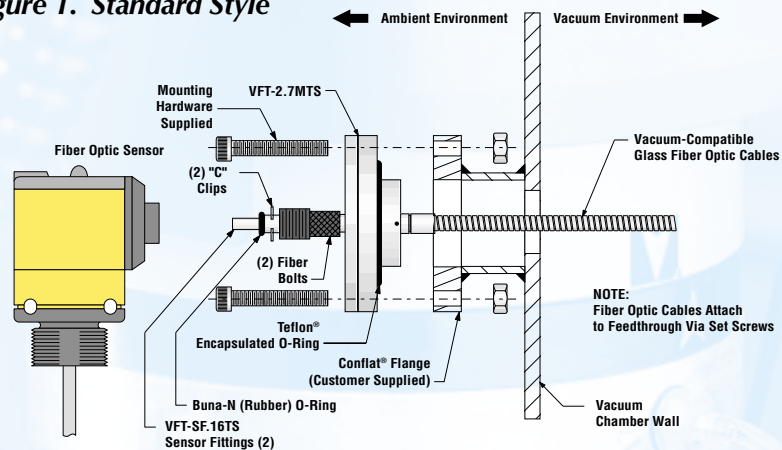


Figure 2. Mini Style

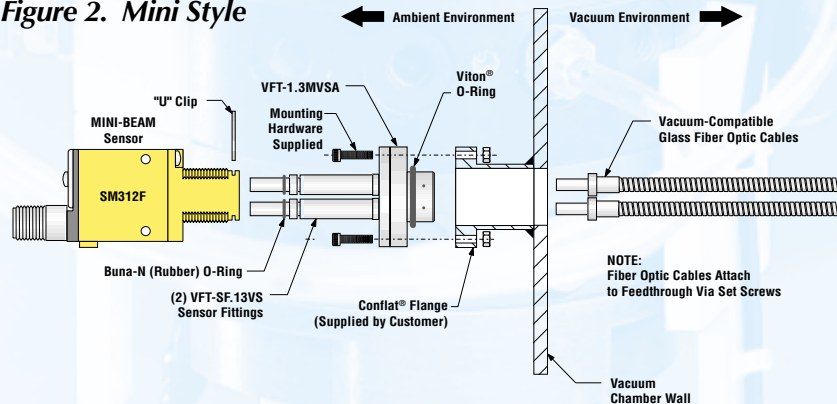


Figure 3. Micro Style

