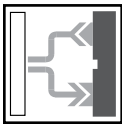


Introduction to Fiber Optic Cables

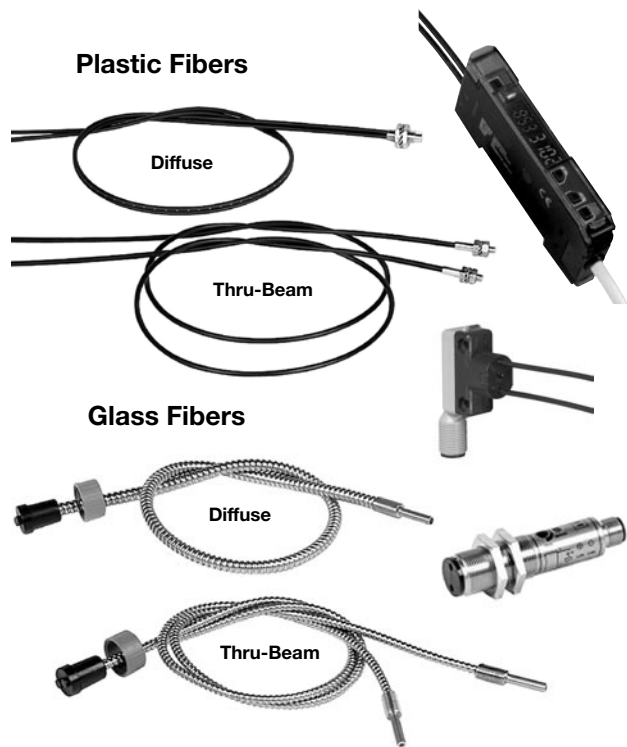


Fiber Optic Diffuse and Thru-Beam Mode

In applications involving small targets or unfavorable conditions, fiber optic cables may be the sensible solution. Glass fiber optic cables are constructed from tiny strands of glass that are bundled together inside an application-specific sheath. Plastic fiber optic cables are manufactured from a light conductive plastic monofilament material which is protected by a PVC jacket.

When attached to the end of certain photoelectric sensors, they guide the light through the cable and out at the sensing head. A separate fiber attached to the receiver returns the light. P+F offers both glass and plastic fiber optic cables. The diameter of the glass fiber optic cables is generally larger than plastic and provides a longer sensing range. P+F's glass cables can withstand temperatures as high as 900 °F while the plastic cables are rated as high as 221 °F. The plastic cables are generally utilized due to their small size and narrow beam diameter. This enables easy detection of small parts such as pins on an IC chip. Plastic cables can be "cut-to-length" in the field, therefore the correct length doesn't have to be specified when ordering. Obtaining the maximum light intensity possible in each application is accomplished by customizing the plastic cables to the shortest possible length. This will reduce the inherent "light losses" that occur inside the cable. P+F offers three standard types of sheaths: stainless steel, silicone, and PVC.

In diffuse mode sensing, a bifurcated cable (2 in 1) is used. Thru-beam requires two individual cables.



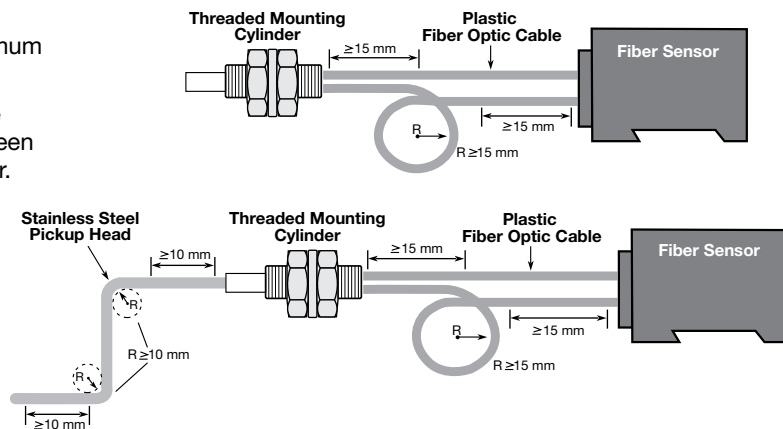
Mounting and Fitting

When positioning plastic fiber optic cable, a minimum bending radius of 15 mm must be maintained.

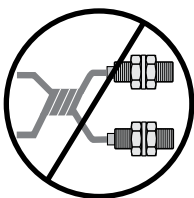
In addition, a straight section of ≥ 15 mm must be maintained at both ends of fiber optic cable between the threaded mounting cylinder and optical sensor.

Some fiber optic cables have a flexible stainless steel pickup attached. In such a case, a minimum bending radius of 10 mm must be maintained.

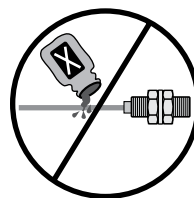
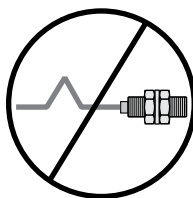
Also, to avoid damage to the pickup head light guide, a straight section of 10 mm must be maintained at both ends.



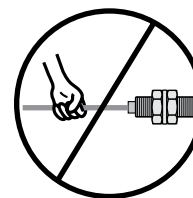
Please Note!



Do not twist or kink plastic fiber optic cables.



Avoid contact with petroleum or organic solvents.



Excessive pulling will lead to severe damage.

Specifications for Glass Fiber Optic Cables

(with Model Numbers L...)

	PVC Sheathing	Stainless Steel Sheathing	Silicone Sheathing
Protection (IEC)	IP67	IP40	IP67
Bending Radius	≤ 30 mm	≤ 20 mm	≤ 25 mm
Working Temperature Range	-58 °F to +248 °F	-58 °F to +572 °F	-58 °F to +356 °F

Minimum Bend Radius for HPF and FE Cables

To help prevent possible damage to fiber optic cables, do not exceed the minimum bend radius.

Glass Armour Grip Cables	1 inch (25 mm)
Glass PVC Monocoil Cables	0.75 inch (19 mm)
Plastic Cables - 1 mm diameter core	1 inch (25 mm)
Plastic Cables - 0.5 mm diameter core	0.5 inch (12.5 mm)

Temperature Ranges for HPF and FE Cables

Fiber Optic Sensor Head	-22 °F to +158 °F (-30 °C to +70 °C)
Plastic Cable	-22 °F to +158 °F (-30 °C to +70 °C)
Plastic Cable (High Temp.)	-22 °F to +662 °F (-30 °C to +350 °C)
Plastic Cable Lens Accessories	-22 °F to +158 °F (-30 °C to +70 °C)
Glass Cable (PVC Monocoil)	-40 °F to +250 °F (-40 °C to +120 °C)
Glass Cable (Armour Grip)	-40 °F to +450 °F (-40 °C to +232 °C)
Glass Cable (High Temp.)	-40 °F to +900 °F (-40 °C to +482 °C)
Glass Cable End Tips	-40 °F to +585 °F (-40 °C to +307 °C)
Glass Cable Lens Accessories	-40 °F to +450 °F (-40 °C to +232 °C)

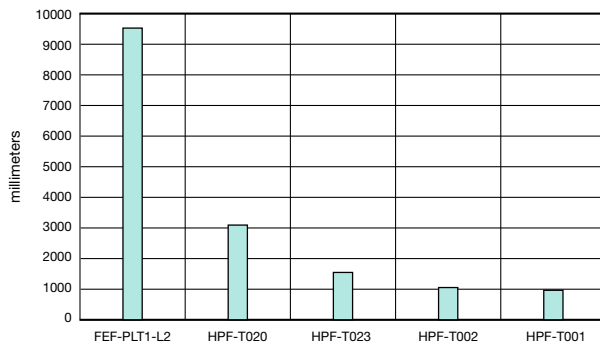
Application Specific Fiber Cables

Plastic Diffuse Long Range	HPF-D001-H
Plastic Diffuse Hi Flex	HPF-D012, HPF-D029, HPF-D030, HPF-D070
Plastic Diffuse Narrow Beam	HPF-D025
Plastic Diffuse Coaxial	HPF-D009, HPF-D010
Plastic Diffuse Pin Point	HPF-D010 with HPF-LU01
Plastic Thru-Beam Hi Temp	HPF-T012
Plastic Thru-Beam Long Range	FEF-PLT1, HPF-T001, HPF-T002, HPF-T020, HPF-T023
Plastic Thru-Beam Hi Flex	HPF-T008, HPF-T009, HPF-T024, HPF-T025, HPF-T070
Plastic Thru-Beam Narrow Beam	HPF-T023
Glass Diffuse Hi Temp	FE-B2B-3HT, FE-BTS6S-3HT
Glass Thru-Beam Hi Temp	FE-T2B-3HT, FE-ITS6S-3HT

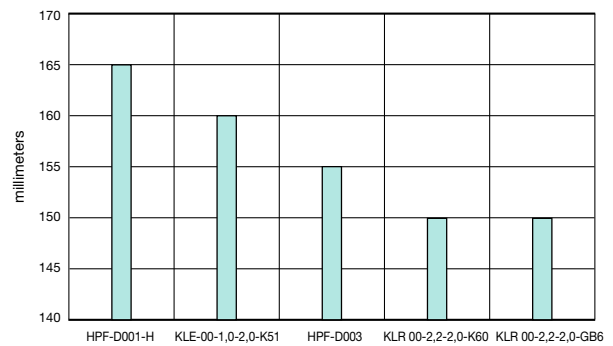
Introduction to Fiber Optic Cables

Longest Sensing Ranges

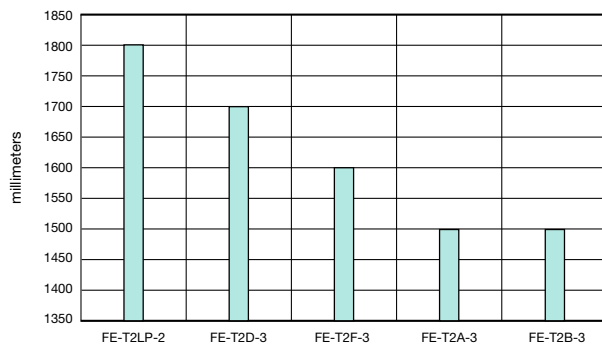
Plastic thru-beam fibers
using SU16-K/82a/103/115 without lens accessories



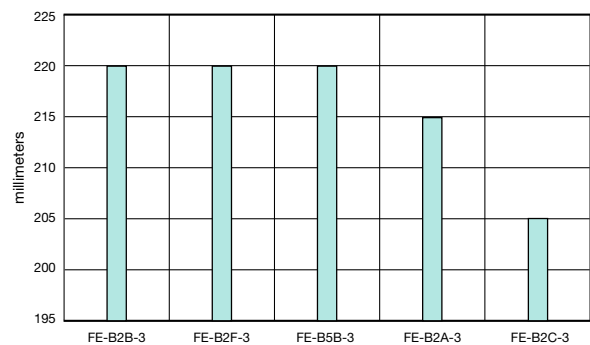
Plastic diffuse fibers
using SU16-K/82a/103/115 without lens accessories



Glass thru-beam fibers
using MPF6HD without lens accessories



Glass diffuse fibers
using MPF6HD without lens accessories



All thru-beam mode plastic fiber optic cables are sold in pairs.

Plastic Fiber Optic Cables

Thru-Beam Mode Plastic Fiber Optic Cables for SU15-K, SU16, SU17, SU17.1, MHP-FR, MPF2HD, and ML17-LL Amplifiers

Cylindrical Sensing Head (cont.)

Model Number	Cable Length	Fiber Diameter	Sheathing Material	Compatible Amplifiers	Sensing Range	Dimensions (mm)
HPF-T008	2 m	1.0 mm	Black polyethylene	SU15-K	85 mm	
				SU16 High Power	140 mm	
				SU16 High Speed	36 mm	
				SU16 Analog	20 mm	
				SU17	93 mm	
				SU17.1	165 mm	
				MHP-FR†	not compatible	
KLE 00-1.0-2.0-K54	2 m	1.0 mm	PVC	MPF2HD†	not compatible	
				ML17-LL	49 mm	
				SU15-K	65 mm	
				SU16 High Power	94 mm	
				SU16 High Speed	30 mm	
				SU16 Analog	variable	
				SU17	79 mm	
KLE 00-2.2-2.0-K53	2 m	2.2 mm	PVC	SU17.1	variable	
				MHP-FR†	not compatible	
				MPF2HD†	not compatible	
				ML17-LL	42 mm	
				SU15-K	320 mm	
				SU16 High Power	550 mm	
				SU16 High Speed	140 mm	
HPF-T003 ⚡	2 m	2.2 mm	Black polyethylene	SU16 Analog	variable	
				SU17	350 mm	
				SU17.1	variable	
				MHP-FR†	78 mm	
				MPF2HD†	67 mm	
				ML17-LL	258 mm	
				SU15-K	250 mm	
HPF-T012	2 m	2.2 mm	Black polyethylene	SU16 High Power	390 mm	
				SU16 High Speed	95 mm	
				SU16 Analog	80 mm	
				SU17	230 mm	
				SU17.1	1100 mm	
				MHP-FR†	63 mm	
				MPF2HD†	33 mm	
HPF-T001 ⚡	2 m	2.2 mm	Black polyethylene	ML17-LL	123 mm	
				SU15-K	240 mm	
				SU16 High Power	375 mm	
				SU16 High Speed	90 mm	
				SU16 Analog	not compatible	
				SU17	220 mm	
				SU17.1	670 mm	
HPF-T001 ⚡	2 m	2.2 mm	Black polyethylene	MHP-FR†	59 mm	
				MPF2HD†	30 mm	
				ML17-LL	118 mm	
				SU15-K	675 mm	
				SU16 High Power	990 mm	
				SU16 High Speed	250 mm	
				SU16 Analog	160 mm	
HPF-T001 ⚡	2 m	2.2 mm	Black polyethylene	SU17	690 mm	
				SU17.1	2100 mm	
				MHP-FR†	170 mm	
				MPF2HD†	94 mm	
				ML17-LL	363 mm	
				SU15-K	675 mm	
				SU16 High Power	990 mm	

† Requires MHPFOA adapter (sold separately).
‡ Requires MPZFOADPT adapter (sold separately).

- ⚡ Stocked item
- Typical delivery 4 weeks or less
Consult factory for all other models

Subject to modifications without notice

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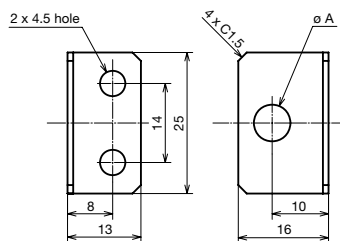
PEPPERL+FUCHS
SENSING YOUR NEEDS

(Dimensions in mm)

Accessories for Plastic and Glass Fiber Optic Cables

Right Angle Mounting Bracket
for fiber optic cables with M3, M4, or M6 threaded optic heads.

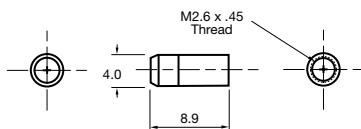
Model No.	Hole Diameter A
FE-PA-FB1	3.5 mm
FE-PA-FB2	4.5 mm
FE-PA-FB4	6.5 mm



Accessories for Plastic Fiber Optic Cables

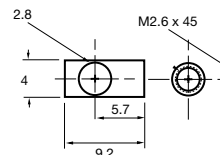
FE-PA-L1

Glass lens accessory pair for use with HPF-T003, HPF-T004, HPF-T010, and HPF-T025 cables. Will improve thru-beam range 3 to 5 times. Threads onto M2.6 fiber head. Sold as a pair.



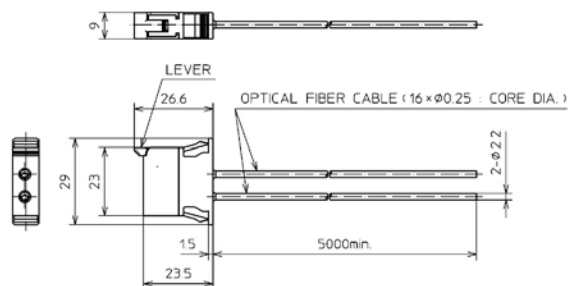
FE-PA-S1

Right angle glass lens accessory pair for use with HPF-T003, HPF-T004, HPF-T010, and HPF-T025 cables. Threads onto M2.6 fiber head. Sold as a pair.



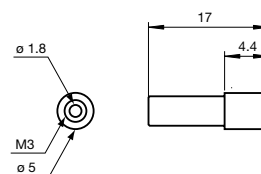
HPF-EU05

5m fiber optic cable extension accessory.
For plastic fiber optic cables.



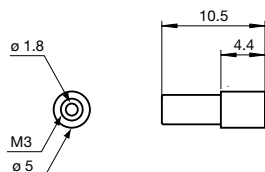
HPF-LU01

Light will converge to a spot diameter of 0.4mm when this lens is attached to HPF-D010.



HPF-LU02

Light will converge to a spot diameter of 2mm when this lens is attached to HPF-D010.



Fiber Optic Cable Accessories

(Dimensions in mm)

Accessories for Plastic Fiber Optic Cables (cont.)

MHPFOA

One-piece adapter that allows use of 2.2mm diameter plastic fiber optic cables with MHP sensor.



MPZFOADPT

Pair of adapters that allow use of 2.2mm diameter plastic fiber optic cables with MPF head. Sold as a pair.



PFA-1MM

The supplied adapter must be used to ensure proper connection for all 1mm bundle diameter plastic fiber optic cables. Sold individually. Two units are required for a fiber optic cable.



HPF-ADPT-3

Alternative adapter shaped like a small straw that ensures proper connection for all 1 mm bundle diameter plastic fiber optic cables. 3 adapters per package.



Armour Grip Protective Sleeves

for plastic fiber optic cables with M3, M4, or M6 threaded optic heads. 1 m length.



Model No.	Description
KM3-1.0	for plastic fiber optic cables with M3 threaded optic heads.
KM4-1.0	for plastic fiber optic cables with M4 threaded optic heads.
KM6-1.0	for plastic fiber optic cables with M6 threaded optic heads.

KL-CUT

Plastic fiber optic cable cutter.



Accessories for Glass Fiber Optic Cables

FE-FZ-L3

Wide angle lens accessory for use with 5/16" threaded end tips. For glass thru-beam pairs only. Sold individually. To complete a thru-beam pair, two units are required.

FE-FZ-L4

High power lens accessory for use with 5/16" threaded end tips. For glass thru-beam pairs only. Sold individually. To complete a thru-beam pair, two units are required.

