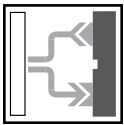


Introduction to Fiber Optic Cables

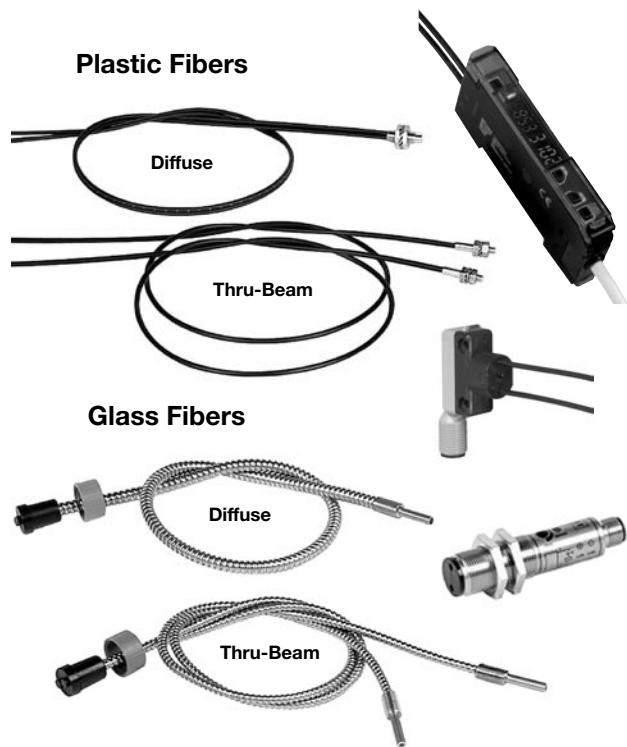


Fiber Optic Diffuse and Thru-Beam Mode

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.



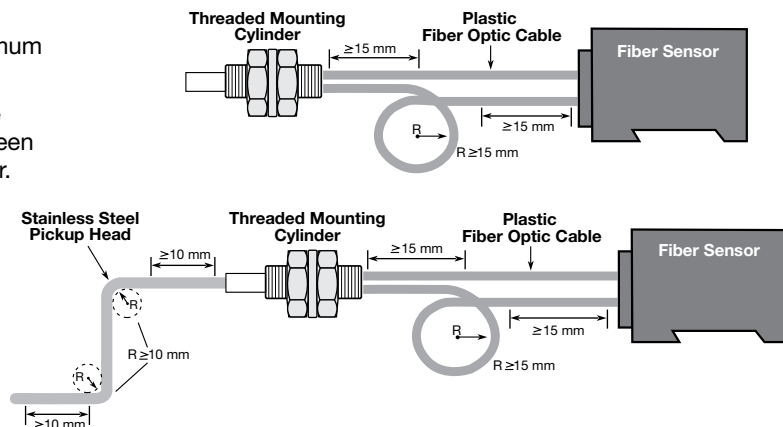
Mounting and Fitting

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

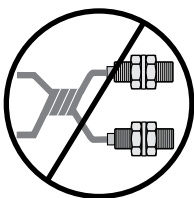
In addition, a straight section of ≥ 15 mm must be maintained at both ends of fiber optic cable between the threaded mounting cylinder and optical sensor.

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.

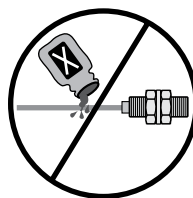
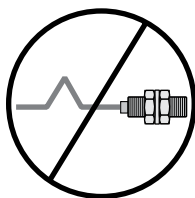
Also, to avoid damage to the pickup head light guide, a straight section of 10 mm must be maintained at both ends.



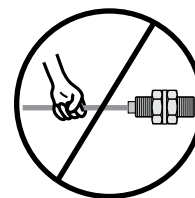
Please Note!



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)

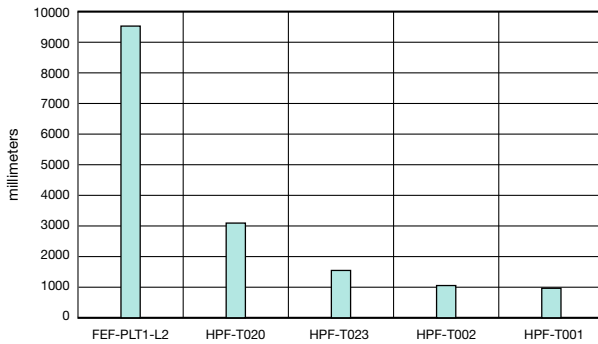
Application Specific Fiber Cables

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

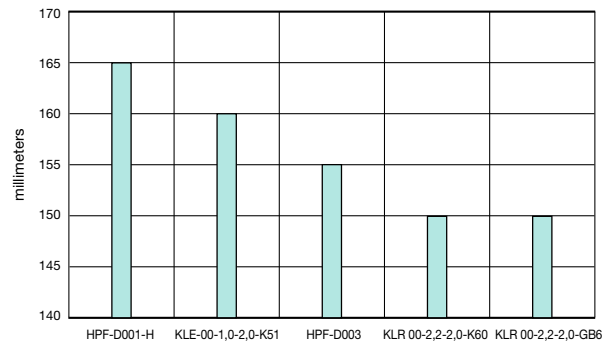
Introduction to Fiber Optic Cables

Longest Sensing Ranges

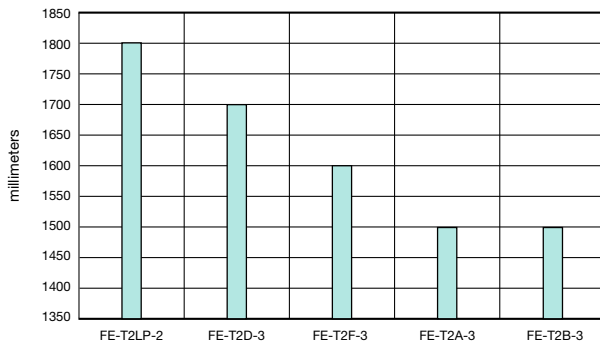
Plastic thru-beam fibers
using SU16-K/82a/103/115 without lens accessories



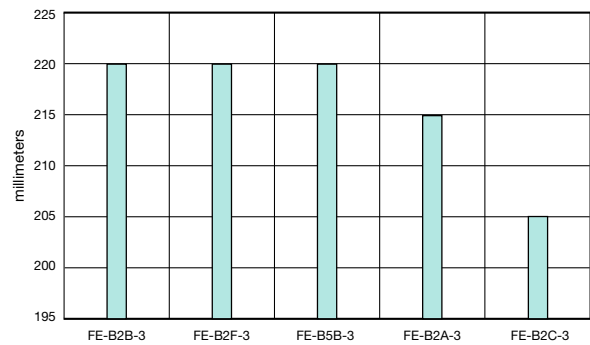
Plastic diffuse fibers
using SU16-K/82a/103/115 without lens accessories



Glass thru-beam fibers
using MPF6HD without lens accessories



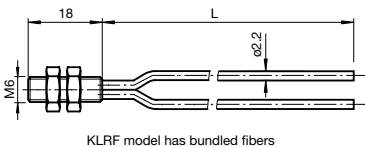
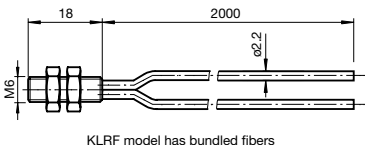
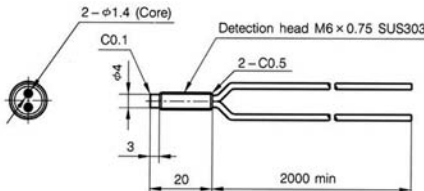
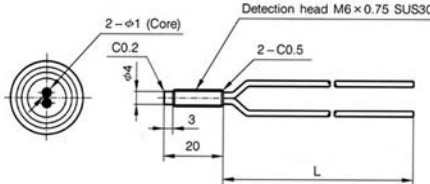
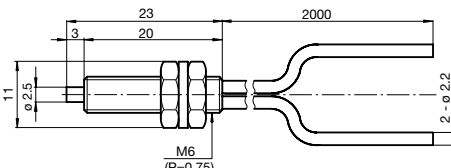
Glass diffuse fibers
using MPF6HD without lens accessories



Plastic Fiber Optic Cables

Diffuse 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)
KLR 00-2.2-2.0-G6*	2 m	2.2 mm	PVC	SU15-K	71 mm	
KLR 00-2.2-5.0-G6				SU16 High Power	89 mm	
				SU16 High Speed	21 mm	
				SU16 Analog	variable	
				SU17	62 mm	
				SU17.1	variable	
				MHP-FR†	8 mm	
				MPF2HD‡	5 mm	
ML17-LL	32 mm					
KLRF 00-2.2-2.0-G6	2 m	2.2 mm	PVC	SU15-K	100 mm	
SU16 High Power				130 mm		
SU16 High Speed				32 mm		
SU16 Analog				variable		
SU17				86 mm		
SU17.1				variable		
MHP-FR†				15 mm		
MPF2HD‡				8 mm		
ML17-LL	43 mm					
HPF-D001-H ⚡	2 m	2.2 mm	Black polyethylene	SU15-K	140 mm	
SU16 High Power				165 mm		
SU16 High Speed				52 mm		
SU16 Analog				24 mm		
SU17				140 mm		
SU17.1				550 mm		
MHP-FR†				33 mm		
MPF2HD‡				23 mm		
ML17-LL	85 mm					
HPF-D002-H* ⚡	2 m	2.2 mm	Black polyethylene	SU15-K	105 mm	
HPF-D002-HL5				SU16 High Power	145 mm	
				SU16 High Speed	44 mm	
				SU16 Analog	16 mm	
				SU17	110 mm	
	SU17.1			400 mm		
MHP-FR†	18 mm					
MPF2HD‡	10 mm					
ML17-LL	60 mm					
HPF-D009	2 m			2.2 mm	Black polyethylene	
SU16 High Power		140 mm				
SU16 High Speed		45 mm				
SU16 Analog		16 mm				
SU17		110 mm				
SU17.1		400 mm				
MHP-FR†		21 mm				
MPF2HD‡		14 mm				
ML17-LL	62 mm					
KLR 00-2.2-2.0-K60	2 m	2.2 mm	PVC	SU15-K	110 mm	
SU16 High Power				150 mm		
SU16 High Speed				50 mm		
SU16 Analog				variable		
SU17				120 mm		
SU17.1				variable		
MHP-FR†				24 mm		
MPF2HD‡				12 mm		
ML17-LL	69 mm					

* Sensing ranges based on this model.

† 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

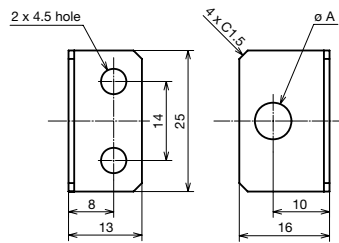
Copyright Pepperl+Fuchs

(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.

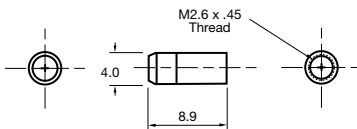
Model No.	Hole Diameter A
FE-PA-FB1	3.5 mm
FE-PA-FB2	4.5 mm
FE-PA-FB4	6.5 mm



Accessories for Plastic Fiber Optic Cables

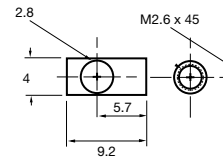
FE-PA-L1

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.



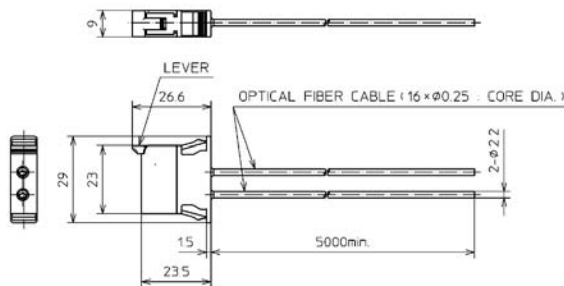
FE-PA-S1

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.



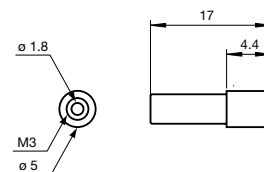
HPF-EU05

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



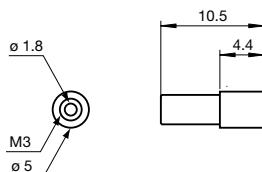
HPF-LU01

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.

