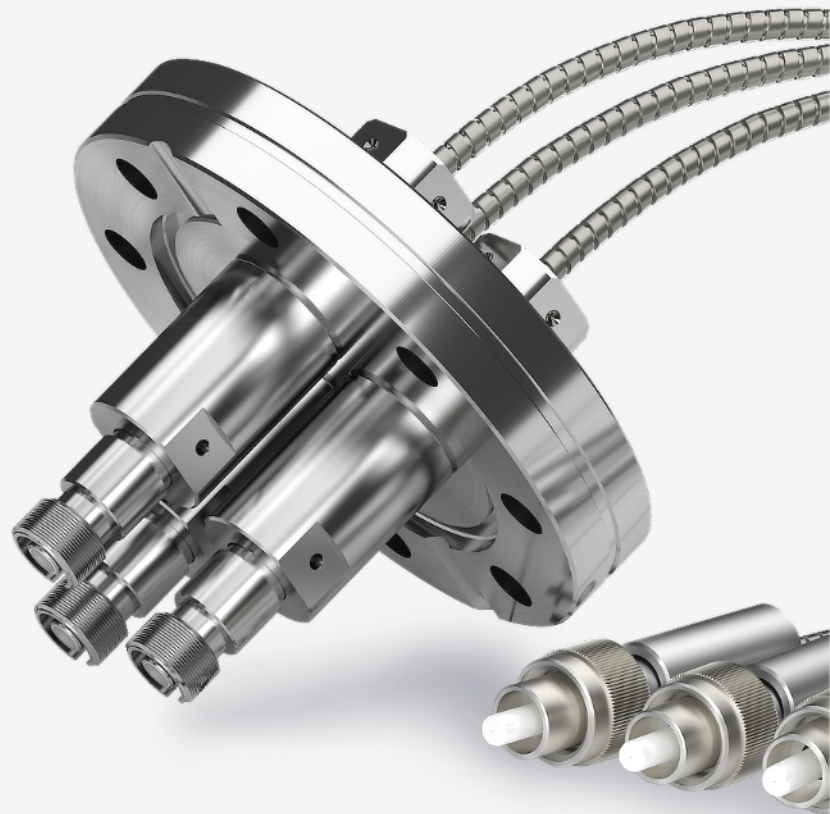


# Fiber Optic Feedthroughs

Vacuum and Pressure Applications



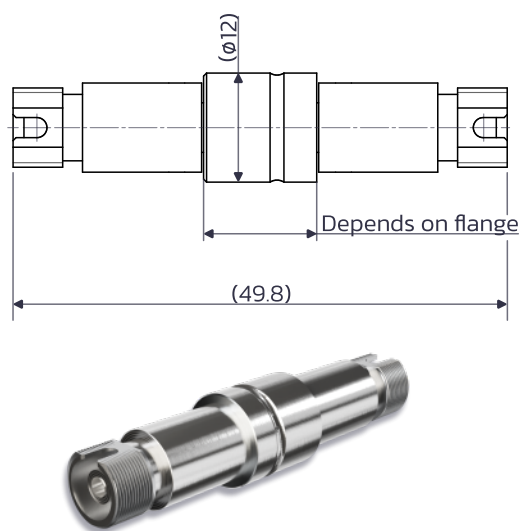
# Fiber Optic Feedthroughs

## Adapter Interface – Vacuum Application

- Fully configurable fiber optic feedthroughs
- Customized dimensions on request
- For applications with SM, MM or PM fibers
- Extremely low helium leakage, operating temperature from -40°C to +180°C (200°C)

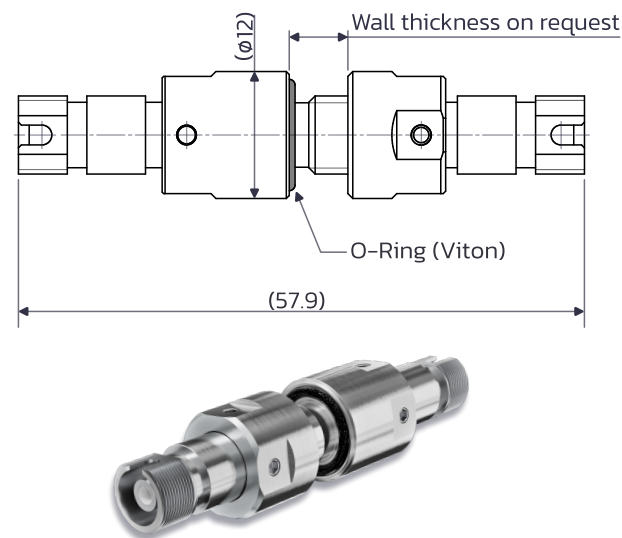
### Sealing Methods for Feedthroughs in Flange

#### Laser Welding (LW)



- > Designed for laser welding into a flange
- > Suitable for UHV and XHV environments
- > Temp-dependent env. including cryogenic env.

#### O-Ring (OR)



- > Designed for O-ring sealing and repairability
- > Suitable for HV and UHV and temperatures from -20°C
- > Inner ferrule repolishing available

Tab. 1 – Flange Type & Feedthrough Quantity

Flange Type and Size	Laser Welding (LW)	O-Ring Sealing (OR)
KF16	1	1
KF25	1	1
KF40	1-4	1-4
KF50	1-8	1-8
CF16	1	1
CF25	1	1
CF40	1-6	1-6
CF63	1-10	1-10

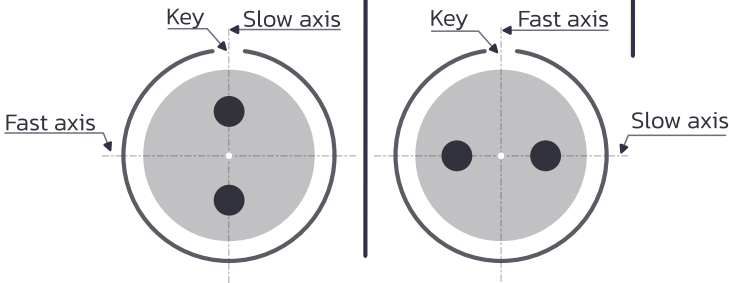
\*Other flange types on request, incl. ISO – K63/K100





Tab. 2 – Fiber Type Sealed in Feedthrough

SM Type		PM Type* (Slow axis to key)		PM Type* (Fast axis to key)		MM (Graded)		MM (190 – 1200 nm)** Core ø		MM (300 – 2400 nm)** Core ø	
SM 1260-1620	S1	PM1550	PS1	PM1550	PF1	OM1	O1	50	MH1	50	ML1
SM1060	S2	PM1310	PS2	PM1310	PF2	OM2	O2	100	MH2	100	ML2
SM980	S3	PM1060	PS3	PM1060	PF3	OM3	O3	105	MH3	105	ML3
SM780	S4	PM980	PS4	PM980	PF4	OM4	O4	200	MH4	200	ML4
SM630	S5	PM780	PS5	PM780	PF5	OM5	O5	365	MH5	365	ML5
SM460	S6	PM630	PS6	PM630	PF6			400	MH6	400	ML6
SM405	S7	PM460	PS7	PM460	PF7			600	MH7	600	ML7
		PM405	PS8	PM405	PF8			1000	MH8	1000	ML8



\*\* MM fibers available with NA=0.12, 0.22 or 0.28  
\* PM fiber standard temperature -20 °C +70 °C

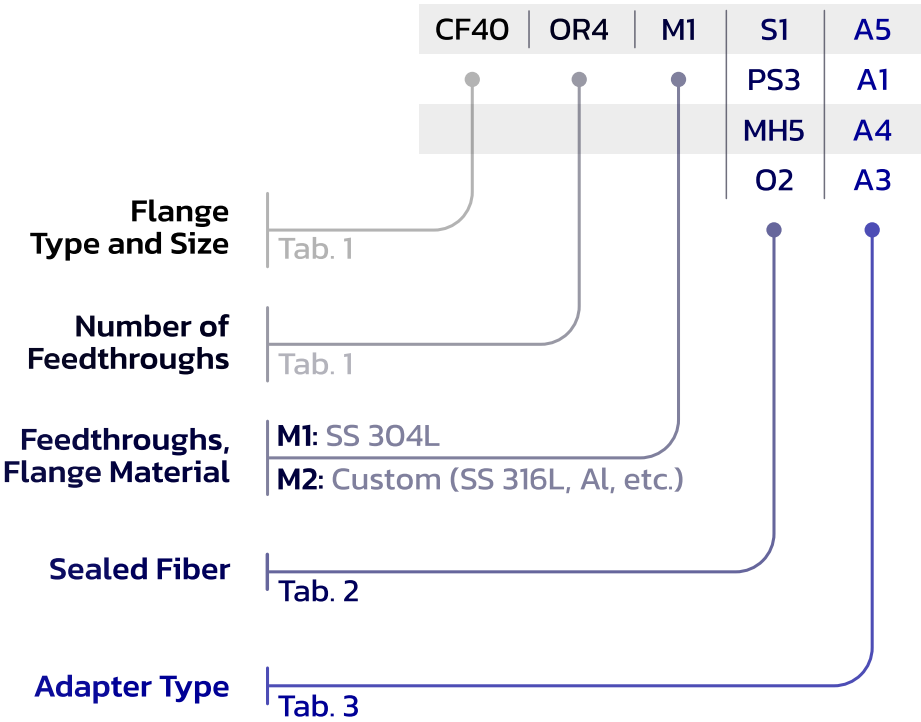
Tab. 3 – A = Adapter Interface for Connectors

FC/APC/N*	FC/APC/W*	FC/PC/N*	FC/PC/W*	SMA 905	ST/PC
1	2	3	4	5	6

\*N = Narrow key; W = Wide key



How to order





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# Feedthrough Options

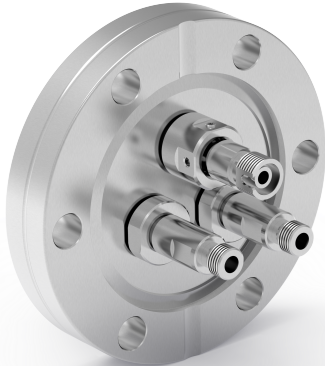


CF40, stainless steel 304L, 2 channels  
 SM1550 and MM 200 µm fibers, laser-welded sealing  
 For FC/APC/N (both sides), UHV, -40 °C to +180 °C

CF40	LW2	M1	S1	A1
			MH4	A1

CF40, stainless steel 316L, 3 channels  
 SM1550, SM630 and MM 365 µm fibers, sealing by O-rings  
 For SMA 905 and FC/APC/W (both sides), UHV, -20 °C to +180 °C

CF40	OR3	M2	S1	A2
			S5	A5
			MH5	A5



KF40, stainless steel 304L, 1 channel  
 PM1060 fiber, feedthrough sealing by O-ring  
 For FC/PC/N (both sides), high vaccum, -20 °C to +70 °C

KF40	OR	M1	PS3*	A3
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\*PM fiber - operating temperature -20°C to +70°C

No-flange, 1 channel, O-ring sealing  
 Fiber MM 400 µm, NA=0.22  
 For FC/APC/N (both sides), UHV, -20 °C to +180 °C

	OR	M2	MH6	A1
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No-flange, 1 channel, laser weldable  
 Fiber SM405  
 For FC/APC/N (both sides), UHV, -40 °C to +180 °C

	LW	M1	S7	A1
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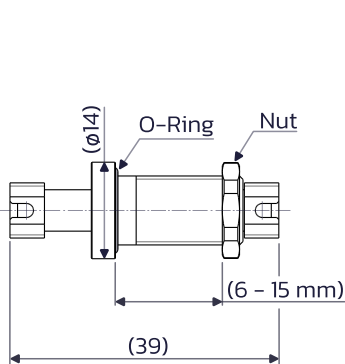
# Fiber Optic Feedthroughs

## Threaded Housing

- Reliable in both vacuum and positive-pressure environments
- Offered in M10 MINI, M10, M12, M16 or custom threads and wall thicknesses
- Compatible with FC/APC, FC/PC, ST/PC or SMA 905 connectors
- Suitable for HV, UHV and for temperatures from -20°C up to +180°C (200°C)

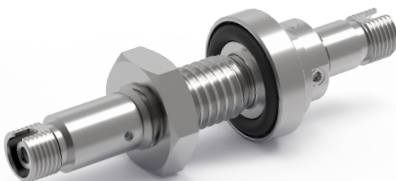
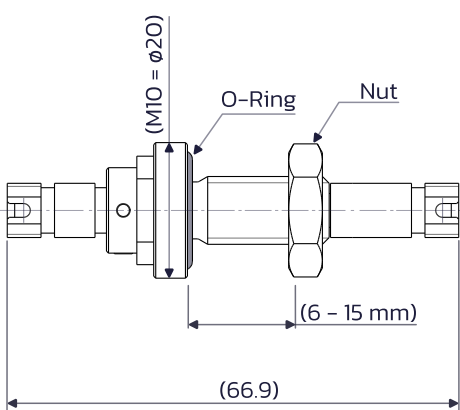
### General Threaded Feedthroughs

M10 Mini



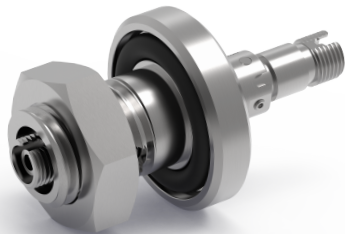
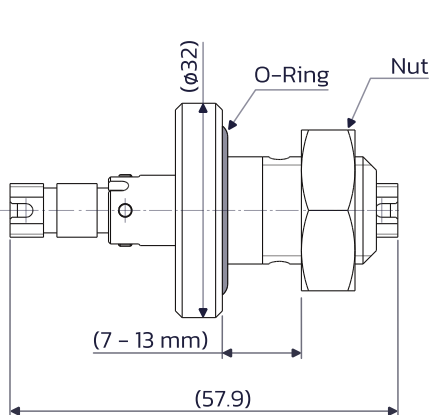
> For hole diameter 10.2 – 10.5 mm

M10



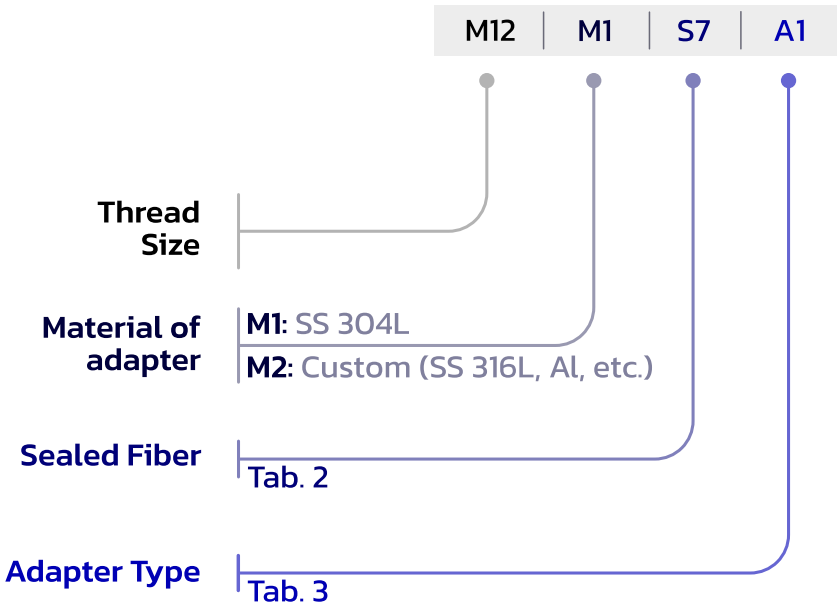
> For hole diameter 10.55 – 11 mm

M16



> For hole diameter 16.5 – 17 mm

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# Fiber Optic Feedthroughs

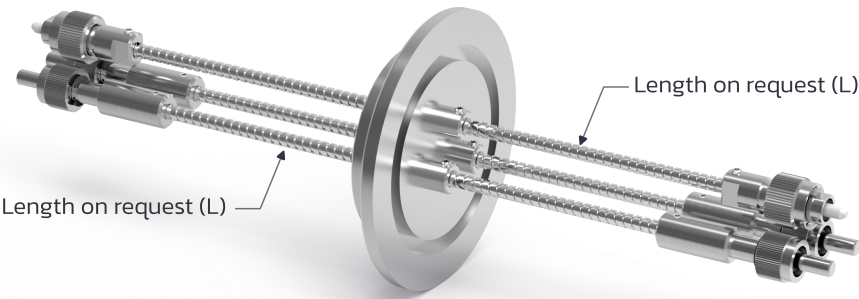
## Pigtail Options

- Customizable feedthroughs for individual and group fiber sealing
- Wide range of connector interfaces for both vacuum and atmospheric sides
- Integration with other feedthroughs (electrical or optical) in a single flange
- Precision-machined stainless steel flanges for high mechanical stability and durability

Tab. 4 – Fiber Coating & Loose Tubings

Fiber Coatings	Loose Tubings
Polyimide	PTFE
Acrylate	PEEK
Aluminium	PVC
Gold	Stainless Steel (SS) 304L / 316L
Copper	PVC coated SS

\*Other materials on request



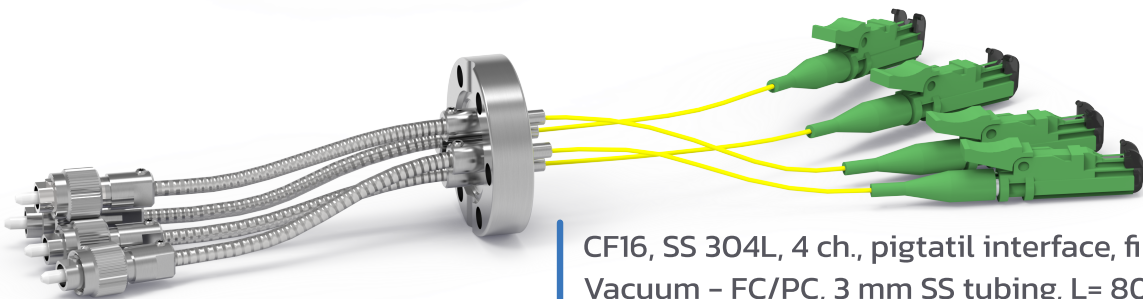
KF40, 2x SMA 905, 1x FC/PC, 3 mm SS tubing

Tab. 5 – Connection type

Vacuum Compatible	Non-Vacuum
FC	LC
SMA 905	SC
ST	E2000
Fiber Array	MPO MTP
Fiber Collimators	MMC



CF40, 4x combined interface FC/APC, 3 mm SS tubing



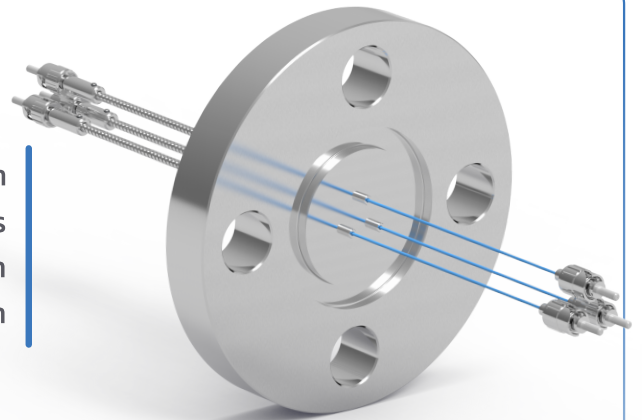
CF16, SS 304L, 4 ch., pigtail interface, fiber SM630  
Vacuum – FC/PC, 3 mm SS tubing, L= 80 mm  
Atmosphere – E2000, PTFE tubing 900 µm, L= 100 mm



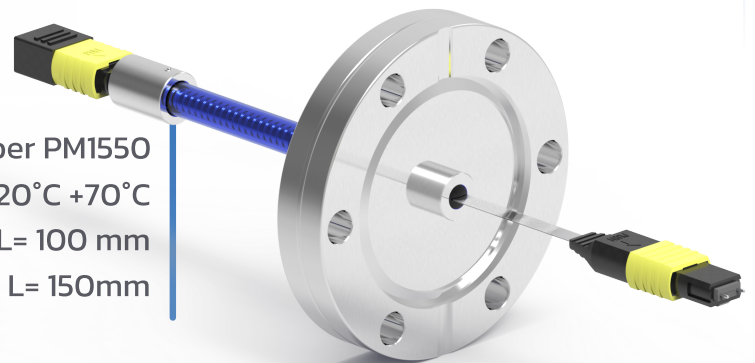
Threaded housing M10, SS 304L, 2 ch., pigtail interface, OM2  
Vacuum – FC/APC, PTFE 900 µm (L= 100 mm) + 3 mm SS tubing (L= 40 mm)  
Atmosphere – no connectors, PTFE 900 µm, L= 50 mm

## Customer Inspired Feedthroughs

Custom flange, 3ch., pigtail interface, fiber MM 200/220  $\mu\text{m}$   
 Ultra high vacuum environment & cryogenic applications  
 Vacuum – ST/PC, 3 mm SS tubing, L= 150 mm  
 Atmosphere – ST/PC, PTFE 900  $\mu\text{m}$  tubing, L= 100 mm



SAE DN14, SS 316L, 2ch., pigtail interface, fiber SM780  
 For positive pressure or UHV environment,  $-20^{\circ}\text{C} + 180^{\circ}\text{C}$   
 Vacuum – FC/APC, 3 mm stainless steel tubing, L= 200 mm  
 Atmosphere – FC/APC, 3 mm stainless steel tubing, L= 300mm



CF40, SS 304L, 16ch., pigtail interface, fiber PM1550  
 For vacuum environment,  $-20^{\circ}\text{C} + 70^{\circ}\text{C}$   
 Vacuum – MTP/APC, 2x 8ch. fiber ribbon, L= 100 mm  
 Atmosphere – MTP/APC, SS tubing with PVC 5 mm, L= 150mm



CF40, SS 304L, 50ch., pigtail interface, fiber SM1310  
 For high vacuum environment & cryogenic applications  
 Vacuum – 50 ch. fiber array, 5 mm SS tubing, L= 200 mm  
 Atmosphere – 50x FC/APC, 5 mm SS tub. with PVC, L= 1000 mm



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# Fiber Optic Feedthroughs

## Integrated Fiber & Electrical Feedthroughs

Customizable feedthroughs with electrical and fiber interfaces in the flange (standard or custom)

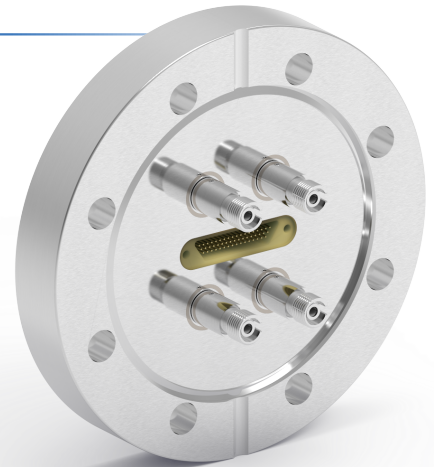
Available with most fiber optic interfaces and fibers (e.g. Tab. 2, Tab. 3)

Electrical interfaces include USB, Coaxial and MIL standard D-Sub, Micro-D

Applicable in a wide range of temperatures and for HV and UHV applications

### Feedthrough Options

CF63, SS 304L, FC adapter interface, Micro-D  
Fiber interface - ready for 4x FC/APC, SM630  
Electrical interface - 51 pin Micro-D connector  
Ultra high vacuum environment



CF63, SS 304L, adapter and pigtail interface, Micro-D  
Fiber interface - ready for 3x FC/APC, 1x ST and 1x SMA 905  
Pigtail, FC/APC, 3mm stainless steel tubing, SM1550  
Electrical interface - 6 contacts acc. to MIL-DTL-26482

CF100, SS 304L, Integrated fiber & electrical feedthroughs  
Fiber interface - ready for FC/APC, fiber SM405  
Pigtail, FC/APC, 3 mm stainless steel tubing, SM1550  
Electrical interface - Micro D, D-Sub, USB and Coaxial



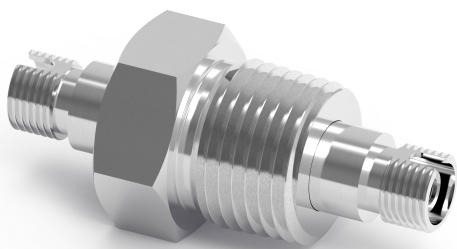
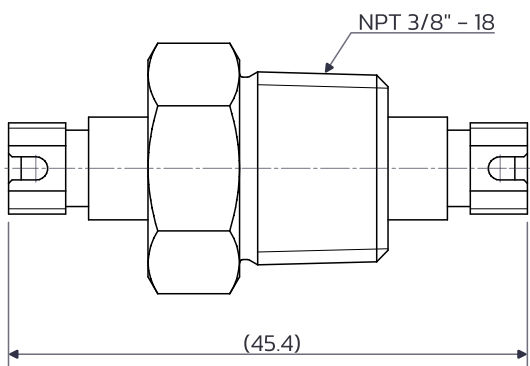
# Fiber Optic Feedthroughs

## Pressure Applications – Adapter Interface

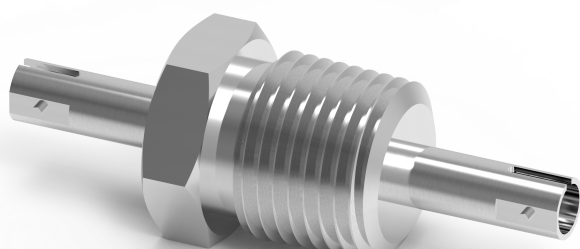
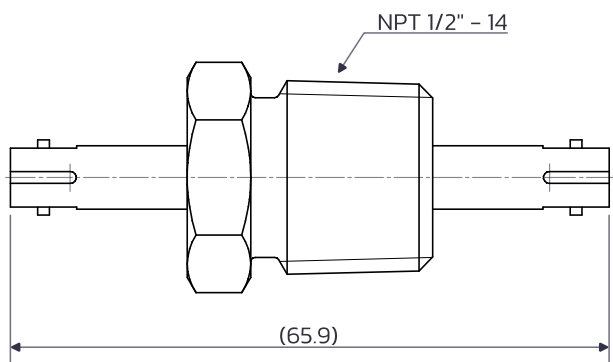
Designed for use in environments with positive pressure up to 20 MPa, high pressure on request  
Complete custom solutions available upon request  
Compatible with wide range of connectors (FC/APC, ST/PC, SMA 905, etc.)  
Offered in different thread sizes, including NPT 3/8", NPT 1/2", NPT 1/4" and more

### NPT Housing Options

NPT 3/8" – FC adapter



NPT 1/2" – ST adapter



### How to order

	NPT3/8"	M1	S7	A1
Thread Size				
Material of adapter		M1: SS 321 M2: Custom (SS 304L, Al, etc.)		
Sealed Fiber			Tab. 2	
Adapter Type				Tab. 3



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# Fiber Optic Feedthroughs

## Pressure Applications – Pigtail Options

Reliable up to 100 MPa and 180 °C (depends on configuration)

Possibility of customization and custom solutions (thread size, length, fibers, tubings, etc.)

A wide variety of flange types such as NPT, SAE, DN or custom solutions

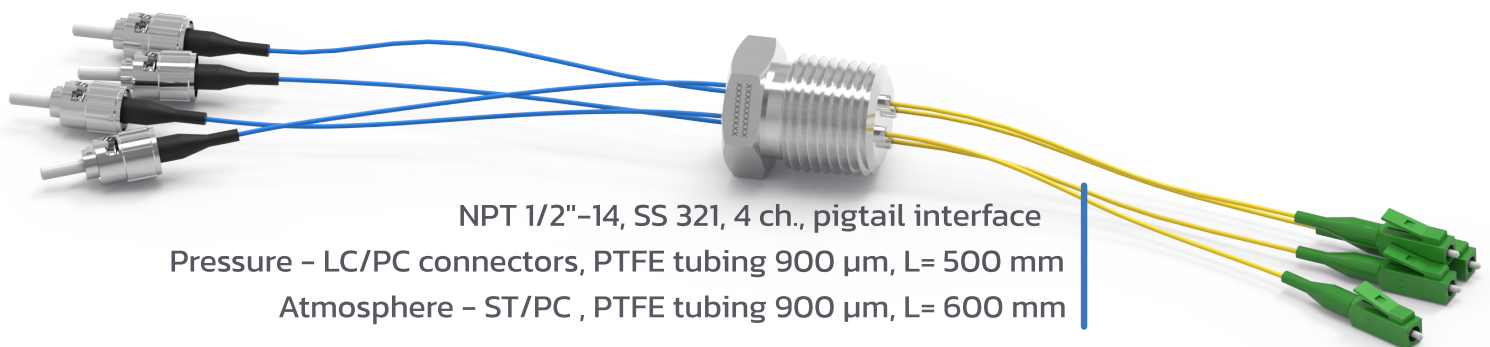
Offered with a wide range of fibers, tubing, and connectors (e.g. Tab.4, Tab.5)



NPT 1/4"-18 housing, SS 321, 2 ch., pigtail interface

Pressure – Optital fibers and PTFE tubing 900  $\mu$ m, L= 100 mm

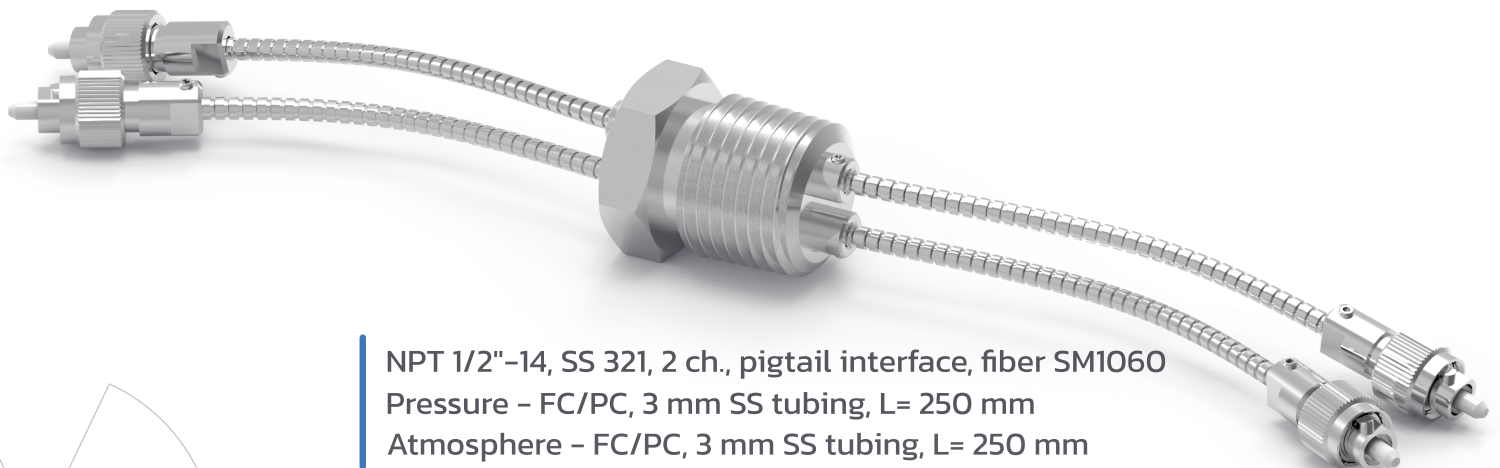
Atmosphere – FC/APC, 3 mm SS tubing, L= 300 mm



NPT 1/2"-14, SS 321, 4 ch., pigtail interface

Pressure – LC/PC connectors, PTFE tubing 900  $\mu$ m, L= 500 mm

Atmosphere – ST/PC , PTFE tubing 900  $\mu$ m, L= 600 mm



NPT 1/2"-14, SS 321, 2 ch., pigtail interface, fiber SM1060

Pressure – FC/PC, 3 mm SS tubing, L= 250 mm

Atmosphere – FC/PC, 3 mm SS tubing, L= 250 mm

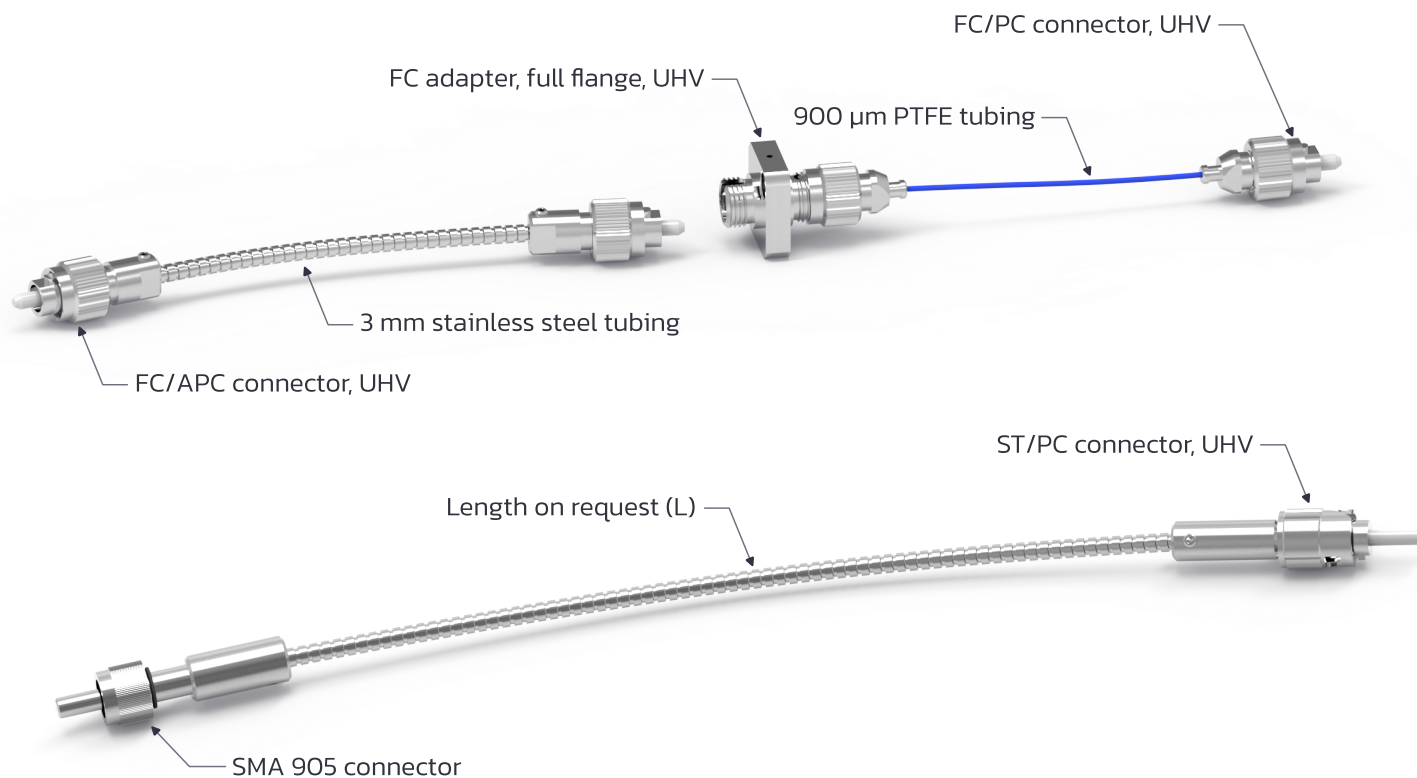
# Fiber Optic Feedthroughs Patch Cords and Adapters

UHV-compatible patchcords and adapters

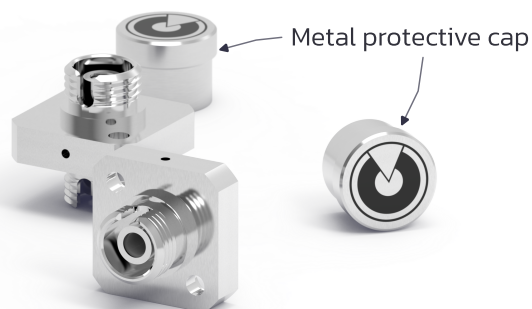
SM, MM, or PM fiber configurations available

Wide connector options: FC/APC, FC/PC, SMA 905, see Tab. 5

Robust fiber protection: Polyimide, PTFE, PEEK or stainless steel loose tube



- > Excellent optical parameters
- > Custom configuration options
- > High-temperature version available



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