

MPO+PLUS[®]

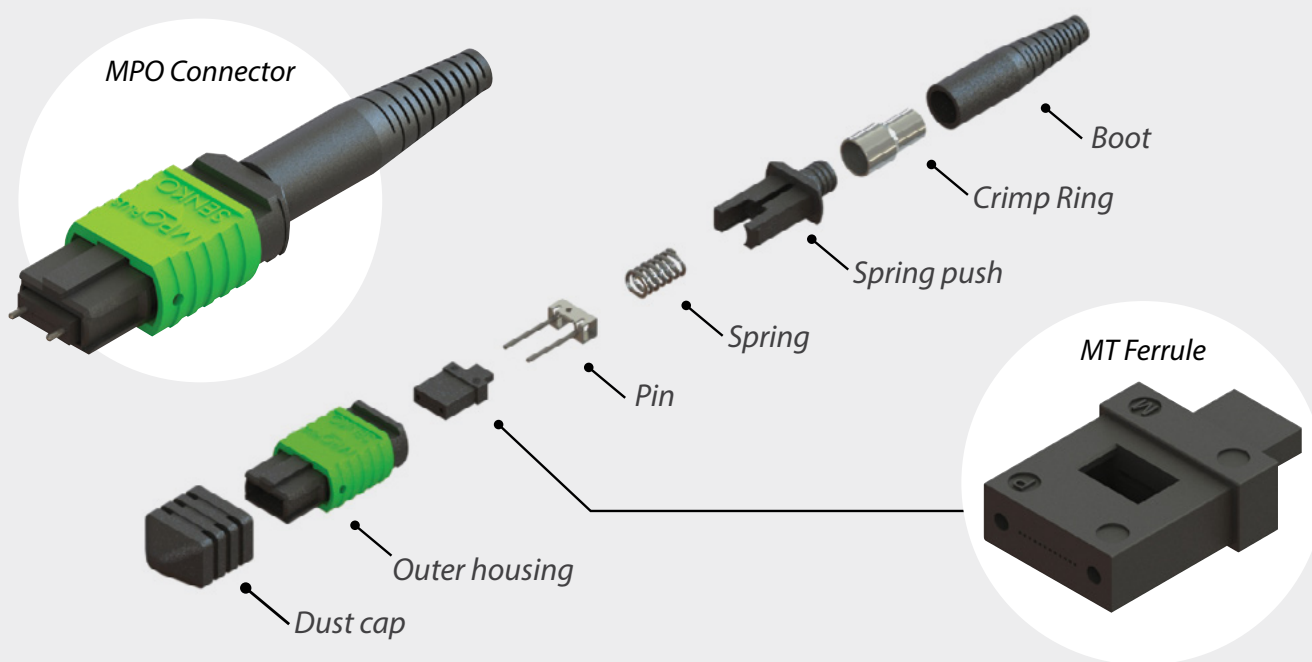
More features than conventional MPO

INDUSTRY'S LOWEST INSERTION LOSS

What is a MPO?

MPO is an industry term to describe a multi-fiber Push On style connector.

By definition, the MPO is a multi-fiber connector (a single connector that houses multiple fiber terminations) that is defined by **IEC-61754-7**, "Fiber optic interconnecting devices and passive components – Fibre optic connector interfaces - Part 7: Type MPO connector family"; and **TIA-604-5-D**, "Fiber Optic Connector Intermateability Standard, Type MPO".



The connector concept was originally designed by NTT Group and finite number of manufacturing licenses were subsequently issued. Senko is among these licensee's. There are several variants of MPO compliant connectors in the markets such as the MTP® connector*.

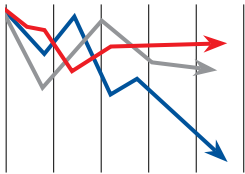
The MPO's rise in popularity stems from its unique ability to mate multiple fibers (2-72 fibers) within a single connector body housing therefore significantly reducing space. The connector's general design also has unique features from conventional connectors such as being rectangular in shape. It utilizes guide pins and precision holes for ferrule to ferrule alignment within the adaptor as opposed to a precision alignment "sleeve" used in conventional adaptors and the ferrule (MT) is made from a monolithic, high precision glassed filled polymer as opposed to a ceramic material.

Whereas most MPO's supplied in the market today continue from the original design parameters, Senko's MPO-PLUS® Series of enhanced MPO style connectors has taken a leadership role in refining and optimizing the original product in the areas of mechanical durability, product features and most importantly the optical performance of the MT ferrule itself.

*MTP is a registered trademark of US Conec Ltd

Key improvements made in the MPO-PLUS®

Low Insertion Loss Ferrule



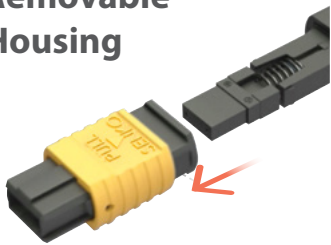
- Industry's lowest insertion loss.
- MAX 0.25dB and a typical lower than 0.1dB on both SM Low Loss and MM Low Loss ferrule

Designed to Pass GR 1435



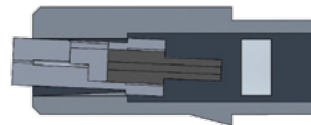
Mechanically stronger, meets and exceeds Telecordia GR-1435

Removable Housing



The removable housing makes it easy to change gender or to clean ferrule

Free Floating Ferrule



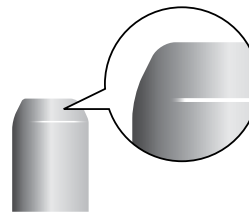
A free floating ferrule design to maintain optical connection during mechanical side-pull forces

Advanced Metal Pin



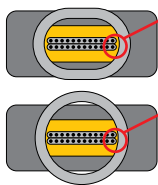
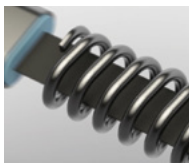
SENKO's stainless steel guide pins are manufactured to the tightest specification, allowing precise alignment of the ferrule

Chamfer Guide Pin



Rounded chamfer on the Guide pin that reduces guide hole chipping thus helping to maintain precise alignment

Improved Spring Design



SENKO's enhanced oval spring provides more ribbon clearance and enhances mechanical performance

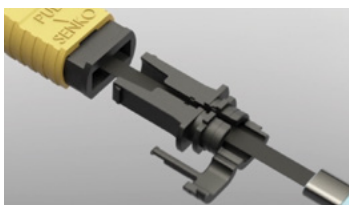
Conventional round spring allows less ribbon clearance; limits mechanical performance

Several Boot Options



Boots are available for Ribbon Cable, Ribbon fiber, Round boot and the patent SENKO Flex Angle boot.

2pc Back Post



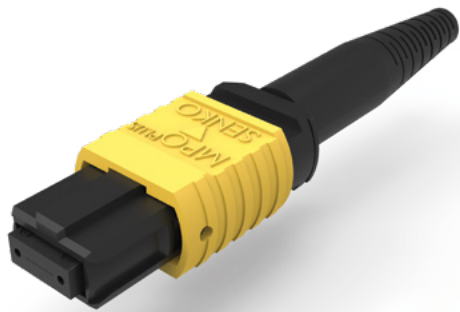
2pc back post and other enhancement allows easier termination



MPO-PLUS®

Standard Connector

The improved MPO Connector



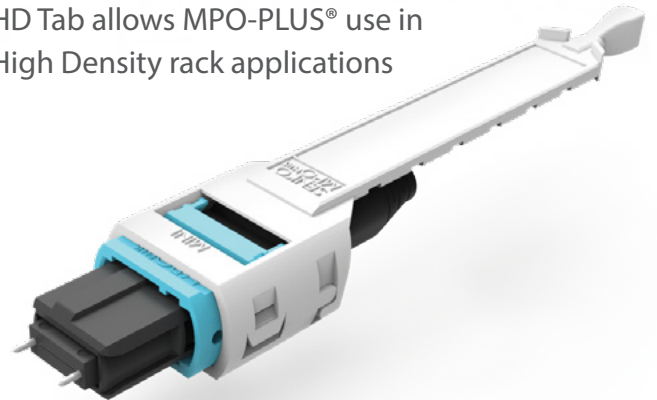
PATENT
PENDING
DESIGN

- Flex Angle boot ready
- Various boot available

MPO-PLUS®

High Density Push Pull tab

HD Tab allows MPO-PLUS® use in High Density rack applications



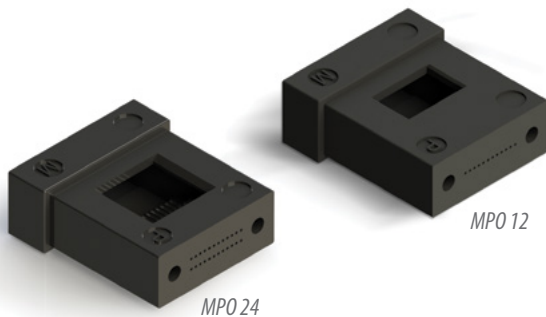
PATENT
PENDING
DESIGN

- Works with MPO-PLUS® Premium Mini Connector

MPO-PLUS®

MT Super Low Loss Ferrule

Industries lowest insertion loss
 12 Fiber SM low loss typical IL under 0.1dB
 12 Fiber MM low loss typical IL under 0.1dB

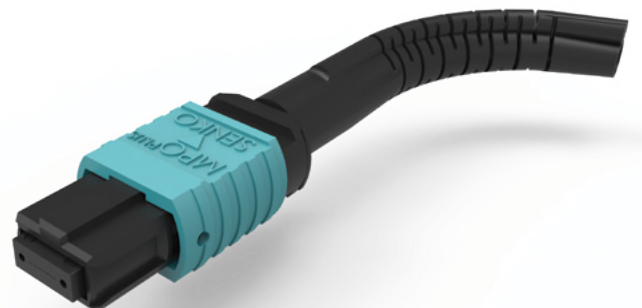


- Exceeds IEC Grade B Random mating

MPO-PLUS®

Flex Angled Boot

Flex in any direction



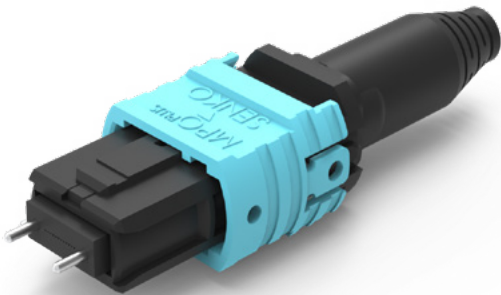
- Works with MPO Standard Connector, MPO Premium Mini Connector and Latch Connector

MPO^{PLUS}

Premium Mini Connector

Simplified Gender change

Total length 37mm (for 3mm round boot)



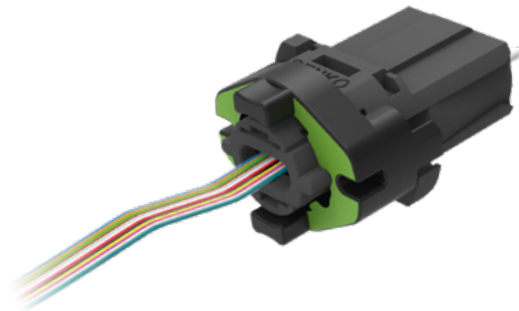
- HD Push Pull tab ready
- Flex Angle boot ready
- Various boot available

MPO^{PLUS}

Bayonet Connector

The Smallest Housed MPO connector in the world

Total length less than 18mm



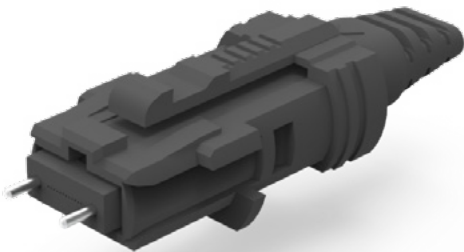
- Simple Bayonet turn for Engage and Disengage
- Works with all standard MPO hardware

MPO^{PLUS}

Latch Connector

A new concept MPO with a latch.

Easy plug-in and plug-out with a single latch



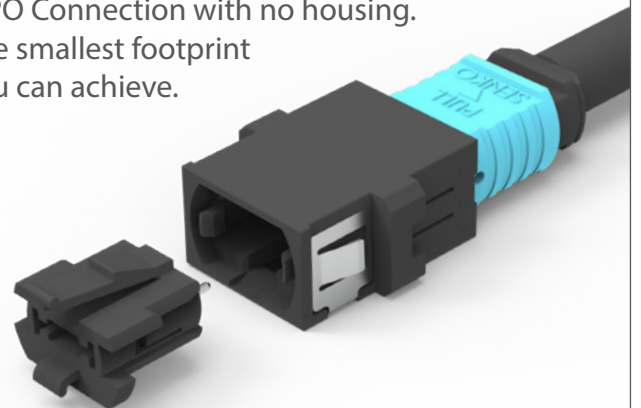
- Various boot type available
- Flex angel boot ready

MPO^{PLUS}

Micro Latch Connector

MPO Connection with no housing.

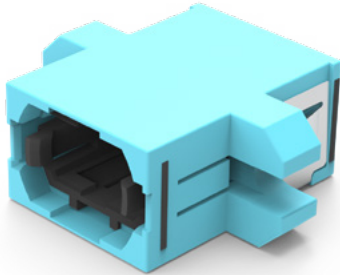
The smallest footprint you can achieve.



- Insert and removable tool available

MPO^{PLUS} Polarity Changeable Adapter

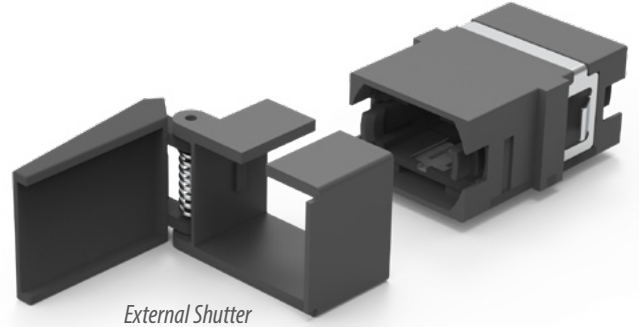
Patented one piece design enhances mechanical strength



- Compatible with Latch and Micro Latch MPO

MPO^{PLUS} SC-Footprint Adapter

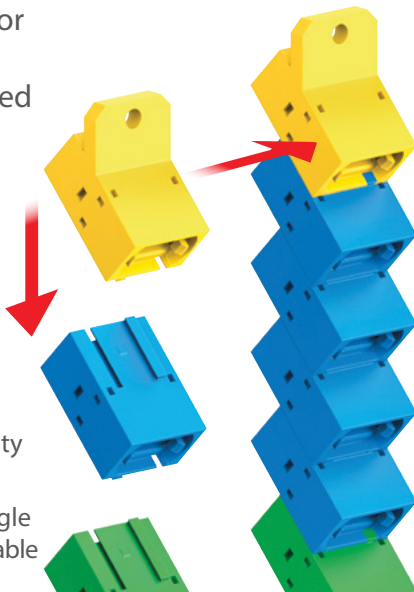
Patented one piece design adapter in a compact SC-Footprint package



- External shutter ready design

MPO^{PLUS} Stackable adapter

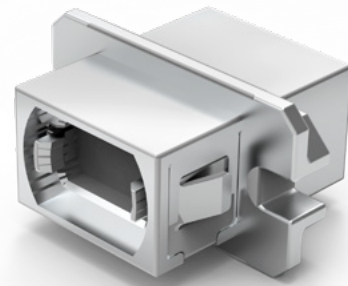
Stack vertically or horizontally, as many as you need



- Super high density application
- Standard and angle versions are available

MPO^{PLUS} Metal Adapter

Metal one piece adapter design



- Various mounting flange available
- Internal metal shutter ready design

MPO-PLUS® Tools

Crimp Tool,
Extraction Tool



- Extraction tool used for Removing MPO Outer housing

MPO-PLUS® Cleaning

MPO Smart Cleaner



MPO-PLUS® Outdoor applications

IP-MPO Weatherproof connector



MPO-PLUS® Test Equipment

End face geometry checking



MPO-PLUS® Accessories

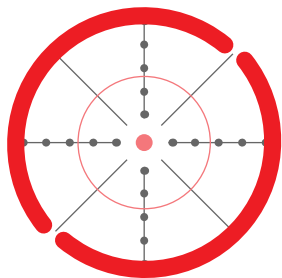
MPO Loopback,
MPO Master Jumpers
and many other
accessories available



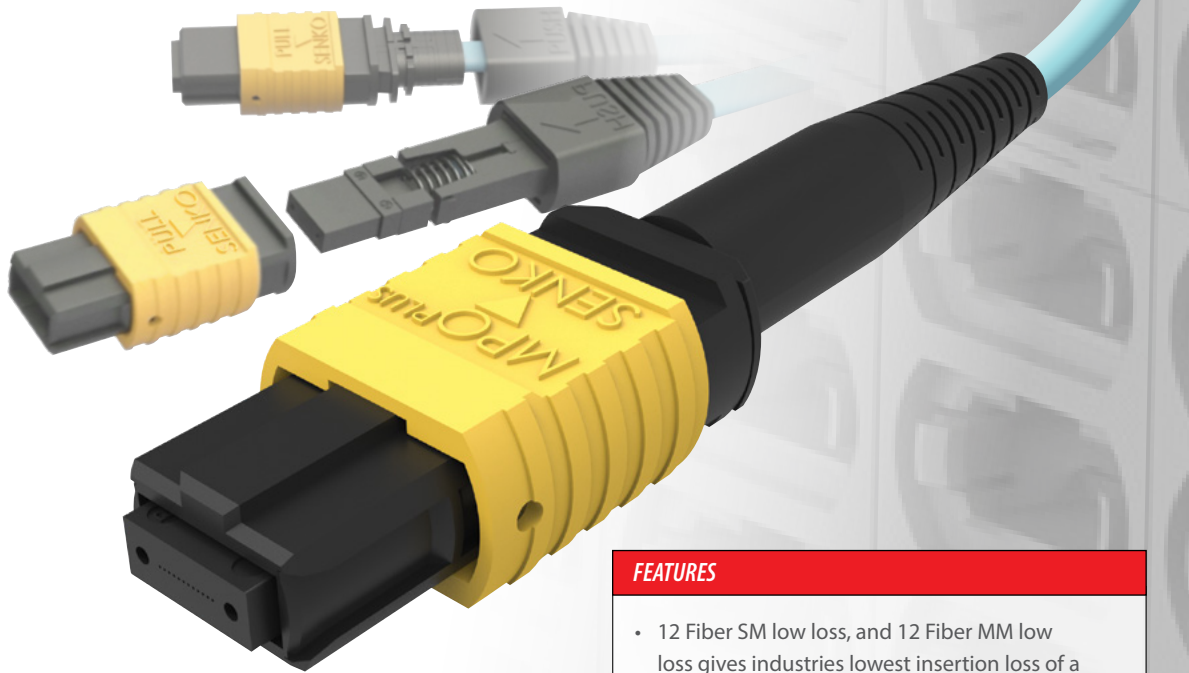


MPO-PLUS® Standard Connector

The Improved MPO Connector



**PRECISE
ALIGNMENT**



FEATURES

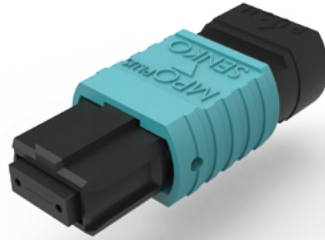
- 12 Fiber SM low loss, and 12 Fiber MM low loss gives industries lowest insertion loss of a Max 0.25dB and a typical of lower than 0.1dB
- Removable housing
- Metal pin holder
- Oval spring
- 20N spring for 24F MM ferrule
- Spring push with slit for easier assembly
- Flex angle boot and other boot styles

The MPO-PLUS® connector offers up to 32 times the density of standard connectors, providing significant space and cost savings. MPO-PLUS® Connectors utilize precision molded MT Ferrules, with metal guide pins and precise housing dimensions to ensure fiber alignment when mating. MPO-PLUS® Connector housing are available in Green (for SM), Yellow (for SM Super Low loss), Beige (for MM) and Aqua (for OM3 Fiber). Ferrule available in 4, 8, 12, 16, 24 and 32 fiber hole configuration. Ferrules are available for SM Standard, SM Super Low Loss, MM Standard and MM Super Low Loss. Boots are available for Ribbon Cable, Ribbon fiber, Round boot and the patent SENKO Flex angle boot.

MPO-PLUS®
Ribbon Cable



MPO-PLUS®
Bare Ribbon Fiber Short



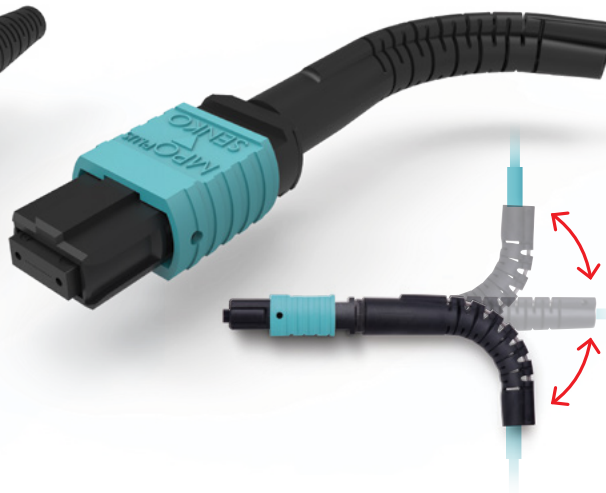
MPO-PLUS®
Bare Ribbon Fiber Mini



MPO-PLUS®
Round 3mm



MPO-PLUS®
Flex Angle Boot



Other Round Cable Boots available



Specialty boot design available.

SPECIFICATION	SM LOW LOSS		SM STANDARD		MM LOW LOSS		MM STANDARD	
	Typical	Max	Typical	Max	Typical	Max	Typical	Max
For MPO 12 fiber								
Insertion Loss*	0.1dB	0.25dB*	0.20dB	0.70dB	0.08dB	0.25dB*	0.15dB	0.50dB
Return Loss	60dB (8 degree polish)		60dB (8 degree polish)		25dB (flat polish)		25dB (flat polish)	
Operating temperature	-40C to +75C							

* SM Low loss and MM Low loss Max IL 0.25dB to be 95% of all fiber

* Above number is only achievable when using SENKO Recommended Reference Jumper, Polishing process and testing method

For Detail IL value on other ferrule types, please refer to page 21, 22 and 23

* Note: IL Values are per single fiber for all fibers



MPO-PLUS® Premium Mini Connector

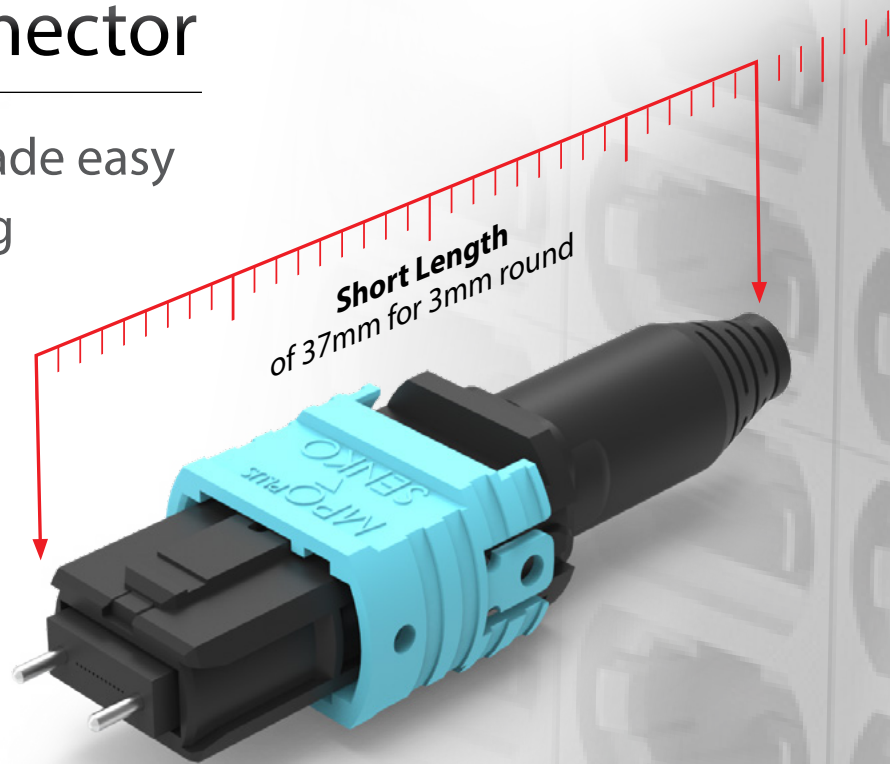
Polarity & Gender change made easy
without opening the housing



POLARITY
CHANGEABLE



GENDER
CHANGEABLE

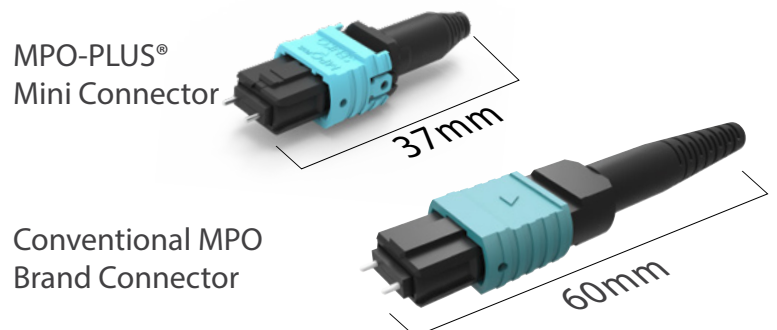


FEATURES

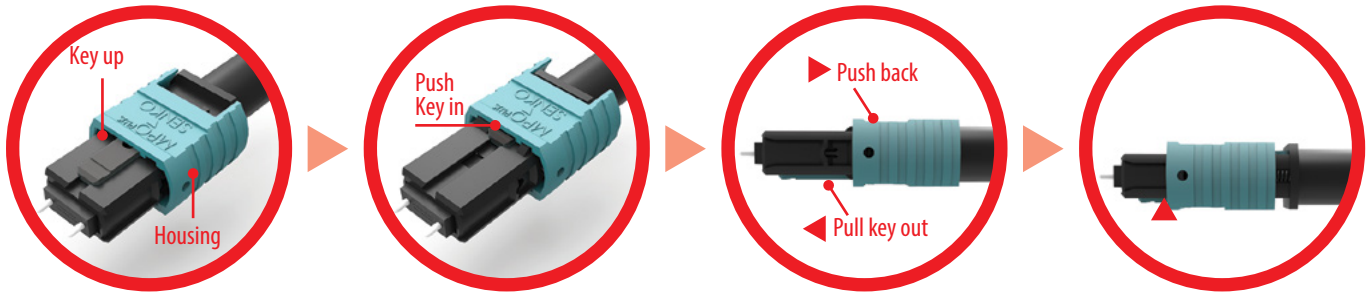
- SENKO patented design
- All the benefit of the MPO-PLUS® and more.
- Industries shortest length of Total length of 37mm for 3mm round
- Simple gender change without taking off the housing
- Various boots types available
- Complies with MPO IEC and TIA/EIA Requirements

MPO-PLUS®
Mini Connector
Push/Pull Tab Ready

Size comparison

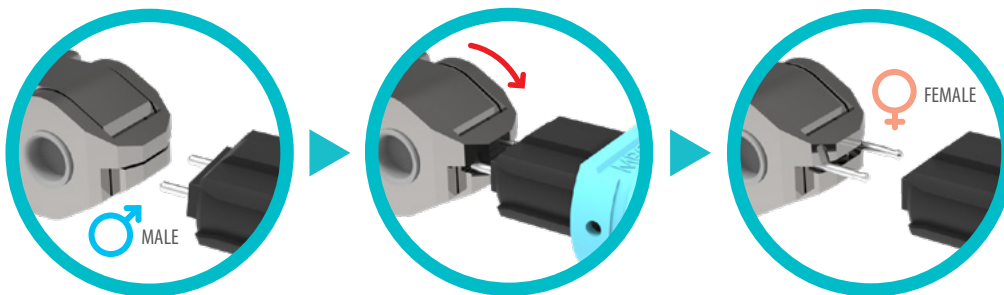


⊕ Polarity change



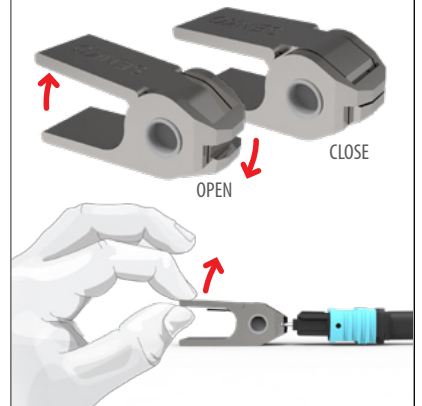
- 1 Key up
- 2 Pull back housing
Push top key in
- 3 Pull bottom key out
release the housing
- 4 Key down

♀ Gender change



- 1 MPO Connector with pins
MALE
- 2 Clamp tool on pins
- 3 Extract pins
FEMALE

How to extract pins in



MPO-PLUS® Mini, ready for 40/100G Ethernet Migration

Unlike traditional 10GbE transmission which utilizes a 2-fiber configuration, the 40GbE and 100GbE are implemented over multi fiber array MPO connectors. It is critical that proper connector orientations are established. The TIA 568 standard provides three methods for configuring systems to ensure that proper connections are made.

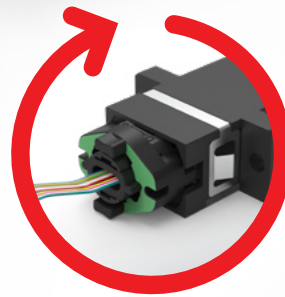
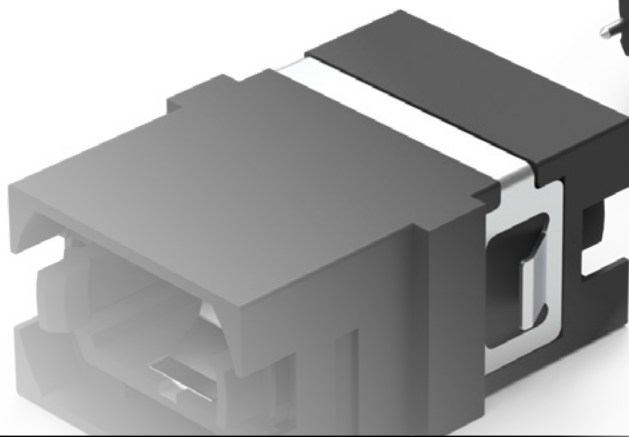
Each MPO connector has a key on one side of the connector body. The “Key Up” position refers to the orientation where the key is located at the top position of the connector. When looking at the end face of the connector, position 1 is on the far left while position 12 is on the far right. Depending on the adopted connectivity orientation, the MPO adapter needs to be suitable for its application, which is either “Key Up to Key Down” or “Key Up to Key Up”. In addition, MPO connectors are differentiated to a Male and Female connector. A Male MPO connector has two alignment pins while a Female MPO connector has two alignment holes where the pins are to be inserted when a connection is made. An MPO connection can only be performed between a Male and Female connector to ensure proper alignment which is required to maintain a low loss connection. SENKO’s MPO-PLUS® MINI Connector allows end users to freely change Polarity or Gender in the field, which gives great flexibility in network configuration.

MPO-PLUS® Bayonet Connector

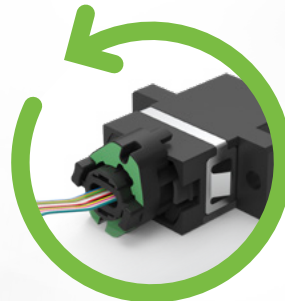
The Smallest MPO Connector in the world



Works with
conventional
MPO Adapter



Plug in Connector and turn Bayonet **clockwise** to
ENGAGE



To remove Connector turn Bayonet **counter clockwise** to
DISENGAGE

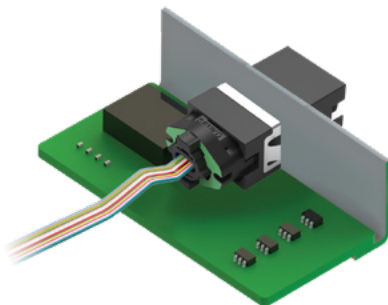
FEATURES

- SENKO patented design
- Smallest housed MPO Connector with a total length of 18.5mm for Ribbon Fiber
- Works with existing conventional MPO adapters.
- SM, SM Super low loss, MM, MM Super low loss type available
- Ribbon Fiber, Ribbon Cable, various boots available
- Spring loaded free floating ferrule
- Integrates other MPO-PLUS® benefits such as low loss ferrule, chamfered metal guide pin, oval spring & ferrule free floating

Solution where space is a matter

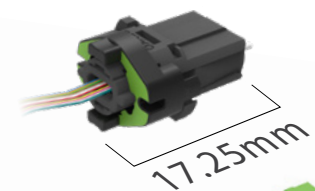
The 17.25mm total length MPO Bayonet MPO Connector, make a ideal solution for usage where space is a limited. Works with all conventional MPO Adapters, and the spring loaded free floating ferrule allows the optical connection in all times.

Color available in Green, Yellow, Aqua, Beige and more.

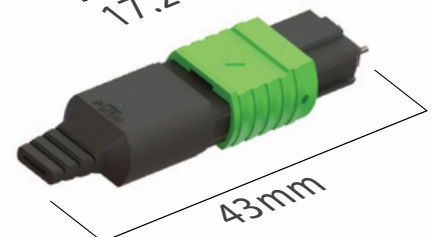


Size comparison

MPO-PLUS®
Bayonet Connector



Conventional
MPO Connector



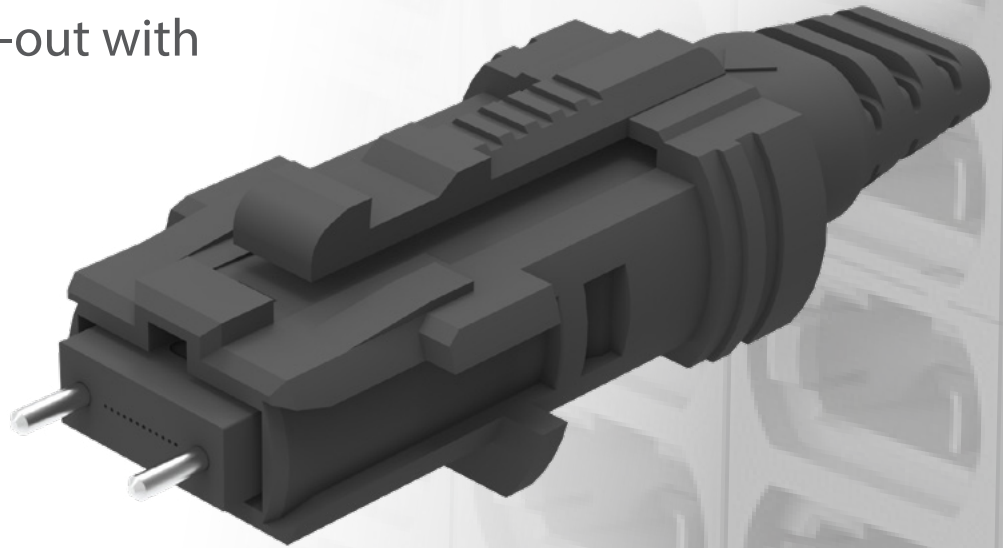


MPO-PLUS® Latch Connector

Easy plug-in and plug-out with a single latch



**EASY
ASSEMBLY**



**EASY
HANDLING**

FEATURES

- SENKO patented design
- Single latch design makes ease of connect and disconnect
- Latch MPO Ready adapter can accommodate Latch MPO Connector and conventional MPO Connector
- Spring loaded free floating ferrule
- Includes other benefits of MPO-PLUS® as, low loss SM and low loss MM Ferrule, metal pin holder & oval spring
- Various boots available

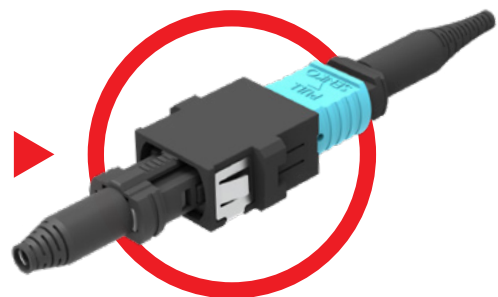
Note: MPO Polarity Changeable Adapter is required. MPO Polarity Changeable ready Adapter can accommodate Latch MPO Connector and Conventional MPO Connector.



1 Latch MPO Connector



2 MPO Polarity Changeable Adapter



3 MPO Polarity Changeable Adapter can accommodate Latch MPO and conventional MPO Connectors

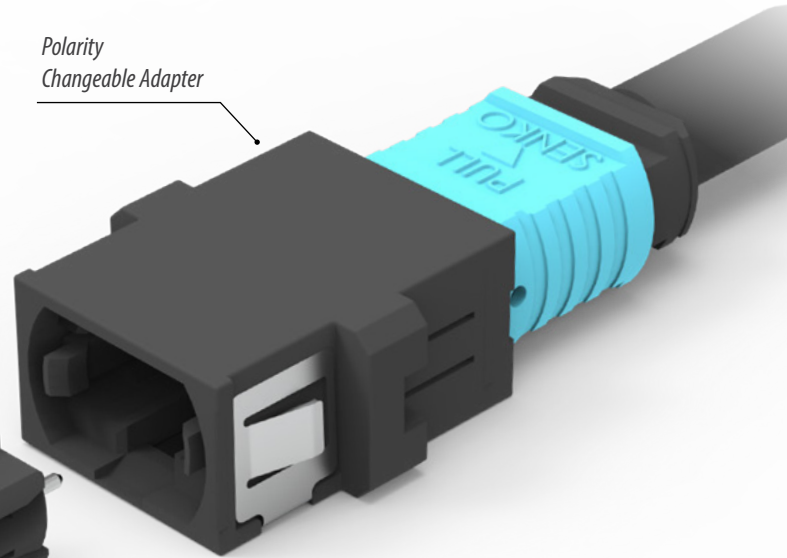


MPO-PLUS® Micro Latch Connector

The smallest size plugable MPO Connector

Polarity Changeable Adapter

MPO Micro Latch Connector



NOTE: Polarity Changeable adapter is needed. Polarity Changeable adapter, one side accommodates a Micro Latch Connector and the other side accommodates a conventional MPO Connector.



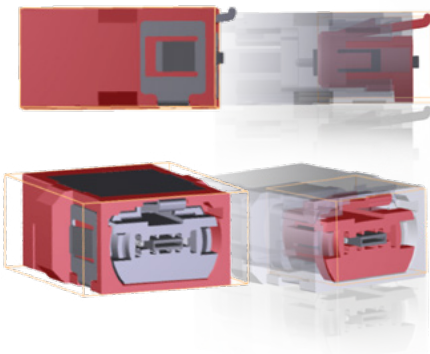
FEATURES

- SENKO patent pending design
- Smallest footprint possible
- NO housing design
- Usage of existing MPO-PLUS® ferrule
- SM low loss, MM low loss and all other MPO-PLUS® ferrule available
- Special tool for Plug in and Plug out

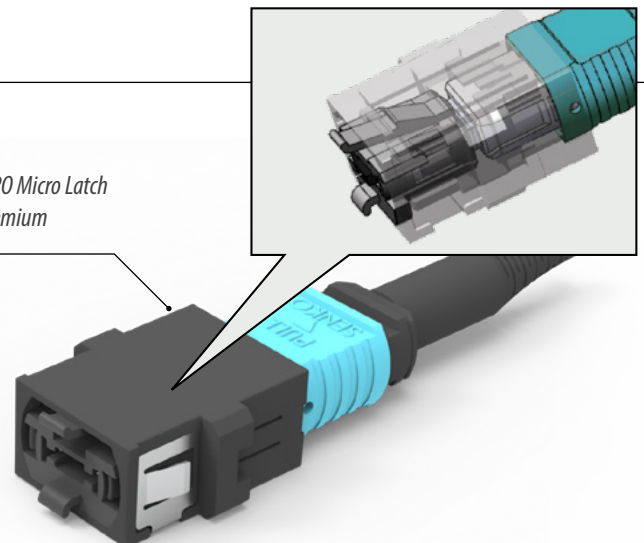
Flush mount reduces space significantly

The Micro Latch Connector fits snugly into the housing.

The very small size of the MPO Micro Latch Connector does not protrude from the housing, greatly reducing space.

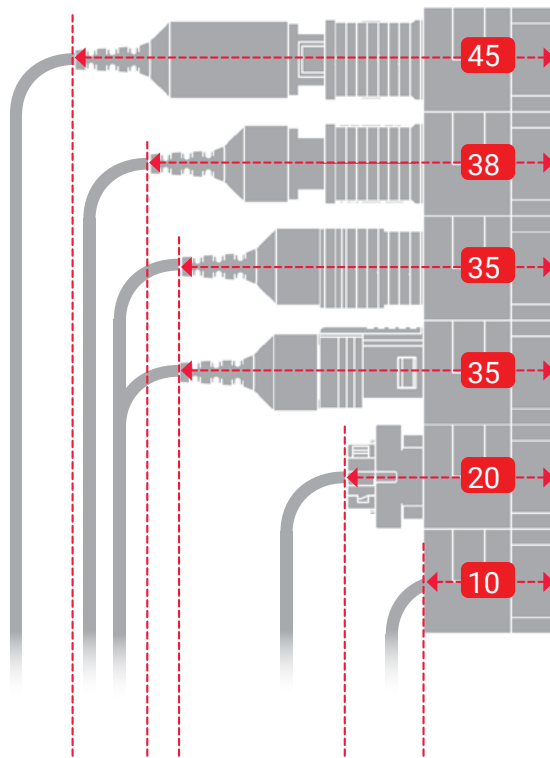


MPO Micro Latch Premium



MPO-PLUS® Connectors Comparison

MPO-PLUS®
reduces cable
protrusion in
panels



Bare Ribbon

Conventional MPO



MPO-PLUS®



Mini



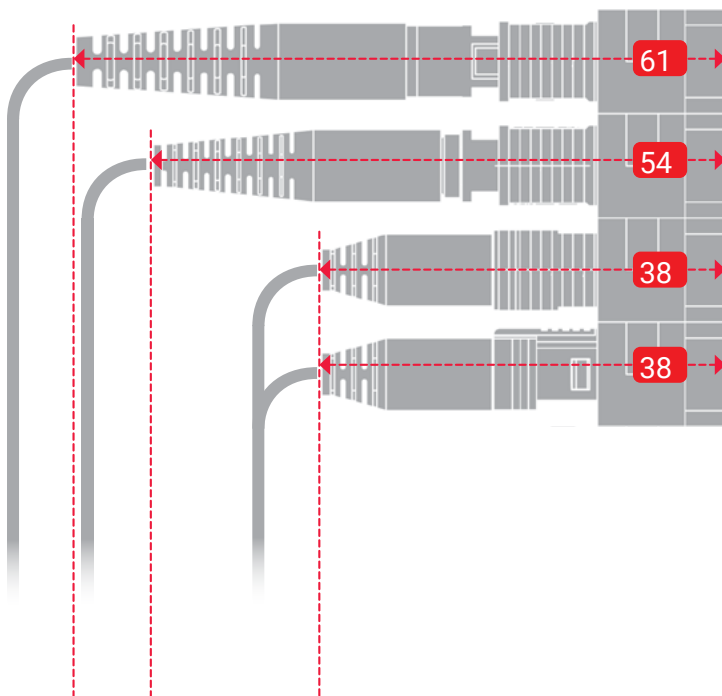
Latch



Bayonet



Micro Latch



3.0mm Cable

Conventional MPO



MPO-PLUS®



Mini



Latch





IP-MPO

Weatherproof connectors

Withstand the elements



Industrial rated IP-68
Hybrid Connector



FEATURES

- Cost effective solution for in house termination
- IP water immersion and dust protection for harsh environment
- Wide range of operational temperature for outside plant --40°C/70°C
- Compatible with a wide range of cables, 5-8mm OD cable with two 2.0mm to 3.0mm jacketed subunits
- Chemical Resistance
- Intermatable to other Industrial LC adaptor per IEC 60603-7
- Simple assembly requiring no special tools
- Durable mechanical mating
- The XP versions allow installers to terminate connectors in the field
- ODVA Compatible
- 100lbs superior pull force
- Patent design
- Feed-through



Exceed ODVA
Requirements



Low
Insertion Loss



Simple Bayonet
Locking System

Safe Lock Feature

- Sliding lock ring
- Provides tamperproof protection
- Assure bayonet collar is fully engaged

1 1st Lock:
Twist the bayonet
to lock position



2 2nd Lock:
Slide the Safe Lock



Bayonet is secure

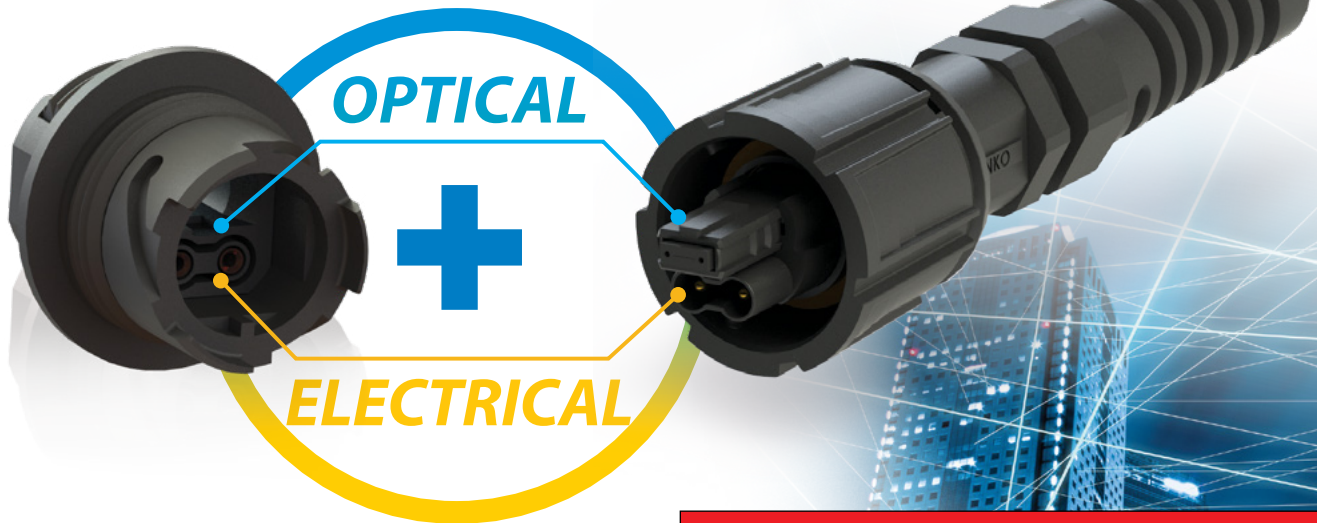


IP-ONE

Optical'n'Electrical

Power/Fiber combined

Industrial rated IP-68
Hybrid Connector



**Faster
Installation Time**



**Indoor/Outdoor
Applications**



**Space
Saving**



**Cost
Effective**

FEATURES

- SENKO patent pending design
- Smallest footprint Bayonet Style outdoor connector
- SC, Field installable SC, SN (2x LC), and MT ferrule available
- Minimizes box size requirement for outdoor application
- Same footprint with various fiber configuration
- Patented Safe Lock Ring feature
- Optimized for aerial application

Empowering the Internet Of Things

SENKO introduces its new IP-ONE hybrid connector, combining Power & Fiber in ONE, specifically designed to meet the demands of the Communications Market.

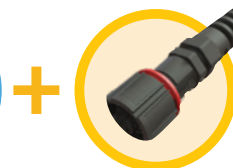
SENKO's IP-ONE is a cost effective hybrid connector designed for harsh environmental applications, providing power and optical connectivity together to any remote equipment. SENKO IP-ONE reduces material cost, simplifies installation and has found applications in Front-haul, Backhaul, DAS and FTTX deployments. It's the connector of choice for anywhere that requires both power and fiber remotely.



MT - up to 12 fiber
3.0 - 5.5mm round cable



Power



Fiber



IP-ONE

MPO^{PLUS}

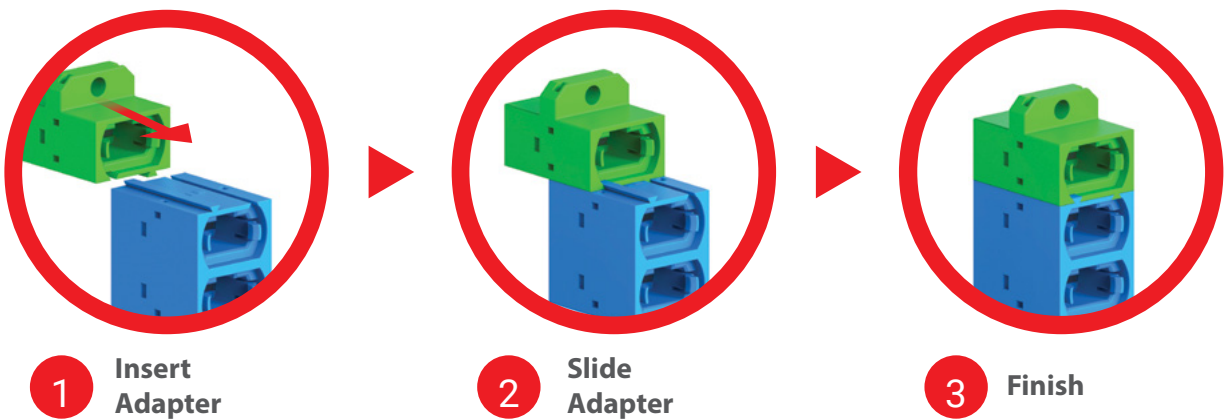
Stackable Adapters

You can stack them vertically & horizontally for as many as you need.








FEATURES

- One piece adapter design for maximum component strength
- Industry standard MPO/MTP* interface
- 90 and 45 degree flange options.

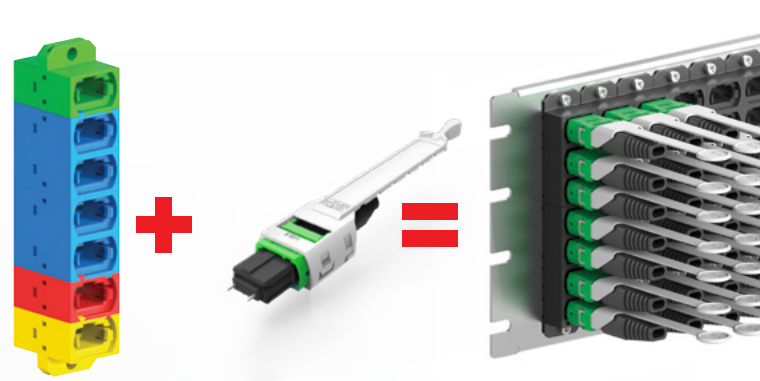
*MTP is a trade mark of US Conec Ltd.



MPO Stackable Adapter Components

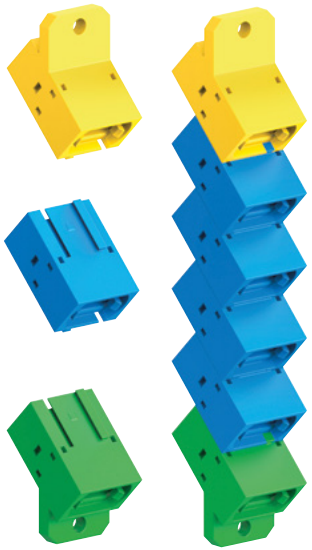
90° FLANGE		45° ANGLE FLANGE	
	Top Adapter Simplex		Top Adapter Simplex
	Center Adapter Duplex		Center Adapter Simplex
	Center Adapter Simplex		Bottom Adapter Simplex
	Bottom Adapter Simplex		

Super High Density Rack



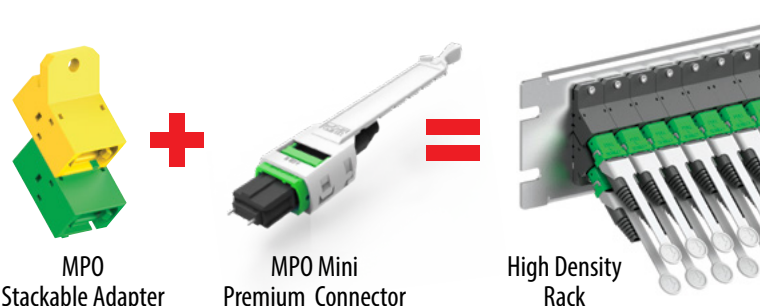
MPO Stackable Adapter + MPO Mini Premium Connector = High Density Rack

45° Angle Out type



For fiber management use the 45° angle flange to create a staggered array for densely populated panels.

High Density Rack with 45° Angle Out Type

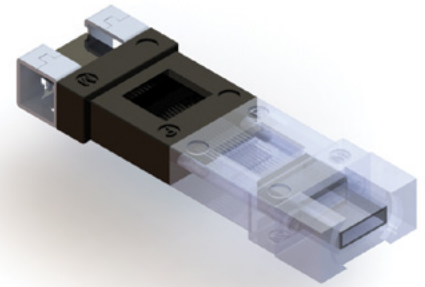


MPO Stackable Adapter + MPO Mini Premium Connector = High Density Rack

1U panel
576 fiber distribution
(Using 12F MPO Connectors)

High quality material for trusted reliability

SENKO's MT Ferrule, made from high quality glass filled PolyPhenylene Sulfide (PPS) is used with our MPO-PLUS® Connectors and tested against the stringent requirement of Telcordia's GR-1435. Glass filled PPS is ideal for precise tolerance molded components because it has minimal water absorption and has a very low coefficient of linear thermal expansion. As such, the ferrule offers excellent performance and properties for all environments.



Ultra precision molding for uncompromised performance

With the recent advancement to precision molding technology, SENKO ferrules are manufactured with much tighter specification as compared to conventional products. With these ultra-precise dimensions, SENKO is able to achieve the lowest industry insertion loss of 0.25dB guaranteed with a typical IL of greater than 0.1dB for the SM and MM Low loss ferrule. SENKO's Low Loss ferrules are made to meet the new IEC 61755-3-31 Grade B requirements.



Ultra precision machined metal guide pin

SENKO's innovative chamfered MT Guide pin design together with its improved spring are key to confidently align 2 MT Ferrules and provide a reliable fiber to fiber mating anytime, every time. SENKO's MPO-PLUS® chamfered stainless steel guide pins are manufactured to the tightest specification having a tolerance of +/-0.1Um for the SM Super low loss guide pin , allowing a super precision alignment of the ferrule. Guide pins are available for SM Grade, SM Super Low Loss grade MM Grade and MM Super Low Loss grade.

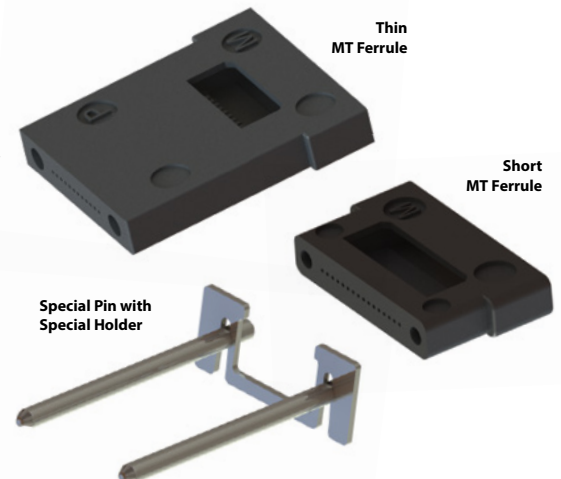


MPO-PLUS® Specialty ferrules and guide pins

SENKO designs and manufactures specialty MT Ferrules and Guide Pins for a variety of applications. Versions up to 48 fibers with various dimensions are achievable. Please contact the SENKO sales team for further information.

FEATURES

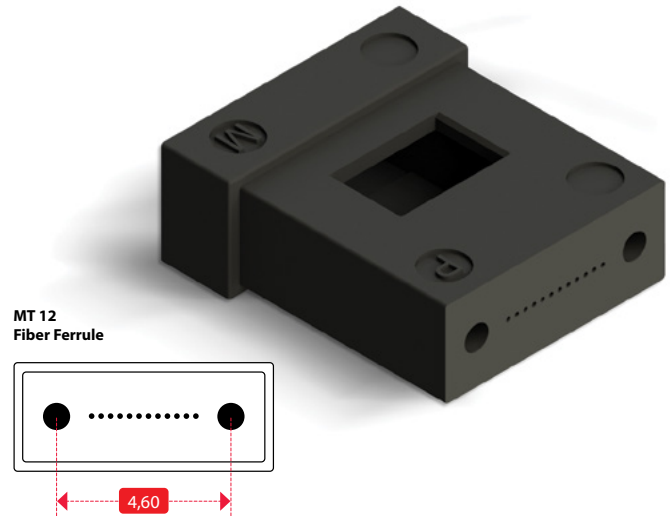
- Special MT ferrule having higher fiber count
- Special MT ferrule having different dimension
- Thin MT Ferrule, Short MT Ferrule
- Special Guide pin and Pin holder



MPO-PLUS® MT Ferrule

12 Fiber Ferrule

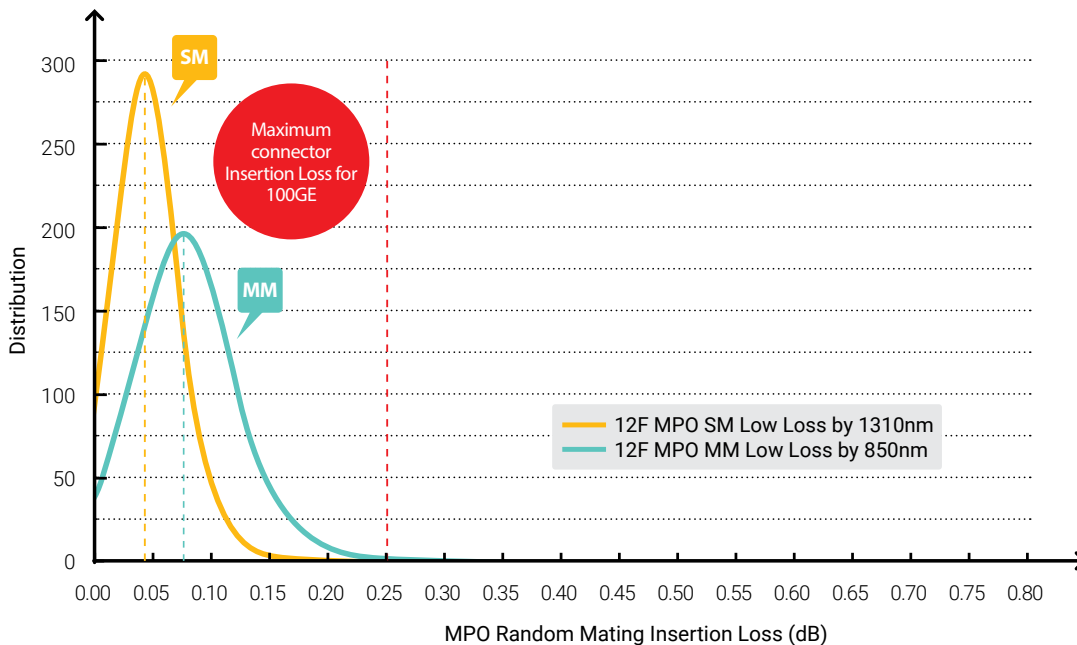
SENKO's MPO-PLUS® MT 12 fiber ferrule are the most common used MT Ferrule in the market which gives the best combination of easy-to-use and low insertion loss. The SM Low Loss and MM Low Loss now guarantees the industry's lowest insertion loss of 0.25dB, with a typical of greater than 0.1dB, which exceeds the IEC 61755-3-31 Grade B Requirement. Quality, Price, durability and ease of assembly makes the 12 fiber your best choice.



SPECIFICATION	SM LOW LOSS	SM STANDARD	MM LOW LOSS	MM STANDARD
IL Typical vs Reference connector	0.10dB	0.20dB	0.08dB	0.15dB
IL Max vs Reference connector	0.25dB	0.70dB	0.25dB	0.50dB
IL Typical Random Mating	0.12dB	0.20dB	0.10dB	0.15dB
Random Mating IEC Spec: IEC61755-3-31	Grade B (0.25)	Grade C (0.5)	n/a	n/a
Return Loss	60dB	60dB	25dB	25dB
Recommended PIN Used	SM Low loss Pin	SM Pin	SM Pin	MM Pin

* Above number is only achievable when using SENKO Recommended Reference Jumper, Polishing process and testing method

* SM Low loss and MM Low loss Max IL 0.25dB to be 95% of all fiber



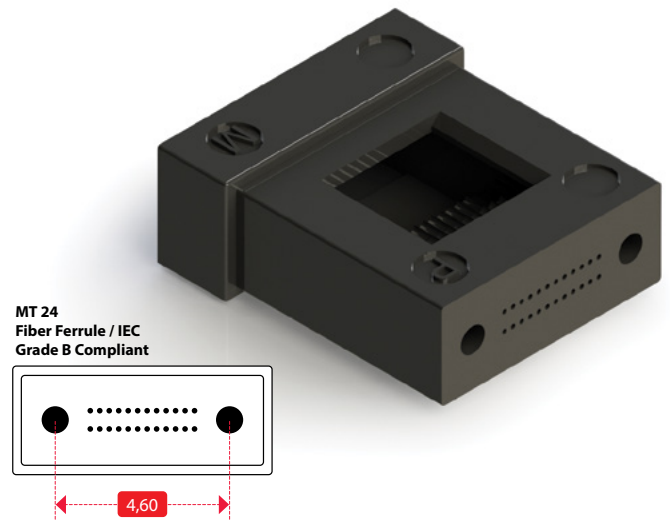
**SENKO SM and MM
12 Fiber Super Low Loss
Insertion loss distribution
MAX IL 0.25dB**

** Above insertion loss and return loss are only achievable when proper polishing is made tested by SENKO's recommended process

MPO-PLUS® MT Ferrule

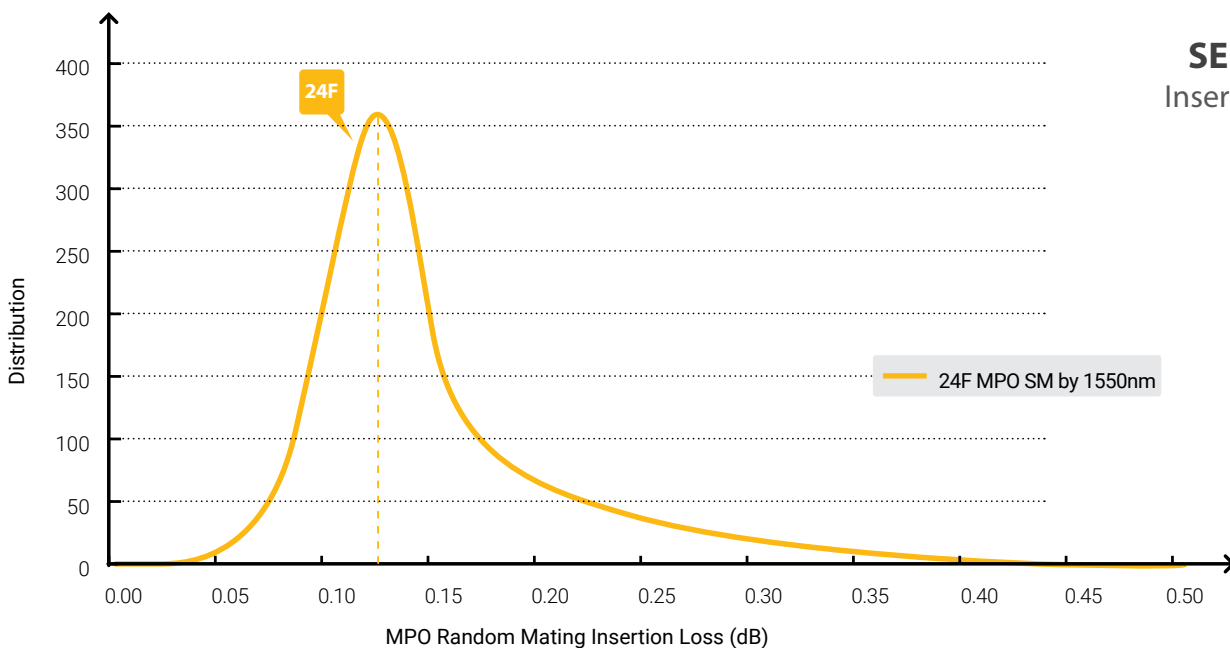
24 Fiber Ferrule

SENKO's MPO-PLUS® 24 fiber MT Ferrule consists of 2 rows of 12 high precision fiber holes, yielding a high density connection with industry leading insertion loss values. Versions available in SM, MM and Low Loss MM make it the ideal choice for super high density connections and high speed 100G and 400G parallel optics platforms. SM 24 and MM 24 fiber are to be used with a 20N High force spring.



SPECIFICATION	SM	MM LOW LOSS	MM
IL Typical vs Reference Connector	0.25dB	0.15dB	0.20dB
IL Max vs Reference Connector	1.00dB	0.35dB	0.50dB
IL Typical Random Mating	0.50dB	0.20dB	0.25dB
Return Loss	60dB	25dB	25dB
Recommended PIN Used	SM Pin	SM Pin	MM Pin

* Above number is only achievable when using SENKO recommended reference jumper, polishing process and testing method



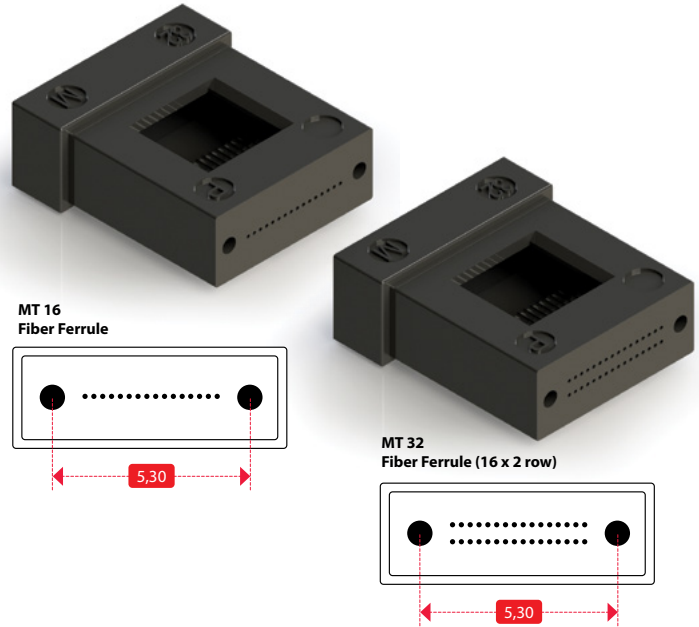
SENKO SM 24 Fiber
Insertion loss distribution
MAX IL 1.00dB

** SM 24 and MM 24 fiber are to be used with a 20N High force spring

MPO-PLUS® MT Ferrule

16 and 32 Fiber Ferrule

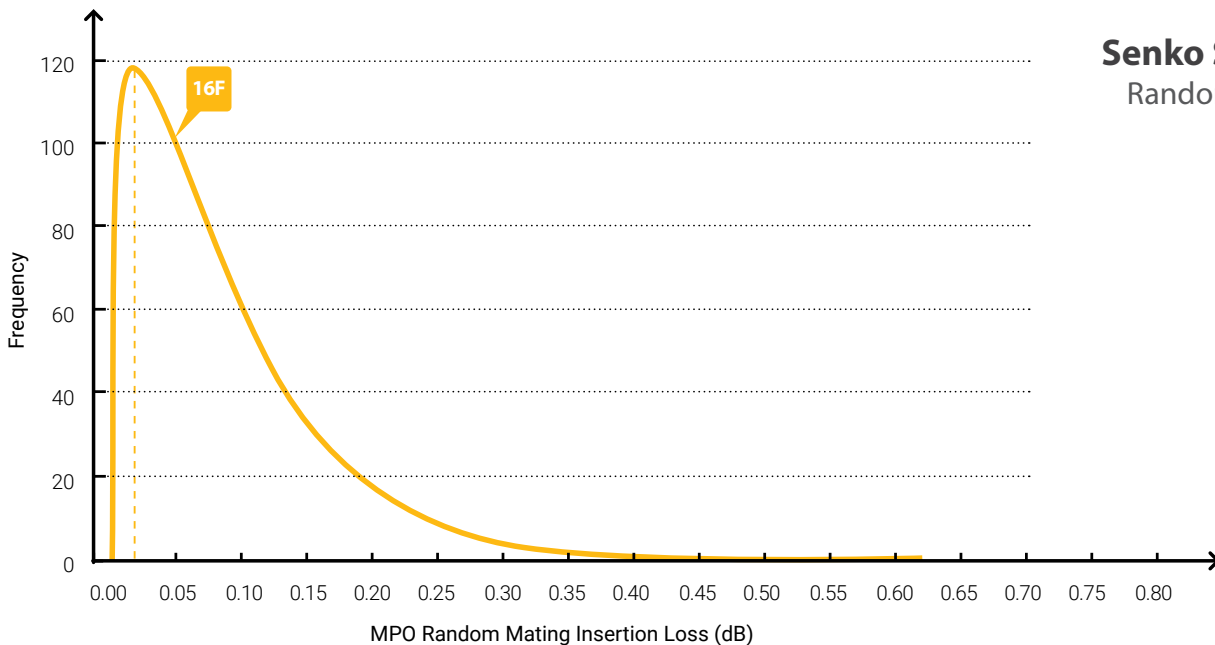
SENKO's MPO-PLUS® MT 16 and 32 fiber ferrules are designed to meet TIA 604-18 standard which addresses 16 fiber hole width MPO requirements and are available in single row 16 fiber and 2x16 row 32 fiber configurations. Industry leading 16F SM Low Loss ferrules meet the most demanding insertion loss and return loss requirements for high speed 100G, 400G and beyond parallel optical networks.



SPECIFICATION	16F SM LOW LOSS	16F MM LOW LOSS	16F MM	32F MM
IL Typical vs Reference Connector	0.15dB	0.15dB	0.20dB	0.25dB
IL Max vs Reference Connector	0.35dB	0.35dB	0.60dB	0.60dB
Random Mating Grade IEC 61755-3-31	0.Grade B*	n/a	n/a	n/a
Return Loss	60dB	25dB	25dB	25dB
Recommended PIN Used	SM Low Loss Pin	SM Pin	MM Pin	MM Pin

- FEATURES**
- One row of 16 fiber or 2 row of 16 fiber (= 32 Fiber)
 - New Pin to Pin width of 5.3mm
 - New pin OD Spec of 0.55mm
 - New MT specification being standardized by TIA 604-1 (FOCIS 18) and IEC (61754-7-3)

* Meets the current IEC Grade B performance requirement for 12F-MT ferrule. The grade specification for 16F MT is underdevelopment in IEC
 **Above number is only achievable when using SENKO recommended reference jumper, pPolishing process and testing method



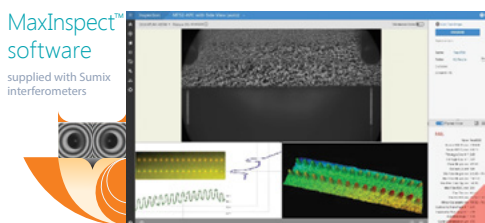
Senko SM 16F Low Loss
Random Mating Test Result



Senko has a complete line of products to help you with getting the optimal performance from your MPO connectivity. Senko has *Try Before You Buy* demo units available so that can do a risk free evolution for deciding if our products will meet your needs. We also offer product training that can be tailored to your requirements as well as full technical support.

SUMIX MAX Quantum Interferometer

P/N MAX-QUANTUM

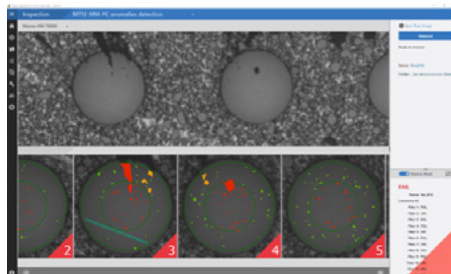


FEATURES

- Measures single fiber connectors in 1.4 second and MT connectors as quickly as 7 seconds
- Measures radius of curvature, apex offset, fiber height, core dip and other surface details as small as 1.47 μm
- Overcome cable tension and ferrule positioning uncertainties in with MPO measurement and control additional parameters for guide holes parallelism and angles

SUMIX Manta W+ Inspection Scope

P/N MNT-W-STAND



- Extremely fast inspection taking 2 seconds to check a standard MPO connector (12 or 16 fibers)
- Detailed high-resolution picture with 1.8 μm resolution and 0.75 μm defect size detection capability
- Large field of view (4.1 × 3.0 mm) and able to see beyond the guide pins and guide pin holes

End Face Metrology & Polarity Management

SUMIX Polaris Benchtop Microscope

P/N POLARIS

Designed for critical examination of the polished fiber end faces and may serve as a reference system to verify and adjust lower resolution microscopes on the production line.



- Check your defects as small as 0.2 μm in diameter and scratches as small as 0.4 μm in width
- Fully automated movement along MPO connector endface automatic tracking of the fibers in numerical order

SUMIX Manta W+ MPO Polarity Verification Module

P/N MPO-VERIFIER

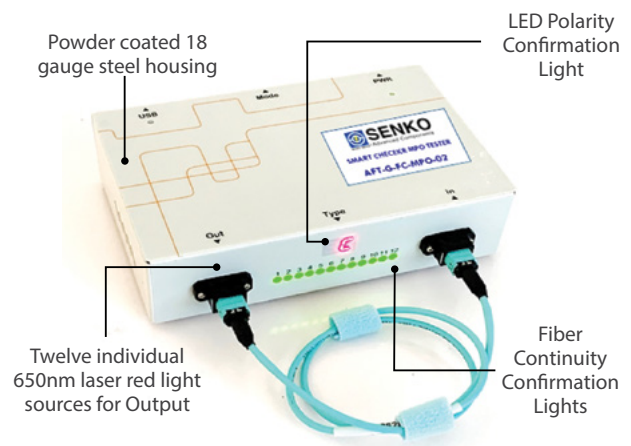


- Supports 12/24/48-fiber and 16/32-fiber MPO, both male and female types, MM and SM
- Non-contact scan (*MPO fibers and pins remain intact*)
- Automated test and analysis

SMART CHECKER MPO Polarity & Continuity Tester

P/N AFT-FC-MPO-02

- Tests 8 and 12 MPO unpinned assemblies for Method A, B and C polarity in 1 sec
- 5 hour battery makes this ideal for bench top and field applications
- Kit options available for checking 24F MPO, MPO cassette modules and MPO loop back assemblies for polarity verification of installed MPO based link



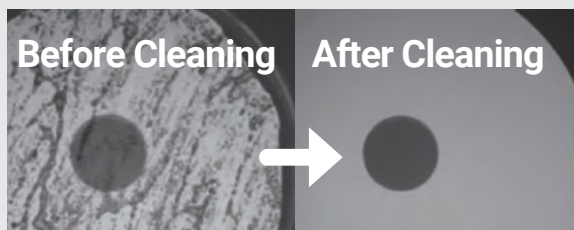
End Face Cleaning *Click Style Cleaners*

Senko's Optical Connector Lineup creates reliability in telecommunications service

The cause of numerous problems in optical communication equipment is contamination of the end face of optical connectors. Senko has developed optical fiber cleaners with fiber specifically for optical connectors to help create a reliable telecommunications service. Senko's optical connector cleaners eliminate even the smallest contaminants that are visible only through magnification.

Why is cleaning optical connectors so important?

Contamination of the optical connector end face can easily occur. The transmission quality will be affected once the contaminants adhere to the 10µm diameter optical fiber core, and there is increased danger that the fiber end face will be damaged by any high powered light. Cleaning the optical connector end face is extremely important before making a connection.



Smart Cleaner™ MPO Series

P/N SCK-SS-MPO & SCK-SS-MPO-02

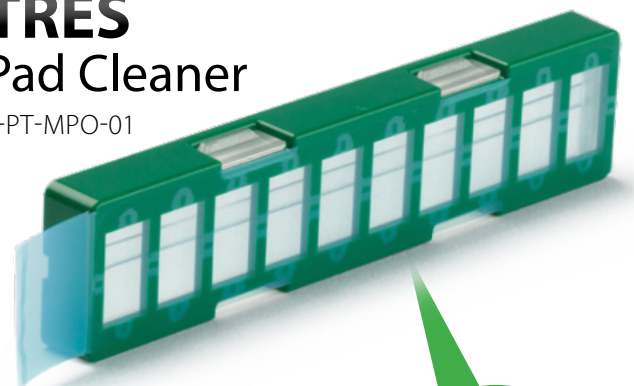
The Smart Cleaner is a dry cloth cleaner specifically designed to clean connections residing in an adapter, faceplate or bulkhead.



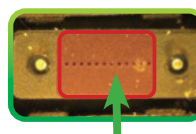
- Cleans 600 end faces
- Cleans in adapter and unmated MPO endfaces
- Centered key tip for 12, 24 and 48 MPO and offset key for 16 and 32 MPO

OPTRES Gel Pad Cleaner

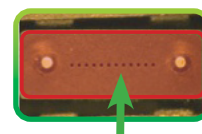
P/N SCK-PT-MPO-01



Conventional Cleaner VS NEW Gel Pad



Particles around the pin area can remain which could cause "air gap"



Full surface of the end face will be cleaned

- Uses zero residue gel trapping surface dust
- Simple tough and go cleaning process
- Can be use for cleaning lensed array ferrules

End Face Cleaning *Cassette Cleaners & Gel Pads*

Smart CleanerTM Cassette Series

P/N SCK-CC-100 & SCK-CC-200

400+
CLEANINGS



- Economy cassette for cleaning up to 400 MPO end faces
- Manual advance cleaning ribbon and compact housing for good ergonomics in the operator's hand
- SCK-CC-100 for unpinned MPO and single fiber end faces
- SCK-CC-200 modified window for cleaning 12 and 16 pinned MPO end faces

OPTIPOP R Cassette Series

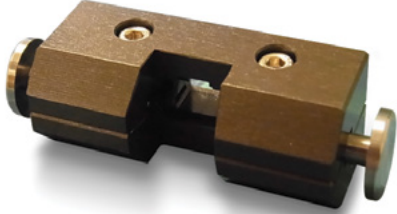
P/N CRE-01, CRE-03 + CRC-RS-0



400+
CLEANINGS

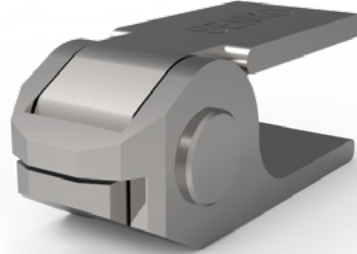
- 400 cleanings per cassette and refillable
- CRE-01 for unpinned MPO and single fiber end faces
- CRE-03 modified window for cleaning 12 and 16 pinned MPO end faces
- CRC-RS-01 refill six packs

MPO-PLUS® Removal Tool



- Removes outer housing for gender change and ferrule cleaning

MPO-PLUS® Gender Changeable Tool



MPO-PLUS® Loopback



- Available for 12ch & 24ch Standard and QSFP applications
- Solid body
- MPO Attenuator loopback also available

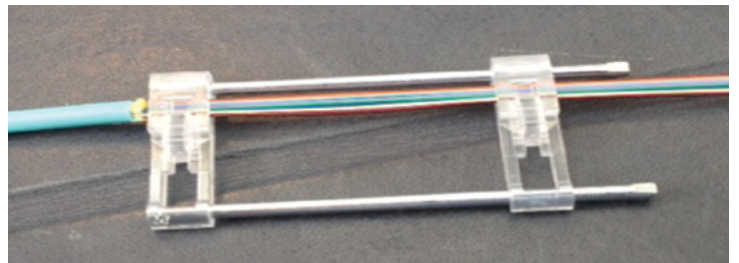
MPO-PLUS® Ribbon stripper



MPO-PLUS® Quality Master Jumper



MPO Ribbonizer



MPO^{PLUS} Standard Connector Kit with Ferrule



MPO Green with Flat Ribbon Cable Boot



MPO Yellow with Bare Ribbon Short Boot



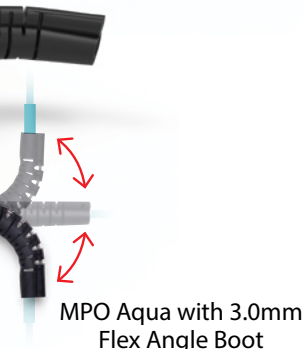
MPO Beige with Bare Ribbon Boot



MPO Violet with 3.0mm Boot



MPO Aqua with 3.0mm Flex Angle Boot



MPO Aqua with 3.0mm Flex Angle Boot

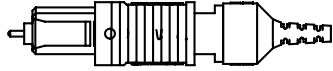
4F ~ 24F TYPE	GENDER/PIN	FERRULE TYPE	FIBER COUNT	HOUSING COLOR	BOOT/CABLE
702F	F Female	SS SM Standard	04 4F	Y SM Low Loss Yellow	01 Bare Ribbon Fiber Bare Ribbon Boot
	M Male	SL SM Super Low Loss	08 8F	G SM Green	02 Bare Ribbon Fiber Bare Ribbon Short Boot
		MS MM Standard	12 12F	V MM OM4 Heather Violet	11 Flat Ribbon Cable Flat Ribbon Cable Boot
		ML MM Super Low Loss	24 24F	A MM OM3 Aqua	21 2.0mm Round 2.0mm Boot with Crimp
				T MM Beige	22 2.0mm Round 2.0mm Boot without Crimp
				B MM Black	31 3.0mm Round 3.0mm Boot
					32 3.0mm Round 3.0mm Flex Angle Boot
					41 3.6mm Round 3.6mm Boot
					42 3.6mm Round 3.6mm Flex Angle Boot
					51 Other Round 4.5mm Round Boot
					52 Other Round 5.0mm Round Boot
					53 Other Round 5.5mm Round Boot

702F - F - MS12 - A31 ORDER CODE example
MPO Female MM Standard 12F Aqua 3mm Boot

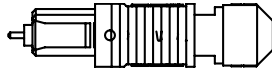
- Note:**
1. Custom configurations available upon request.
 2. Please visit Senko.com/mposelect for other combinations.
 3. 3.8mm and 4.0mm boot option available.

Ribbon Boots

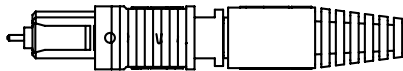
01 Bare Ribbon



02 Bare Ribbon Short

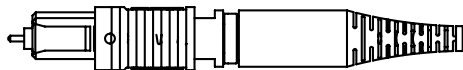


11 Flat Ribbon Cable

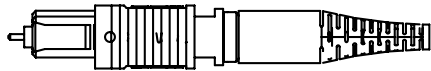


2.0mm Round Boots

21 2.0mm Boot with Crimp

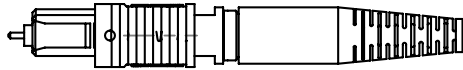


22 2.0mm Boot without Crimp

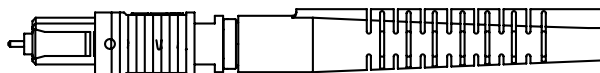


3.0mm Round Boots

31 3.0mm Boot



32 3.0mm Flex Angle

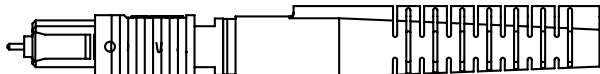


3.6mm Round Boots

41 3.6mm Boot

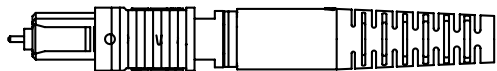


42 3.6mm Flex Angle



4.5/5.0/5.5 Round

51 4.5mm Boot



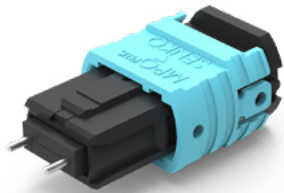
52 5.0mm Boot



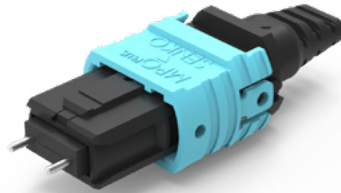
53 5.5mm Boot



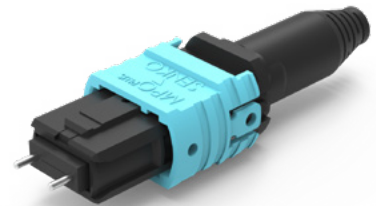
MPO-PLUS® Mini Connector



MPO Mini Connector Aqua with No Boot



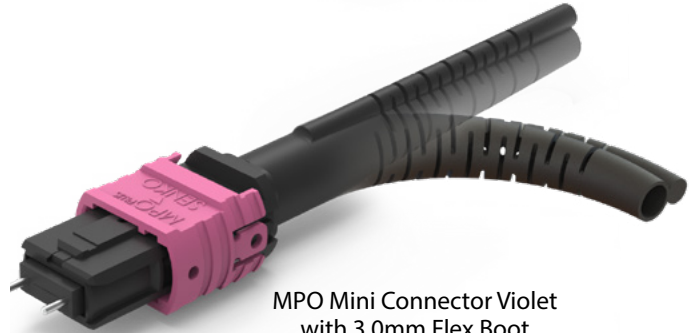
MPO Mini Connector Aqua with Bare Ribbon Boot



MPO Mini Connector Aqua with 3.0mm Short Boot



MPO Mini Connector Aqua with 3.6mm Short Boot



MPO Mini Connector Violet with 3.0mm Flex Boot

MPO MINI	GENDER/PIN	FERRULE TYPE	FIBER COUNT	HOUSING COLOR	BOOT/CABLE
703F	G Female Gender Changeable	SS SM Standard	04 4F	Y SM Low Loss Yellow	00 Bare Ribbon Fiber Bare Ribbon No Boot
		SL SM Super Low Loss	08 8F	G SM Green	01 Bare Ribbon Fiber Bare Ribbon Boot
		MS MM Standard	12 12F	V MM OM4 Heather Violet	21 2.0mm Round 2.0mm Boot without Crimp
		ML MM Super Low Loss	24 24F	A MM OM3 Aqua	22 2.0mm Round 2.0mm Boot with Crimp
				B MM Black	32 3.0mm Round 3.0mm Flex Angle Boot
					A1 3.0mm Round 3.0mm Boot (GR Metal Back Post)
					33 3.0mm Round 3.0mm Short Boot
					42 3.6mm Round 3.6mm Flex Angle Boot
					46 3.6mm Round 3.6mm Short Boot
					51 4.5mm Round 4.5mm Round Boot
					52 Other Round 5.0mm Round Boot
					53 5.5mm Round 5.5mm Round Boot

703F - G - SS12 - G33 ORDER CODE example
MPO Mini Male SM Standard 12F Green 3.0mm Boot

- Note:**
1. Custom configurations available upon request.
 2. Gender changeable pins sold separately. Two pins required for one MPO connector. See P.51 for details.
 3. MPO-HD push pull tab option sold separately.
 4. Please visit Senko.com/mposelect for other combinations.
 5. 3.8mm and 4.0mm boot option available.

MPO-PLUS® Push Pull Tab



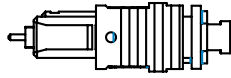
TYPE	
703-HDPP-34-W	MPO-PLUS® Mini Push Pull Tab 34mm White
703-HDPP-50-W	MPO-PLUS® Mini Push Pull Tab 50mm White
703-HDPP-64-W	MPO-PLUS® Mini Push Pull Tab 64mm White

703-HDPP-50-W ORDER CODE example

- Note:**
1. Gender Changeable Tool available - see P.51 for details.
 2. Push Pull tab can be used for the MPO-PLUS® Premium Mini 12/24F Connector.

Ribbon Boots

00 Bare Ribbon No Boot

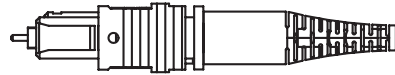


01 Bare Ribbon Short

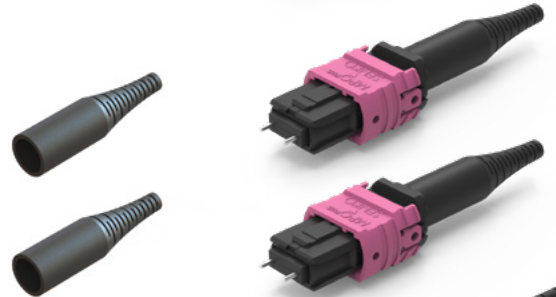
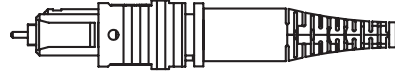


2.0mm Round Boots

21 2.0mm Boot without Crimp

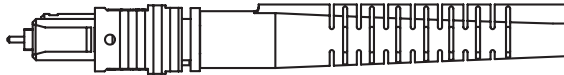


22 2.0mm Boot with crimp

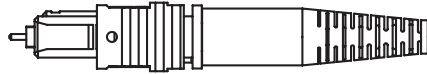


3.0mm Round Boots

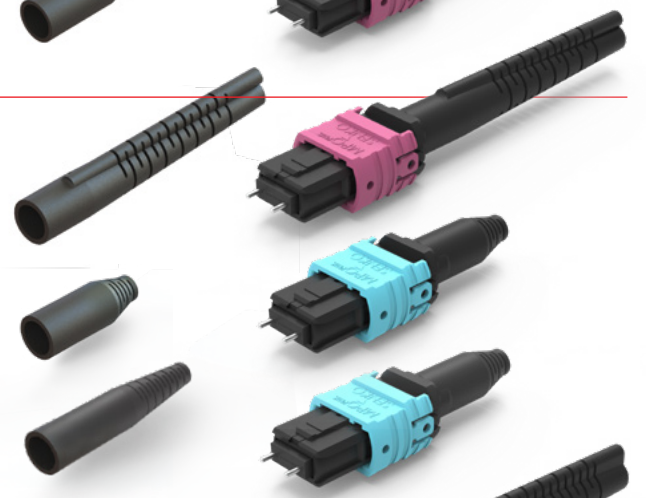
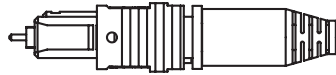
32 3.0mm Flex Angle



A1 3.0mm Boot (GR Metal Back Post)



33 3.0mm Short

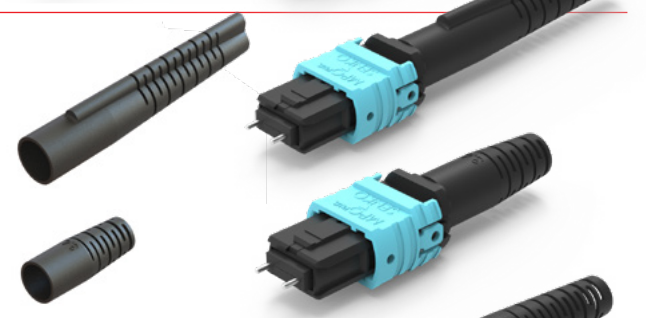


3.6mm Round Boots

42 3.6mm Flex Angle

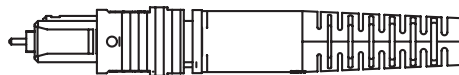


46 3.6mm Short

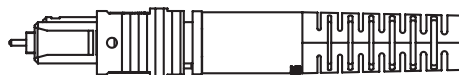


4.5/5.0/5.5 Round

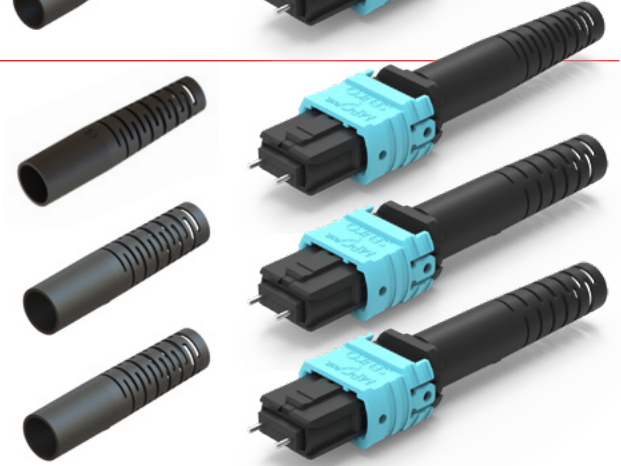
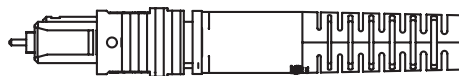
51 4.5mm Boot



52 5.0mm Boot



53 5.5mm Boot



MPO^{PLUS} 16/32F Standard and Premium Mini Connector



MPO Mini Connector Aqua with 3.0mm Short Boot



MPO Mini Connector Aqua with 3.6mm Short Boot



MPO Mini Connector Aqua with 4.5mm Boot



16 Fibers MPO Connector with 3.6mm Flex Angle Boot



16 Fibers MPO Connector with Bare Ribbon Boot



16 Fibers MPO Connector with 3.6mm Boot

16/32 TYPE	GENDER/PIN	FERRULE TYPE	FIBER COUNT	HOUSING COLOR	BOOT/CABLE
712F Premium	F Female	SS SM Standard	16 16F	Y SM Low Loss Yellow	01 Bare Ribbon Fiber Bare Ribbon Boot
713F Mini	M Male	SL SM Super Low Loss	32 32F	G SM Green	02 Bare Ribbon Fiber Bare Ribbon Short Boot
		MS MM Standard		V MM OM4 Heather Violet	31 3.0mm Boot 3.0mm Boot
		ML MM Super Low Loss		A MM OM3 Aqua	A1 3.0mm Boot 3.0mm Boot (GR Metal Back Post)
				T MM Beige	32 3.0mm Boot 3.0mm Flex Angle Boot
				B MM Black	33 3.0mm Boot 3.0mm Short Boot
					41 3.6mm Boot 3.6mm Boot
					42 3.6mm Boot 3.6mm Flex Angle Boot
					46 3.6mm Boot 3.6mm Short Boot
					51 4.5mm Boot 4.5mm Round Boot
					52 Other Round 5.0mm Round Boot
					53 Other Round 5.5mm Round Boot

712F - F - MS16 - A31 ORDER CODE example
MPO Female MM Standard 12F Aqua 3.6mm Boot

- Note:** 1. Custom configurations available upon request.
2. Please visit Senko.com/mposelect for other combinations.
3. 3.8mm and 4.0mm boot option available.

MPO+PLUS® Latch Connector



MPO Latch Connector with 3.0mm Short Boot



MPO Latch Connector with Bare Ribbon Boot



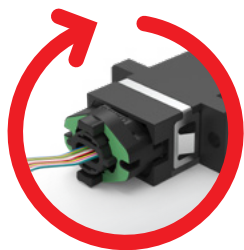
MPO Latch Connector with Flex Angle Boot

MPO LATCH	GENDER/PIN	FERRULE TYPE	FIBER COUNT	HOUSING COLOR	BOOT/CABLE
704F	F Female	SS SM Standard	04 4F	B MM Black	00 Bare Ribbon Fiber Bare Ribbon "No" Boot
	M Male	SL SM Super Low Loss	08 8F		01 Bare Ribbon Fiber Bare Ribbon Boot
	G Female	MS MM Standard	12 12F		21 2.0mm Round 2.0mm Boot without Crimp
	Gender Changeable (pin sold separately)	ML MM Super Low Loss	24 24F		22 2.0mm Round 2.0mm Boot with Crimp
					32 3.0mm Round 3.0mm Flex Angle Boot
					33 3.0mm Round 3.0mm Short Boot
					41 3.6mm Round 3.6mm Boot
					42 3.6mm Round 3.6mm Flex Angle Boot
					46 3.6mm Round 3.6mm Short Boot
					51 Other Boot 4.5mm Boot
					52 Other Boot 5.0mm Boot
					53 Other Boot 5.5mm Boot

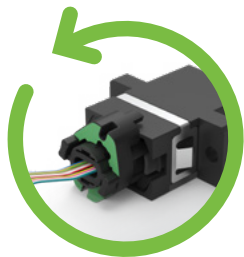
704F - M - SS12 - B32 ORDER CODE example
MPO Latch Male SM Standard 12F Black 3.0mm Flex Angle Boot

- Note:**
1. Custom configurations available upon request.
 2. Gender changeable pins sold separately. Two pins required for one MPO connector.
 3. Please visit Senko.com/mposelect for other combinations.
 4. 3.8mm and 4.0mm boot option available

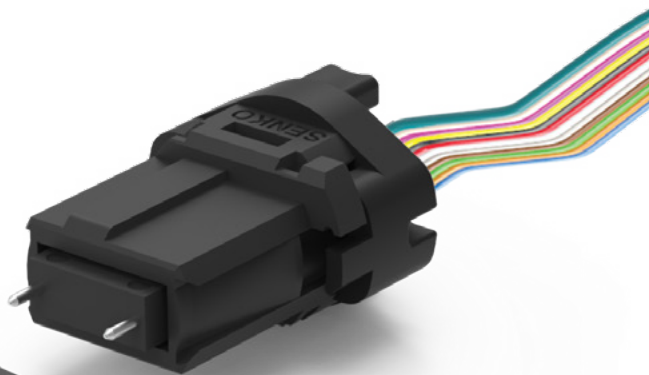
MPO-PLUS® Bayonet Connector



Plug in Connector and turn Bayonet **clockwise** to **ENGAGE**



To remove Connector turn Bayonet **counter clockwise** to **DISENGAGE**



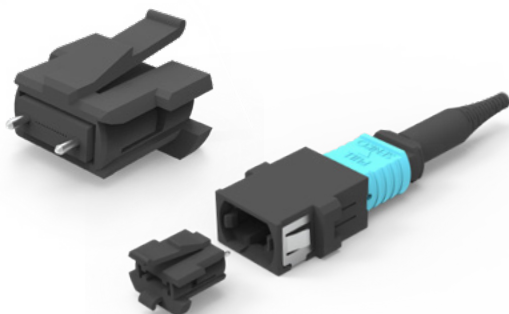
PATENT PENDING DESIGN

BAYONET	GENDER/PIN	FERRULE TYPE	FIBER COUNT	HOUSING COLOR	BOOT/CABLE
705F	F Female	SS SM Standard	04 4F	Y SM Low Loss Yellow	00 No Boot
	M Male	SL SM Super Low Loss	08 8F	G SM Green	
		MS MM Standard	12 12F	V MM OM4 Heather Violet	
		ML MM Super Low Loss		A MM OM3 Aqua	
				T MM Beige	
				B MM Black	

BAYONET	GENDER/PIN	FERRULE TYPE	FIBER COUNT	HOUSING COLOR	BOOT/CABLE
715F	F Female	SL SM Super Low Loss	16 16F	Y SM Low Loss Yellow	00 No Boot
	M Male	MS MM Standard	32 32F	G SM Green	
				V MM OM4 Heather Violet	
				A MM OM3 Aqua	
				T MM Beige	
				B MM Black	
				M Lime Green	

715F - M - SS12 - G00 ORDER CODE example

MPO-PLUS® Micro Latch Connector



MICRO	GENDER/PIN	FERRULE TYPE	FIBER COUNT
706F	F Female Pin Clamp	SS SM Standard	04 4F
	M Male Pin Assembly	SL SM Super Low Loss	08 8F
		MS MM Standard	12 12F
		ML MM Super Low Loss	24 24F

706F - F - SS12 ORDER CODE example

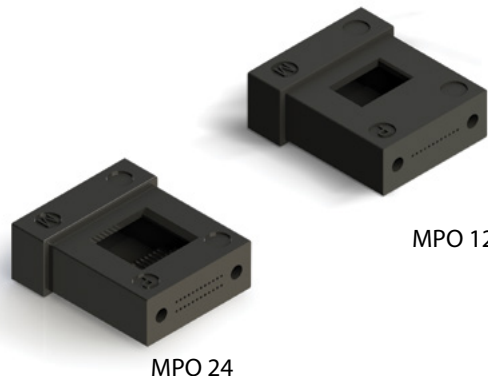
Note: Requires use of MPO Polarity Changeable adapter.

MPO+PLUS® MT Ferrule

MT FERRULE	TYPE	FERRULE TYPE	FIBER COUNT
MT	01	MT Ferrule for MPO	SS SM Standard
	02	MT Style Ferrule Thin Type	SL SM Super Low Loss
			MS MM Standard
			ML MM Super Low Loss
			SR Master

ORDER CODE example
 MTSM Low Loss 12F Ferrule

Note: Super Low Loss Ferrules are available only for 12 fiber.



MPO+PLUS® Guide Pin

PIN KEEPER CODE	TYPE
705-PC Guide Pin Assembly 24F/12F	MM-01 Multimode (Standard, Latch Series)
	SM-01 Singlemode (Standard, Latch Series)
	LL-01 SM Low Loss (Standard, Latch Series)

ORDER CODE example
 705-PCMM-01

PIN KEEPER CODE	TYPE
701-PC Guide Pin Assembly 32F/16F	MM-32-03 Multimode (Standard 32F/16F)
	SM-32-03 Singlemode (Standard 32F/16F)
	LL-32-03 Singlemode Low Loss (Standard 32F/16F)

ORDER CODE example
 701-PCMM-01



MPO+PLUS® Gender Changeable Pin

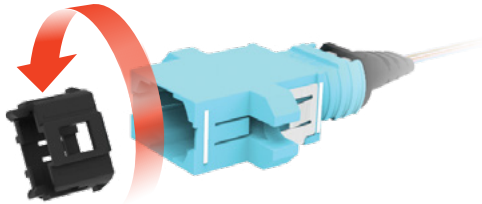
GUIDE PIN CODE	TYPE
701-PIN-G MPO Gender Changeable Pin	MM-02 MM Pin (Premium Mini, Latch Series)
	SM-02 SM Pin (Premium Mini, Latch Series)
	LL-02 Low Loss Pin (Premium Mini, Latch Series)
	32MM-01 MM Pin (Premium Mini 32F/16F)
	32SM-01 SM Pin (Premium Mini 32F/16F)
	32LL-01 Low Loss Pin (Premium Mini 32F/16F)

ORDER CODE example
 701-PIN-G-SM

- Note:
- Two Gender Changeable pins required for one MPO connector.
 - Gender changeable pins can be used with Gender Changeable Female pin keeper for MPO+PLUS® Premium Mini and MPO+PLUS® Latch connectors.



MPO-PLUS® Polarity Changeable Adapter

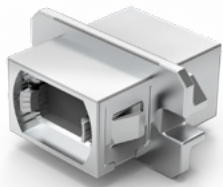


ADAPTER FLANGE		ADAPTER COLOR	
773	Flange (Standard Flange)	1	Black
774	No Flange (Reduced Flange)	2	OM3 Aqua
7W3	MPO 16/32F, Standard Flange	3	OM4 Heather Violet
7W4	MPO 16/32F, No Flange	K	Gray Aligned Key

773 - 1 ORDER CODE example

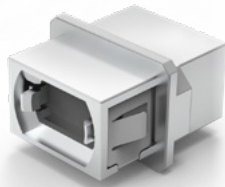
- Note:**
1. Polarity changeable feature recommended for non-angled ferrules only.
 2. RMT-609 tool required for polarity change.
 3. Latch and Micro Latch MPO compatible

MPO-PLUS® Metal Adapter



MPO Adapter EMI with Internal Shutter

MPO Adapter EMI No Flange



ADAPTER FLANGE		ADAPTER COLOR		SHUTTER	
7M7	Flange (Standard Flange)	1	Regular Key	None	No Shutter
7M8	No Flange (Reduced Flange)	K	Aligned Key	A	Inner Shutter

7M7 - 1 - A ORDER CODE example

Features

- One-piece design
- Flange and Non-Flanged Types
- Superior shielding effectiveness
- Protects against dust, provides eye safety and reduces EMI when no connector is installed

MPO-PLUS® Dust Shutter Adapter



ADAPTER FLANGE		ADAPTER COLOR		SHUTTER	
7D7	Flange	1	Black	A	
7D8	No Flange	2	Aqua		
		3	Heather Violet		
		8	Lime		
		K	Gray, Aligned Key		

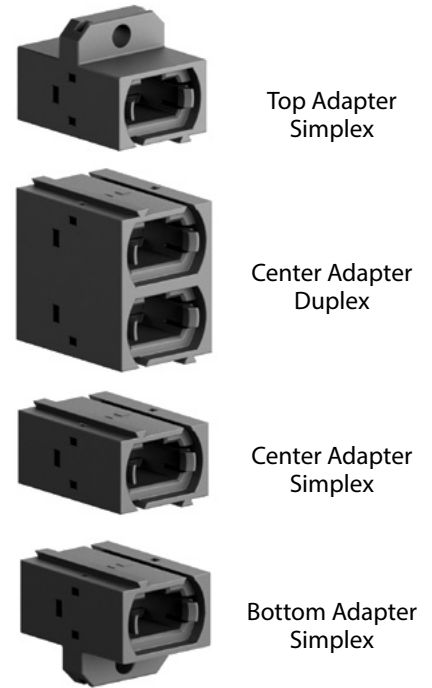
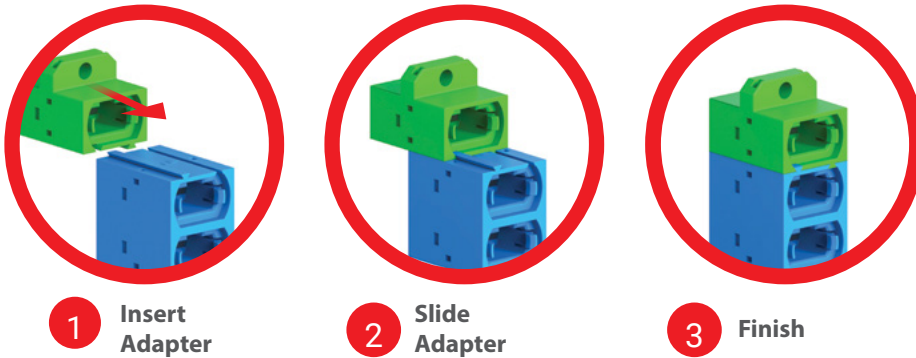
7D7 - 1A ORDER CODE example

Note: Front shuttered side is compliant with female MPO connectors only

Features

- Unique twin door shutter closes to prevent any ingress of contamination
- 100% automatic shutter mechanism means one handed connection
- No dust cap required on shutter side
- Fully meets GR-1435 mechanical and environmental requirements

MPO+PLUS® 90° Stackable Adapter



STACKABLE ADAPTER		STYLE	SHAPE	ADAPTOR COLOR		SHUTTER			
780	MPO Stackable	1	90° Type	T	Top Adapter Simplex	1	Black	None	No Shutter
				B	Bottom Adapter Simplex	2	OM3 Aqua	A	Inner Shutter
				1	Center Adapter Simplex	3	OM4 Heather Violet		
				2	Center Adapter Duplex	K	Gray Aligned Key		

ORDER CODE example: 780-1T-1A MPO Stackable 90° Bottom Adapter Simplex Black

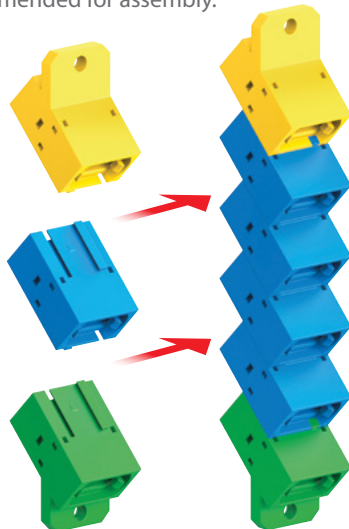
MPO+PLUS® 45° Stackable Adapter

STACKABLE ADAPTER		STYLE	SHAPE	ADAPTOR COLOR		SHUTTER			
780	MPO Stackable	2	45° Type	T	Top Adapter Simplex	1	Black	None	No Shutter
				B	Bottom Adapter Simplex	2	OM3 Aqua	A	Inner Shutter
				1	Center Adapter Simplex	3	OM4 Heather Violet		
						K	Gray Aligned Key		

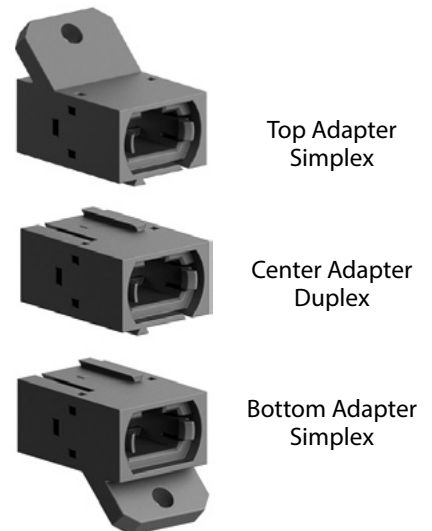
ORDER CODE example: 780-2T-1A MPO Stackable 45° Bottom Adapter Simplex Black



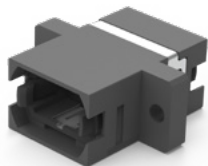
Note: Tool recommended for assembly.



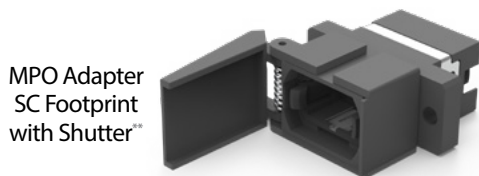
Use the 45° angled flange to create a staggered array to assist with fiber management in densely populated panels.



MPO^{PLUS} SC Footprint Adapter



MPO Adapter SC Footprint with Flange



MPO Adapter SC Footprint with Shutter**

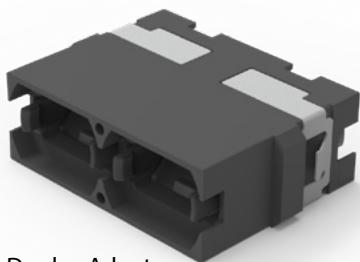
ADAPTER FLANGE		ADAPTER COLOR	
775	Flange (Standard Flange)	1	Black
776	No Flange (Reduced Flange)	2	OM3 Aqua
7W5	MPO 16/32F, Standard Flange	3	OM4 Heather Violet
7W6	MPO 16/32F, No Flange	K	Gray Aligned Key

Note: **External shutter sold separately - part number 775-OSHU-01. **775 - 1** ORDER CODE example

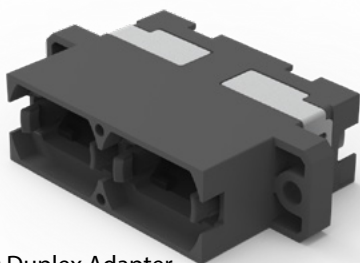
Features

- One-piece design
- Flange and Non-Flanged Types
- Regular and Reversed Key Options
- SC Footprint
- External shutter option

MPO^{PLUS} SC Footprint Duplex Adapter



MPO Duplex Adapter with Shutter SC DX Footprint No Flange



MPO Duplex Adapter SC DX Footprint With Flange

ADAPTER FLANGE		ADAPTER COLOR		SHUTTER	
7A5	Flange (Standard Flange)	1	Black	None	No Shutter
7A6	No Flange (Reduced Flange)	K	Gray (Aligned Key)	A	Shutter

7A5 - 1 - A ORDER CODE example

Features

- Unique twin door shutter closes to prevent any ingress of contamination
- 100% automatic shutter mechanism
- Laser and IP5X dust protection
- SC duplex footprint
- Compatible with standard MPO connectors
- Micro Latch MPO compatible on rear side

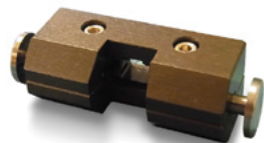
MPO-PLUS® Tools



TYPE

RBN-601 MPO-PLUS® Ribbonizer Tool

_____ RBN-601 ORDER CODE example



TYPE

RMT-603 MPO-PLUS® Disassemble Tool

_____ RMT-603 ORDER CODE example



TYPE

RMT-604 Gender Changeable Pin Assembly/Removal Tool

_____ RMT-604 ORDER CODE example

MPO-PLUS® Crimp Tool



TYPE

CRT-605 Crimp Tool for MPO-PLUS® Connector (Oval)

CRT-606 Crimp Tool for MPO-PLUS® 3.0 - 5.5mm round crimp (for thick jacket crimp)

CRT-607 Crimp Tool for MPO-PLUS® 3.0 - 5.5mm round crimp

_____ CRT-607 ORDER CODE example

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