NAFICON

MPO/MTP-Products

Naficon was established in 1994 and is specialized in products for Passive Optic Networks (PON). Naficon is located in Nauvo, in the archipelago of Turku. Over the past four decades we have established ourselves as one of the leading operators on the field of end-products for optical fiber networks in Finland. Quality, flexibility and understanding are the three words that describe best the way we operate. Using high-class materials, the newest production equipment and continuous development of skills are the reasons for maintaining good quality year in and year out.

In July 2015 we founded subsidiary in Dubai, United Arab Emirates. The name of the company is NFOM (Naficon Fiber Optic Manufacturing) LLC. NFOM manufactures similar products as we do in Finland using the same materials and production equipment. Certain products, like trunk cables for mobile masts and other cell sites, are still made from start to finish in Nauvo. The production in NFOM started in February 2016. In April 2017 NFOM quality management system got ISO 9001 quality certification. In November 2024, we started manufacturing MPO connectors ourselves at the Dubai factory.

In Nauvo, we manufacture pigtails, patch cords and multifiber cables with connectors ready-made. Used cables are for indoor and outdoor applications according to customer needs. Beside those products we manufacture pre-terminated fiber panels for different purposes.

We manufacture products with all the most common connectors: SC, LC, FC and ST. All of them can be polished with UPC (no angle) and SC, LC and FC connectors are available as APC connectors. APC connectors feature fiber end face that is polished at an 8-degree angle. We also offer both MTP and MPO products.

Besides comprehensive stock of our own products, we have all the essential PON products in stock. Adapters, splice protector sleeves, attenuators, splitters, CWDM etc. We have thousands of products in stock so even bigger deliveries can be made swiftly.

Flexibility, quality and understanding

- three words that describe Naficon's products and operations

MPO/MTP-Products

Fiber optic products with MPO and MTP connectors – efficiency for high-density network environments

Fiber optic solutions equipped with MPO and MTP connectors offer a highly efficient and space-saving option for modern data centers, server rooms, and high-capacity fiber networks. They enable the consolidation of multiple fibers into a single connector, accelerating installations and improving cable management.

MPO vs. MTP – What is the difference?

- MPO (Multi-Fiber Push-On) is a generic term for connectors in which multiple fibers are combined into a single ferrule. It is standardized by the IEC and TIA/EIA standards.

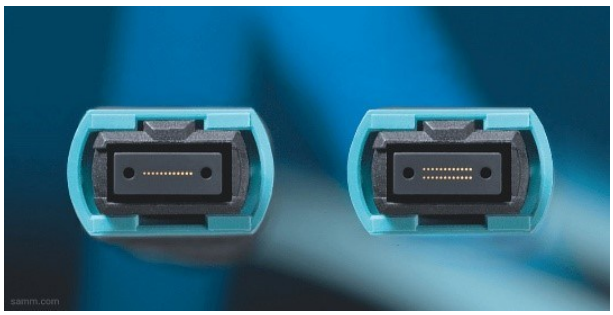
- MTP® (Mechanical Transfer Push-On) is a registered trademark of US Conec, representing a technically enhanced version of the MPO connector. MTP connectors feature more precise alignment, improved optical performance, and a modular design that allows for component replacement and maintenance.

Connectors

There are two types of MPO/MTP connectors: male and female. The male connector has alignment pins, while the female connector has corresponding holes to accommodate them. Male connectors are typically used inside panels and for equipment interfaces. Female connectors are commonly used in patch cords, equipment cables and trunk cables.

MTP/MPO connectors are available in 8-, 12-, and 24-fiber versions. All fiber counts use the same connector size. Both the 8- and 12-fiber versions have a ferrule with 12 fiber positions, but in the 8-fiber version, the middle four positions are left unused. This 8-fiber connector is primarily used in multimode products and 40Gb systems.

The 24-fiber ferrule has 12 fiber positions arranged in two rows.



The 12-fiber connector is currently the most common. One advantage of using a 24-fiber ferrule is higher connection density, which reduces the number of required trunk cables by half. However, the challenge with 24-fiber ferrules lies in the complexity of manufacturing, which significantly increases the cost.

Typical insertion loss for MPO/MTP connectors is slightly higher than that of standard ceramic ferrule connectors (such as SC and LC), typically around 0.25 dB. Return loss is also lower compared to standard ferrules. For this reason, single-mode MPO/MTP connectors are always polished with APC (Angled Physical Contact), achieving a typical return loss of approximately 55 dB.

When using these connectors, it is crucial to consider polarity already in the design phase. Adapter selection is also based on polarity. More information about polarity can be found at the end of the brochure.

Patch Cords

Patch cables are available for all fiber counts — 8, 12, and 24 fibers. Both ends can be equipped with MPO/MTP connectors, or one end can be terminated with LC or SC connectors. The staggered positioning of the connectors can be precisely customized, making neat installations easy to achieve. Length and polarity can be selected as needed, as well as the fiber type (SM, OM3, OM4, and OM5).

Trunk Cables

Trunk cables are available with 12, 24, 48, 72, 96, 144 and 192 fibers. The length is customizable to the needs and the connectors can be at both ends or only at the other end.

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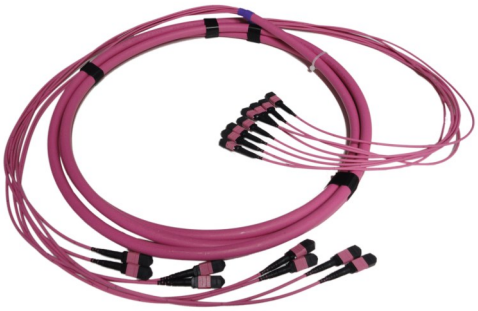
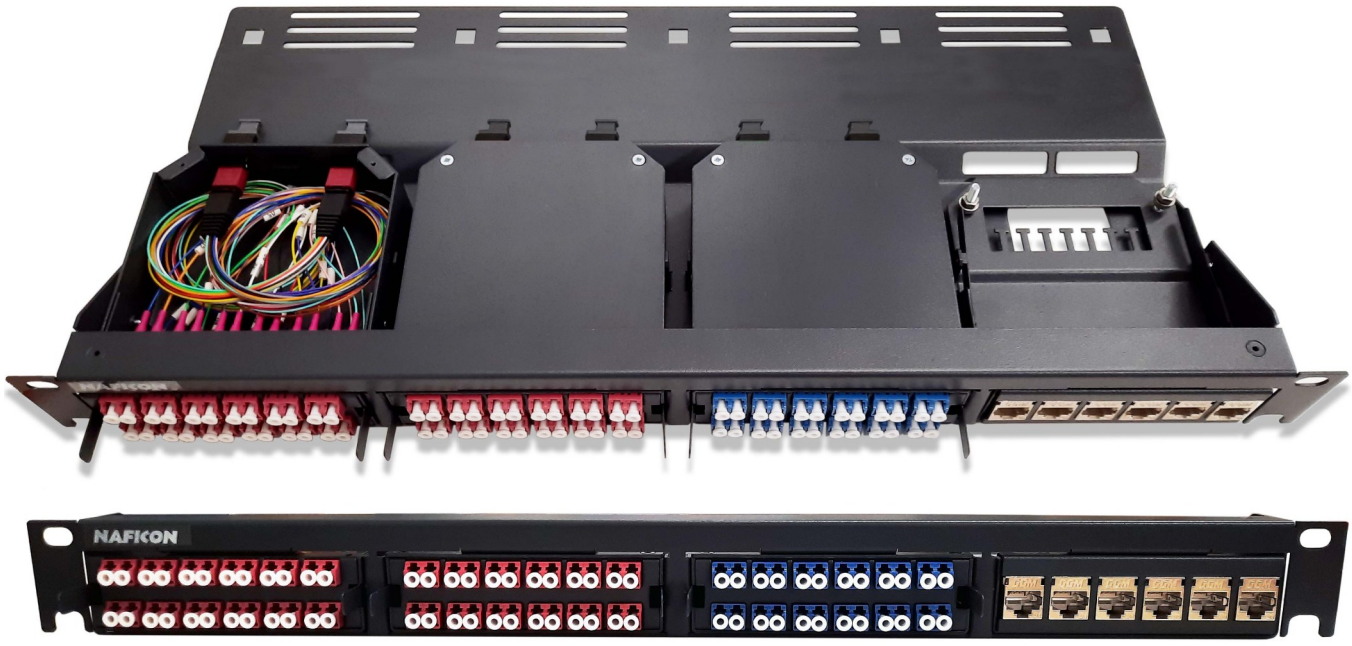


Panel and Modules

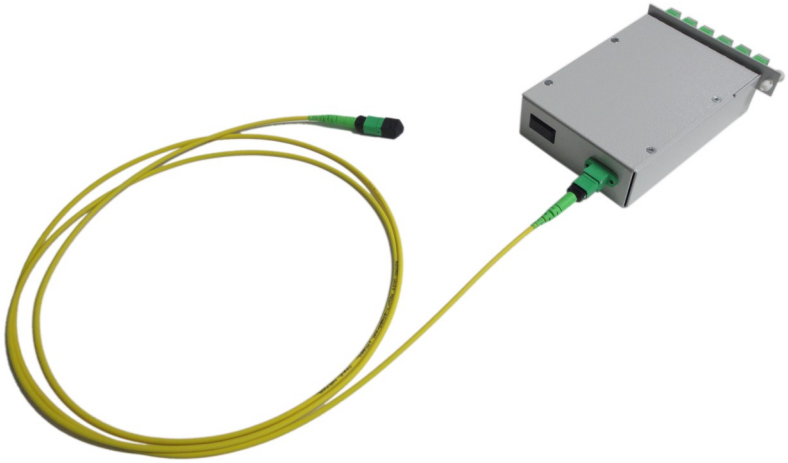
In our 19” modular frame, both optical and copper cables can be installed side by side. The fiber module features three MPO/MTP connector ports at the rear and twelve LC duplex adapter slots at the front. This allows for the integration of three 8-fiber cables, two 12-fiber cables, or one 24-fiber cable. Inside these modules, short MPO-LC patch cords are pre-installed according to the specified requirements. In the image below, the module contains two 12-fiber OM4 MPO-LC patch cords.

The CAT6A module contains six CAT6A keystone connectors. CAT6A cables can be pre-installed in the module so that they only need to be pushed into the rack from the rear.

Four modules can be installed in a 1U modular frame. Additional modules can be added as needed. Unused slots are covered with blank panels.



We also offer a frame and modules designed exclusively for fiber optics. Each module has two MPO/MTP connector ports at the rear and six LC-QUAD adapter slots at the front. The frame accommodates four modules and is also available with a protective and guiding tray. These modules are pre-installed with short MPO-LC patch cords according to the specified configuration.



Polarity

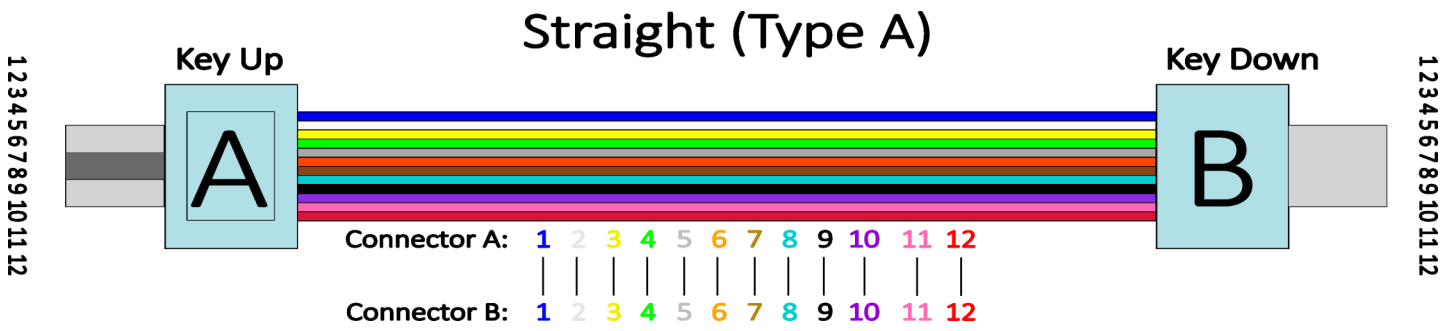
The polarity of MPO and MTP connectors refers to the arrangement of fibers from one end of the connector to the other—correct polarity ensures that the transmitting fiber (Tx) is properly aligned with the receiving fiber (Rx).

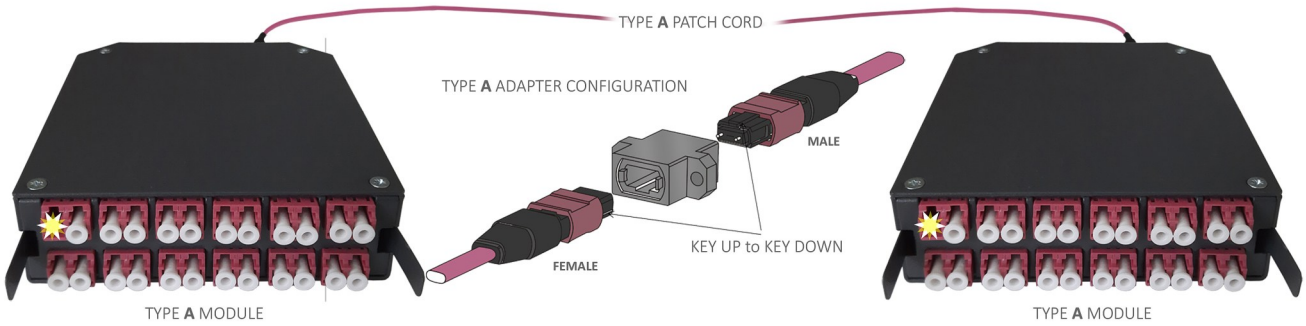
A **Type A** cable, also known as a **straight cable**, has one connector in the **key-up** position and the other in the **key-down** position. This means that the fiber positions remain the same at both ends of the cable. The term 'key' refers to the guide feature on top of the connector that aligns with the adapter.

This polarity type is common in trunk cables, but it requires careful planning to ensure that transmit (Tx) and receive (Rx) ends are correctly aligned. If necessary, adapters or reversed connectors can be used to ensure proper signal direction.

Why Type A?

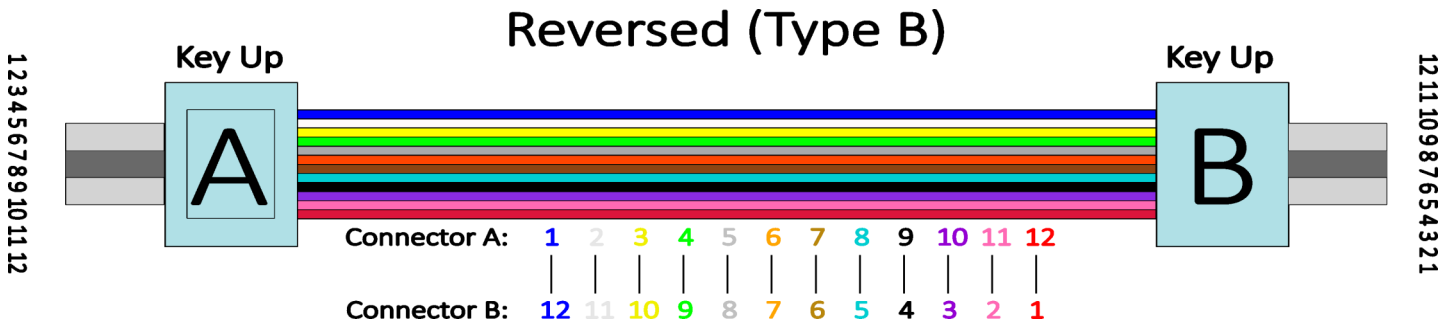
- **Simplicity of polarity:** A straight fiber arrangement simplifies design and documentation.
- **Compatibility:** Most MPO-based systems and panels are designed for Type A polarity.
- **Modularity:** Easy to integrate with other components, such as MPO-LC fanout cables.





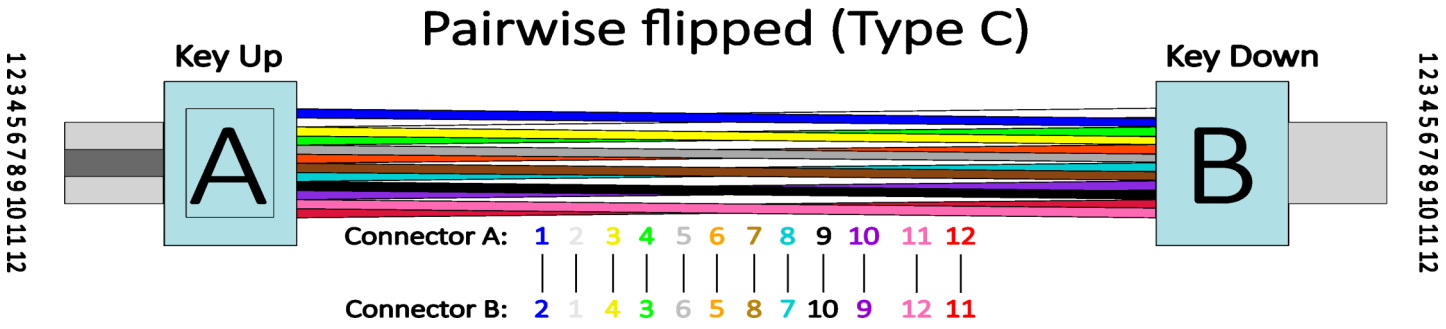
A **Type B** cable, also known as a **reversed cable**, uses connectors in the **key-up position at both ends**. This configuration causes the fiber positions to be reversed—fibers switch places from one end of the cable to the other.

This polarity is common in trunk cabling where a simple and direct connection is desired—such as straight links from transmitter to receiver without additional adapters. It ensures that transmiting and receiving fibers align correctly when standardized interconnection systems are used. This simplifies rapid deployment and reduces the likelihood of errors.



A **Type C** cable, also known as a **pairwise flipped cable**, is externally similar to a Type A cable: it has a **key-up** connector at one end and a **key-down** connector at the other. However, **the fiber arrangement is not straight—each adjacent fiber pair is reversed at one end of the cable**

Type C cables are particularly used in **duplex applications**, where each fiber pair forms a transmit–receive (Tx–Rx) link. This configuration enables direct connection to LC–LC patch cables without additional adapters or manual fiber flipping.



DATA CENTERS

Juho Latva

+358 45 899 9797

Juho.latva@naficon.fi

Mika Sormunen

+358 40 632 6632

mika.sormunen@naficon.fi

Naficon Liitin Oy

Lahdentie 7 D

21660 Nauvo FINLAND

www.naficon.fi