

# WHAT IS A MPO?

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**Category:** [Data Center](#)

**MPO**, Multi-fiber push on, is a plug & play solution that combines several fibers in a single connector. Available in connectors of 8, 12, 24, 32, 48, 60 and 72 fibers, they are used a lot in high density applications, like data centers for example.

In addition to MPO, there is also MTP, a trademark registered by the *US Conec* compatible with MPO standards, developed with the goal of being able to support greater tolerances in order to improve their performance compared to MPO.

At Higgs the connector we use is the MTP® PRO from US Conec which contains 12 fibers per connector.

The use of these connectors must be within the standards established for them by the International

Electrotechnical Commission - IEC-61754-7, and the Telecommunications Industry Association - TIA-604-5.

MPO/MTP are the only connectors that meet all TIA (Telecommunications Industry Association) and IEEE (Institute of Electrical and Electronics Engineers) standards for the migration path from 40G to 400G, while showing at the same time the necessary characteristics for high density solutions.

These connectors can be singlemode or multimode. In singlemode the connectors are always **APC** (Angled Physical Contact), and in multimode they are usually **UPC** (Ultra Physical Contact).

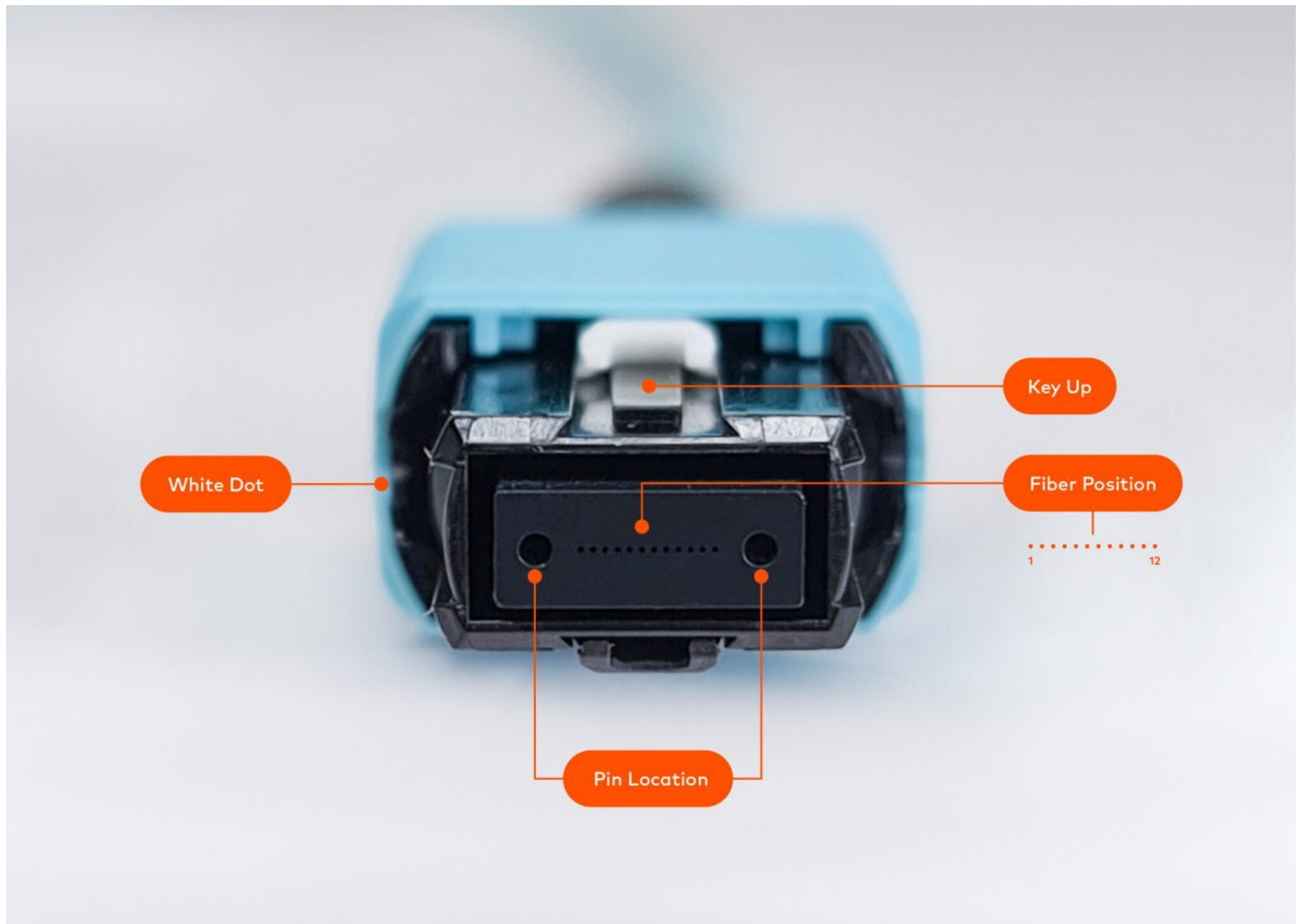
One of the characteristics of MPO/MTP is the fact that the connectors have gender. The male connector has two alignment pins while the female connector has two guiding holes. It is only possible to connect the male to the female connector so damage can be avoided.

Another very important feature in MPO/MTP is Polarity. Polarity is about the organization and placement of fibers within the connectors. Fibers can be organized in three ways:

- **Type A (straight)** – The fiber inserted in position 1 at one end is in the same position at the other end, so the fiber is in position 1 on both ends;
- **Type B (inverted)** – The fiber inserted in position 1 at one end will be in position 12 at the other end;
- **Type C (twisted)** – The fiber inserted in position 1 at one end will be in position 2 at the other end, and the fiber that is in position 1 of that same end, will be in position 2 on the opposite side, and so on.

Along with the polarity, it is necessary to pay attention to the key position. The connectors have a key in one side, when the key is facing up it means that the fibers inside the connector are in sequence, according to the colors pattern, from right to left. As well as helping to determine the fiber placement, the key also ensures that the connector can only be inserted one way into the adapter without being damaged.

The image below shows the structure of an MPO / MTP connector, where the fibers are placed:



And in the next image there is a demonstration of the three types of polarity and the proper position of the key:

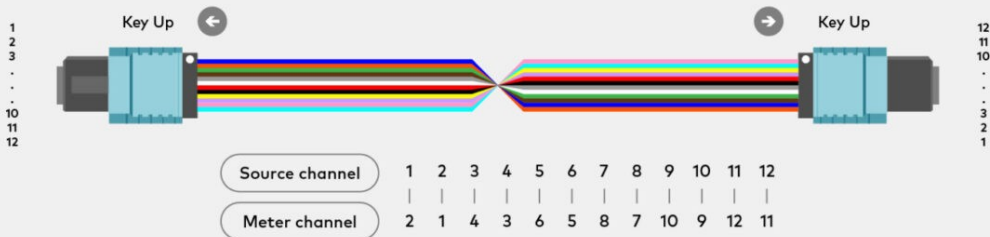
### Straight Through MPO to MPO Polary (Type A)



### Reversed MPO to MPO Polary (Type B)



### Flipped Pairs MPO to MPO Polary (Type C)



MPO/MTP have several benefits compared to other connectors, including the fact that they are quick to install, they don't need to be merged and they don't take up much space, it's possible to have a connector with 12 fibers, for example, instead of having 12 individual connectors. In this aspect, they prove to be a

more practical and effective option as they allow faster and more secure connections.

Another advantage that makes the difference in MPO's / MTP's is the possibility of the housing being removable. This allows you to change the connector's gender, change the pins and polarity on the field, for example, this way you can adapt the connector to your needs, whenever you need it.

It is for these reasons that MPO/MTP are increasingly the choice for high density, they have the ability to join several fibers in a single connector, installation is practical, saves up space, allows better cable management and organization, increases the network and safety, and if necessary, it is possible to change the polarity of the connector.