

# Understanding Fiber Polarity

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## 1. What's Polarity?

In any installation, it is important to ensure that the optical transmitter at one end is connected to the optical receiver at the other. This matching of the transmit signal (Tx) to the receive equipment (Rx) at both ends of the fiber optic link is referred to as polarity.

## 2. Polarity Overview

Two types of fiber links are outlined in the TIA standard: serial duplex signals connections and parallel signals connections. This paper discusses the impact of polarity as it pertains to serial duplex signals and parallel signals.

### 2.1 Fiber Patch cords

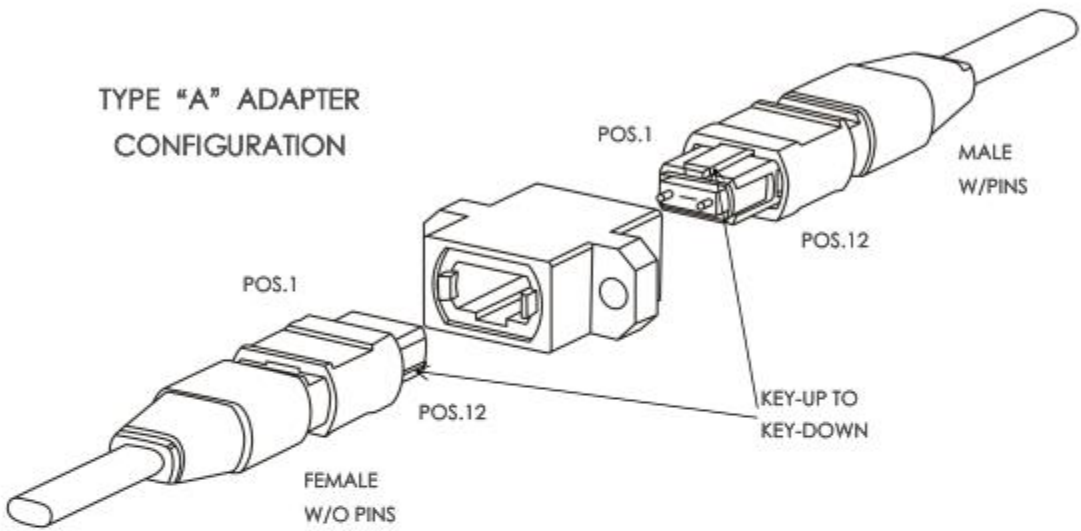
Two types of duplex fiber patch cords are defined in the TIA standard: A-to-A type shown in Figure 1 and A-to-B type shown in Figure 2.

Note: A-to-A patch cords are not commonly deployed and should be used only when necessary as part of a polarity method (See ANSI/TIA-568-C.0).

## 2.2 MTP/MPO Fiber Adapter

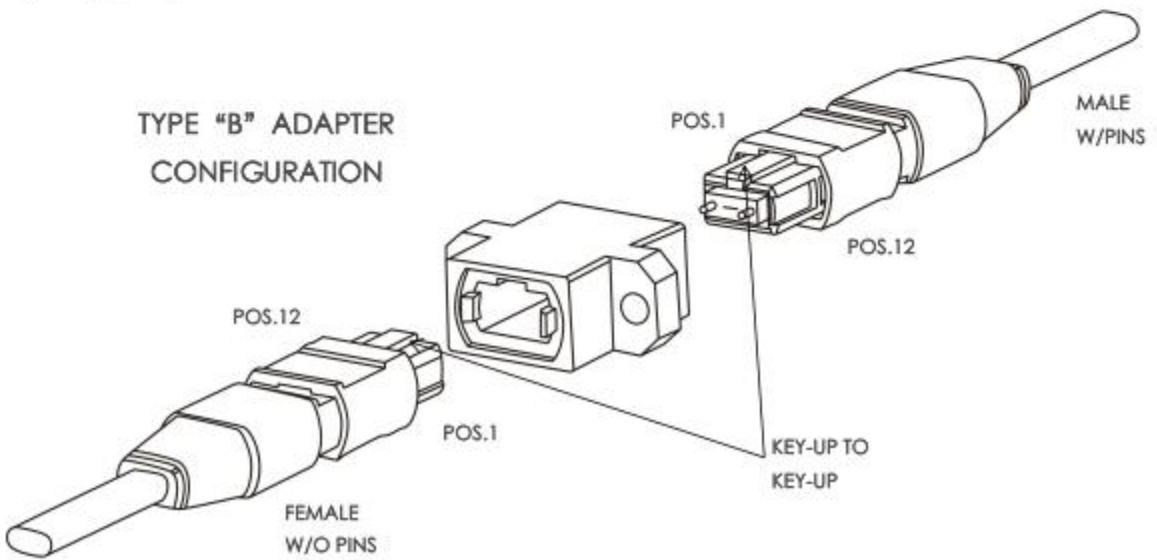
### 2.2.1 Type A adapters

There are two types of array adapters, Type A and Type B. Type A adapters shall mate two array connectors with the connector keys key-up to key-down.

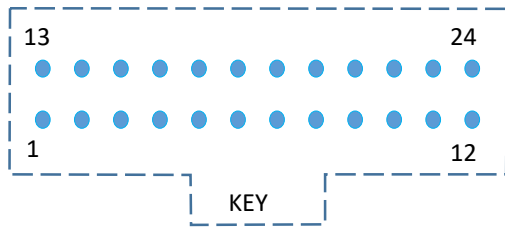
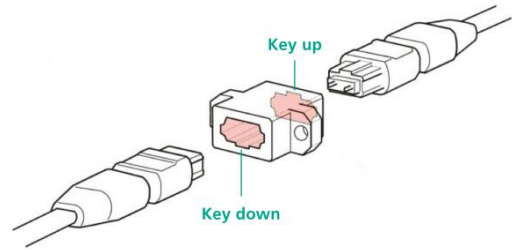
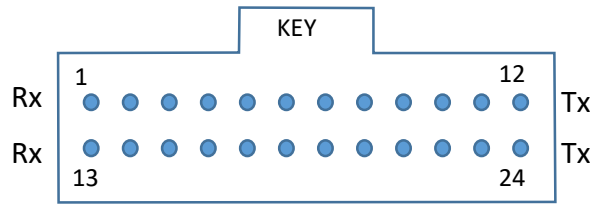


### 2.2.2 Type B adapters

Type B adapters shall mate two array connectors with the connector keys key-up to key-up (keys aligned).

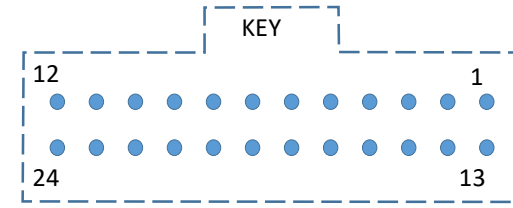
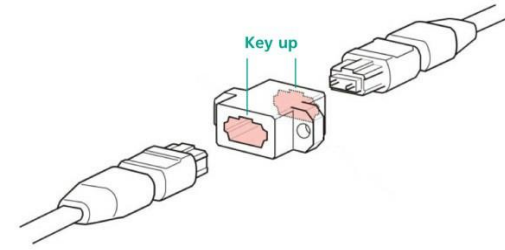
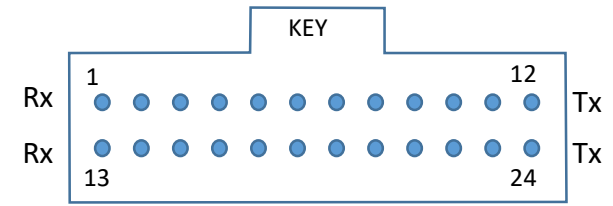


### DTH FireFly (male)



Ext. cable (female)

### DTH FireFly (male)



Ext. cable (female)

Position 1 indicated by white dot on MPO/MTP connector  
Usually on top left when key up (but key is not the ref for pin 1)

## 2.4 24-fiber MTP/MPO array patch cord

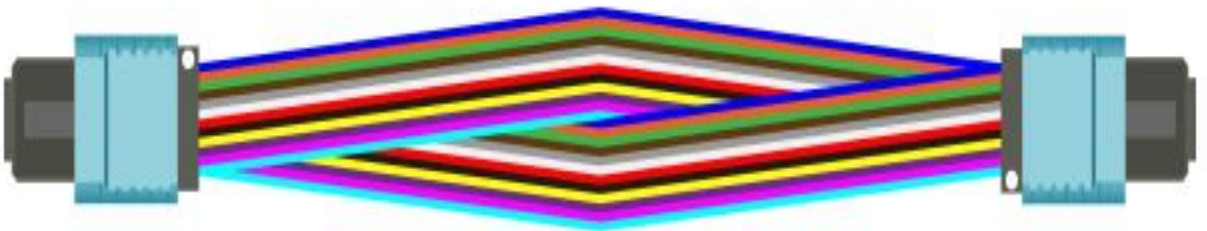
There are three different 24-fiber MPO/MTP-to-MPO/MTP backbone cables defined in the TIA standard (TIA-568.3-D). The three different cables: Type A, B and C are used for the three different connectivity Methods A, B and C respectively.

Type A  
Key-up to Key-Down  
P1 to P13



A:	1	2	3	4	5	6	7	8	9	10	11	12
B:	13	14	15	16	17	18	19	20	21	22	23	24
A:	13	14	15	16	17	18	19	20	21	22	23	24
B:	1	2	3	4	5	6	7	8	9	10	11	12

Type B  
Key-up to Key-up  
P1 to P24



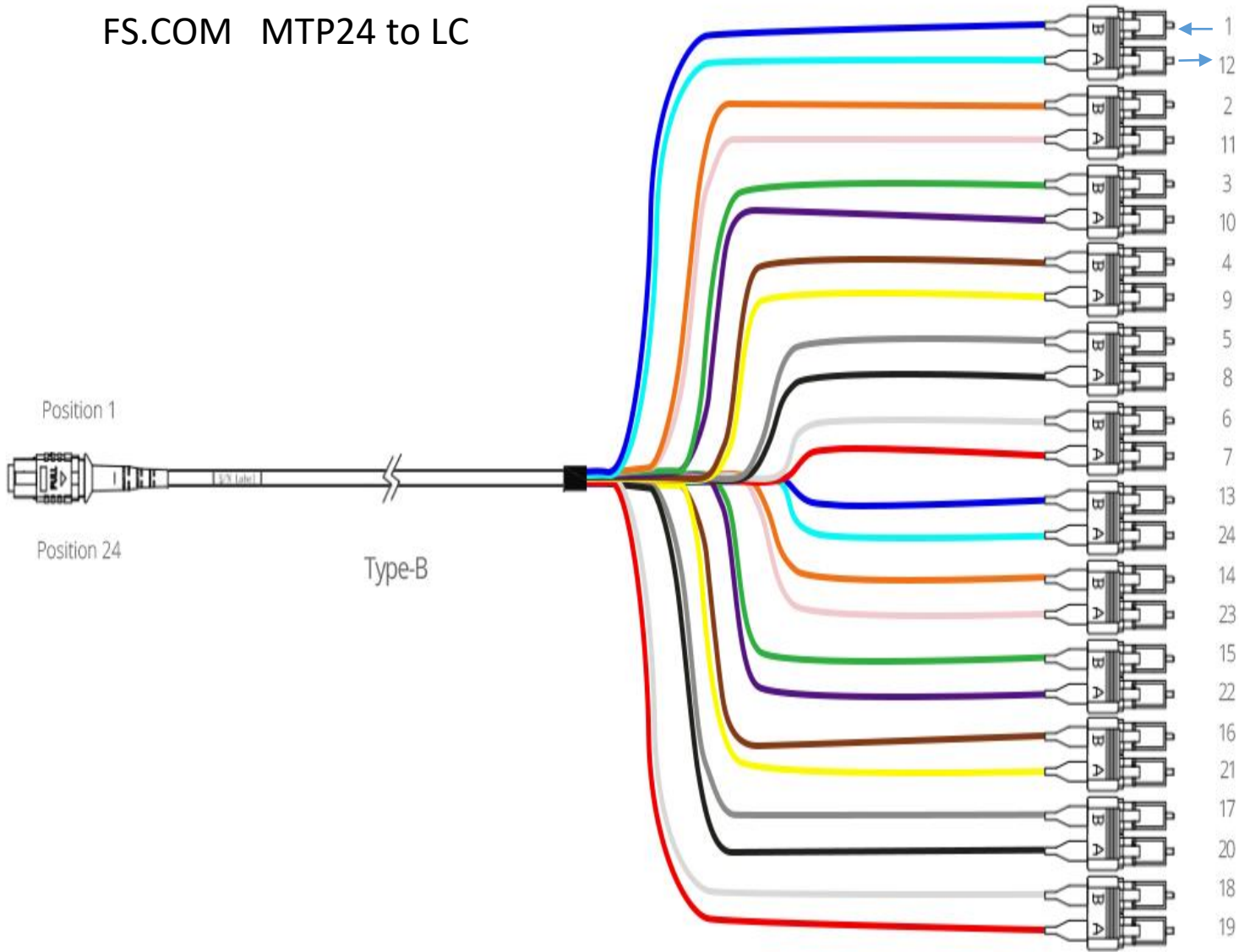
A:	1	2	3	4	5	6	7	8	9	10	11	12
B:	24	23	22	21	20	19	18	17	16	15	14	13
A:	13	14	15	16	17	18	19	20	21	22	23	24
B:	12	11	10	9	8	7	6	5	4	3	2	1

Type C  
Key-up to Key-Down  
P1 to P14



A:	1	2	3	4	5	6	7	8	9	10	11	12
B:	14	13	16	15	18	17	20	19	22	21	24	23
A:	13	14	15	16	17	18	19	20	21	22	23	24
B:	2	1	4	3	6	5	8	7	10	9	12	11

FS.COM MTP24 to LC



	Mounted on DTH-P1	Not Used
	Key Up / Key Down	Key Up / Key up
1-12	RX5-TX5	TX1-RX1
2-11	RX6-TX6	TX2-RX2
3-10	RX7-TX7	TX3-RX3
4-9	RX8-TX8	TX4-RX4
5-8	XX	XX
6-7	XX	XX
13-24	RX1-TX1	TX5-RX5
14-23	RX2-TX2	TX6-RX6
15-22	RX3-TX3	TX7-RX7
16-21	RX4-TX4	TX8-RX8
17-20	XX	XX
18-19	XX	XX