NORDEN®

MTP®/MPO
High Density Fibre Solution
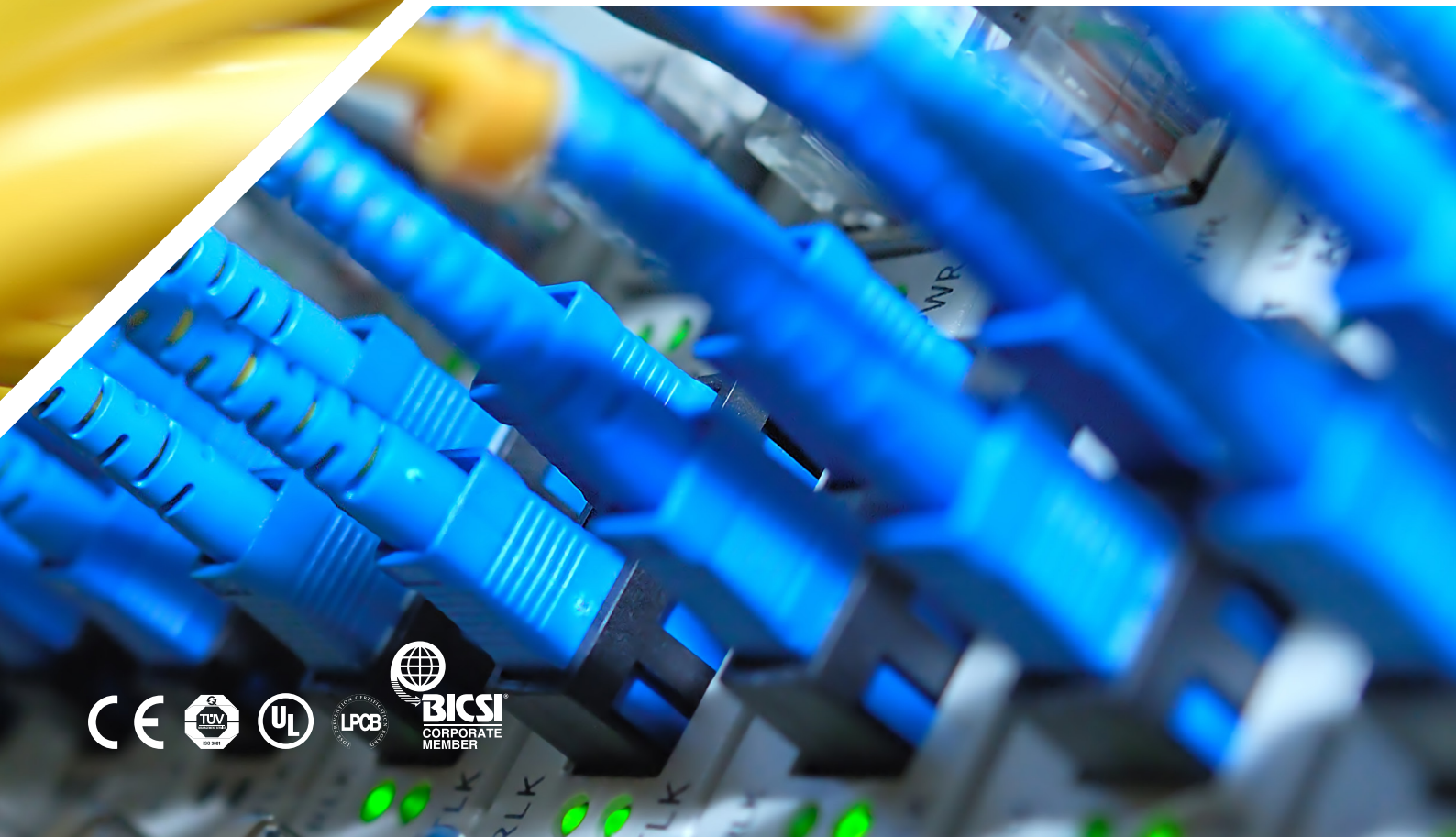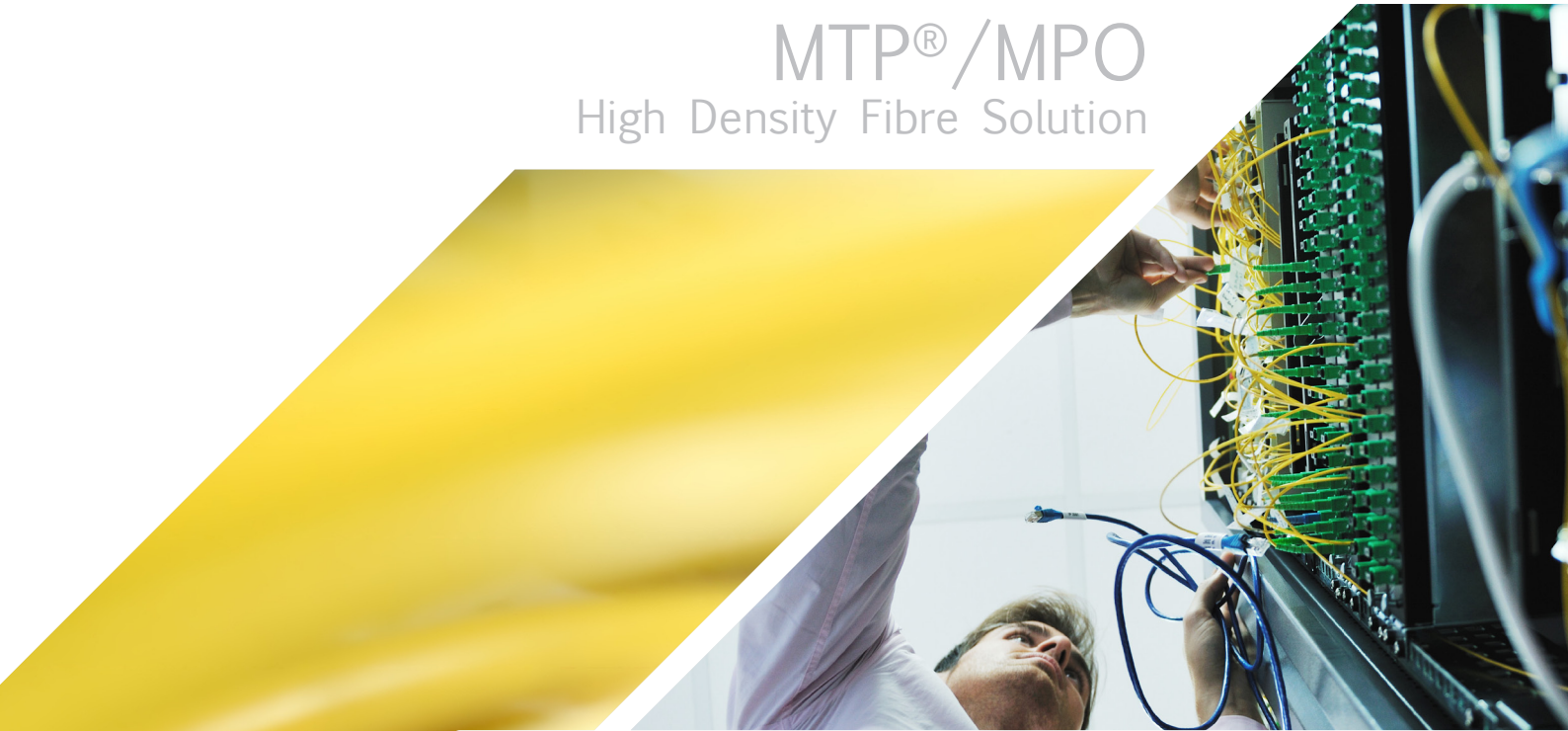
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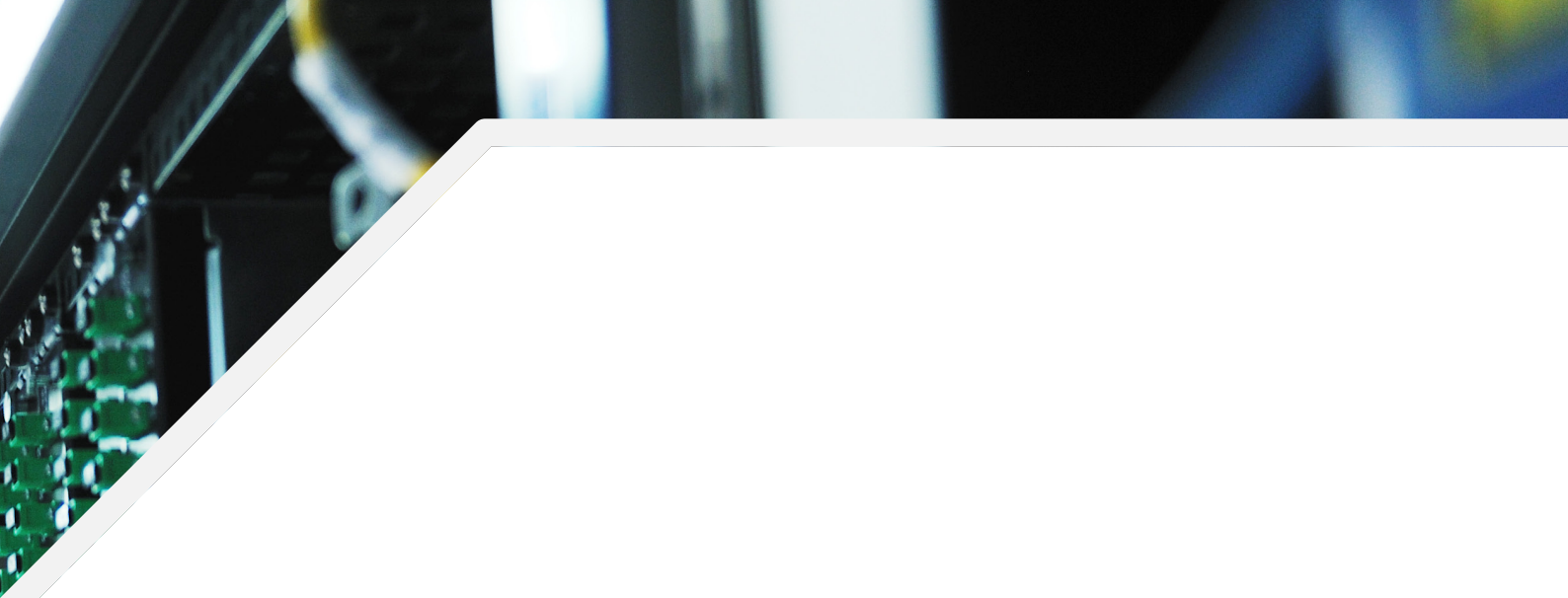
MTP® DATA CENTER SOLUTIONS

High density Fiber solutions

IT operations are crucial to organisation for business continuity. Data centers are the central location for data interchange in IT operation of organisations and networked server farms. Ribbon fiber cables, array-based fiber connectors, and packaged breakout assemblies provide modular small form factor connectivity and enable fast, reliable interconnection of fiber optic links in high-density data center environments. Higher bandwidth requirement for 10G/40G/100G parallel optics, requirement to reduce cable size for better air flow, structured zone approach, reduction in rack space, higher density of servers and ports and reduction in installation time has brought in requirement for factory terminated high density cabling solutions. Factory terminated cable systems reduce installation time and offers scalable design and implementation.

MTP® High density solution

Norden MTP® high density cabling solutions utilizes MPO (multi fiber push on) ferrule providing connection of 12 or 24 fibers. MTP® provides superior physical and optical characteristics than standard MPO for precision alignment with spring loaded mechanism and guide pins. They have a removable adaptor that mates female connectors to a male connector with specially designed guide pins for orientation and maintaining polarity along the channel. The Micro-core cables used in factory terminated MTP® fiber cable assemblies give 65% reduction in cable size from traditional fiber cables. Pre-connected MTP® solution with 24 core LC duplex adapters offers 72 LC terminations in 1U rack space and 288 LC terminations in 4U rack space using modular patch panels.

Features of MTP®

- *Floating ferrule design ensures fiber contact integrity*
- *Terminates ribbon fiber or loose individual fibers*
- *Designed for low loss and standard loss SM and MM applications*
- *Elliptical guide pin tip to minimize ferrule debris*
- *Ruggedized round cable, oval cable and bare ribbon options available*
- *Color coded housings available to differentiate fiber type, polish type and/or connector grade*
- *Housing is removable for quick change of pin clamps and easy ferrule cleaning /re - polishing*
- *Alignment achieved with high precision guide pins*
- *No - epoxy housing design*
- *Family of bulkhead adapters available*

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Application and Associated Standards of MTP®

- Array trunk cables
- Array fiber to single fiber fan outs and cassettes
- High fiber density card edge access
- Optical switching interframe connections
- Meets IEC Standard 61754-7
- Meets TIA/EIA 604-5 Type MPO
- Structured cabling per TIA- 568-C
- Parallel Optics
- Optical Internetworking Forum (OIF) Compliant
- Infiniband Compliant
- 10 G Fiber Channel Compliant
- 40G and 100G IEEE 802.3
- SNAP 12
- POP 4
- QSFP

Specifications of MTP®

	MM MT Elite® Multimode MT Ferrule	Standard Multimode MT Ferrule	SM MT Elite® Single- mode MTFerrule	Standard Single-mode MT Ferrule
Insertion Loss	0.1dB Typical (All Fibers) 0.35dB Maximum (Single Fiber)2,3	0.20dB Typical (All Fibers) 0.60dB Maximum (Single Fiber)2,3	0.10dB Typical (All Fibers) 0.35dB Maximum (Single Fiber)1	0.25dB Typical (All Fibers) 0.75dB Maximum (Single Fiber)1
Optical Return Loss	⟩ 20dB	⟩ 20dB	⟩ 60dB (8° Angle Polish)	⟩ 60dB (8° Angle Polish)

1) As tested for ANSI /EIA -455 -171 Method D3
2) As tested for ANSI /EIA -455 -171 Method D1
3) As tested with proposed encircled flux launch conditioned on 50um fibre and 850 nm per IEC 61280-4-1

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High Density Fiber Optic Patch Panel

MTP® Patch Panels are scalable modular which are designed for high density Gigabit Ethernet Applications. They are used for terminating backbone cables at the Main Distribution Area (MDA) and Horizontal Distribution Area (HDA). MTP® Patch Panels are available with 1U and 4U, suitable for standard 19" racks. 1U MTP® Patch Panel can accommodate up to three MTP® Cassettes, giving a high connectivity of 72 LC fiber terminations in it. 4U MTP® Patch Panel can accommodate up to 12 MTP® Cassettes, resulting in a maximum of 288 LC terminations per panel.

Features:

- Up to 12 x 24 fiber MTP® Cassettes
- Multiple adaptor options available
- Suitable for loose tube, distribution cable and MTP® Trunk Cable
- Fits standard 19" rack

Application:

- Data Center Infrastructure
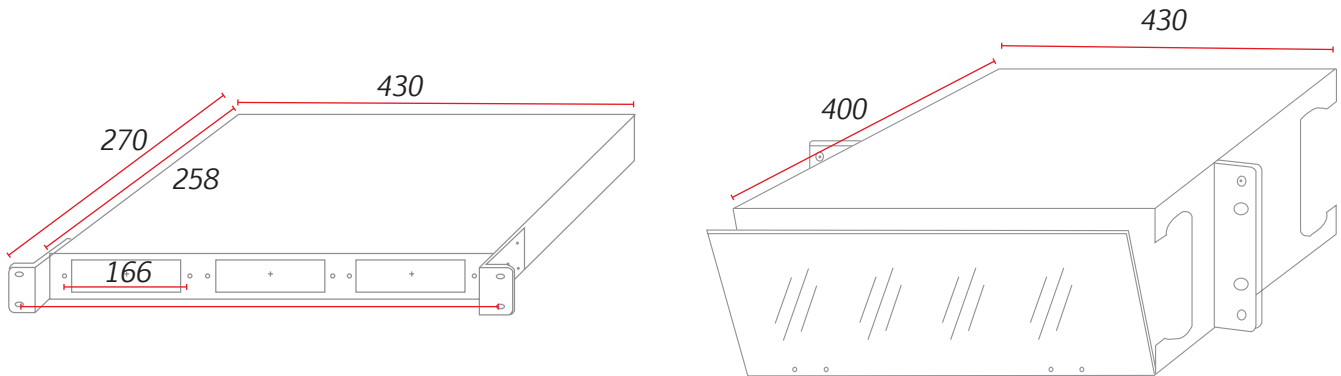- Ethernet, fiber channel, ATM, LAN, MAN and WAN

Specification:

Element	Characteristic
Size	1U (44mm) 4U (176mm)
Material	Cold-rolled steel
Material Thickness	1.2mm
Material Coating	Powder coating

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High Density Fiber Optic Patch Panel

Assembly Structure Illustration:

430

270

258

166

430

400
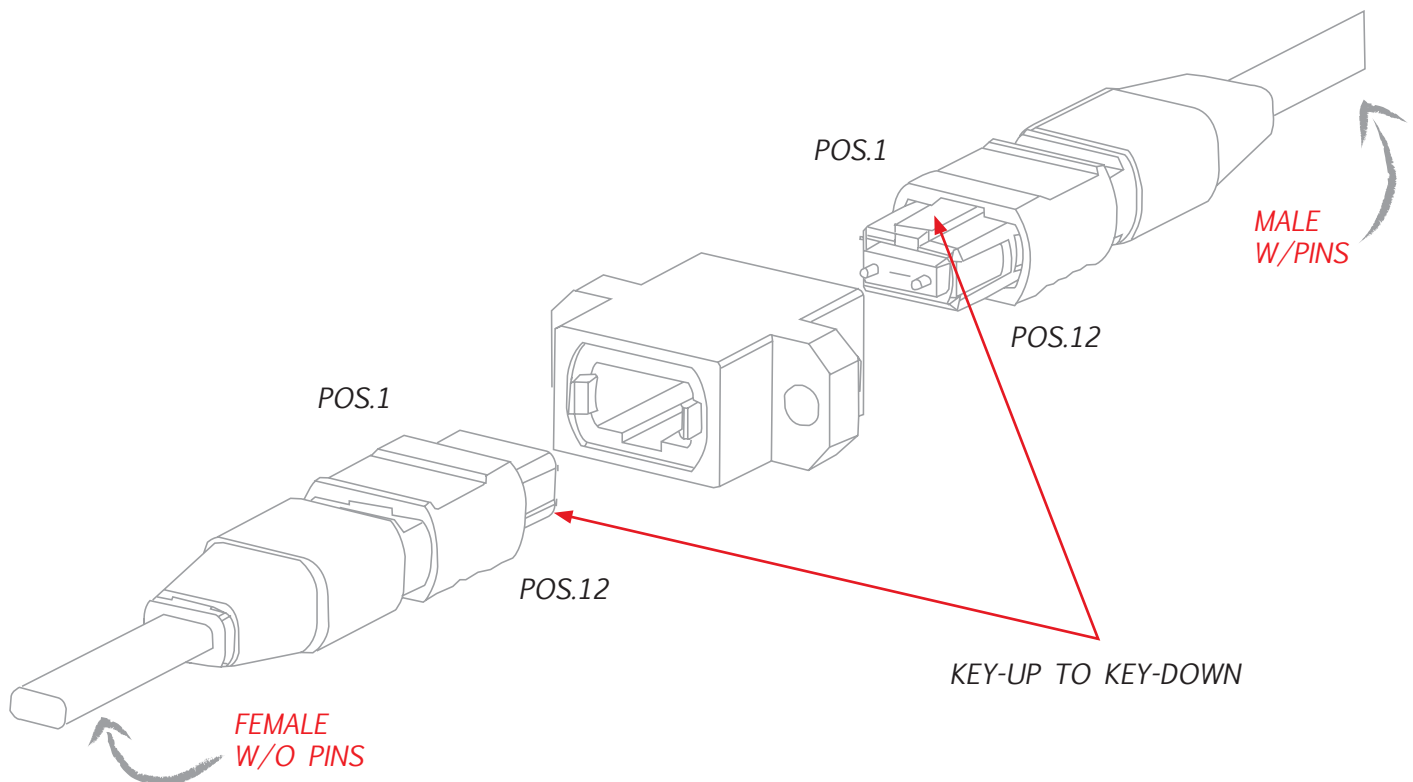
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Understanding Polarity:

The TIA-568-C.0 standard provides Parallel transmission fiber polarity guidance for systems using MPO optical connectivity. The TIA-568-C.0 standard includes guidance on three methods identified as Method A, Method B and Method C. Pre-connect MTP® Solution standardizes its products on Method 'A' for both the multimode and single mode fiber systems. This is the most flexible and reliable method . simple to install, operate and maintain

*Method A has the most flexible and reliable method for the following reasons:*

- *Customers expect systems based on standards. Standards incorporate best practices and incorporate paths to upgrade as technology advances, so system investments are better protected from risk of obsolescence.*
- *Customers need flexibility. Method A provides the most flexible options for current system designs and includes an easy path to migrate to higher data rates via parallel optics.*

TYPE ''A'' ADAPTER CONFIGURATION

POS.1

POS.1

POS.12

POS.12

MALE W/PINS

KEY-UP TO KEY-DOWN

FEMALE W/O PINS

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Method A

Method A employs Key Up to Key Down Adapters to link straight-through Key Up to Key Down ribbon cables to fiber cassettes (see Figure). This method maintains registration of Fiber 1 throughout the permanent link: Fiber 1 in the near-end cassette mates to Fiber 1 in the ribbon cable assembly, which mates to Fiber 1 in the remote cassette. The fiber circuit is completed by utilizing one flipped patch cord,either at the beginning or end of the permanent link, to move Fiber 1 into the Fiber 2 position at the face of the remote cassette to ensure proper Tx-Rx orientation.

KEY UP/KEY DOWN ADAPTERS

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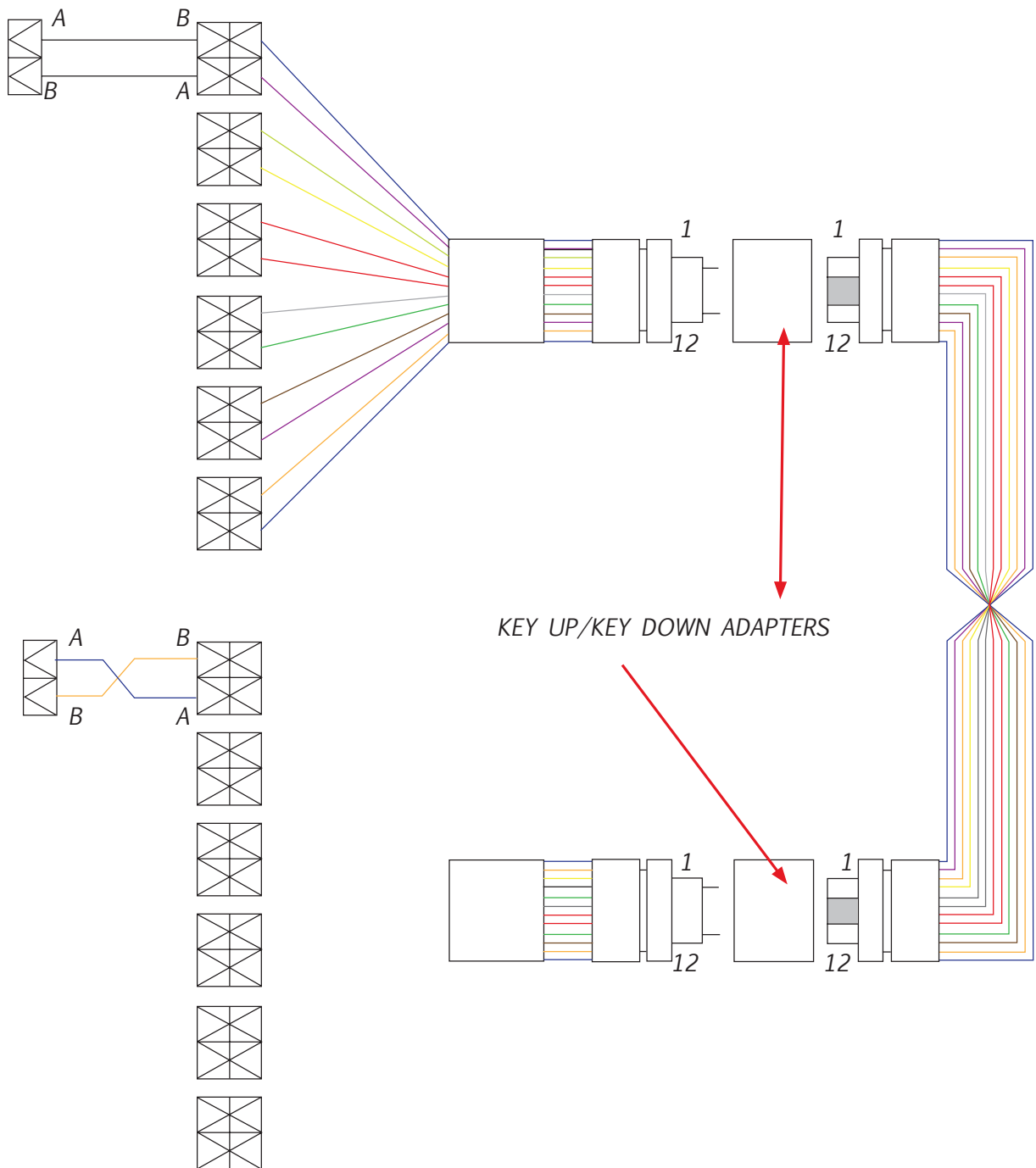
MTP® Fiber Optic Solution includes:

- MTP® Cassette, 12 or 24 SC, LC Ports
- MTP® Trunk Cable
- MTP® Fan-out Hydra Cable with LC or SC Connectors
- Modular Patch Panel

MTP® Connectors type:

MTP® MM MT Elite® Multimode MT Ferrule

MTP® Standard Multimode MT Ferrule

MTP® SM MT Elite® Single-mode MT Ferrule

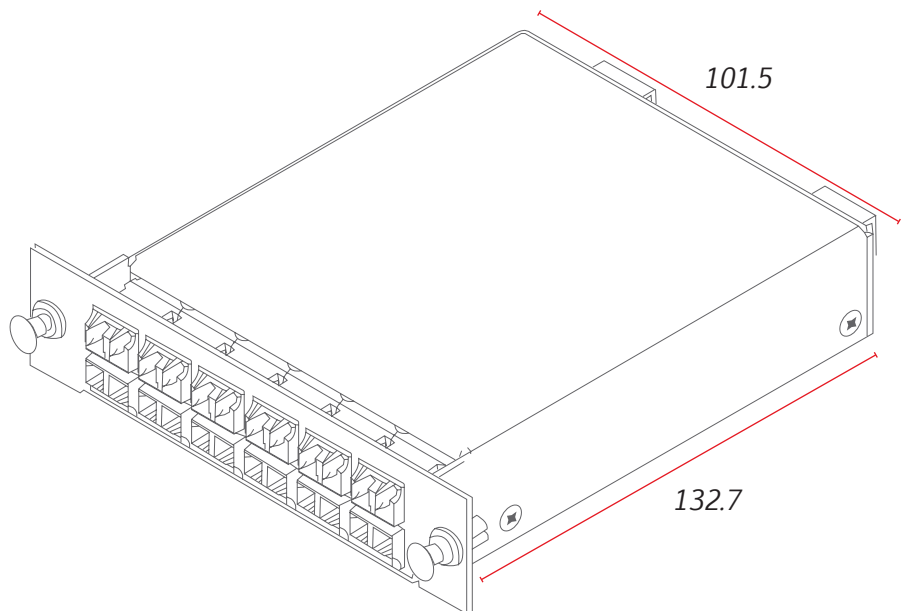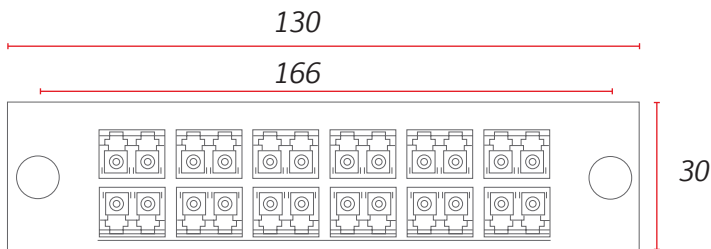MTP® Standard Single-mode MT Ferrule

MTP® Cassette

LC to MTP® and SC to MTP® Fiber modules provide a quick and efficient way to deploy up to 24 LC or 12 SC fiber ports in a single module. These factory terminated and tested ports are protected within the housing for reliably high performance and simply connected via 12-strand MTP® ports. Modules are available in OM3 ,OM4 & SM fibre .

Modular fiber cassettes are enclosed units that contain 12 or 24–fiber factory terminated fan-outs inside.These cassettes serve to "transition" small diameter ribbon cables terminated with a MTP® connector to the more common LC or SC interface used on the transceiver terminal equipment.
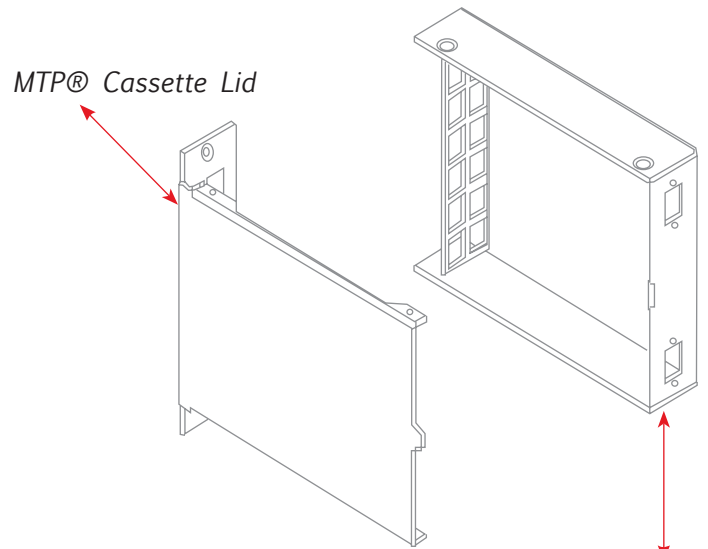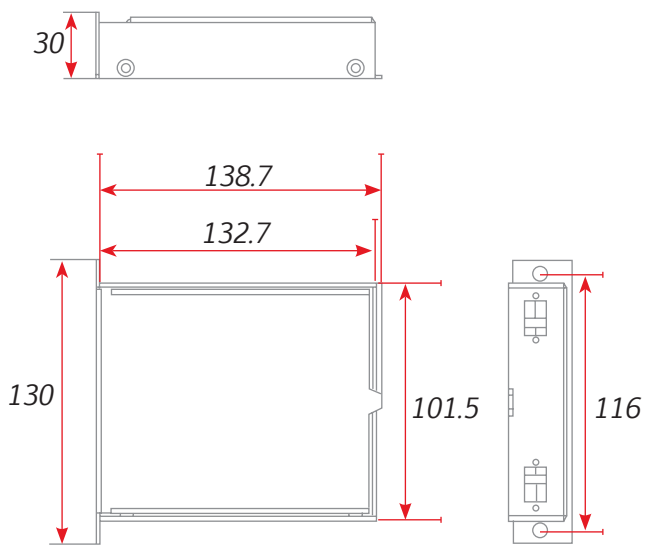
The fan-outs typically incorporate SC, LC connectors plugged into adapters on the front side of the cassette and a MTP® connector plugged into a MTP® adapter mounted at the rear of the cassette.
One or more MTP® fan-out assemblies may be installed inside the cassette to connect up to two 12-fiber ribbon cables for a total of 24 fibers. Alignment pins are pre-installed in the MTP® connector located inside the cassette

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Features:

- Easy and fast installation
- High-density and small design;
- Metallic shell with high strength protect the inner fibers effectively
- Factory-terminated and tested cable and apparatus for instant field connections with guaranteed quality and performance
- 12-fiber MTP® connector-based modular design enables simple connections
- Support easy reconfiguration for moves, adds, and changes
- Dimension: Height x Width x Depth(mm) : 30 x 130 x 140

Assembly Structure Illustration:

30

138.7

132.7

130

101.5

116

MTP® Cassette Lid

MTP® Cassette - 2*12-fiber - MTP® - LC

1 12

13 24

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MTP® Adaptors

MTP® adapters provide quick connection for up to 24 optical fibers. Connection integrity is provided by adapter latches which are locked into place by a spring loaded sliding mechanism on the MTP® connector plug. Precision alignment is achieved with patented MTP® connector guide pins combined with the tightly controlled guide pin holes on MT ferrules. Numerous single port and ganged configurations are available to satisfy a variety of applications. MTP® adapters are fully compliant with IEC Standard 61754-7 and TIA 604-5 – Type MPO.

MTP® Trunk Cable

Pre-connector MTP® Trunk Cable Assemblies are made up of 12, 24, 48 fiber LSOH jacketed micro cables terminated at both ends with MTP® Connectors (without pins). These are used as backbone or horizontal cable interconnections . These plug and play solutions with micro core cable maximize bend radius and minimize cable weight and size. MTP® Trunk Cable are factory pre-terminated, tested and packed along with the test reports. These assemblies are available in OM3, OM4 and SM fiber. Standard lengths of 5, 10, 25 meters are available. Custom lengths are also available on request. The MTP® Trunk cables are packed as coils in lengths up to 50m long and on reels . OM3 and OM4 cables are available in aqua and SM cables are in yellow color.

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MTP® DATACENTER SOLUTIONS

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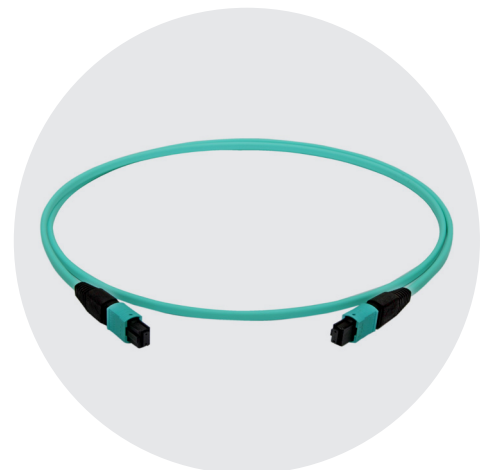
Features:

- High Performance in IL & RL
- Available in 8,12 and 24 fiber
- Precise dimension
- 100% in-house tested
- Customized furcation length to cater for different installation situations
- Single-fiber connector interface available in SC & LC in forms of Simplex or Duplex channel.
- Support higher speed Ethernet and Fibre Channel applications (OM3, OM4 and SM fibers) .

Associated Standards:

- Data Centre Infrastructure
- Storage Area Network-Fiber Channel
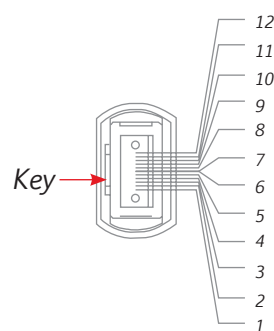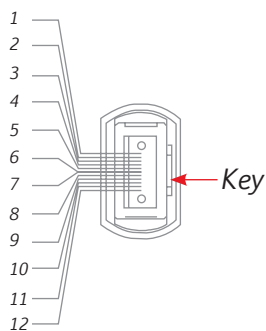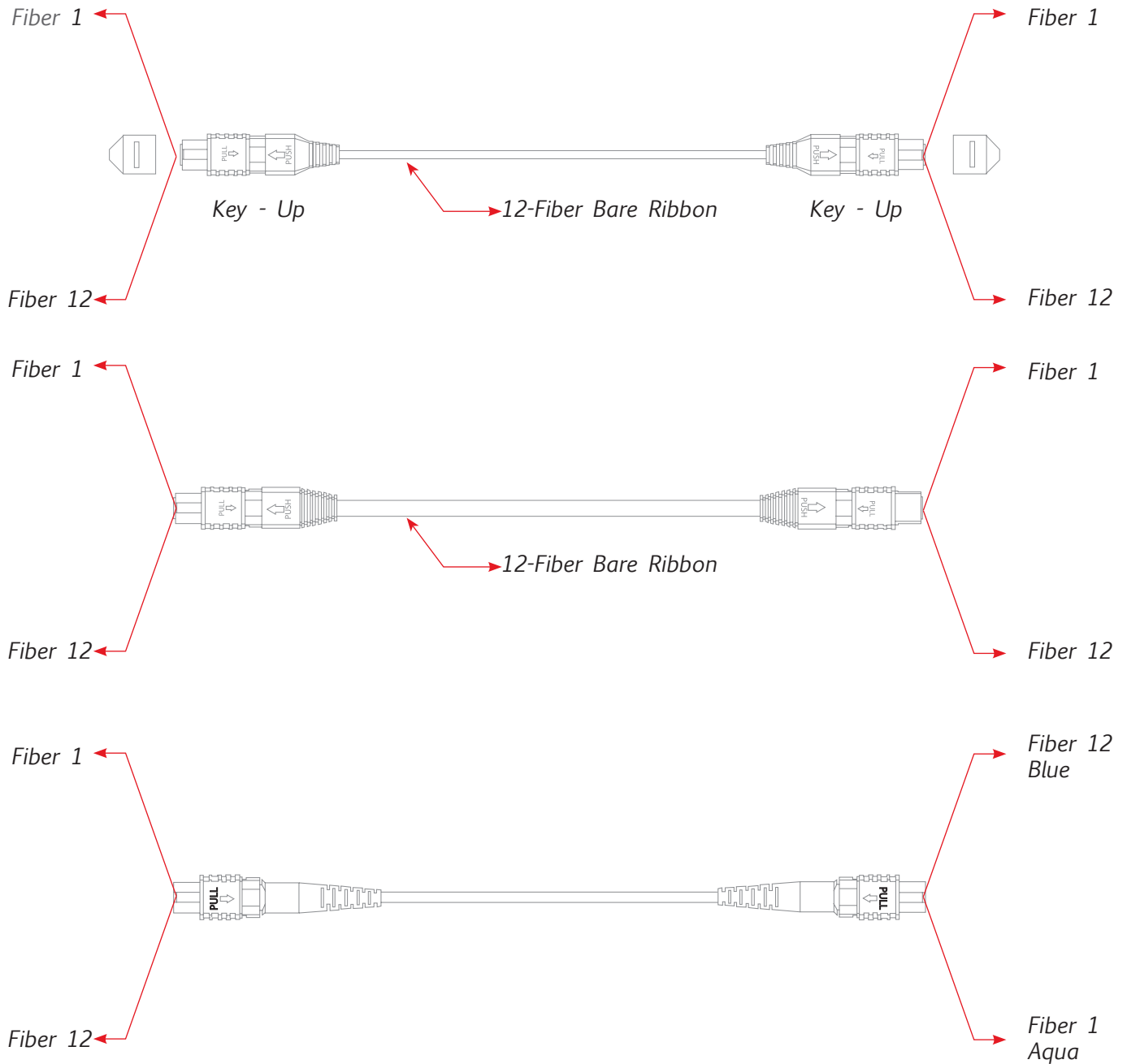- Emerging 40 & 100Gps Protocols

Specifications:

MTP® CONNECTOR

Connector Type	IL Average	IL Maximum	Return Loss
MTP® Elite (MM)	0.10db	0.35db	〉 20db
MTP® (MM)	0.20db	0.65db	〉 20db
MTP®Elite (SM)	0.10db	0.35db	〉 60db
MTP® (SM)	0.25db	0.75db	〉 60db

GENERIC CONNECTOR

Fiber Type	Singlemode		Multimode
Parameter	UPC	APC	UPC
Insertion Loss Maximum	〈0.30dB		
Return Loss	〉55dB	〉60dB	〉20dB
Durability	1000 Matings		
Operating Temperature	-40o C to 80o C		
Test Wavelength	1310nm		850nm

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Assembly Structure Illustration:

Fiber 1

Fiber 1

Key - Up   12-Fiber Bare Ribbon   Key - Up

Fiber 12

Fiber 12

Fiber 1

Fiber 1

12-Fiber Bare Ribbon

Fiber 12

Fiber 12

Fiber 1

Fiber 12
Blue

Fiber 12

Fiber 1
Aqua

1
2
3
4
5
6   Key
7
8
9
10
11
12

12
11
10
9
8
7
6   Key
5
4
3
2
1

DATAPRO

MTP® Fan-out Hydra Cable

Pre-connector MTP® Fan-Out Hydra Cable Assemblies are designed for high density applications which require high performance and speedy installation without onsite termination. MTP® Fan-Out Hydra Cable Assembly is made up of 12 LSOH jacketed cable terminated at one end in MTP® connectors, through a bifurcation unit, to SC or LC connectors terminated on 2mm OD simplex cables. These are used to connect equipment in racks to MTP® terminated backbone cables. MTP® fan-out cables are numbered for full traceability.

Available in 12 core configuration, these space saving assemblies comes with either MTP® Male or MTP® Female Connectors on one end and LC or SC Connectors on the other end. They are available in OM3, OM4 or SM fiber in lengths of 5, 10, 25 meters, custom lengths are available on request.

Features:

- High Performance in IL & RL
- 8,12 and 24 fiber connector terminations and assemblies
- Ruggedized round cable, oval cable and bare ribbon options available
- Economical solution for mass-termination of fiber
- Color coded housings available to differentiate fiber type, polish type and/or connector grade
- 100 % house tested
- Support higher speed ethernet and fibre channel applications for OM3 ,OM4 & SM fibers.

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Associated Standards:

- *Meets IEC Standard 61754-7 & JIS C5982*
- *Meets TIA / EIA 604-5 Type MPO*
- *Structured cabling per TIA-568-C*
- *Parallel Optics*
  - *Optical Internetworking Forum (OIF) Compliant*
  - *Infiniband Compliant*
  - *10G Fiber Channel Compliant*
  - *40G and 100G IEEE 802.3*
  - *SNAP 12*
  - *POP 4*
  - *QSFP*

Applications:

- *Optical switching inter frame connections*
- *High fiber density card edge access*
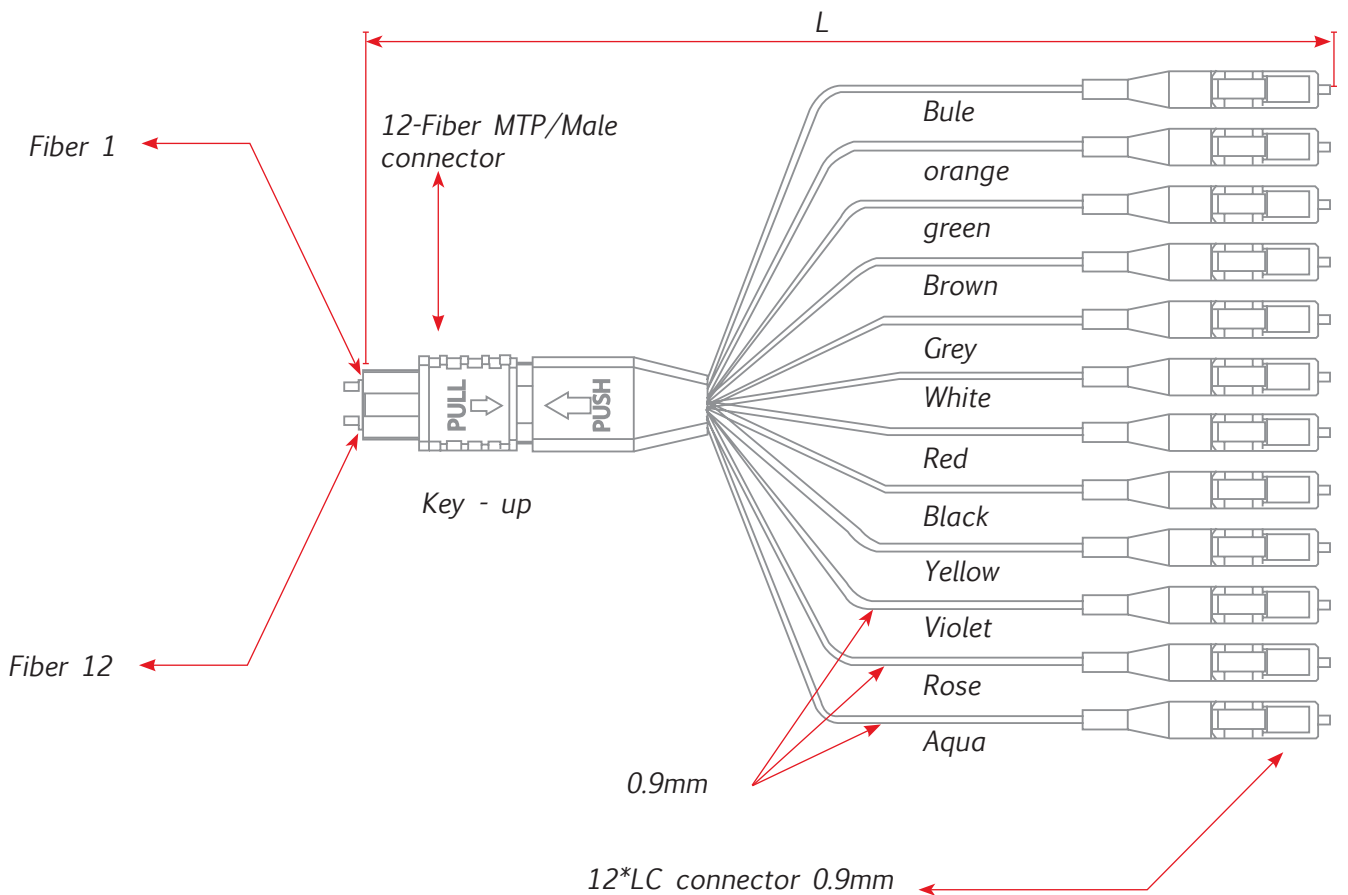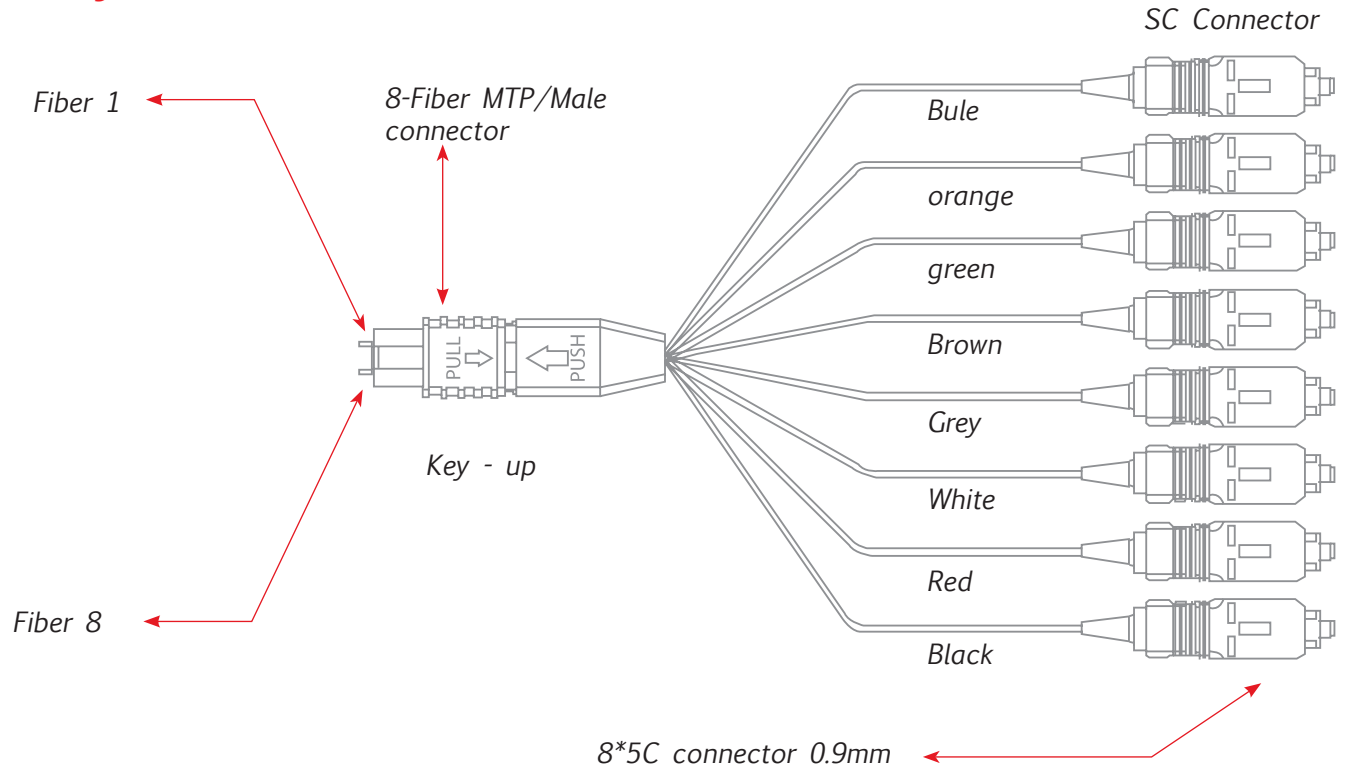- *Array trunk cables*
- *Datacenter cabling*

MTP® Connector;

Connector Type	IL Average	IL Maximum	Return Loss
MTP® Elite (MM)	0.10db	0.35db	＞ 20db
MTP® (MM)	0.20db	0.65db	＞ 20db
MTP®Elite (SM)	0.10db	0.35db	＞ 60db
MTP® (SM)	0.25db	0.75db	＞ 60db
LC,SC (MM)	0.15db	0.30db	＞55/65db*
LC,SC (SM)	0.18db	0.25db	＞55/65db*

Generic Connector;

Fiber Type	Singlemode		Multimode
Parameter	UPC	APC	UPC
Insertion Loss Maximum	＜0.30dB		
Return Loss	＞55dB	＞60dB	＞20dB
Durability	500 Matings	Operating Temprature	40o C to 80o C
Test Wavelength	1310nm		850nm

MTP® DATACENTER SOLUTIONS

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Assembly Structure Illustration:

SC Connector

Fiber 1

8-Fiber MTP/Male connector

Bule

orange

green

Brown

Grey

White

Red

Black

Fiber 8

Key - up

8*5C connector 0.9mm

L

Fiber 1

12-Fiber MTP/Male connector

Bule

orange

green

Brown

Grey

White

Red

Black

Yellow

Violet

Rose

Aqua

Fiber 12

Key - up

0.9mm

12*LC connector 0.9mm

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Assembly Structure Illustration:

L1

L2

Fiber 1

12 - fiber MTP® Connector

Fiber 1
Fiber 12

Fiber 2
Fiber 11

Fiber 3
Fiber 10

Key - Up

12 - fiber Round Cable

Fiber 12

2.0mm x 8 0range Tubing

Fiber 4
Fiber 9

8 x LC Simplex Connector with transparent Clip

QSFP Optical Fanout Cable Assemble

L1

12 - fiber Round Cable

2.0mm *12

LC 2.0mm Connector