3M Telecommunications
Solutions for Networks

Solutions for
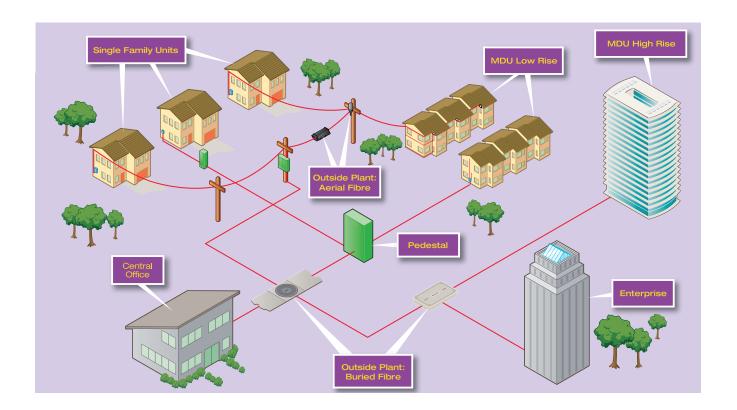Optical
Fibre
Telecommunications
Networks

Product Catalogue 2010

3M

Dear Customer,

the demand for more content, greater speed and new communication protocols is exploding across many global markets. Services such as High Speed - Internet Access, Voice-over-Internet, Video-on-Demand- and High Resolution TV Broadcasting represent substantial new revenue opportunities for telecommunication operators and network suppliers.

3M supports FTTH implementation with an unmatched history of innovation in fibre interconnect and management technology. 3M has decades of experience in the telecommunications access network, industry leading research and development resources.

The purpose of this catalogue is to demonstrate that 3M is the ideal partner for you who have to deploy fibre from long haul to customers' connections: 3M Telecommunications offers innovative and efficient solutions with regard to Total Cost of Ownership (TCO) as well as focus on quality for each part of the network.

This catalogue highlights how 3M solutions can fulfil your requirements and meet specifications of key players with emphasis to the four main fibre optic network segments as there are: underground feeder & distribution, outside distribution, customer premises, customer connections.

The last chapter concentrates on 3M Solutions for Fibre Network Management & Tracking.

We are sure, in this catalogue you will find the tools you need to build the NGN of the future.

Sincerely,
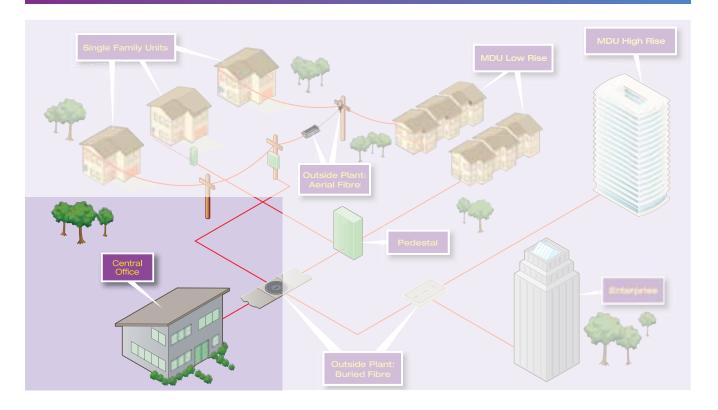3M Telecommunications Team

Solutions for **Optical Fibre** Telecommunications **Networks**

1. Central Office

Central Telecom - POP

Product Range

RFO NG 144

This is the new upgrade of the RFO Distribution on vertical frames. The optical cable head reaches the density of 144 connection points. It is an open system for medium and high capacity. This new range can be mixed with the previous RFO 96. The new RFO NG 144 offers additional features and advanced technical capabilities. It allows new applications in ETSI frames, wallmount- and street cabinets.

RFO 96

This is the current generation on the basis of 96 connection points. The cables heads of the RFO NG 144 and the RFO 96 can be mixed without any restrictions on the same frame.

MODF 2K

This distribution frame is designed with subracks and modules for cabinet and 19" frame. It has an excellent density with 144 connection points on 4U.

SPP3-E and Eco-SPP3

These are standard 19" patch panels in sliding design with a one piece drawer. SPP3-E panels are available as empty version or pre-assembled with couplings. Eco-SPP3 panel always have couplings inside and are available in grey and black.

1. **Central Office**

Description

Optical distribution frames have the same function as copper distribution frames - as network flexibility points.

The choice of distribution frame is of primary importance and depends on the type of optical fibre cable and the constraints on deployment.

With the increasing use of optical fibre networks, it seems a good timing to guide you in the choice of your distribution frame.

Key questions to be asked:
- What will be the final capacity?
- Does it need to be modular? Ready for easy extensions
- What is the purpose of the frame? Cross connection, interconnection, patching, mixed?
- Will there be frequent changes?
- Who will make the changes?
- When will they occur?

- Who will use the distribution frame?
- These questions will allow you to make the best choice of distribution frame.
- It is important to consider the installation location and accessibility.
- It maybe more appropriate to use a distribution frame with drawers in an open space and use frames for a single operator.
- The 3M range fits perfectly with current network designs and permits flexible usage of the installation.

3M™ RFO Optical Distribution Cable Management & Frames

- The RFO modular range is the next generation of large capacity fibre distribution frames.

Specifications
- Metal frames and cable modules
- Modular system with flexible fibre count from 12 to 96 fibres
- Pre-assembled connection modules
- Fits on existing frames

Advantages
- Robust complete system for large capacity distribution frames
- Investment can be tailored to exact requirements
- Easy installation and management
- Secure intervention on every single module
- Answer to extendibility needs on existing distribution frames

3M™ 19" MODF 2K Distribution Frame

- Complete modular ODF with 19" Sub-rack and plug in connection modules for different connector types.

Specifications
- Compact connection module
- Plug-in modules with seperated storage area for backbone/trunk fibres and pigtails fibres

Advantages
- Capacity of 144 connections in only 4U (19" width)
- Extremely easy to install
- Patchcords management organisation and control of the minimum bend radius
- Over-length storage available

3M™ 19" Patchpanels

Specifications
- Sliding design
- Multiple cable entry ports
- Fixing for breakout manifolds
- Fixing thread for splice tray (DIN)
- Port numbering on front panel
- Universal cage nuts and bolts for 19" frames
- For all common connector standards

Advantages
- Easy handling, installer friendly
- Handles all kind of backbone cable
- Handles also pre-terminated backbone cable
- Comfortable fibre management
- Easy traceability
- Comfortable installation

1. Central Office

Density in number of connections points in standard SC or SC/APC

	ETSI 300 x 600 in 1U	ETSI 300 x 600 In frame 42 U	19" 600 x 600 in 1U	19" 600 x 600 In frame 42U	Remark
RFO NG 144	24	1008	48	2008	19" frame with front and rear access
RFO 96	16	672	32	1344	19" frame with front and rear access
MODF 2K	N/A	N/A	48	1536	19" frame with front and rear access
SPP3 / Eco-SPP3	N/A	N/A	24	1008	With panel for buffer slack

Modularity / Extendability

	RFO	MODF	SPP3
Modularity	**	****	**
Extendability	****	***	*

Overview of the 3M Solutions vs. Applications

Environment and Compatibility with standards supports

		Vertical Frame	Frame ETSI 300 x 600	Frame 19" 600 x 600	Wallmount cabinet depth. 300	Street Cabinet depth. 300
RFO NG 144		Compatible	Compatible	Compatible	Compatible	Compatible
RFO 96		Compatible	Not Adpated	Compatible	Not Adpated	Not Adpated
MODF 2K		Not Adpated	Not Adpated	Compatible	Compatible	Not Adpated
SPP3 /SPP3 ECO		Not Adpated	Not Adpated	Compatible	Compatible	Compatible

Compatible   Not Adpated

1.1 3M™ RFO Optical Distribution Cable Management & Frames

Description

The modular cable management system 3M RFO NG is the next generation of optical distribution frames for central office.

The modular design is the basis for ease of installation and quick termination in all central distribution locations of FTTH networks.

- The 12 port connectivity modules are the interfaces for the flexible connections and increase the port density to 144 SC simplex ports per cable head.

- Additional connectivity trays have been added to accomplish splitters and breakout configurations.

Pre-assembly of the connectivity modules ensures consistancy of highest quality.

The new design allows smarter cable management with an increase of 30% in port density.

Application
Distribution point for central office and point of presence (POP)

Description
Modular system designed with very few basic components

- Vertical mounting frames of 2 m, 2.5 m or 3.25 m height. Adjustable on site.
- Cable head for 12 connectivity trays with 12 SC ports enables a density of 144 ports per cable head.
- Breakout and interconnect trays.
- Splitter trays.
- Strain relief and breakout manifold components for backbone/trunk cables.
- Protection guide tubes between backbone/trunk cables and connectivity modules.

Advantages

- Creation of any type of optical distribution frames
- Limited amount of components / simplified supply chain
- Open access system from the 4 sides of the frame and with channels separation

Evolutionary system with the ability to add vertical mounting frames, cable heads and connectivity trays to existing installation as required.

One system for multiple environments

The RFO NG cable head and tray modules can be used in

- distribution frames
- indoor cabinets type 600 x 300
- indoor wallmount cabinets type 600 x 300
- outdoor cabinets
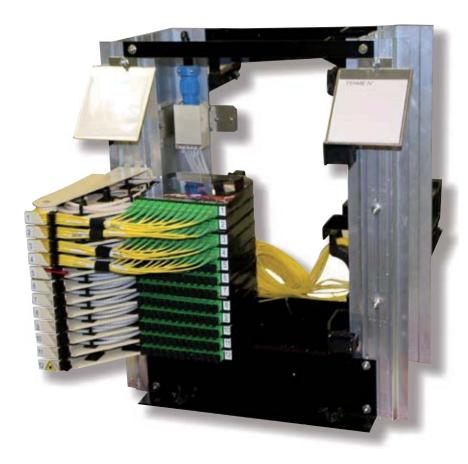
Distribution Frames

- The design of the frame gives optimal distribution management:
  - management from the front
  - cable path separation
  - cable path independence
- More than 10 years market presence with this design guarantees the proven reliability of this system.
- The availability in different heights means that the same product is suitable for use in both high capacity central office installations and for small distribution points.
- Two columns of 2 m will be enough for more than 1000 connection points in a volume close that of 19" rack.

Cabling Modules

- The cable modules have been developed to match the improvements in the frame.
- The cable modules are supplied prewired on request.
- For improved installation efficiency, the module may be placed near to the splicer during the splicing process
- The drawers store the excess tubes between the cable and the module.
- Each module is prewired and tested in the 3M factory.

1.1 3M™ RFO Optical Distribution Cable Management & Frames

Description

Application

Distribution point for central office and point of presence (POP)

Description

Modular system designed basically with fifteen components

- 3 frames of 2 , 2.5 and 3.25 m adjustable on site
- 1 cable head for 12 tray modules / 144 connection points
- 3 connections, break out and inter-connection modules
- 3 splitter modules
- 3 anchoring and break out system for cables
- Protection tube for cable modules
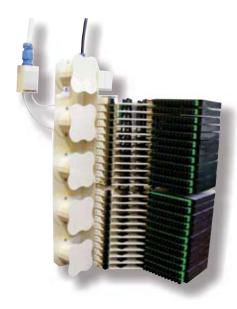
Advantages

- Creation of any type of optical distribution frames
- Limited amount of components / simplified supply chain
- Open access system from the 4 sides of the frame and with channels separation
- Evolutive system with ability to add frames, cable heads and tray modules on ODF already in use
- Almost fifteen years of experience, fifth generation of cable head and tray modules

One system for multiple environments

The RFO NG cable head and tray modules can be used in

- distribution frame
- indoor cabinets type 600 x 300
- indoor wallmount cabinet type 600 x 300
- outdoor cabinets

3M™ RFO Optical Distribution Cable Management & Frames

Technical Specifications

Vertical mounting frames
- The RFO NG is based upon 2 mounting frames
- 2 m height 6 cable heads 864 ports SC simplex
- 2.5 m height 8 cable heads 1152 ports SC simplex
- 3.25 m height 11 cable heads 1584 ports SC simplex

Configuration
- The vertical aluminium profiles provide fixing of the cable management components and anchoring of the cable heads
- Front: 6 to 11 cable heads
- Right hand side: cable management rings attached to the aluminium profile
- Left hand side: storage area for patchcords
- Rear: cable guiding system between frames
- Delivered complete with accessories except for the cable modules

Cable Heads
- The cabling heads have a metallic frame equipped with 12 independent swivelling drawers.
- Each drawer fulfils a number of requirements:
  - Anchoring of the tubes coming from the DEECAM break out modules
  - Storage of over-length tube
  - Supporting the management trays
  - Guiding the module patchcords

Connectivity Tray
- The tray incorporates the following features:
  - Anchoring of the tube coming from the cable
  - Splice protection tray
  - Pigtail management area
  - Coupling front plate

Dimensions
- Height: 2 m for 6 cable heads
                           2.5 m for 8 cable heads
                           3.25 m for 11 cable heads
- Depth: 0.7 m
- Width incl. cable heads: 0.335 m
- Width of last frame: 0.5 m
- Pitch between frames: 0.4 m

Installation
- Each frame is a complete assembly with accessories mounted in the 3M factory, except for the horizontal guide rings and tubing guides which must be installed on site.
- Right angled brackets are used to fix the frames to the floor. The fixing of the top of the frames must be configured to suit the site.

Dimensions
- Height: 260 mm
- Depth: 270 mm
- Width: 290 mm

Basic Configuration
- One vertical mounting frame with 3 pre-assembled cable heads and 8 swivelling drawers including connectivity modules
- Additional cable heads and connectivity modules must be ordered separately
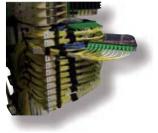
Installation
- The cable head is fixed on the RFO aluminium vertical mounting frame with screws.
- The swivelling of the drawers allows access to the cable anchoring area.
- Individual lables can be fixed in order to identify each drawer, each module and each connector.

1.1 3M™ RFO Optical Distribution Cable Management & Frames

Ordering Information

RFO NG – Cable Head and Connectivity Modules

> Cable head 12 drawers without tray modules	Ref. No.
	801619

> Connectivity module pre-assembled 12 SC/APC	Ref. No.
	541133

> Connectivity module for splicing of a break out cable	Ref. No.
	541134

> Interconnection module for 12 links	Ref. No.
	541135

> Connectivity module 1 splitter 1x8 in SC/APC	Ref. No.
	541136

> Connectivity module 2 splitters 1x4 in SC/APC	Ref. No.
	541137

> Connectivity module 4 splitters 1x2 in SC/APC	Ref. No.
	541138

1.1 3M™ RFO Optical Distribution Cable Management & Frames
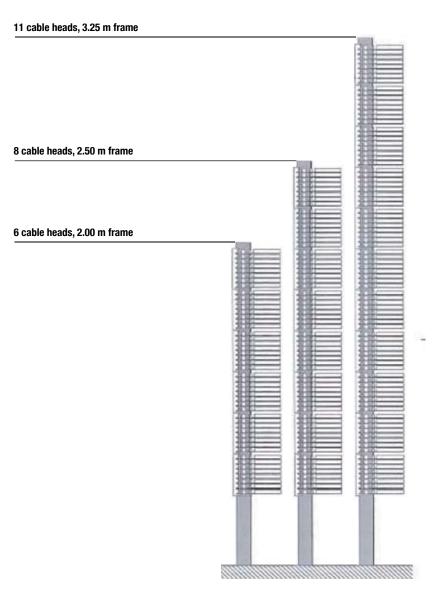
RFO NG – Vertical Mounting Frames

> **Continuation**
- The 3 frames are identical with the ones used for the modular RFO 96
  with always the ability to adjust the height on site

	Ref. No.
Frame 2 m for 6 cable heads	**801585**
Frame 2,50 m for 8 cable heads	**801595**
Frame 3,25 m for 11 cable heads	**801584**

11 cable heads, 3.25 m frame

8 cable heads, 2.50 m frame

6 cable heads, 2.00 m frame

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1.1 3M™ RFO Optical Distribution Cable Management & Frames

Ordering Information

RFO NG – Accessories
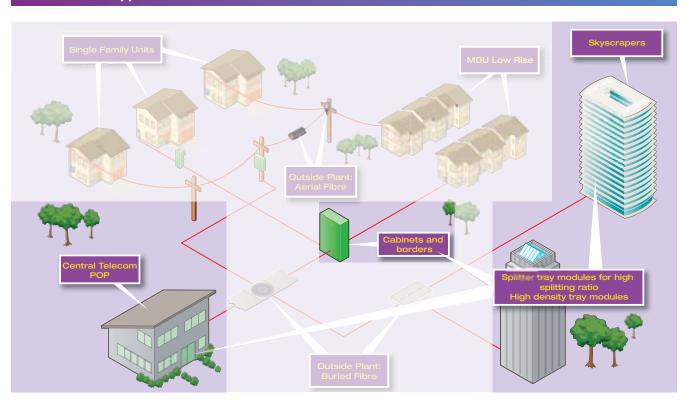
> **Anchoring and Break out**
- 3 kits are now available
- The two kits for loose tube cables use the D5/3 tubing material (5 mm OD/3 mm ID)
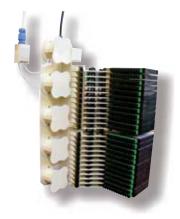
	Ref. No.
The two kits for loose tube cables use the D5/3 tubing material (5 mm OD/3 mm ID)	**711547**
Break out module DEECAM D25 for 60 each tubes D5/3. Usually for 144 fibre cable	**711597**
Set quare fixation kit for 8 break out cables. Used for 720 fibre cables	**711584**

	Ref. No.
Reel of 1000 m of tube DEECAM D5/3	**581203**

3M™ RFO Optical Distribution Cable Management & Frames

RFO NG – New Applications

Single Family Units

MDU Low Rise

Skyscrapers

Outside Plant: Aerial Fibre

Cabinets and borders

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Splitter tray modules for high splitting ratio
High density tray modules

Outside Plant: Buried Fibre
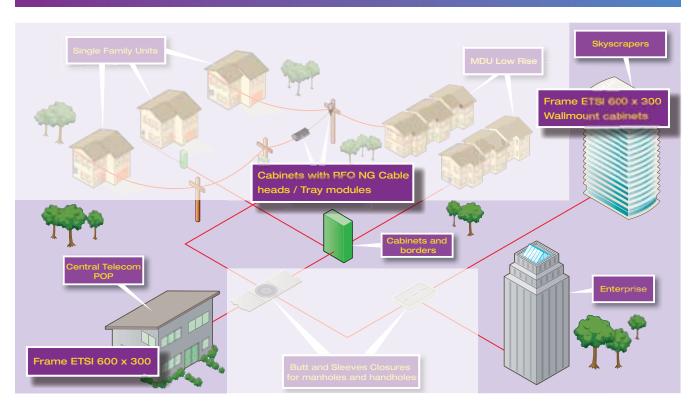
Connectivity Modules for splitters with high splitting ratio

The new designed RFO NG drawers and connectivity modules allow the integration of modules with different height in order to host splitters with high splitting ratio.

- Tray module for splitter 1 : 16
- Tray module for splitter 1 : 32
- Tray module for splitter 1 : 64

1.1 3M™ RFO Optical Distribution Cable Management & Frames

RFO NG – New Environment

Single Family Units

MDU Low Rise

Skyscrapers

Frame ETSI 600 x 300 Wallmount cabinets

Cabinets with RFO NG Cable heads / Tray modules

Central Telecom POP

Cabinets and borders

Enterprise

Frame ETSI 600 x 300

Butt and Sleeves Closures for manholes and handholes

ETSI standard frame 600 x 300 with RFO NG

- RFO NG cable heads are downwards compatible with the vertical mounting frames.
- The standard ETSI frame with its small depth is a preferred choice for the integration of the RFO NG.
- A maximum of 7 cable heads with a capacity of 1008 ports (SC simplex) can be managed in such combination.

ETSI based wall mount and cabinet solutions

3M also offers ETSI spacing adaptions and frames for the implementation of RFO NG in wall mount boxes and cabinets.

Frames and Cabinets TSI RFO NG

Frame ETS300-119-3
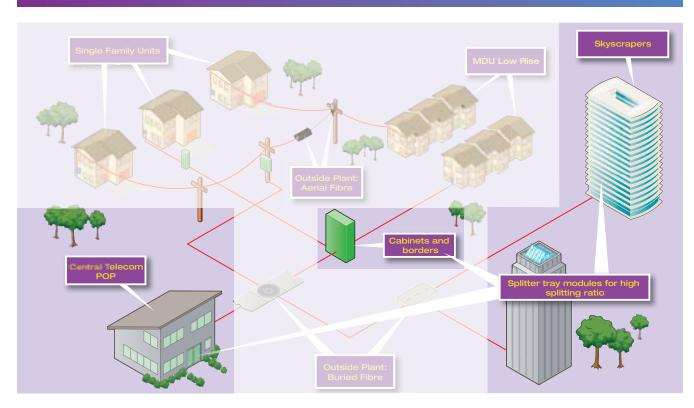
Dimensions: Base 600 x 300 mm

H: 2200 mm

Capacity: 8 RFO cable heads

           Total = 1152 connections SC/APC

RFO 96 Maintenance

Single Family Units

MDU Low Rise

Skyscrapers

Outside Plant: Aerial Fibre

Cabinets and borders

Central Telecom POP

Splitter tray modules for high splitting ratio

Outside Plant: Buried Fibre
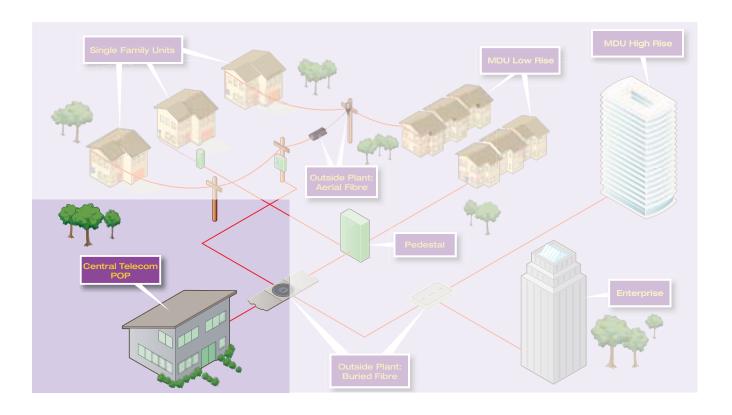
Modular RFO 96 points - Maintenance

> **The standard RFO 96 port components are still available for extensions or modifications of existing installations**

	Ref. No.
Cable head 8 drawers without modules SC/APC	**431077**
Pre-assembled connectivity module 12 SC/APC	**541129**
Break out module equipped with 1 tray and 12 couplings SC/APC	**541116**
Interconnection module for 12 splices with 12 threading tubes	**5411167**
Connectivity module equipped with 1 splitter PLC 1x8 connectorized in SC/APC	**541123**
Connectivity module equipped with 4 splitters PLC 1x2 connectorized in SC/APC	**541124**

1.2 3M™ 19" MODF 2K Distribution Frame

3M MODF 2K/19" – Modular technology for 19" subracks

With its modular optical fibre technology, 3M offers the user a complete system for central optical fibre distribution frames with high fibre counts.

Possible applications are centrally located FO main distribution frames for network providers or Fibre To The Desk cabling (FTTD) with single-level hierarchy.

Taking into account the specific characteristics of fibre optics, both applications require a compact and accessible solution for the termination of optical fibres. Furthermore, the system must guarantee trouble-free extension and no downtime maintenance. 3M's 2K modular technology provides the user with an extremely compact FO patching or splicing system which, as a patch distribution frame, offers a capacity of up to 144 fibres on three height units. If used as a splice distribution frame, the capacity increases to 288 fibres per 19" subrack.

The patch system's core is the 2K connector module, also available for various FO connector types. All connector modules are installed in 19" subracks and are easily accessible from the front. The 2K modular system is completed by an excess fibre tray to accommodate incoming bunched fibre reserves, a patch panel for lateral exit of patch cords and a cable management system for 19" cabinets.

Specifications

- Complete system for optical fibre distribution frames
- Extremely high capacity, per subrack:
  - 144 fibres when used as patch distribution frame, or
  - 288 fibres when used as splice distribution frame per subrack
- Extremely easy to install and maintain
- Expandable any time
- Co-ordinated patch cord routing, observance of minimum bending radius
- Orderly storage of excess fibre
- 2K connector modules for SC/APC, SC, FC and ST technology

1.2 3M™ 19" MODF 2K Distribution Frame

2K Connector module

2K connector modules (7 distance units) for 10 or 12 connectors each and FO pigtails, type E2000, SC, FC, and ST with printed port identification. The primary coat of the pigtails is offset, all pigtail ends are colour-coded.

Each 19" subrack can house up to twelve 2K connector modules. Splicing reserves and excess lengths of pigtails are stored in two separate cassettes to simplify installation.

2K splice module

FO splicing module (7 DU) for the creation of high-capacity splice distribution frames.

A 2K splicing module permits the inclusion of up to 24 splice connections in two FO splicing cassettes.

FO 19" subrack

Subrack (84 DU, 3 HU) to accommodate up to twelve 2K connector or splice modules (7 DU) or dummy panels.

FO 19" excess fibre tray

Excess fibre tray (1 HU) for easy storage of bunched fibre reserves of incoming or outgoing FO cables. The excess fibre tray is installed below the 19" subrack and can be pulled out towards the rear during installation work.

FO 19" patch panel

Patch panel for lateral exit of patch cords, observing the minimum bending radius.
Rotating radius limiters enable different routing directions. The patch panel is installed in front of the excess tray.

1.2 3M™ 19" MODF 2K Distribution Frame

Ordering Information

3M MODF Components

2K Connector module

> Single-mode 9/125µm with

	Ref. No.
SC-APC 8°, 12 fibres	**40395-514 45**
SC-PC, 12 fibres	**40395-546 45**
FC-PC, 12 fibres	**40395-544 45**
LC Duplex, 12 fibres	**40395-551 00**

> Multi-mode 50/125µm with

	Ref. No.
SC, 12 fibres	**40395-514 55**
ST, 12 fibres	**40395-507 57**
SC duplex, 12 fibres, horizontal	**40395-523 57**
LC Duplex, 12 fibres	**40395-550 00**

> Multi-mode 62.5/125µm with

	Ref. No.
SC, 12 fibres	**40395-514 65**
ST, 12 fibres	**40395-507 67**
SC duplex, 12 fibres	**40395-523 67**

FO connector type	Single-mode 9/125 µm	Multi-mode 50/125 µm	Multi-mode 62.5/125 µm
SC (APC 8°) simplex/12 fibres	•		
SC (PC) simplex/12 fibres	•	•	•
ST (PC) 12 fibres		•	•
FC (PC) 12 fibres	•		
SC (PC) duplex/12 fibres		•	•
LC duplex, 12 fibres	•	•	

- Dimensions: 128 x 35 x 215 mm (H x W x D)
- Weight: approx. 0,3 kg

Delivery:
- Aluminium front panel (7 DU), installed with 12 connectors
- Port ID 1 through 12
- 1 FO splicing cassette and 1 FO excess fibre tray, mounted on cassette tray
- Secondary pigtail stripped and stored in splicing or excess fibre tray
- All pigtail ends are colour-coded or numbered
- Various cable straps
- Mounting materials for 19" subrack

1.2 3M™ 19" MODF 2K Distribution Frame

Ordering Information

3M MODF Components

> **2K splice module, 7 depth units**
> for up to 24 splicing connections
- Dimensions: 128 x 35 x 215 mm (HxWxD)
- Weight: approx. 0,3 kg

  Delivery:
- 7 DU aluminium front panel, with cassette tray
- 2 FO splicing cassettes with lid
- 2 splice protector holders for crimp splice protection
- Various cable straps
- Fastening materials for 19" subrack

Ref. No.
40395-517 30

> **2K dummy front plate, 7 DU**
> to cover unused sockets in the 19" subrack
- Dimensions: 128 x 35 x 1,5mm (H x W x D)

  Delivery:
- Aluminium front panel (7 DU), no imprint
- Fastening materials for 19" subrack

Ref. No.
40018-018 30

> **GF-19" subrack. 3 HU, 84 DU**
> to accommodate up to 12 2K connector modules/2K splice modules
- Dimensions: 135 x 483 x 190 mm (H x W x D)
- Weight: approx. 1,2 kg
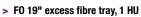
  Delivery:
- 19" subrack, aluminium
- 24 guide rails, installed
- Attachment materials for 19" racks/frames

Ref. No.
40026-515 30

> **FO 19" excess fibre tray, 1 HU**
> for storage of excess bunched fibre, pull-out design
- Pull-out length: 200 mm
- Colour: RAL 7032 (pebble grey)
- Dimensions: 44 x 483 x 280 mm (H x W x D)
- Weight: approx. 3,3 kg

  Delivery:
- 1 Excess fibre tray
- 2 Cable guide rings to guide FO bunched fibre
- various cable straps
- Attachment materials for 19" racks

Ref. No.
40040-502 30

> **FO 19" patch panel, 1 HU**
> for attachment and radius limiting for FO patch cords. Rotary radius limiters,
> providing a choice of left or right side FO patch cord exit.
- Colour: RAL 7032 (pebble grey)
- Weight: approx. 1,0 kg
- Dimensions: 73 x 485 x 100 mm (H x W x D)

  Delivery:
- Patch panel, installed
- with 6 rotating radius limiters
- Attachment materials for 19" racks

Ref. No.
40036-521 30

1.2 3M™ 19" MODF 2K Distribution Frame

3M Fibre Optic splice holders

3M Fibre Optic splice holders are designed to fit into the 3M DIN Splice Cassette.
Three different types are available. All splice holders have a snap-on design with no additional fixing parts required.

Type 2529-H is designed for 6 each Fibrlok 2529 and 2529 AS splices.

Type 05-760-08000 accepts up to 12 each aluminium crimp splices.

Type 05-760-11900 can take up to 6 each heat shrink fusion splice protectors of 2.4 mm diameter and 45 mm or 60 mm length.

Features

- Snap fit
- For DIN Splice Trays

Benefits

- Easy installation, no accessories
- Made according to standard

Specifications

2529-H:

3M FO splice holder for 3M Fibrlok 2529 mechanical splices

- Dimensions: 42 x 35 mm
- Colour: black
- Capacity: 6 each 3M Fibrlok 2529 or 2529-AS splices

05-760-08000:

3M FO splice holder for crimp splice protectors

- Dimensions: 42 x 35 mm
- Colour: black
- Capacity: 12 each crimp splice protectors

05-760-11900:

3M FO splice holder, heat-shrink protection

- Dimensions: 28 x 38 mm
- Colour: black
- Capacity: 6 each heat shrink splice protectors 2.4 mm diameter after shrinking

1.2 3M™ 19" MODF 2K Distribution Frame

Ordering Information

> **Splice holder for 6 each 3M Fibrlok 2529 splices**

Ref. No.
2529-H

> **Splice holder for 12 each Crimp Splice Protectors**

Ref. No.
05-760-08000

> **Splice holder for 6 each heat-shrink splice protectors**
- (2.4 mm diameter after shrinking)

Ref. No.
05-760-11900

1.3 3M™ 19" Patchpanels

Description - 3M SPP3-E 19" Fibre Optic Patchpanels

The SPP3-E patchpanel range is designed as a universal fibre optic patchpanel for direct termination with e. g. the 3M Hotmelt- or NPC connectors, or as a splice drawer to store pigtails in DIN splice cassettes.

Multiple entry ports allow the use and fixation of 2 - 4 fibre horizontal cable as well as backbone cable with up to 48 fibres. The cable can be fixed either via cable glands or cable ties. The panels offer also fixing hooks for manifolds of pre-terminated backbone cable. A central thread allows stacking up to 4 DIN splice cassettes incl. top lid.

The panels have a sliding mechanism with a defined hard stop, which prevents the drawer from being pulled out completely and therefore offers the installer a comfortable handling for both, new installation and re-arrangements.

The SPP3-E program offers two different versions.
• Empty panels
• Panels with pre-terminated couplings

Features

- Sliding design
- Multiple cable entry ports
- Fixing for breakout manifolds
- Fixing thread for splice tray (DIN)
- Port numbering on front panel
- Universal cage nuts and bolts for 19" frames
- For all common connector standards

Benefits

- Easy handling, installer friendly
- Handles all kind of backbone cable
- Handles also pre-terminated backbone cable
- Comfortable fibre management
- Easy traceability
- Comfortable installation
- One design fits all applications

Specifications

Design features:
- Sliding 1U patchpanel with defined stop for the drawer
- Un-detachable knurled nut to fix the drawer to the housing
- Fixed front panel, not exchangeable

Included accessories:
- Universal cage nuts, screws and washers for 19" mounting
- Instruction manual

Housing material:	Steel
• Dimensions:	44 x 483 x 250 mm (H x W x D), [19", 1U]
• Colour:	RAL 7035 Light grey
• Surface:	Powder coated, slightly structured
• Port numbering:	Black, screen printed

1.3 3M™ 19" Patchpanels

Ordering Information

> Empty patchpanels	Ref. No.
Patchpanel 1U for 12 ST or FC D-Mount	**SPP3-E-1T**
Patchpanel 1U for 24 ST or FC D-Mount	**SPP3-E-2T**
Patchpanel 1U for 6 SC Duplex	**SPP3-E-6CD**
Patchpanel 1U for 12 SC Duplex	**SPP3-E-1CD**
Patchpanel 1U for 24 SC Duplex	**SPP3-E-2CD**
Patchpanel 1U for 12 SC Simplex or 12 LC Duplex	**SPP3-E-1CS**
Patchpanel1U for 24 SC Simplex or 24 LC Duplex	**SPP3-E-2CS**

> Pre-assembled patchpanels with couplings	Ref. No.
Patchpanel, 1U with 12 ST MM Couplers	**SPP3-E-1T-M**
Patchpanel, 1U with 24 ST MM Couplers	**SPP3-E-2T-M**
Patchpanel, 1U with 6 SC Duplex MM Couplers	**SPP3-E-6C-DM**
Patchpanel, 1U with 12 SC Duplex MM Couplers	**SPP3-E-1C-DM**
Patchpanel, 1U with 24 SC Duplex MM Couplers	**SPP3-E-2C-DM**
Patchpanel, 1U with 12 SC Simplex SM Couplers	**SPP3-E-1C-SS**
Patchpanel, 1U with 24 SC Simplex SM Couplers	**SPP3-E-2C-SS**

1.3 3M™ 19" Patchpanels

Description - Eco-SPP3 Patchpanels

The 3M Eco-SPP3 range is designed as fibre optic patchpanels mainly for backbone cable with pigtail splicing in splice cassettes, but can also be used for direct termination with e.g. the 3M Hotmelt- or NPC connectors. Four entry ports allow to fix backbone cable with up to 48 fibres through cable glands (16 and 20 mm). The panels offer also fixing hooks for manifolds of pre-terminated backbone cable. A central thread allows to stack up to 4 DIN splice cassettes incl. top lid. The cassettes are secured against rotation.

Pre-terminated pigtail/cassette modules are available separately as accessories.

The panels have a sliding mechanism with a defined hard stop, which prevents the drawer from being pulled out completely and therefore offers the installer a comfortable handling for both, new installation and re-arrangements.

Eco-SPP3 panels are available in light grey (RAL 7035) and in black (RAL 9005).

The Eco-SPP3 program offers only panels with pre-terminated couplings.

Pre-assembled pigtail-splice cassette modules are available for easy field assembly of a complete 19" patchpanel.

| Features	Benefits
• Sliding design	• Easy handling, installer friendly
• Multiple cable entry ports	• Handles all kind of backbone cable
• Fixing for breakout manifolds	• Handles also pre-terminated backbone cable
• Fixing thread for splice tray (DIN)	• Comfortable fibre management
• Port numbering on front panel	• Easy traceability
• Universal cage nuts and bolts for 19" frames	• Comfortable installation
• For all common connector standards	• One design fits all applications

1.3 3M™ 19" Patchpanels
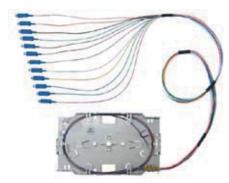
Ordering Information

> Light grey Eco-SPP3 Patchpanels (RAL 7035)	Ref. No.
Patchpanel, 1U with 12 ST MM Couplers	ECO-SPP3-E-1T-M
Patchpanel, 1U with 24 ST MM Couplers	ECO-SPP3-E-2T-M
Patchpanel, 1U with 6 SC Duplex MM Couplers	ECO-SPP3-E-6C-DM
Patchpanel, 1U with 12 SC Duplex MM Couplers	ECO-SPP3-E-1C-DM
Patchpanel, 1U with 24 SC Duplex MM Couplers	ECO-SPP3-E-2C-DM
Patchpanel, 1U with 12 SC Simplex SM Couplers	ECO-SPP3-E-1C-SS
Patchpanel, 1U with 24 SC Simplex SM Couplers	ECO-SPP3-E-2C-SS
Patchpanel, 1U with 12 SC/APC Simplex SM Couplers	ECO-SPP3-E-1APC-SS
Patchpanel, 1U with 24 SC/APC Simplex SM Couplers	ECO-SPP3-E-2APC-SS
Patchpanel, 1U with 12 LC Duplex MM Couplers	ECO-SPP3-E-1LC-DM
Patchpanel, 1U with 24 LC Duplex MM Couplers	ECO-SPP3-E-2LC-DM
Patchpanel, 1U with 12 LC Duplex SM Couplers	ECO-SPP3-E-1LC-SS
Patchpanel, 1U with 24 LC Duplex SM Couplers	ECO-SPP3-E-2LC-SS

Ordering Information

> Black Eco-SPP3 Patchpanels (RAL 9005)	Ref. No.
Patchpanel, 1U with 12 ST MM Couplers, black	ECO-SPP3-EB-1T-M
Patchpanel, 1U with 24 ST MM Couplers, black	ECO-SPP3-EB-2T-M
Patchpanel, 1U with 6 SC Duplex MM Couplers, black	ECO-SPP3-EB-6C-DM
Patchpanel, 1U with 12 SC Duplex MM Couplers, black	ECO-SPP3-EB-1C-DM
Patchpanel, 1U with 24 SC Duplex MM Couplers, black	ECO-SPP3-EB-2C-DM
Patchpanel, 1U with 12 SC Simplex SM Couplers, black	ECO-SPP3-EB-1C-SS
Patchpanel, 1U with 24 SC Simplex SM Couplers, black	ECO-SPP3-EB-2C-SS
Patchpanel, 1U with 12 SC/APC Simplex SM Couplers, black	ECO-SPP3-EB-1APC-SS
Patchpanel, 1U with 24 SC/APC Simplex SM Couplers, black	ECO-SPP3-EB-2APC-SS
Patchpanel, 1U with 12 LC Duplex MM Couplers, black	ECO-SPP3-EB-1LC-DM
Patchpanel, 1U with 24 LC Duplex MM Couplers, black	ECO-SPP3-EB-2LC-DM
Patchpanel, 1U with 12 LC Duplex SM Couplers, black	ECO-SPP3-EB-1LC-SS
Patchpanel, 1U with 24 LC Duplex SM Couplers, black	ECO-SPP3-EB-2LC-SS

1.3 3M™ 19" Patchpanels

Description - Couplings / Pigtails / Patchcords

These pre-terminated modules are designed for 19" patchpanels which have a central thread to allow the mounting of DIN splice cassettes.

These modules make the installer's life easier and safe cost.

12 each semi-tight buffered pigtails in different standard colours (IEC or Bellcore) are terminated in a DIN splice cassette. On the ends of the pigtails, the 900μm buffer is stripped off 1m. All pigtails are bundled and fixed with 2 cable ties at the entrance port of the cassette.

The stripped fibre ends are routed inside the cassette and are secured with tape as shipping protection.

Outside of the cassette the fibre bundle is held together by 4 short tubes, which can be slid over the bundle for flexible positioning.

The cassette is closed with a snap on lid.

6 twist tie clips with adhesive tape are included for more flexible fibre routing.

Features

- Pre-stripped pigtails
- Terminated in DIN splice cassettes
- Colour coded pigtails
- Fibre bundles with sliding tubes

- For all commonly used connector types
- Snap on lid
- Twist tie clips with adhesive tape

Benefits

- Safes installation time and cost
- Fits most of the 19" fibre patchpanels
- Easier connection to backbone cable
- Best fibre management and routing of pigtails in panel
- Universal solution for all fibre patchpanels
- Lid can be removed without moving cassette
- Flexible fibre routing

Specifications

- **Material of cassette:** ABS
- **Dimensions of cassette:** 115 x 92 x 8 (W x D x H) without lid (IEC 61073, DIN 47662 Draft)
- **Colour of cassette:** RAL 9010
- **Pigtail length:** Stripped length inside 1m, buffed length outside 1m, decreasing

- **Pigtail colours IEC 304:** Red, green, blue, yellow, white, grey, brown, violet, aqua, black, orange, rose
- **Pigtail type:** 900μm semi-tight buffer
- **Fibre Routing support:** 6 each fibre routing clips with adhesive tape included
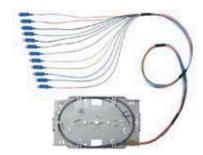
- **Dimensions:** Total length of each pigtail is 2,0 m

1m

Length of 900μm buffered fibre bundle bundle between cassette and connectors is 1m,

1m

Coil length of 250μ stripped fibre inside of the splice cassette is 1m.

1.3 3M™ 19" Patchpanels

Ordering Information

> DIN-Cassette/Pigtail Modules	Ref. No.
Pigtail Module ST 50/125 w/DIN-Cassette	**FMP-12T5**
Pigtail Module ST 62,5/125 w/DIN-Cassette	**FMP-12T6**
Pigtail Module SC/PC 9/125 w/DIN-Cassette	**FMP-12C9**
Pigtail Module SC/UPC 9/125 w/DIN-Cassette	**FMP-12UPC9**
Pigtail Module SC 50/125 w/DIN-Cassette	**FMP-12C5**
Pigtail Module SC 50/125 OM3 w/DIN-Cassette	**FMP-12C5OM3**
Pigtail Module SC 62,5/125 w/DIN-Cassette	**FMP-12C6**
Pigtail Module FC/PC 9/125 w/DIN-Cassette	**FMP-12F9**
Pigtail Module LC/PC 9/125 w/DIN-Cassette	**FMP-12L9**
Pigtail Module LC/UPC 9/125 w/DIN-Cassette	**FMP-12UPL9**
Pigtail Module LC/PC 950125 w/DIN-Cassette	**FMP-12L5**
Pigtail Module LC 50/125 OM3 w/DIN-Cassette	**FMP-12L5OM3**
Pigtail Module LC 62,5/125 w/DIN-Cassette	**FMP-12L6**

Accessories (not included)

> Splicing protection holder, crimp	Ref. No.
• For 12x crimp splice protectors	
• PU: 10 pcs	**05-760-08000**

> Crimp splice protector	Ref. No.
• PU: 150 pcs	**05-760-08100**

> Splicing protection holder, shrink	Ref. No.
• For 6x shrink splice protectors	
• PU: 10 pcs	**05-760-11900**

> Splicing holder Fibrlok Universal	Ref. No.
• For 6x Fibrlok	
• PU: 20 pcs	**2529-H**

1.3 3M™ 19" Patchpanels

Accessories (not included)

> **Splicing cassette**
- Incl. strain relief and cable management
- Dimensions: 155 x 92 x 8 mm (H x W x D)
- Colour: RAL 9001 (cream white)
- PU: 10 pcs

Ref. No.
29026-500 31

> **Splicing cassette**
- Incl. splice protective holder for 12 crimp splice protectors and cable management
- Dimensions: 155 x 92 x 8 mm (H x W x D)
- Colour: RAL 9001 (cream white)
- PU: 30 pcs

Ref. No.
29026-500 30

> **Lid**
- For splicing cassette
- Dimensions: 155 x 92 x 2 mm (H x W x D)
- Colour: RAL 9001 (cream white)
- PU: 10 pcs
- PU: 30 pcs

Ref. No.
29025-503 31
29025-503 30

> **Hinge**
- To connect splicing cassette and lid
- PU: 100 pcs

Ref. No.
03-756-00500

> **Strain relief**
- For 12 fibres with Ø 0.9 and 1.1 mm coating
- PU: 50 pcs

Ref. No.
29031-000 30

> **Splicing protection holder, crimp**
- For 12x crimp splice protectors
- PU: 10 pcs

Ref. No.
05-760-08000

> **Crimp splice protector**
- PU: 150 pcs

Ref. No.
05-760-08100

> **Splicing protection holder, shrink**
- For 6x shrink splice protectors
- PU: 10 pcs

Ref. No.
05-760-11900

	Ref. No.
> **FO heatshrink splice protector, 60mm/3 mm diam.**	**2170-S 3,0 X 60**
> **FO heatshrink splice protector, 45mm/2,4 mm diam.**	**2170-S 2,4 X 45**
> **FO heatshrink splice protector, 60mm/2,4 mm diam.**	**2170-S 2,4 X 60**

> **Splicing holder Fibrlok Universal**
- For 6x Fibrlok
- PU: 20 pcs
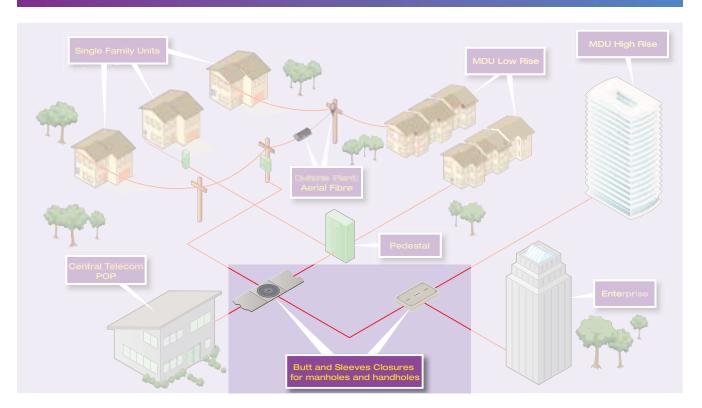
Ref. No.
2529-H

For further products see chapter "5. FTTx Network - Customer Connection"

3M™ Closures

Single Family Units

MDU Low Rise

MDU High Rise

Outside Plant
Aerial Fibre

Pedestal

Central Telecom
POP

Enterprise

**Butt and Sleeves Closures
for manholes and handholes**

3M™ Closures for manhole installation

> BPEO

Range of 3 watertight closures for fibres count from 36 to 576 fibres G657

For further information, please, see chapter 2.3

> µQODC

Micro sleeve for 6 to 24 fibres G652

> FDC12

Large capacity dome closure for 720 fibers count fibres G657

2.1 3M™ Closures for manhole installation

Introduction

This is the second generation of the BPEO range which has evolved in response to demands from PON and point to point FTTH network architectures.

In addition to the basic concept of three standard bodies with latch mechanisms and the ECAM range of mechanical cable entries, the product now offers additional features:

- Single fibre management
- Splitter integration
- Mechanical fibre splices
- Compatible with blown fibre
- Microcable management
- May be installed in sewers

Adapted for use in high density networks, and installation in city centres.

In addition to the features already described, the product can now handle :

- Cable with 12 to 1152 fibres
- Full coverage of most applications with only 3 different closure sizes

The BPEO Evolution Concept

- The concept of the BPEO Evolution product range is similar to the modular approach often used in copper connectivity modules and termination blocks.
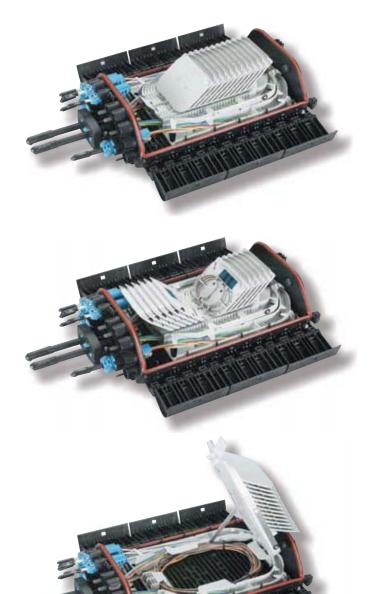
- The closures are delivered with a fibre organiser with a capacity of 12, 28 or 48 splice tray slots depending on the closure size.

- The splice trays are a standard size taking up one or two slots (5 mm or 10 mm spacing). They can be mixed and matched at will, giving the product great flexibility.

- Additional wall brackets are available for fixing the closure securely in place.

- Finally, the unique mechanical cable sealing ECAM kits are available to fit the cables into the closure and seal them in place.

- Additional splice trays and cable entry kits can be installed whenever new cables are added to the closure.

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2.1 3M™ Closures for manhole installation

The new organisers and splice trays

The new organisers contain all the proven advantages of the early designs with additional features:
- A larger storage area for tubes (microstructures), or for by-passing cables (un-cut fibres).
- The splice trays are structured in a tree style, allowing easy access to each splice tray.
- Each splice tray is protected by an individual cover.
- The marking of each splice tray is visible in both the open or closed positions.

The new BPEO also has a fibre guide for 250 micron fibres from the cable entry to the splice trays. This means that each fibre can be individually routed, which is essential for FTTH installation or when using splitters.

The different models of splice trays allow three types of circuit management:
- Fusion splices in single or double stacking.
- Mechanical Fibrlok splices 2540G in groups of 6 or 12.
- Splitter splice trays with a zone for the splitter and different type of splices.

Each tray can also be used for fibre storage in figure 8 format which is particularly useful with splitter assemblies. Different splice trays can be installed on the same organiser, and all splice trays are delivered with covers.

K7-1 slot - 6 Fibrlok 4x4

K7-2 slot - 12 Fibrlok 4x4

K7-2 slot - splitter

- **Bundle area for uncut loose tubes within the size 2 closure.**
- **This area is equipped with 2 specific trays for the protection and storage of microstructures or primary coated fibres.**

3M™ Closures for manhole installation

Easy opening and closing

The mechanical latch closing mechanism is quick and easy to open and close

- The seal is always watertight even after frequent use.
- No special tool or adjustments are required.

- Even though the sealing gasket requires no maintenance, it can be changed if damaged

The cable entry kit

The 3M ECAM mechanical cable entry sealing system:

- The ECAM system is 100% mechanical and only requires standard tools (i.e. no heating or electrical power needed).
- The ECAM system is fitted before the cable is installed in the closure.
- This feature avoids working on the cable inside the closure close to fibres that are already in use. It is also particularly useful when attaching cables with strength members.

- The design gives maximum protection against pulling on the cable. The ECAM system is attached to the cable and the strength members. A watertight cable entry can be obtained without any specific expertise.
- The seal is made with O-ring. The ECAM is held in place with a locking part (fork).
- It is possible to replace or change a cable at any time.

2.1 3M™ Closures for manhole installation

Description - BPEO Watertight Splice Closure Size 1

The BPEO Evolution Size 1

• Watertight closure for up to 72 mechanical Fibrlok splices 2540G or 144 fusion splices.

• The organiser can be used with up to 12 splice trays for standard micro structures or 8 splice trays for loose tube cable.

Standard product composition

• Closure body and cover with pressure test valve and plugs in all of entry ports including the double cable entry port.

• The organiser is fixed in the closure and is supplied without splice trays but with accessories for fixing the tubes and micro-structures, an installation tool and an inter-splice-tray fibre bridge guide.

• The fibre bridge guide visible in the front side of the organiser is used to route individual fibres from one splice tray to another, which is particularly useful when using a splitter which has separation between active and unused fibres.

• The closures are 100% tested to 500 millibar flash test pressure.

Accessories:

• The splice tray, cable entry seals and closure supports need to be ordered separately.

Specifications

Stockage loose tubes

General

Sealing: 80 millibar continuous and 500 millibar flash test 15 min (IP68)
Impact test: resistant to 20 joule (IK10)
Pull force: tested a 100 DecaNewton on cable

Dimension (overall in mm)	Closure Body	With wall support	With Pole/wall support
Length	335	335	335
Width	204	310	230
Depth	92	97	122
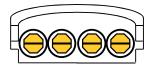
Entry Configuration	EOC	CDP	EDP	FDP
Midspan entry (uncut)	no	yes	yes	yes
Storage (tube/microcable)	yes	yes	yes	yes

BPEO Range Organiser Capacity
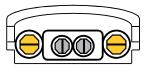
Capacity depends directly on the volume and type of stored unused fibres/tubes.

Cable type	Tray	Fusion (10 mm)	Fusion (5 mm)	Fibrlok 2540G (5 mm 6/10 mm 12)
Microstructures	12	72	144	72
Loose Tubes	8	48	96	48

Stockage micro-structures

2.1 3M™ Closures for manhole installation
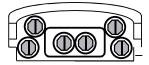
End Of Cable EOC

Cable Distribution Point CDP

End Distribution Point EDP

Fibre Distribution Point FDP

Cable Entries

- **BPEO Evolution** Size 1 is equipped with different numbers and types of cable entry depending on the model. The description of the cable entry kits indicates the diameter of the cables which can be used.
- ECAM **D5-18**: entry for one cable, diameter 5-18 mm.
- ECAM **D5-20**: double entry for uncut cable 5 to 20 mm.
- Double cable entry seals can be used for uncut cables or two each single cable entries.

- **End Of Cable EOC**
- 4 single entries for ECAM D5-18

- **Cable Distribution Point CDP** 2 possible configurations
- 1 double port ECAM D5-20 and 2 single ports ECAM S5-18
- or 2 single ports ECAM S5-18 and 2 single ports ECAM S4-12

- **End Distribution Cable EDP** 2 possible configurations
- 1 double port ECAM D5-20 and 4 single ports ECAM S4-12
- or 6 single ports ECAM S4-12

- **Branch Distribution Point FDP** 2 possible configurations
- 1 double port for ECAM D5-20 and 6 single ports ECAM S4-8
- or 2 single ports ECAM S4-12 and 6 single ports ECAM S4-8
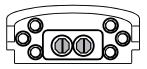
 S18 single cable seal for diameters between 5-18 mm

S12 single cable seal for diameters between 4-12 mm

S08 single cable seal for diameters between 4-8 mm

 D20 double cable seal for diameters between 5-20 mm

Trays

- The three sizes of the BPEO Evolution can handle the same range of trays. The different models of splice trays can be mixed into the same organiser.
- The tray designation contains the tray depth shown by the number of slots, the splice capacity and the type of splice. Each tray is equipped with a cover and can also be used for fibre storage in figure 8 format.
- All trays are supplied fitted with a cover.

K7-1 slot-12 fusion
- 12 fusion splices in 1 slot for high density
- For 60 mm or 45 mm heat shrink splice protectors

K7-2 slots-12 fusion
- 12 fusion splices in 2 slots – the same density as the previous BPEO trays
- For 60 mm or 45 mm heat shrink splice protectors
- Can accommodate 70 x 10 x 6 mm PLC splitters

K7-2 slots-Universal for 12 splices
- Accepts mechanical or fusion splices

K7-1 slot-6 Fibrlok 4x4
- 6 Fibrlok mechanical splices in 1 slot
- Compatibility with the new Fibrlok 2540G

K7-2 slot- 12 Fibrlok 4x4
- 12 Fibrlok mechanical splices in 2 slots
- Compatibility with the new Fibrlok 2540G

K7-2 slots- Fibrlok 4x4 + Splitter
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 10 Fibrlok 2540G

K7-1 slot- 9 fusion and splitter
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 9 fusion splices

K7-1 slot-6 Fibrlok 4x4

K7-2 slot-12 Fibrlok 4x4

K7-2 slot - splitter

2.1 3M™ Closures for manhole installation

Description – BPEO Watertight Splice Closure Sizes 2 & 3

BPEO Evolution Sizes 2 & 3

- Watertight splice closures for up to 168 Fibrlok 2540G mechanical splices or 336 fusion splices (BPEO size 2) and up to 288 Fibrlok 2540G mechanical splices or 576 fusion splices (BPEO size 3).

- The organiser size 2 can be used with up to 28 splice trays, size 3 accommodates up to 48 trays. Storage area for bare fibre tubes or microcables is provided below the organiser.

Standard product composition

- Closure body with pressure test valve and dummy plugs in all entry ports including the double cable entry port.

- The organiser is fixed in the closure and is supplied without splice trays but with accessories for fixing the tubes and micro structures .

- Storage zone at the bottom of the organiser for 250μm fibres and microcables.

- The closures are 100% tested to 500 millibar flash test pressure before delivery.

Accessories:

- The splice tray , cable entry seals and closure supports need to be ordered separately.

Specifications

General

Sealing: 80 millibar continuous and 500 millibar flash test 15 mn (IP68)
Impact test: resistance to 20 joule (IK10)
Pull force: tested a 100 DecaNewton on cable

Dimensions (overall in mm)	Length	Width	Closure body	Depth	Depth	Depth
Size 2	520	341	149	154	178	149
Size 3	661	341	149	154	178	149

Entry Configuration	CDP	EDP	BDP
Midspan entry (uncut)	yes	yes	yes
Storage (tube/microcable)	yes	yes	yes
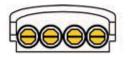
Capacity of the organisers of the BPEO range

Closure Size	Capacity of the organiser (No. of splice trays)	Fusion splices K7-2slots-12 fusion	Fusion splices K7-1slot-12 fusion	Fibrlok 2540G splices K7-1 slot- 6 or 12 slots 12 Fibrlok
BPEO Size 1	12	72	144	72
BPEO Size 2	28	168	336	168
BPEO Size 3	48	288	576	288

3M™ Closures for manhole installation

Ordering Information

The closures
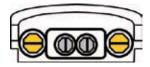
- All BPEO closures kits - size 1, 2 and 3 have the same composition:
  - Closure body, cover with air release valve
  - Installed organiser, storage zone for micro-structures
  - Dummy plugs on all cable entry ports
  - Instructions, fixing template
  - Splice trays, fixing brackets and ECAM cable entry seals must be ordered separately.

> End Of Cable BPEO S1 EVOL EOC 12 slots	Ref. No.
	N501487A

> Cable Distribution Point BPEO S1 EVOL CDP 12 slots	Ref. No.
	N501488A

> Cable Distribution Point BPEO S1 EVOL CDP 28 slots	Ref. No.
	N501491A

> Cable Distribution Point BPEO S3 EVOL CDP 48 slots	Ref. No.
	N501494A

> End Distribution Point BPEO S1 EVOL EDP 12 slots	Ref. No.
	N501489A
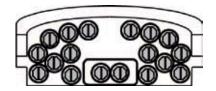
> End Distribution Point BPEO S2 EVOL EDP 28 slots	Ref. No.
	N501492A

> End Distribution Point BPEO S3 EVOL EDP 48 slots	Ref. No.
	N501495A

> Branch Distribution Point BPEO S2 EVOL BDP 28 slots	Ref. No.
	N501493A

> Branch Distribution Point BPEO S3 EVOL BDP 48 slots	Ref. No.
	N501496A
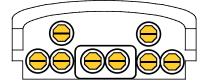
> Fibre Distribution Point BPEO S1 EVOL FDP 12 slots	Ref. No.
	N501490A
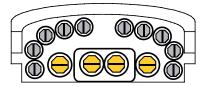
2.1 3M™ Closures for manhole installation

Cable Distribution Point CDP
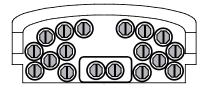
End Distribution Point EDP

Branch Distribution Point

Cable Entries

- **BPEO Evolution** Size 2 & 3 are equipped with the same front face with different cable entry configuration.
- The description of the cable entry kits indicates the diameter of the cables which can be used.
- ECAM **S5-18**: entry for one cable, diameter 5 to18 mm.
- ECAM **D5-20**: double entry for uncut cable 5 to 20 mm.
- ECAM **D5-27**: double entry for uncut cable 5 to 27 mm.
- Double cable entry seals can be used for uncut cables or two each single cable entries.

- **Cable Distribution Point CDP** 2 possible configurations.
- 1 double port ECAM D5-27 and 6 single ports ECAM S5-18
- or 8 single ports ECAM S5-18.

- **End Distribution Point EDP** 2 possible configurations.
- 1 double port ECAM D5-27, 2 ports ECAM S4-18 and 10 ports ECAM S4-12
- or 4 single ports ECAM S5-18 and 10 ports for ECAM S4-12.

- **Branch Distribution Point FDP** 2 possible configurations.
- 1 double port ECAM D5-20 and 16 single ports ECAM S4-12
- or 18 single ports ECAM S4-12.

S18 single cable seal for diameters between 5-18 mm

S12 single cable seal for diameters between 4-12 mm

S08 single cable seal for diameters between 4-8 mm
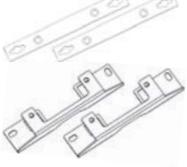
D27 double cable seal for diameters between 5-27 mm

D20 double cable seal for diameters between 5-20 mm

Accessories

- **The three models of BPEO Evolution** use different mounting supports depending on their location.

Wall Mounting
- 2 plates fixed on the base of the closure body.
- The new 4 mm deep supports give space saving in manholes/handholes.

Pole/wall mount support
- Two metal brackets allow wall or pole mounting. For pole mounting a metal band is required in addition to the brackets

Support for sewer mounting - BPEO Size 2 and 3
- Size 2 & 3 closure only
- For horizontal mounting of the closures. Total depth of the mounted closure is less than 150 mm.

Ordering Information

Splice trays

- The splice trays have to be selected according to the type of splice (fusion, mechanical, i.e.), if splitters are used or not and according to the density.
- The tray size indication '1 slot' or '2 slots' allows the necessary tray capacity to be gauged and the correct size closure chosen.

> **K7-1 slot-12 fusion**
- Compatible with 45 or 60 mm fusion splice protectors
- Tray delivered with cover

Ref. No.
N541106A

> **K7-2 slots-12 fusion and splitter**
- Compatible with 45 or 60 mm fusion splice protectors
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Tray delivered with cover

Ref. No.
N541104A

> **K7-2 slots-Universal for 12 splices**
- Accepts mechanical and fusion splices
- Tray delivered with cover

Ref. No.
N541121A

> **K7-1 slot-9 fusion and splitter**
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 9 fusion splices
- Tray delivered with cover

Ref. No.
N541113A

> **K7-1 slot-6 Fibrlok 4x4**
- Compatible with Fibrlok mechanical splice 2540G
- Tray delivered with cover

Ref. No.
N541103A

> **K7-2 slot-12 Fibrlok 4x4**
- Compatible with Fibrlok mechanical splice 2540G
- Tray delivered with cover

Ref. No.
N541108A

> **K7-2 slots-10 Fibrlok 4x4 and splitter**
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 10 Fibrlok 2540G
- Tray delivered with cover

Ref. No.
N541110A

2.1 3M™ Closures for manhole installation

Ordering Information

Fixing supports

> **Plastic Wall Support for BPEO Size 1**

Ref. No.
N711599A

> **Plastic Wall Support for BPEO Size 2 & 3**

Ref. No.
N711600A

> **Metal Wall Support for BPEO Size 1**

Ref. No.
N711540A

> **Metal Wall Support for BPEO Size 2 & 3**

Ref. No.
N711541A

> **Pole/Wall support for BPEO size 1**

Ref. No.
N711438A

> **Pole/Wall support for BPEO size 2 & 3**

Ref. No.
N711440A

> **Support for sewer mounting for BPEO size 2 & 3**

Ref. No.
N711546A

2.1 3M™ Closures for manhole installation

Ordering Information

Cable Entry Sealing Kits

- Mechanical cable entry sealing kit for single ports or double ports (for uncut cable).
- The kits are supplied complete with a fixing wrench. Holders and anchors are with the closure.

> Double cable entry sealing for uncut cables
- ECAM D5-20
- Double entry cable sealing for cables of 5-20 mm diameter

Ref. No.
N721077A

- ECAM D5-27
- Double entry cable sealing for cables of 5-27 mm diameter

Ref. No.
N721069A

> Single cable entry sealing for straight splices or cable distribution
- ECAM S4-12
- Single entry cable sealing for cables of 4-12 mm diameter

Ref. No.
N721079A

- ECAM S4-18
- Single entry cable sealing for cables of 4-18 mm diameter

Ref. No.
N721059A

> MULTI ECAM for 4 cables or microducts
- ECAM 4D4
- Four way entry for 4 cables or tubes of 4 mm +/- 0.1 mm
- Compatible with single port ECAM D4-12

Ref. No.
N721098A

- ECAM 4D6
- Four way entry for 4 cables or tubes of 6 mm +/- 0.1 mm
- Compatible with single port ECAM D4-12

Ref. No.
N721097A

2.1 3M™ Closures for manhole installation

Decision guide

- The older BPEO models continue in production in order to smooth the transition to BPEO Evolution.
- The on-demand-configuration of the previous BPEO models is stopped as it is part of the BPEO Evolution product benefit.

- To help with the choice, the table below shows the correspondence between the standard BPEO and BPEO Evolution.

Size 1 correspondence table
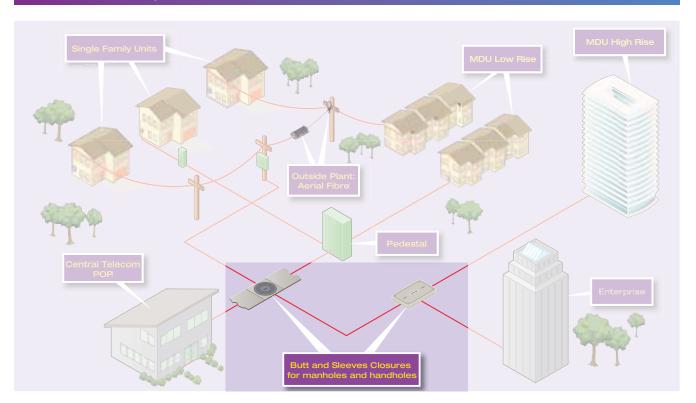
N721079A	Evolution Range Designation	Ref. No.
	End Of Cable BPEO S1 EOC 12 slots	N501487A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	ECAM S5-18	N721059A
	Pole/Wall support size 1	N711438A

N501352A	Evolution Range Designation	Ref. No.
	End Of Cable BPEO S1 EOC 12 slots	N501487A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	ECAM S5-18	N721059A
	Pole/Wall support size 1	N711438

N501199A	Evolution Range Designation	Ref. No.
	Cable Distribution Point BPEO S1 CDP 12 slots	N501488A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	ECAM D5-20	N721077A
	Pole/Wall support size 1	N711438

N501256A	Evolution Range Designation	Ref. No.
	Cable Distribution Point BPEO S1 CDP 12 slots	N501488A
	BPEO – K7-2slots – 12 fusion and splitter	N541106A
	ECAM D5-20	N721077A
	Pole/Wall support size 1	N711438

N501368A	Evolution Range Designation	Ref. No.
	End Distribution Point BPEO S1 EDP 12 slots	N501489A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	Pole/Wall support size 1	N711438A

N501369A	Evolution Range Designation	Ref. No.
	End Distribution Point BPEO S1 EDP 12 slots	N501489A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	Pole/Wall support size 1	N711438A

2.1 3M™ Closures for manhole installation

Size 2 & 3 correspondence table
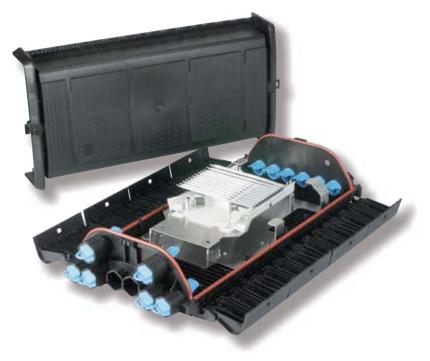
N501240A	Evolution Range Designation	Ref. No.
	Cable Distribution Point BPEO S2 CDP 28 slots	N501491A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	ECAM S5-18	N721059A
	Pole/Wall support size 2 & 3	N711440A

N501257A	Evolution Range Designation	Ref. No.
	Cable Distribution Point BPEO S2 CDP 28 slots	N501491A
	BPEO – K7-2slots – 12 fusion and splitter	N541106A
	ECAM D5-27	N721069A
	Pole/Wall support size 2 & 3	N711440A

N501370A	Evolution Range Designation	Ref. No.
	End Distribution Point BPEO S2 CDP 28 slots	N501492A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	Pole/Wall support size 2 & 3	N711440A

N501284A	Evolution Range Designation	Ref. No.
	Cable Distribution Point BPEO S3 CDP 48 slots	N501494A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	ECAM S5-18	N721059A
	Pole/Wall support size 2 & 3	N711440A

N501370A	Evolution Range Designation	Ref. No.
	End Distribution Point BPEO S3 CDP 48 slots	N501495A
	BPEO – K7-2slots – 12 fusion and splitter	N541104A
	Pole/Wall support size 2 & 3	N711440A

2.1 3M™ Closures for manhole installation

Outside Plant – Transport / Distribution

Single Family Units

MDU Low Rise

MDU High Rise

Outside Plant: Aerial Fibre

Pedestal

Central Telecom POP

Enterprise

Butt and Sleeves Closures for manholes and handholes

BPEO Size 2 and 3 in-line with removable organiser

> **Concept**

Equip a BPEO Size 2 or 3 in-line (cable entries on closure both sides) with a removalbe BPEO S1 organiser.

> **Kit**

The closure BPEO, the organiser 144 fibres, the cable buffer area.

2.1 **3M™ Closures for manhole installation**

3M™ BPEO In-Line

Size 2 and Size 3

The BPEO can be an in-line closure designed for both mechanical and fusion splices to be placed in and underground distribution point.
With this design, there is space in the closure for up to 2.5 m over-length of cable to allow splicing and other work to be performed on street level.

The major advantages of the BPEO are:

- Installation time is considerably shorter than traditional closures
- With the allowance for 2.5 m of cable over-length, splicing in the hand/man-hole is not necessary but can be accomplished at street level.
  - Easy service restoration
    - Subscriber cables are easily inserted into the closure
      - Crimping is no longer required
        - This configuration of the BPEO is for multiple 48 subscriber-drop cables

Waterproof splice protection
BPEO/2 with ECAM 4D6

In a buried installation

Ordering Information

> **BPEO In-Line Size 2 - EVOL**	Ref. No.
• organiser 12 slots	**N501583A**

> **BPEO In-Line Size 3 - EVOL**	Ref. No.
• organiser 12 slots	**N501574A**
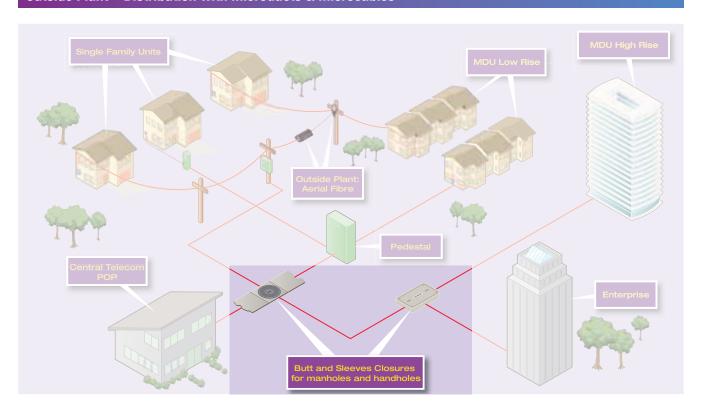
> **Kit Protection Cable Entry BPEO In-Line**	Ref. No.
	N711578B

2.1 3M™ Closures for manhole installation

Outside Plant – Distribution with microducts & microcables

Product range for installation in Telecom manholes

> BPEO « Feed »

Specific front side for up to 8 drops of 6 mm

> BPEO S1 Multidrops

Equipped with 9 PG9 for 36 drops of 4 mm or up to 54 drops of 2 mm

> BPEO S2 & S3 equipped with MultiECAM

With the use of standard BPEO front sides, the MultiECAM will manage a number of drops depending from the drops diameter, the numbers of drops per MultiECAM and the number of ports.

2.1 3M™ Closures for manhole installation

Description - New BPEO features

New features to meet new demands.
The closures accommodate cables & tubes of varying sizes and provide flexibility to add ports on both ends . With a revolutionary new "MultiECAM" which fits with the available port entry configuration of the BPEO front sides , a great flexibility is offered to answer to all the different applications . A flexible tray system allows positionable or fixed splice inserts. Technicians can re-enter and swap out splice holders, and mix and match splice types (fusion and mechanical).

3M BPEO Size 1 FDP Drops

for microducts & microcables infrastructure

This BPEO closure has a product range which fits perfectly with requirements for transport, distribution of FTTH applications.
The "Fibre Distribution Point" types of closures have been enlarged with front sides specifically designed for multidrops fibre distribution.
Cable glands "PG9" or "PG13" are used with grommets in order to handle the multiple drops diameter (such as 1.8, 3 or 4 mm).

This product range is, as always for the BPEO, based on mechanical entries and organisers and trays able to accept fusion, mechanical or splitter splices.

BPEO closure size 1 FDP Drops

Type: 8 "PG7"
           9 "PG9" and 2 "S6"
           6 "PG9" and 1 uncut D4-20
           4 "PG13" and 1 uncut D4-20

Density: 96 fusion splices maximum
           or 36 mechanical splices maximum
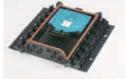
Composition
The closures can be delivered with standard trays from previous BPEO product range or with Evolution trays, this according to the room necessary to manage the drops/tubes at the internal of the closure.

Ordering Information

- All closures kits - size 1, 2 and 3 have the same composition:
  - Body and cover with valve for sealing test
  - Fitted tray organiser
  - Storage area for microstructures
  - All entry ports supplied plugged
  - Instructions and installation templates
  - Supports are part of the kit package

> BPEO S1 FDP DROPS 8 x 6 mm	Ref. No.
• Size 1, 2 trays 5 mm 12 fusion	**501455**

> BPEO S1 FDP DROPS 35 x 4 mm	Ref. No.
• Size 1, 6 trays 10 mm 12 fusion	**528442**

> BPEO S1 FDP 12 24 x 3 mm 1 uncut	Ref. No.
• Size 1, 6 trays 10 mm 12 fusion	**501498**

> BPEO S1 FDP 12 x 5 mm 1 uncut	Ref. No.
• Size 1, 6 trays 10 mm 12 fusion	**501524**

2.1 3M™ Closures for manhole installation

MultiECAM for D18 single port

ECAM 4D6 & ECAM 4D4 for D12 single port entry

Waterproof splice protection BPEO/2 with ECAM 4D6

3M MultiECAM

for BPEO Evol port D12 or D18

The MultiECAM range has been developed to answer to the application of Fibre Distribution Point (FDP) for microducts or microcables infrastructure. They have been designed to fit the standard front sides of the BPEO closures. With multiholes gromets, you will be able to manage multidrops applications with IP68 watertightness requirements.

The table below highlights the link between the number of drops, the drops diameter and the the ports size. Then refer to the number of ports per closure, to determine the total amount of drops per closure.

Ordering Information

> **BPEO MultiECAM S12 - 6 x 2 mm**

Ref. No.
721117

> **BPEO MultiECAM S18 - 4 x 5.6 mm**

Ref. No.
721112

> **BPEO MultiECAM S18 - 4 x 7 mm**

Ref. No.
721105
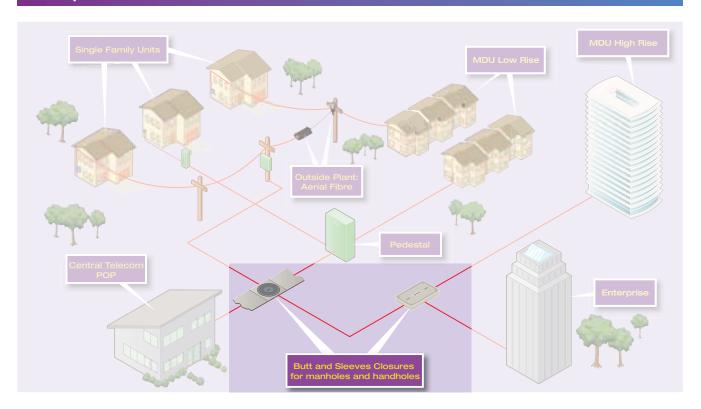
Please contact 3M to design your MultiECAM according to the numbers of drops, the drops diameter. 3M will advise what BPEO front side to use and will design appropriately the MultiECAM to serve your application.

2.2 **3M™ Distribution with microducts & microcables**

Quick Optic Derivation Closures

µQODC, QODC in-line closure for fusion splices protection of G657 fibres

> **Description**

2 closure sizes for derivation and splices of mini bundles from window cut cables or mid span access cables.

Outside Utilisation
In-line closure installed directly on the distribution cable.
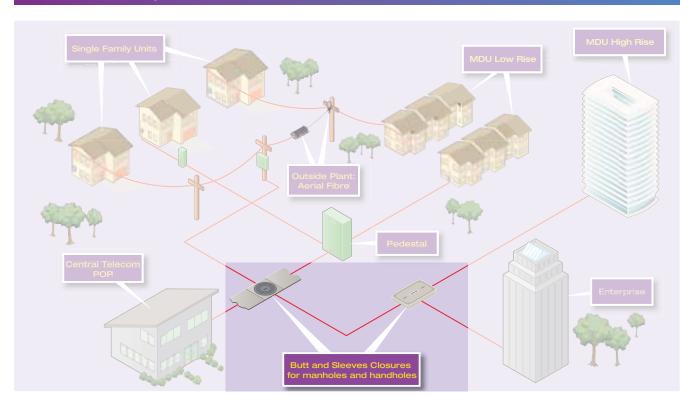
> **Specifications**

Closures in thermoplastic
Watertighness IP 68
Wallmount with 2 screws
Anchoring of the cable with cable ties
Derivation on cables or tubes according application

2.2 3M™ Distribution with microducts & microcables

Outside Plant – Transport / Distribution

Single Family Units

MDU Low Rise

MDU High Rise

Outside Plant: Aerial Fibre

Pedestal

Central Telecom POP

Enterprise

Butt and Sleeves Closures for manholes and handholes

3M QODC Splice Protection Sleeve for FTTH network

> **The QODC is a new concept of watertight closures based on:**

In-line or butt installation
Cable entries fully mechanical without vinyl tape nor gel.
3 entries for distribution cables of 5 to 16 mm

3 outlets on ECAM 4-12 (4 to 12 mm) and 4 son ECAM 3-7 (3 to 7 mm) or 8 outlets on ECAM 3-7 (3 to 7 mm)
Opening and closing of the closure with clamps.

Feeder cable mid span or window cut
Capacity of 72 splices and 4 splitters

3M™ Distribution with microducts & microcables

Description

3M QODC Splice Protection Sleeve for FTTH network

Waterproof closure for midspan access and window cut cable for FTTH network.

The QODC is a watertight splice protection closure for distibution and branching customers connections to fibre optics networks.

The closure of an overall volume of 4 dm³ is designed to be installed in handholes type L2T.

Main cable:

Installation in-line or in butt configuration. Straight derivation or slack of micromodules on the main cable. Cable entries fully mechanical without butyl or gel.

Main & Drops cables:

Cables or Tubes outlets on mechanical cable entries type ECAM standards S4-7 or S4-12.

Fibre management:

Organiser 6 trays to meet the different applications

• 72 fusion splices and 4 splitters PLC

• 66 fusion splices and 6 splitters PLC

• Additional options based on mechanical splices Fibrlok 4x4

Features
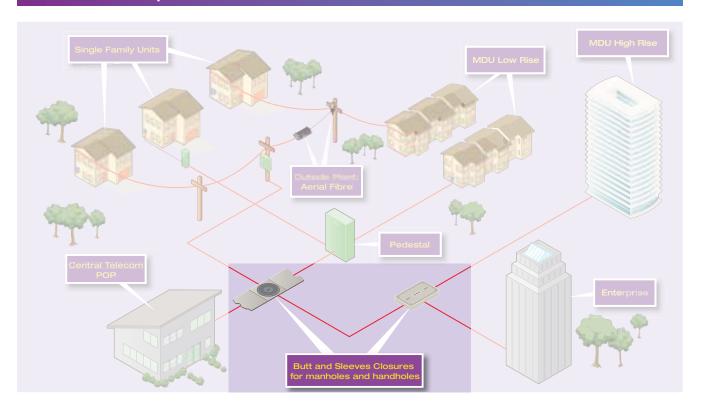
• Compact

• Mechanical closing waterproof

• Extraction with or without splices

• Compatible for microcables

• Until 72 splices and 4 splitters PLC

• IP68 / IK09

• Until 8 cable outlets to 7 mm in diameter

Benefits

• Less than 6 dm³ for installation in handhole L2T

• Open/close thanks to unique toolless latching

• A unique product for different distribution configurations

• Space saving in manholes & ducts

• Utlization in PON and PtoP

• Very robust product polyvalent for underground manholes, buried, wallmount

• Application for secondary distribution

2.2 3M™ Distribution with microducts & microcables

Outside Plant – Transport / Distribution

Single Family Units

MDU Low Rise

MDU High Rise

Outside Plant Aerial Fibre

Pedestal

Central Telecom POP

Enterprise

Butt and Sleeves Closures for manholes and handholes

µQODC Sleeve < 2 dm³ for handhole installation

> **The µQODC** is based on the derivation sleeve 3M BPDO, usually installed in sewer, with the same basics parts.

> **New equipments**

Two new entries for the distribution cables in
　　11 mm for the window cut cable
　　4,2 mm for mid span access cable

Two new branching outlets for:
　　Two tubes or cables of 12 mm
　　or two tubes or cables of 6 mm
　　or 4 cables of 2,6 mm (2,5 to 3,5)

One tray holder for 1 swivelling tray + branching cables strength members anchoring systems

One tray for 24 fusion splices + 1 splitter

Description

3M µQODC Splice Protection Sleeve for FTTH network

Waterproof Derivation Closure for FTTH network.

The µQODC is a watertight splice protection dedicated to customer branching fibre optics networks.

The closure with a volume less than 2 dm³ is designed to be installed in handhole type L1T.

Main feeder installation:

Fibre modules extraction on windows cut cables or on standard cables or micro cables.
In a splicing utilisation, the volume under the tray allow to store a slack of 7 x 2,20 m of uncut micro modules or fibres.

Two types of feeder cables:
- Cable diameter 11 mm
- Micro cables diameter 4,2 mm
- Other diameter, please consult 3M

Two types of derivation cables:
- Derivation on 2 tubes 3,3/5 mm or 2 cables 4/6 mm
- Derivation on 8 micro cables of 2,5 mm

Fibre management:
- Tray for 12 fusion splices and 1 splitter PLC 4x4
- Tray with double slack for G657 fibres
- Splice holder for 24 fusion splices as accessory

Features

- Compact
- Waterproof and mechanical closing
- Extraction with or without splices

- Compatible for microcables
- Up to 24 splices and 1 splitters PLC
- IP68 / IK09

- Up to 8 cables outlets to 2,5 mm diameter

Benefits

- Less than 6 dm³ for installation in handhole L1T
- No flame, no resin. No special tool
- A unique product for different distribution derivation, cables looping configuration
- Space saving in manholes & ducts
- Utilisation in PON and PtoP
- Very robust product polyvalent for underground manholes, buried, wallmount
- Application for residential distribution

2.2 3M™ Distribution with microducts & microcables

Products

Closure
- Dimensions (H x W x L): 295 x 83 x 55 mm
- Overall Volume: 1,35 dm^3
- Colour: black
- Material: Base/cover in thermoplastic Inox screwing
- Fixation: 2 screws Ø 6 mm (not supplied)
- Protection: IP68 / IK 10

Cable entries
- feeder: window cut 11 mm or micro cable of 4,2 mm
- drops: 2 tubes of 3/3,5 mm OR
          2 cables of 4/6 mm   OR
          8 cables of 2,5/3,5 mm

Splicing Management
- Micromodules
  - 7 x 2,20 m in slack under the trays if utlisation in standard mid span access

Splices
  - delivered with splice holder for 24 fusion splice 45 mm

Splitters
  - dedicated space for 1 splitter PLC type 4x4

Packaging
Complete kit without additional accessories or cables entries

Ordering Information

Product Description	Ref. No.
µQODC empty closure without any internal accessories	**N501600A**
µQODC equipment kit for empty closure with 1 tray 24 splices and 1 splitter PLC, 1 tray holder and 2 gromets for outlets 4 x 2,5 mm	**N801610A**
µQODC closure 24 splices with complete accesories kit for 4 drops of 2,5 mm	**N501605A**

2.2 3M™ Distribution with microducts & microcables

Overview of 3M™ waterproof closures applications
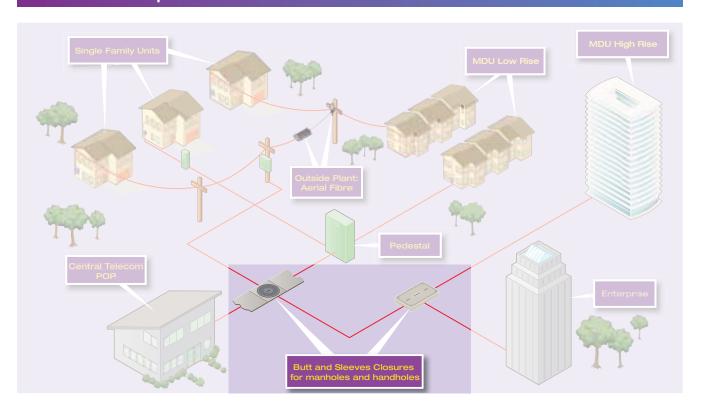
Dimensions and Specifications of the 3M Closures

The below table summarises the dimensions and specifications of our closures for their implementation

DESIGNATION	µQODC	QODC	BPEO S1	BPEO S2	BPEO S3
Volume range	< 2 dm^3	< 6 dm^3	< 10 dm^3	< 30 dm^3	< 40 dm^3
Splicing capacity	24	72	144	366	576
Closures dimensions	260 x 83 x 55 mm	270 x 120 x 96 mm	330 x 204 x 97 mm	472 x 315 x 154 mm	612 x 315 x 154 mm
Overall dimensions (entries included)	295 x 83 x 55 mm	356 x 120 x 96 mm	375 x 204 x 97 mm	520 x 315 x 154 mm	660 x 315 x 154 mm
Closures volumes	1,17 dm^3	3,11 dm^3	6,53 dm^3	22,90 dm^3	29,67 dm^3
Overall volumes (entries included)	1,35 dm^3	4,10 dm^3	7,42 dm^3	25,23 dm^3	32 dm^3

2.3 3M™ BPEO Pre-Connected Closures

Outside Plant – Transport / Distribution

BPEO Closure Size 1, 2 and 3, pre-connected

> **Concept**

On the basis of standards closures, implementation of couplings supports in order to allow the BPEO as flexibility point.

> **Applications**

Building basement or distribution closure in Telecom manhole.

> **The kits**

The support modules 6 or 12 connectors are available for all 3 sizes of the BPEO.

> **The pre-wiring service**

These BPEO as for the MDUO can be supplied pre-wired with pigtails and couplings pre-installed and pre-labelled.

2.3 3M™ BPEO Pre-Connected Closures

| 3M BPEO Pre-connect |

for customized applications

Frames have been designed to support SC couplings and can be inserted into the new organisers size 1 , 2 & 3 of the BPEO Evolution product range.

This capability added to the features previously proposed allows to get flexibility point or testing point even in the outside plants networks. It allows also to directly connect the customer with drops straight from the distribution closure.

Module for 6 couplings

Module for 12 couplings

- **BPEO-1**
  2 modules (metal) each 6 couplings = 12 couplings / 3 free slots

- **BPEO-2**
  4 modules (metal) each 12 couplings = 48 couplings / 8 free slots

- **BPEO-3**
  8 modules (metal) each 12 couplings = 96 couplings / 8 free slots

Closures are produced pre-connected (couplings + pigtails) in the 3M factory in order to speed up the installation in the field. The configuration is on demand, please contact 3M.

2.3 3M™ BPEO Pre-Connected Closures

BPEO Size 1 to 3 – BPEO with couplings
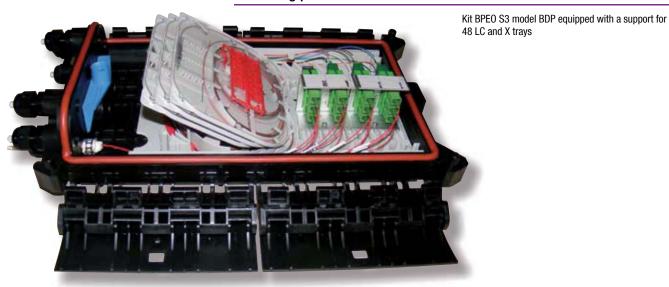
Kit building basement (example)

Kit BPEO S1 model FDP equipped with a holder for 12 SC and 3 trays
- 1 for the riser 12 fusion splices
- 1 for the network with a splitter 1 to 8 and the possibility for 7 fusion splices
- 1 as reserve type 9 fusions + splitter
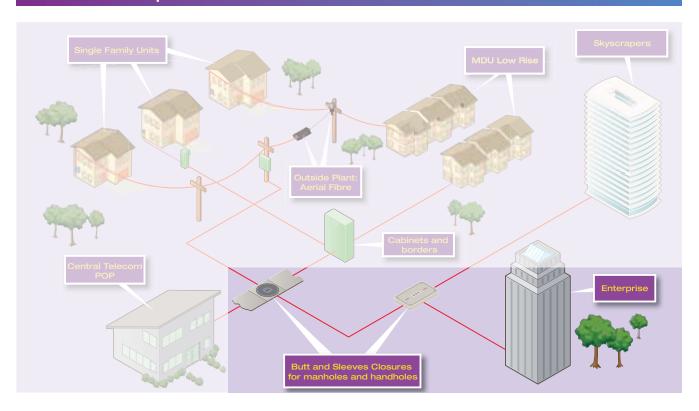
Branching point for 1 area

Kit BPEO S3 model BDP equipped with a support for 48 LC and X trays

2.4 3M™ Fibre Dome Closures and Terminals

Outside Plant – Transport / Distribution

Single Family Units

MDU Low Rise

Skyscrapers

Outside Plant: Aerial Fibre

Cabinets and borders

Central Telecom POP

Enterprise

Butt and Sleeves Closures for manholes and handholes

FDC12S > 40 dm³ for manhole installation

> The FDC12S

Watertight protection to splice up to 720 single fusion.

Content of the delivery

Base , cover with pressure test valve and plug on all the entries as for the dual port for the uncut cable.
Organiser within the bottom part the storage of the uncut micro bundles and in the upper part the swivelling trays.
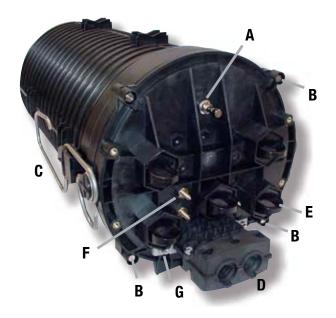
ECAM D27

The FDC12 is equipped with one dual ECAM and with 5 single ECAM.
Large entries can accept cables diameter up to 27 mm.
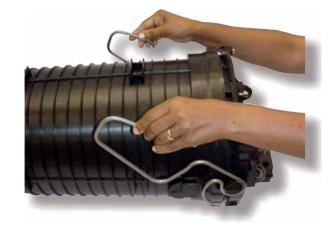
2.4 3M™ Fibre Dome Closures and Terminals

Description - FDC12S

External

A – Valve
B – Locks
C – Latches
D – Dual port for ECAM D4-27
E – 5 ports for single ECAM D4-27
F – Groundig kit
G – Locking dual port

Dome opening / closing

The rotation of the latches allows the cover be moved into the correct position for locking. No special tools necessary.

Internal management

At the bottom part: the storage gasket for uncut tubes or micro bundles.
At the upper part: the organiser with its plating trays.

2.4 3M™ Fibre Dome Closures and Terminals

3M Fibre Dome Closure FDC 12S

The FDC 12S is equipped with one oval port for express or midspan cable applications and five round branch cable ports. The oval main cable port accommodates two 27 mm (1.06") and the round cable ports accommodate one 27 mm (1.06") all-dielectric or armored cables. The splice capacity is 792 single and 1152 mass fusion splices.

The closure features a fixed O-ring sealing system along with an innovative latching mechanism. This combination provides for simple, error-free closure sealing and re-entry

3M Fibre dome Closure FDC 12S with 2543 Tray

The FDC 10 & FDC 12 closures

The fibre dome closures utilize the external cable assembly module (ECAM) built-in cable entry port system. The ECAM design allows true plug-and-play capability which can reduce installation and labor costs because the cable preparation and installation are completed outside of the closure body. Also, the built-in cable entry system allows the technician to add and remove cables from the closure without breaking the cable seals.

Features

- Constructed of highly chemical-resistant material
- ECAM port design with true plug-and-play capability
- Built-in cable entry termination system
- No special tools required
- Spacious slack storage area

- Adjustable and removal tray support bracket

- Hinged splice trays
- Fixed O-ring seal
- Innovative latching mechanism

Benefits

- Can be deployed in all environments: buried, underground, and aerial
- Helps reduce installation and labor cost: cable preparation and installation is completed outside of the closure
- Permits re-entry into the closure without breaking the cable seals
- Simple installation and re-entry
- Slack storage basket provides separate area for routing, protecting, and "expressing" buffer tubes and ribbon fibers
- Splice trays are secured to a mounting plate that can be adjusted to different levels to provide additional slack storage. The splice tray mounting plate is removable, thus, allowing for easier installation of cables after the initial install
- Allows access to any splice without distributing other trays
- Easy, error-free closure sealing and re-entry
- Simple re-entry into closure by lifting the dome lid away from the base

2.4 3M™ Fibre Dome Closures and Terminals

Ordering Information
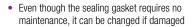
Product Description	Ref. No.
FDC-12S-F-2NN-01H-C FOCLOS 3GND,27MM-1,27SMM-2,2542-SF2MM TR-1	80611332190
FDC-12S-F-2NN-01J-C FOCLOS 3GND,27MM-1,27SMM-2,2542-SF3MM TR-1	80611332216
2542-72-SF-2.4MM 2542 FO SPLTRAY 72 SINGLE FUSION 2.4MM	80611332240
2542-72-SF-3.0MM 2542 FO SPLTRAY 72 SINGLE FUSION 3.0MM	80611332257
ECAM-27MM-S 27MM SINGLE ECAM CABLE ENTRY	80611329493

2.1 3M™ Closures for manhole installation

Easy opening and closing

The mechanical latch closing mechanism is quick and easy to open and close

- The seal is always watertight even after frequent use.
- No special tool or adjustments are required.

- Even though the sealing gasket requires no maintenance, it can be changed if damaged

The cable entry kit

The 3M ECAM mechanical cable entry sealing system:

- The ECAM system is 100% mechanical and only requires standard tools (i.e. no heating or electrical power needed).
- The ECAM system is fitted before the cable is installed in the closure.
- This feature avoids working on the cable inside the closure close to fibres that are already in use. It is also particularly useful when attaching cables with strength members.

- The design gives maximum protection against pulling on the cable. The ECAM system is attached to the cable and the strength members. A watertight cable entry can be obtained without any specific expertise.
- The seal is made with O-ring. The ECAM is held in place with a locking part (fork).
- It is possible to replace or change a cable at any time.

2.4 3M™ Fibre Dome Closures and Terminals

Technical Specifications

Stock Number	Fibre Dome FDC 08M	Fibre Dome FDC 08S-B	Fibre Dome FDC 08S-A	Fibre Dome FDC 10S S E	Fibre Dome FDC 10S D	Fibre Dome FDC 12
Dimensions (L x H (dia) x W) mm	305 x 184 x 152	521 x 178 x 137	521 x178 x 137	549 x 257 x 255	549 x 257 x 255	658 x 338 x 339
Cable Entry Ports & Size	Round Ports: 8 8: 12 mm	Round Ports: 8 8: 12 mm	Round ports: 8 Round Cable: 4 - 12 mm o.d. Flat Cable: 8.5 x 4.3 mm	Round Ports: 5 5 - 18 mm	Round Ports 7: 7 - 18 mm	Round Ports: 5 5 - 27 mm
	Oval Ports: 1 20 mm	Oval Ports: 1 27 mm	Oval Ports: 1 20 mm	Oval Ports: 1 27 mm	N/A	Oval Ports: 1 27 mm
Closure Material	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene	Polypropylene
Closure Sealing System	O-ring and stainless steel latch	O-ring and stainless steel latch	O-ring and stainless steel latch	O-ring and stainless steel latch	O-ring and stainless steel latch	O-ring and stainless steel latch
Cable Sealing System	Oval Ports: Butyl strips & cord for loop-through cable Round Ports: Rubber grommet & O-ring for branch cables	Oval Ports: Butyl strips & cord for loop-through cable Round Ports: Rubber grommet & O-ring for branch cables	Oval Ports: Butyl strips & cord for loop-through cable Round Ports: Rubber grommet & O-ring for branch cables	Oval Ports: Butyl strips & cord for loop-through cable Round Ports: Rubber grommet & O-ring for branch cables	Oval Ports: Butyl strips & cord for loop-through cable Round Ports: Rubber grommet & O-ring for branch cables	Oval Ports: Butyl strips & cord for loop-through cable Round Ports: Rubber grommet & O-ring for branch cables
Tools Required for Installation	5/16" Nut Driver, Flat-Head Screw Driver, Allen Wrench (provided)	5/16" Nut Driver, Flat-Head Screw Driver, Allen Wrench (provided)	5/16" Nut Driver, Flat-Head Screw Driver, Allen Wrench (provided)	5/16" Nut Driver, Flat-Head Screw Driver, Allen Wrench (provided)	5/16" Nut Driver, Flat-Head Screw Driver, Allen Wrench (provided)	5/16" Nut Driver, Flat-Head Screw Driver, Allen Wrench (provided)
Number of Splice Trays	Discrete: 2	Discrete: 4	Discrete: 4	Discrete: 6	Discrete: 6	Discrete: 11
	Ribbon: 2	Ribbon: 2	Ribbon: 4	Ribbon: 3	Ribbon: 3	Ribbon: 3
Splice Capacity	Discrete: 24	Discrete: 96	Discrete: 96	Discrete: 288	Discrete: 288	Discrete: 576
	Ribbon: 72	Ribbon: 288	Ribbon: 288	Ribbon: 432	Ribbon: 432	Ribbon: 864
Grounding	# of Feed-Thru Lugs: 0 or 1	# of Feed-Thru Lugs: 1	# of Feed-Thru Lugs: 1	# of Feed-Thru Lugs: 3 or 7	# of Feed-Thru Lugs: 3 or 7	# of Feed-Thru Lugs: 3, 7 or 9
Flash Test	Yes : 5 PSI	Yes : 5.8 PSI	Yes : 5.8 PSI	Yes : 5.8 PSI	Yes : 5.8 PSI	Yes : 5.8 PSI

2.4 3M™ Fibre Dome Closures and Terminals

Outside Plant – Transport / Distribution

Single Family Units

MDU Low Rise

Skyscrapers

Outside Plant:
Aerial Fibre

Cabinets and
borders

Central Telecom
POP

Enterprise

Butt and Sleeves Closures
for manholes and handholes

3M Fibre Dome Closure (FDC) & Terminal (FDT)

The 3M Fibre Dome Product Family is perfectly designed to meet the needs of anyone using fibre optic splice closure in long haul, metro, local access (DSL, HFC, mobile wireless back haul) and FTTP feeder and distribution network.
This section will highlight also the Fibre Dome Heat Shrink recently launched.

2.4 3M™ Fibre Dome Closures and Terminals

Description

3M Fibre Dome Terminals (FDT)

FDT08 Fibre Dome Terminal Closures

ECAM-FD, Pre-Terminated, ECAM Drop Cable

FDST 08 Pre-Stubbed Terminals

FDT 08M

FDC 08ST 20 mm
ECAM-D 12 mm
ECAM (8)
Up to 8 connectors

2.4 3M™ Fibre Dome Closures and Terminals

Technical Specifications - FDT

Features	Fibre Dome FDT 08M	Fibre Dome FDST 08	Fibre Dome FDT 08S Internal with ECAM FD
Dimensions (L x H (dia) x W) mm	305 x 178 x 137	305 x 184 x 152	521 x178 x 137
Cable Entry Ports & Size	Round Ports: 3 x 12mm FRP drop: 48 x (2.0 mm x 3.0 mm)	4. 6 or 8 Drop Termination	Up to 8 ECAM FD Drop Cables
	Oval Ports: 1 20 mm	Factory Terminated Drop - ECAM FD Drop	Oval Ports: 1 20 mm
Number of Splice Trays	2 (splice tray can accomodate 1 ea 1x8900 µm output splitter	0	Discrete: 2
Stub Cable Length		15 m to 610 m	
Splice Capacity	Discrete: 24		Discrete: 24
Connector Type	SC/UPC or SC/APC	SC/UPC or SC/APC	SC/UPC or SC/APC
Splitter Type	1x4 or 1x8 ruggedized / bare (250 µ or 900 µm)	4, 6, 8 SC/APC connectors	
Number of SC couplings	Up to 10		Up to 8
Closure Sealing System	O-ring and stainless steel latch		
Cable Sealing System	Oval Ports: Butyl strips & cord for loop-through cable Round Ports: Rubber grommet & O-ring for branch cables		
Tools required for Installation	5/16" Nut Driver, Flat-Head Screw Driver, Allen Wrench (provided)		
Grounding	# of Feed-Thru Lugs: 0 or 1	# of Feed-Thru Lugs: 1	# of Feed-Thru Lugs: 3 or 5
Flash Test	Yes: 5.8 PSI	Yes: 5.8 PSI	Yes: 5.8 PSI

2.4 3M™ Fibre Dome Closures and Terminals

Description - 3M FDC-HS Fibre Dome Closure Heat Shrink

The 3M FDC-HS Fibre Dome Closures – Heat Shrink are hermetically sealed fibre dome closures designed for aerial, buried/underground above-grade and below-grade applications. These closures help meet the needs of anyone deploying fibre optic networks: long haul, metro, local access (DSL, HFC, mobile wireless backhaul) and FTTP networks.

The FDC-HS closure features an O-ring sealing system along with an innovative latching/locking mechanism. This combination is designed to allow simple, watertight closure sealing and re-entry. The closure utilises heat shrink technology for cable sealing which helps provide a watertight seal.

The closure is equipped with a built-in fibre management system which provides a separate area for storing, routing, protecting, and "expressing" buffer tubes, single and ribbon fibres. The hinged splice trays include a modular splice holder design which allows them to accept single fusion, single mechanical, and various mass fusion splices (4-, 6-, 8- and 12-fibre ribbon) by simply replacing the splice holder.

The closures are available in two sizes: FDC-HS-L5 and FDC-HS-S4. Both sizes are designed to be used with any type of fibre optic cable: all-dielectric or armored; loose buffer tube, slotted-core, or central tube core; single fibre or ribbon fibre (4, 6, 8 or 12).

The FDC-HS-L5 closure is equipped with one oval port for express cable applications and five round cable ports. The oval port can accommodate two cables up to 25 mm (1.0") in diameter and the round ports can accommodate cables up to 20 mm (0.76") in diameter. The single fusion splice capacity for the L5 closure is 144 and the mass fusion splice capacity for 4-ribbon, 6-ribbon, 8-ribbon & 12-ribbon fibre is 288, 432, 480 or 720, respectively.

The FDC-HS-S4 closure is equipped with one oval port for express cable applications and four round cable ports. The oval port can accommodate two cables up to 28 mm (1.1") in diameter and the round ports can accommodate cables up to 20 mm (0.76") in diameter. The single fusion splice capacity for the S4 closure is 48 and the mass fusion splice capacity for 4-ribbon, 6-ribbon, 8-ribbon & 12-ribbon fibre is 96, 144, 160 or 240, respectively.

An optional built-in air valve is designed to allow flash testing.

The 3M Fibre Dome Closures - Heat Shrink FDC-HS-L5 and FDC-HS-S4

Features	Benefits
• Constructed of highly chemical-resistance material	• Can be deployed in most environments: aerial, buried and underground
• Built-in integral multipurpose fibre storage system	• Provides separate area for sorting, routing, protecting, and "expressing" buffer tubes, single and ribbon fibres
• Innovative latching/locking O-ring closure sealing system	• Designed to allow for a simple, watertight closure sealing and re-entry
• Heat shrink cable seal	• High quality and reliable environmental sealing
• Hinged tray design	• Easy access to fibres/splices without removing other trays
• Modular splice holder design	• Accommodates various fibre splice types: single fibre and ribbon mass fusion (4-fibre, 6-fibre, 8-fibre and 12-fibre)
• Common accessories and installation procedures	• Enhances productivity, reduces inventory of accessories (splice trays, cable entry kits) and decreases training time

2.4 3M™ Fibre Dome Closures and Terminals

Technical Specifications

Feature	FDC-HS-L5	FDC-HS-S4
Dimensions (L x H x W) mm (in.)	510 x 180 (20.1 x 7.1)	460 x 160 (18.1 x 6.3)
Cable Entry Ports & Size	Round ports: 5 10 to 20 mm (0.4 in. to 0.76 in.) Oval port: 1 10 to 25 mm (0.4 in. to 1.0 in.)	Round ports: 4 10 to 20 mm (0.4 in. to 0.76 in.) Oval port: 1 10 to 28 mm (0.4 in. to 1.1 in.)
Closure Material	Polypropylene	Polypropylene
Closure Sealing System	O-ring & clamping system	O-ring & clamping system
Cable Sealing System	All ports: heat shrink	All ports: heat shrink
Splice Tray	2533	2533
Number of Splice Trays	Discrete: 6 Ribbon: 6	Discrete: 2 Ribbon: 2
Splice Capacity*	Discrete: 144 *Ribbon: 4/6 ribbon fibre = 288/432 8/12 ribbon fibre = 480/720	Discrete: 48 *Ribbon: 4/6 ribbon fibre = 96/144 8/12 ribbon fibre = 160/240
Grounding	# of feed-thru studs: 0, 1 or 2	# of feed-thru studs: 0 or 1
Flash Test (w/optional air valve installed)	Yes; 10 PSI (69 kPa)	Yes; 10 PSI (69 kPa)
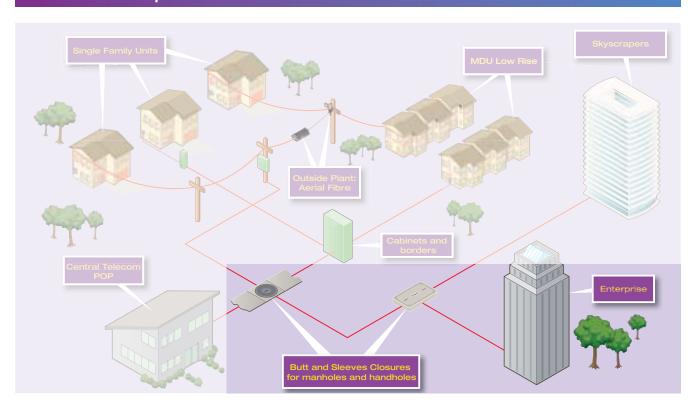
*If crossing of ribbon fibres in the tray is not allowed, then splice capability is reduced by 50%.

Ordering Information

Product Description	Ref. No.
2533-24-SF; 2533 Splice Tray, 24 single fusion splices	XS-0038-5060-8
2533TR Splice Tray, 24 single fusion splices with transparent tubes	XZ-0046-9441-4
FDC-HS-OVAL-HSTUBE (for L5 & S4)	XS-0038-4060-9
FDC-HS-WALL-BRKT; Wall mount bracket (1 set)	XS-0038-5321-4

If you are interested in more information, don't hesitate to contact your local subsidiary:

www.3MTelecommunications.com/eu

2.5 3M™ 2178 Fibre Optic Splice Closure

Outside Plant – Transport / Distribution

Single Family Units

MDU Low Rise

Skyscrapers

Outside Plant: Aerial Fibre

Central Telecom POP

Cabinets and borders

Enterprise

Butt and Sleeves Closures for manholes and handholes

2178-XSB

2178-S

2178-SL

2178-LS

2178-LL

2178-XL

Description

Reliable Protection for Your Application

The 3M Fibre Optic Splice Closure 2178 family provides secure protection for a broad range of fibre cables. The 2178 family is engineered to meet specific needs and field conditions, with different sizes to accommodate varying splice counts.

All 2178 closures are made of a tough chemical-resistant material and have a new gasket seal making them ideal for a wide variety of applications. They feature tough, rigid non-filled closures, tested under real-world conditions, that stand up to moisture, vibration and extreme temperatures.

Growing technologies require growing solutions

You want to build reliable FTTP networks faster and cheaper. But as more fibre is deployed in the distribution network, a wider variety of environmental conditions are encountered. Preserving the integrity of fibre optic facilities is essential, regardless of environmental conditions. The expanded 2178 family of fibre optic splice closures can meet these needs for all applications (including aerial, buried, underground, vault and building entrance) and cables (including loose buffer tube, tight buffer tube, central tube, discrete fibre, ribbon fibre, armored or dielectric).

2.5 3M™ 2178 Fibre Optic Splice Closure

Multiple solutions for evolving networks

The 3M Fibre Optic Splice Closure 2178 family provides multiple real-world solutions with five key aspects:

1. A Complete Product Family
The 2178 family now includes six distinct models (XSB, S, SL, LL and XL) in both flame-retardant and non-flame-retardant versions, each with flexibility built in for growing networks.

2. Future-Proof Solutions
The 2178 family has scalability and flexibility, allowing you to expand the system based on splicing capacity and the number of cable entry ports. It also allows you to defer your investment until it is required.

3. Easily Re-Enterable Designs
A reusable gasket makes tool-less re-entry easy, while bolted halves provide greater security than that of dome closures. With the 2178 family, you can re-enter, re-configure and add or remove cables in all outside plant and inside plant environments.

4. Flexible Environmental Applications
The 2178 family can be effectively used in nearly any environment including aerial (pole and strand) mount, central office vault, manhole, pedestal and handhole. It can also accommodate all splicing methods (mechanical and fusion) as well as inline and butt splicing configurations.

5. Network Flexibility
3M designs a variety of sizes, materials (flame retardant vs. non flame retardant) and configuration options so that our fibre optic splice closures can be used in every segment of the network. A single product family meets a range of needs.

Features

- Full range of sizes

- No special tools required

- Constructed of a highly chemical-resistant material

- Gasket seals

- Unique strength member clamp assembly

- Spacious fibre management areas

- Flexible drop or cable addition

- Flame-retardant materials

Benefits

- Fits your specific application

- Easy installation and re-entry

- Can be deployed in all environments: buried, underground and arial

- Reusable for easy re-entry

- Prevents cable sheath movement with temperature changes

- All closures provide separate areas for routing, protecting, and expressing buffer tubes and ribbon fibres

- Multiport grommets provide entry for drops or cables

- All 2178 closures are available in a flame-retardant model, giving you even more application choices

2.5 3M™ 2178 Fibre Optic Splice Closure

Specifications

Product Number	Size in. (mm)	Splice Configuration	Cable Entry Ports	Maximum Splice Capacity
> 2178-XSB	14.6 x 10.1 x 4.6 (369.8 x 256.5 x 117.3)	Butt	3 Butt	48 Single Fusion 144 Mass Fusion
> 2178-S	21.9 x 8.5 x 4.7 (556.3 x 215.9 x 119.4)	Inline Butt	4 Inline 2 Butt	96 Single Fusion 288 Mass Fusion
> 2178-SL	21.9 x 8.5 x 8.0 (556.3 x 215.9 x 203.2)	Inline Butt	4 Inline 2 Butt	96 Single Fusion 288 Mass Fusion
> 2178-LS	21.9 x 8.5 x 8.0 (556.3 x 215.9 x 203.2)	Inline Butt	4 Inline 2 Butt	288 Single Fusion 864 Mass Fusion
> 2178-LL	21.9 x 8.5 x 11.3 (556.3 x 215.9 x 287.0)	Inline Butt	4 Inline 2 Butt	288 Single Fusion 864 Mass Fusion
> 2178-XL	27.0 x 13.3 x 11.0 (660.4 x 336.6 x 279.4)	Inline Butt	8 Inline 4 Butt	576 Single Fusion 1728 Mass Fusion

Ordering Information

Product Description	Ref. No.
2178-S Small Fibre Optic Splice Case (Gasket)	**2178-S**
2178-LS Large Fibre Optic Splice Case	**2178-LS**
2178-LL Extra Large Fibre Optic Splice Case	**2178-LL**
2181-LS Cable Addition Kit for 2178-LS series splice case	**2181-LS**

A large range of Accessories are available to complete the 2178 series which will fit perfectly into your application. For more information, don't hesitate to contact your local 3M subsidiary: www.3MTelecommunications.com/eu

2.6 3M™ 2179-CS Closure

Description

The 2179-CS Fibre Optic Splice Closure is a moulded plastic enclosure used for protecting splices in fibre optic cables. It's suitable for buried, underground, aerial, and pedestal applications. The splice closure has two cable entrance ports on each end. Port plugs allow the closure to be used for butt or in-line splices. The rigid non-encapsulated closures provide physical and environmental protection.

The splice closures are suitable for short-term pressurisation during flash testing.

2179-CS closures are delivered with trays and accessories.

*Only 2179-CS/DIN closure is delivered without DIN trays and accessories. To be ordered separately.

Features

- Compact in size (44,7 cm x 17,52 cm x 10,67 cm)

- Fibre capacity up to 48 single fibres
- Accepts variety of splice/protector versions: heat shrink single fusion splice protector, crimp protector, Fibrlok
- Proven sealing technology
- Available in complete kit (with trays + accessories)
- Sliding latch mechanism

Benefits

- Suitable for limited space applications, too. (handholes)
- Applicable for all networks. FTTH/FTTC solutions.
- Covers different splice methods for low fibre count applications
- Wide area of usage: underground, aerial, direct buried, pedestal
- Reduced inventory
- No requirement for special tooling. Saves time and cost
- Easy application

Ordering Information

Product Description	Ref. No.
2179-CS Fibre Optic Closure (w/o tray)	2179-CS/0
2179-CS Fibre Optic Closure (12C w/1 tray)	2179-CS/1
2179-CS Fibre Optic Closure (24C w/2 trays)	2179-CS/2
2179-CS Fibre Optic Closure (36C w/3 trays)	2179-CS/3
2179-CS Fibre Optic Closure (48C w/4 trays)	2179-CS/4
Aerial Hanger Kit	2179-CS/AHK
2180CS Re-entry Accessory Kit	2180-CS/RAK
2179-CS Port Accessory Kit	2179-CS/PAK
2179-CS Pole-mount Kit	2179-CS/PK
2179-CS Fibre Optic Closure (with DIN tray bracket)	2179-CS/DIN

2.6 3M™ 2179-CS Closure

3M FFSS Heat Shrink Fibre Fusion Splice Sleeves

Transparent plastic tube and stainless steel bar for single fibre protector, ceramic strength bar for ribbon fibre protector designed to prevent stress and protect fusion fibre optic splices in field and factory operations. Sleeves are made ethylene vinyl acetate (EVA) with heat-activated memory which causes them to shrink under exposure to heat. Sleeves shrink tightly to exclude air and hold the bar firmly, preventing abrasion of delicate glass fibres.
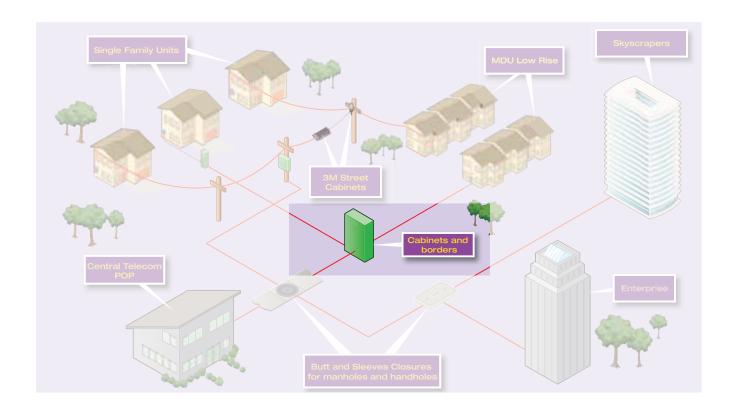
Three different versions are available, single fibre sleeve (60 mm in length). 6 fibre ribbon sleeve (40 mm in length) and 12 fibre ribbon sleeve (40 mm in length). Minimum shrink temperature is 90°C, heating time 2-3 min @ 120°C. Minimum diameter after shrink; for single fibre sleeve 3.00-3.20 mm, for 6 fibre ribbon sleeve is 4.25-4.45 mm and for 12 fibre ribbon sleeve 5.35-5.55 mm.

Ordering Information

Product Description	Ref. No.
FO heatshrink splice protector, 60mm/3 mm diam.	2170-S 3,0 x 60
FO heatshrink splice protector, 45mm/2.4 mm diam.	2170-S 2,4 x 45
FO heatshrink splice protector, 60mm/2.4 mm diam.	2170-S 2,4 x 60
6 fibre ribbon fusion splice sleeve	FFSS-6
12 fibre ribbon fusion splice sleeve	FFSS-12

If you are interested in more information, don't hesitate to contact your local subsidiary:
www.3MTelecommunications.com/eu

3.1 3M™ 8900 Outdoor Distribution Cabinets

Description

The Fibre Distribution Cabinet range is applied for fibre distribution or splitter storage in FTTH deployment. 8900 series cabinet can accommodate 144, 288 or 576 ports.

3M proposes 3 models of fibre cabinets which comply to ROHS version for 144, 288 and 576 couplings:
- 8900DS cabinet
- 8900D cabinet
- 8900DL cabinet

3.1 3M™ 8900 Outdoor Distribution Cabinets

Description

8900 cabinets are pre-terminated with pigtails, couplings and pre-assembled with high performance, low loss optical connectors and optical splitters.

The cabinets are destined for rapid and easy field deployment.

Installation involves mounting the cabinets to pad and then splice the fibre cables in nearby fibre optic closures. The cabinets are provided with lifting ears for use with straps or for mounting u-bolts for easy lifting during installation.

The 8900 cabinet series provides termination, interconnection and splitting in one compartment. The units accommodate either metallic or dielectric OSP cables via sealed grommet entry.

The 8900 cabinet range provides grounding for metallic members and for the cabinets.

The 8900 cabinets are offered in pad mount configurations.

Technical Specifications

Feature	8900DS Splitter Cabinet	8900D Splitter Cabinet	8900DL Cabinet
Fusion Trays:	All-in-one fusion tray with coupling	All-in-one fusion tray with coupling	All-in-one fusion tray with coupling
Capacity:	144 fibre	288 fibre	576 fibre
Tray Capacity:	12 fibre	12 fibre	12 fibre
Tray Number:	12 each	24 each	48 each (24 right, 24 left)
Size (H x W x D):	1220 x 760 x 360 mm	1450 x 760 x 360 mm	1600 x 1420 x 360 mm
	120 bare fibre or 240 ribbon fibre 2 each 1:32 splitter (64 fibre) 4U for 19 inch space Have 36 coupling stop place	120 bare fibre or 240 ribbon fibre 6 each 1:32 splitter (192 fibre)	120 bare fibre or 240 ribbon fibre 8 each 1:32 splitter (256 fibre) 8U for 19 inch space

Ordering Information

Product Description	Ref. No.
8900DS cabinet (empty)	8900DS
8900D cabinet (empty)	8900D
8900DL cabinet (empty)	8900DL
Splice tray (right) with SC coupling and SC/APC pigtail	8012D right
Splice tray (left) with SC coupling and SC/APC pigtail	8012D left

For the following accessories, please, get in touch with your local 3M subsidiary.
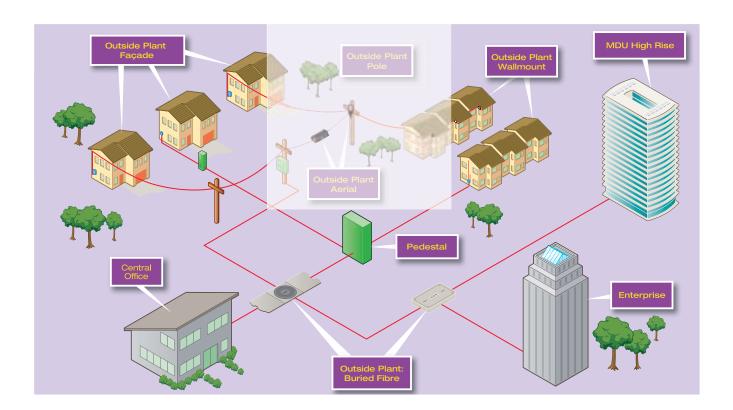
1*32 PLC Splitter (Box 2 mm EXPJKT 1.5 m SC connector)
1*32 PLC Splitter (Box 2 mm EXPJKT 0.5 m SC connector)
2 x 32 PLC Splitter (Box 2 mm EXPJKT 1.5 m SC connector)
19 inch Splitter panel

4. Aerial- and Pole Fibre Distribution

Product Range

> **3M SLIC**

3M SLIC are in-line closures designed for aerial applications. They are free-breathing watertight for direct drops splicing or pre-assembled drops connection.
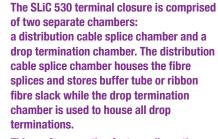
> **3M PBO Size 1**

Delivered complete with 3 trays.
Supports fusion splicing, 3M Fibrlok, Tyco.
Specific mounting bracket for pole installation.

4.1 3M™ SLiC FO Splice Closure

Description

The SLiC fibre aerial terminal closure is an aerial, strand mount, free breathing (breathable) fibre terminal for FTTP (fibre to the premises) applications. It is designed to be used for inline, taut sheath and butt splicing configurations.

The SLiC 530 terminal closure is comprised of two separate chambers: a distribution cable splice chamber and a drop termination chamber. The distribution cable splice chamber houses the fibre splices and stores buffer tube or ribbon fibre slack while the drop termination chamber is used to house all drop terminations.

This craft separation feature allows the installer (I&R craftperson) to terminate and maintain the drop without entering the splice chamber. The 530 terminal closure has the capability of handling 4, 6, 8, and 12 external drop cable terminations.

SLiC fibre closures are tested to Bellcore GR-771-CORE mechanical and environmental requirements for free-breathing closures.

The SLiC fibre aerial terminal closure 530 with external drop termination is Rural Development (RUS) Listed.

Features / Benefits

Features	Benefits
• One-piece construction	• Easy installation and allows access to the cable splice without removing the closure or the terminal
• Separate splice and drop termination chambers	• Allows easy & secure access for service connections and drop maintenance (cleaning & testing) without having to enter the closure splice chamber
• Double-walled construction	• Durable protection from bending & cracking in the most extreme environments
• Spacious fibre management area	• Slack storage basket provides separate area for routing, protecting and "expressing" buffer tubes and ribbon fibres
• Multiple splicing applications	• Accommodates inline and butt end span and midspan as well as taut sheath applications
• Quick-release latches	• Easy installation and re-entry without the need for special tools
• Interlocking ends	• Permits the closure chamber to be extended to protect damaged sheath

4.1 3M™ SLiC FO Splice Closure

3M SLiC 530 Internal Drop Terminations for Direct Spliced Drops

Technical Specifications
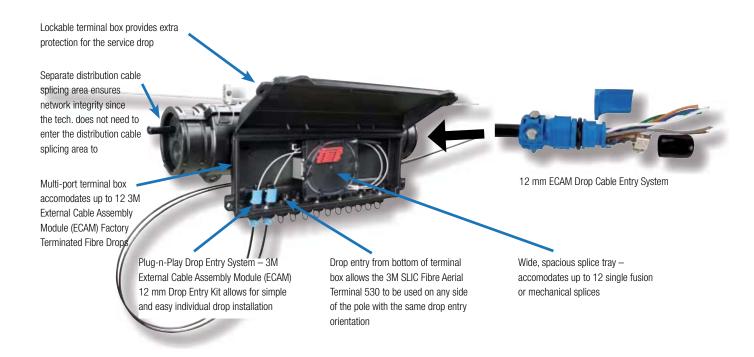
- **Dimensions (L x H x W) mm:**   762 x 264 x 218 mm
- **2 separate chambers:**   - Distribution cable splice

   - Drop termination chamber

- **Cable entry ports and size:**   4 ports - 2 ports per end: 5 - 36 m
- **Splice capacity:**   2 trays with 96 single fusion
- **Accommodates:**   4, 6, 8, & 12 factory terminated SC/APC or SC/UPC ECAM FD fibre drops

- **Designed for strand-mount in-line, butt, or taut sheath single fibre applications**
- **Designed to Telcordia's GR-771-CORE Issue 1, July 1994, Generic Requirements for Fibre Optic Splice Closures - Free-breathing closures**
- **Weather-tight, free-breathing, aerial, strand mount fibre terminal closure**

If you are interested in more information, don't hesitate to contact your local subsidiary:
www.3MTelecommunications.com/eu

4.1 3M™ SLiC FO Splice Closure

3M SLiC 530 Internal Direct Splice

Lockable terminal box provides extra protection for the service drop

Separate distribution cable splicing area ensures network integrity since the tech. does not need to enter the distribution cable splicing area to

Multi-port terminal box accomodates up to 12 3M External Cable Assembly Module (ECAM) Factory Terminated Fibre Drops

12 mm ECAM Drop Cable Entry System

Plug-n-Play Drop Entry System – 3M External Cable Assembly Module (ECAM) 12 mm Drop Entry Kit allows for simple and easy individual drop installation

Drop entry from bottom of terminal box allows the 3M SLIC Fibre Aerial Terminal 530 to be used on any side of the pole with the same drop entry orientation

Wide, spacious splice tray – accomodates up to 12 single fusion or mechanical splices

Technical Specifications

- **Dimensions (L x H x W) mm:**   762 x 264 x 218
- **2 separate chambers:**   - Distribution cable splice
                                        - Drop termination chamber
- **Cable entry ports and size:**   4 ports - 2 ports per end: 5 - 36 m
- **Splice capacity:**   2 trays with 96 single fusion
- **Ports:**   12 round drop: 4 - 12 mm
- **Designed for strand-mount in-line, butt, or taut sheath single fibre applications**
- **Designed to Telcordia's GR-771-CORE Issue 1, July 1994, Generic Requirements for Fibre Optic Splice Closures - Free-breathing closures**
- **Weather-tight, free-breathing, aerial, strand mount fibre terminal closure**

4.2 3M™ PBO Size 1 Distribution Box (Outdoor/Indoor)

Description

PBO Size 1
- Will accommodate up to 30 Fibrlok splices 2540G and 36 fusion splices.
- Organiser with 3 standard trays each allowing splitter integration suitable for for PON networks.
- Termination of dropped cable tubes allowing uncut tubes to cascade to one or more boxes.
- Very flexible box may be installed indoor or outdoor, wall mounted and – because of its dimensions – in a riser.

Content of Standard Product
- BMX10 style box with hinged cover and ¼ turn lock.
- Anchoring point for network cable and customer drops.
- Three trays each with a position for a splitter of
  6 x 10 x 70 mm.

Technical Specifications

Dimensions
- Height: 207 mm
- Width: 240 mm
- Depth: 80 mm

Dielectric strength for installation on an electrical support
- More than 4 kV

Fixing
- Wall mount with 2 x M6 screws
- Metal band (20 x 0.7 mm)
- Metal Mounting Bracket

Splice Protection Box Application

		Capacity	
• Fusion Splice:		36	12 per tray
• Fibrlok Mechanical Splice 2540G:		30	10 per tray
• Splitter 1x8:		3	1 per tray

(1 splitter and 9 fusion splices per 2 slots tray of 10 mm)

Cable Anchorage
- Strain relief bar for main cable and drop cables. Fixed by cable ties.
- Capacity: 1 main cable (may be window cut configuration)
  16 drop cables

Ordering Information

Box

> **PBO Size 1**
- Delivered with 3 splice trays
- Splice holders for fusion or Fibrlok

Ref. No.
N501458A

Fixing Supports
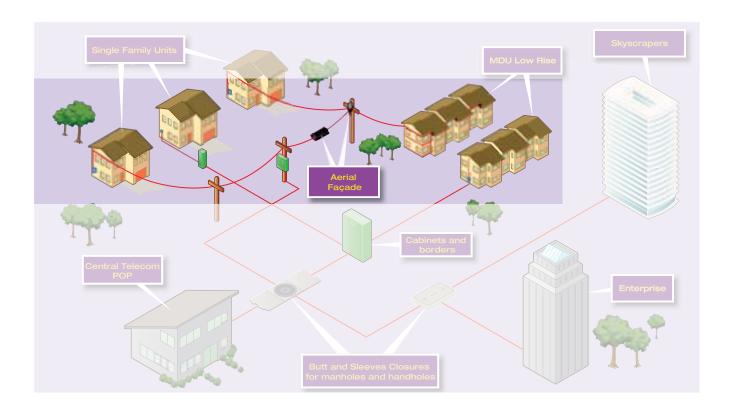
> **PBO Size 1 support**
- Support suitable to install the box into a riser
- Only 1 support is required for PBO size 1

Ref. No.
N711523A

5.1 3M™ Façade Distribution (splicing)

3M PBO Outdoor Splicing and Splitter Protection Boxes

Description

- 2 protection boxes for splices and splitters
- Outdoor or Indoor utilisation
- 36 to 144 fusion splices
- Compatible mechanical splices integration of PLC splitters

5.1 3M™ Façade Distribution (splicing)

Description

PBO Size 1
- Delivered completely with 3 trays
- Splice holders fusion, 3M Fibrlok, Tyco splices

Please, find more information in chapter 4.2

PBO Size 2
- Delivered without Evolution trays
- Organiser with 12 slots

Technical Specifications

Distribution point (splices and splitters)

	Splices capacity	Environment	Dimensions (mm)	Splitter
PBO size 1	36	Façade, Pole, Indoor	270 x 240 x 80	3
PBO size 2	144	Façade, Pole, Indoor	400 x 255 x 86	Up to 12 splitters and 108 splices

5.1 3M™ Façade Distribution (splicing)

Description - 3M PBO Size 2 Distribution Box (Outdoor/Indoor)

PBO Size 2

- Suitable for a branching point or in a building basement. Uses the indoor/outdoor box BDX3000 equipped with the brand new 12 slot organiser from the BPEO size 1.
- Capacity of 72 splices Fibrlok 2540G or fusion splices.
- Ability to accommodate splitter trays.

- Termination of dropped cable tubes allowing uncut tubes to cascade to one or more boxes.
- Very flexible outdoor box, wall mount, indoor and even, thanks to its dimension, in a building riser.

Composition

- BDX3000 style box with hinged cover.
- A strain relief bar to anchor network cable and customer drops.
- An organiser with 12 slots ready to install Evolution trays.

Specifications

Dimensions

- Height: 400 mm
- Width: 255 mm
- Depth: 86 mm

Protection Performance

- IP 55 and IK 06

Fixing

- Wall mounted 4 x M6 screws
- Metal band (20 x 0.7 mm)
- On metal frame

Capacity Splice Distribution Boxes

- Fusion splice: 72 (6 or 12 per tray)
  Fibrlok 2540G: 72 (6 or 12 per tray)
- Splitter 1 by 8:   12 (1 splitter and 9 fusion splices per 5 mm tray)

Cables Anchorage

- Strain relief bar for main cable and drop cables. Fixed by cable ties.
- Capacity: 1 feeder cable (can be window cut); 8 drop cables.
- Additional configurations (consult 3M)
  - Customers drops directly from the box
  - Microducts fed directly to the box

5.1 3M™ Façade Distribution (splicing)

Ordering Information

Box

> **PBO Size 2**
- Delivered complete with 1 BPEO style organiser with 12 slots (without trays)

Ref. No.
N501499A

Fixing Supports

> **PBO Size 1 support**
- Support designed to install the box into the riser
- Two supports are necessary for the PBO size 2 (MOQ = 4)

Ref. No.
N711523A

BPEO Trays

> **K7-1 slot-12 fusion**
- Compatible with 45 or 60 mm fusion splice protectors
- Tray delivered with cover

Ref. No.
N541106A

> **K7-2 slots-12 fusion and splitter**
- Compatible with 45 or 60 mm fusion splice protectors
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Tray delivered with cover

Ref. No.
N541104A

> **K7-2 slots-Universal for 12 splices**
- Accepts mechanical and fusion splices
- Tray delivered with cover

Ref. No.
N541121A

> **K7-1 slot- 9 fusion and splitter**
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 9 fusion splices
- Tray delivered with cover

Ref. No.
N541113A

> **K7-1 slot-6 Fibrlok 4x4**
- Compatible with Fibrlok mechanical splice 2540G
- Tray delivered with cover

Ref. No.
N541103A

> **K7-2 slot- 12 Fibrlok 4x4**
- Compatible with Fibrlok mechanical splice 2540G
- Tray delivered with cover

Ref. No.
N541108A

> **K7-2 slots- 10 Fibrlok 4x4 and splitter**
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 10 Fibrlok 2540G
- Tray delivered with cover

Ref. No.
N541110A

5.2 3M™ OSSC, OSLC and OSC30

Description

- For FTTx applications
- The OSSC and OSLC are watertight protection for window cut cables. These 2 closures are used in the distribution of microcables in mid span access application.
- Designed for outdoor use, wall mounted or pole mounted.
- Their small size allows them to be placed indoors or in distribution ducts.

Composition
- Tool-free closing, re-enterable

One Step Small Closure

Technical Specifications

- Protection performance: IP67
- Material: Thermoplastic
- Colour: Black, white available on demand
- Cable anchoring: Cable ties
- Wall mount: 2 screws
- Cables: window cut, 1 or 2 tube drops

Dimensions / Diameters Operating Window
- **OSSC 121T:** 140 x 36 x 30 mm
  Distribution cable: diameter 6.5 mm maximum
  Drop cable: 1 x diameter 6.5 mm maximum
- **OSSC 122T:** 140 x 36 x 30 mm
  Distribution cable: diameter 6.5 mm maximum
  Drop cable: 2 x diameter 6.5 mm maximum
- **OSLC 222:** 150 x 50 x 40 mm
  Distribution cable: diameter 13 mm maximum
  Drop cable: 2 x diameter 6.5 mm maximum
- **OSC 30:** 290 x 95 x 50
  Distribution cable: diameter from 13 to 18 mm
  Drop cable: 2x diameter from 9 to 13 mm

One Step Large Closure

One Step Closure 30

5.2 3M™ OSSC, OSLC and OSC30

Technical Specifications

Dimensions Summary

	OSSC	OSLC	OSC30
Cable diameters in mm	6,5	13	18
Tubes diameters in mm	2 x 6,5	2 x 6,5	13
Length in mm	140	150	200
Width in mm	36	50	80
Depth in mm	30	40	50
Dimension cavity	16 x 68	30 x 75	55 x 176

Ordering Information

> Mid Span Closure OSSC 121
- One main cable 6.5 mm max diameter
- Two drops 6.5 mm max diameter

Ref. No.
N501425A

> Mid Span Closure OSSC 122
- One main cable 6.5 mm max diameter
- Two drops 6.5 mm max diameter

Ref. No.
N501454A

> Mid Span Closure OSLC 222
- One main cable from 5 to 13 mm
- Two drops 6.5 mm max diameter
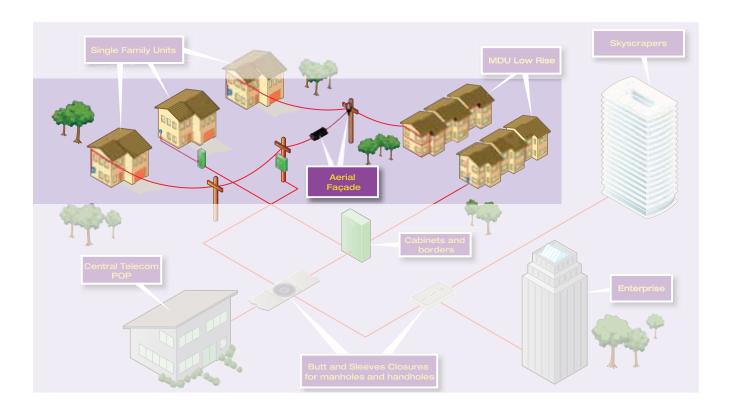
Ref. No.
N501426A

> Mid Span Closure OSC 30
- One main cable from 13 to 18 mm
- Two drop cable from 9 to 13 mm
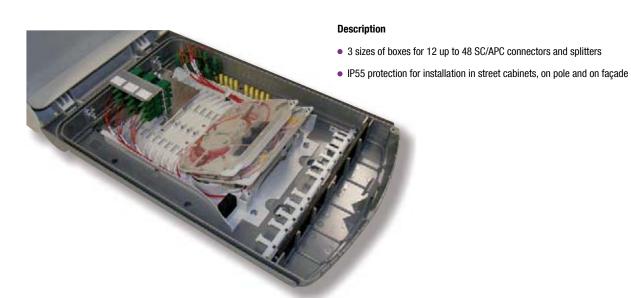
Ref. No.
N501601A

5.3 3M™ Façade Connection

Single Family Units

MDU Low Rise

Skyscrapers

Aerial Façade

Central Telecom POP

Cabinets and borders

Enterprise

Butt and Sleeves Closures for manholes and handholes

3M MDUO Outdoor Connection Boxes

Description

- 3 sizes of boxes for 12 up to 48 SC/APC connectors and splitters
- IP55 protection for installation in street cabinets, on pole and on façade

5.3 **3M™ Façade Connection**

Description

MDUO 12 Configuration for PON & PtoP
- 12 SC/APC connectors
- 84 splices

For more information see chapter X.X

MDUO 24 Configuration for PON & PtoP
- 24 SC/APC connectors
- 144 splices

For more information see chapter X.X

MDUO 40 Configuration for PON & PtoP
- 40 SC/APC connectors
- 144 splices

For more information see chapter X.X

MDUO 48

- For this connection box, please get in touch with your local subsidiary

Specifications

Summary Table for MDUO Connection Boxes

	No. of SC/APC connectors	Environment	Dimensions (mm)	Space* for splices & splitters
MDUO 12	36	Façade, Indoor	400 x 255 x 86	7 slots
MDUO 24	24	Façade, Indoor	400 x 255 x 116	12 slots
MDUO 48	48	Façade, Indoor	400 x 255 x 146	12 slots

*No. of available slots on organiser

5.3 3M™ Façade Connection

Description MDUO 12 Demarcation Box

Multidwelling unit box.

Installed in the building basement to connect 12 customers.

Interface between the network and building distribution. Allows unbundling of the building fibre network between operators.

12 customers connections using SC/APC or SC/PC connectors.

Product composition
- One BDX3000/T2B box with hinged cover
- One 7 slot organiser type BPEO Evolution
- One hinged support plate 12 SC/PC or SC/APC couplings
- One cable strain relief anchor
- One buffer storage section for 24 pigtails

Pre-wiring
- MDUO 12 boxes are pre-wired in the 3M factory with :
  - Evolution trays inserted in the organiser and labelled
  - SC/PC or SC/APC couplings
  - SC/PC or SC/APC pigtails with label flags
  - Pre-connectorised splitters for PON Application

Technical Specifications

Dimensions
- Height: 400 mm
- Width: 255 mm
- Depth: 86 mm

Protection Performance
- IP 55 and IK 06

Dielectric strength for installation on an electrical support
- More than 4 kV

Fixing
- Wall mount - 4 x M6 screws
- Metal band (20 x 0.7 mm)
- On a metal frame

Colour
- Cover - Light grey RAL 7035
- Box - Dark grey RAL 7037

Material
- Thermoplastic and metal
- Flammability rating: UL94 (V0 at 1.5 mm)

Cable Anchoring
- On strain relief bar with cable ties

Security
- May be pre-installed by the 3M factory
- A ¼ turn triangle lock N691022A
- One lock with key (consult 3M)

Connection
- 7 slot organiser with the complete range of Evolution splice trays.
- Maximum capacity: 84 fusion splices

Couplings
- As standard, SC/APC is supplied

Passive Splitters
- As standard, PLC splitters with 250µm tails or pre-connectorised with SC/APC.

5.3 3M™ Façade Connection

Description - Interface Box MDUO 24

Building basement box for 24 customers connections.

Multidwelling unit box.

Interface between the network and building distribution. Allows unbundling of the building fibre network between operators.

24 customer connections on SC/PC or SC/APC connectors.

Product Composition
- One BDX3000 T2M box with hinged cover
- One 12 slot organiser model BPEO Evolution
- One hinged support plate for 24 SC or SC/APC couplings
- One strain relief bar for cables
- One buffer storage device for 30 pigtails

Prewiring
- The MDUO 24 boxes are prewired in the 3M factory with:
  - Evolution trays mounted and labelled
  - SC or SC/APC couplings
  - SC or SC/APC labelled pigtails
  - Bare fibres splitters or pre-connectorised for PON application

Technical Specifications

Dimensions
- Height: 400 mm
- Width: 255 mm
- Depth: 116 mm

Protection Performance
- IP 55 and IK 06

Dielectric strength for installation on an electrical support
- Better than 4 kV

Fixing
- Wall mount - 4 x M6 screws
- Metal band (20 x 0.7 mm)
- On a metal frame

Colour:
- Cover - Light grey RAL 7035
- Box - Dark grey RAL 7037

Material:
- Thermoplastic and metal

Cable Anchoring
- On strain relief bar with cable ties

Security
- May be pre-installed by the 3M factory
- A ¼ turn triangle lock N691022A
- One lock with key (consult 3M)

Connection
- 12 slot organiser with the complete range of BPEO Evolution splice trays.
- Maximum capacity: 144 fusion splices

Couplings
- As standard, SC/APC is supplied

Passive Splitters
- As standard, PLC splitters with 250µm tails or pre-connectorised with SC/APC

5.3 3M™ Façade Connection

MDUO 12 & 24

- MDUO 12 & 24 boxes are prepared in the 3M factory in different prewiring configurations.
- This table gives the options to define the right configuration (additional configurations on demand)

A - Box capacity

- Number of connectors: define the number of couplings installed on the connector support
  MDUO 12 : from 6 to 12
  MDUO 24 : from 5 to 24
- Type of couplings   SC/APC

B - Network wiring side for point to point configuration

- Number of pigtails
- Type of coupling: SC/PC single mode or SC/APC
- Type of tray: for 12 fusion splices or 12 Fibrlok mechanical splices 2540G
- Number of trays: used for the network side

Or Network wiring side for PON configuration (i.e. with splitters)

- Number of splitters: PLC type
- Type of splitter: 1x2, 1x4, 1x8, 1x16
- Number of trays: splitter trays
- Type of tray: 1 slot for 9 fusion splices and 1 PLC splitter
  2 slots for 12 fusion splices and 1 PLC splitter
- Type of termination on incoming fibre: 250µm fibre or preconnectorised
- Type of couplings: SC/PC or SC/APC
- Type of termination on outgoing fibre: 250µm fibre or preconnectorised
- Type of couplings: SC/PC or SC/APC

C - Building wiring side

- Number of pigtails
- Type of coupling: SC/PC single mode or SC/APC
- Type of tray: for 12 fusion splices or 12 Fibrlok mechanical splices 2540G
- Number of trays: used for the building side

Preparation

- All the links are labelled
- The pigtail connections or network side splitters are placed in the buffer storage device
- The building network side pigtails are installed into the couplings
- All the pigtail terminations and splitter terminations are labelled
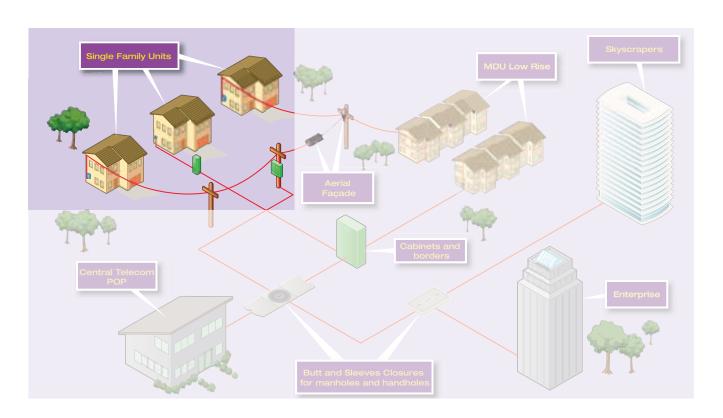
The configuration is on demand, please contact 3M.

**Note: the MDUO product lines have been also designed with LC couplings plates.
Please contact 3M to get stock numbers**

5.4 3M™ Façade Termination

Single Family Units

MDU Low Rise

Skyscrapers

Aerial
Façade

Central Telecom
POP

Cabinets and
borders

Enterprise

Butt and Sleeves Closures
for manholes and handholes

Product range

3M BTI – outdoor branching point

- The BTI is a façade branching box for 4 splices
- Compatibility with fusion- or mechanical splices

3M FTB-M – outdoor splitting point

- The FTB is a façade branching box equipped with 6 SC/APC- or 12 LC/APC connectors

  and with an Evolution splice tray for 12 fusion splices

5.4 3M™ Façade Termination

Description - 3M BTI Transition Box (Outdoor/Indoor)

The BTI

- Splice protection for indoor or outdoor customer drops; mini branching point connect to other drop points.
- Organiser - 1 tray for 4 splices Fibrlok 2540G
- 4 entry ports for 4 mm cable diameter

Product composition

- Base and cover
- Tray with holder for 4 Fibrlok splices 2540G
- 4 elastomer sealing gaskets
- May be mounted outside, indoor or in a riser.

Specifications

Dimensions

- Height: 92 mm
- Width: 90 mm
- Depth: 43 mm

Protection Performance

- IP 54 and IK08
- UL 94 (V0) at 1,5 mm

Fixing

- Wall mount with 2 x M6 screws
- Frame mount with metal band (20 x 0.7 mm)

Capacity Splices Protection Distribution Box

- Mechanical Splice Fibrlok 4x4:   4   (4 per tray)

Sealing / Cable anchorage

- Deformable rubber seals + 1 strain relief bar for drop anchorage

Ordering Information

> **BTI Transition Box**

Ref. No.
N501471A

5.4 3M™ Façade Termination

Description - 3M FTB-M Outdoor Fibre Termination Box

Multi-dwelling unit box to connect 4 to 6 customers, installed indoor / outdoor.

Could be used as an interface between the network and a residential distribution.

Could be used as floor box for building fibre distributions.

- Possible configurations:
  - 4 field mountable connectors
  - 12 fusion splices & 6 SC/APC simplex connectors
  - 8 fusion splices & 8 LC/APC duplex connectors

Content:

- Base
- Cover
- FEM membrane cable gland for incoming grommets
- Exit bend guide
- Tray holder for 5 mm Evolution tray

Fibre Termination Box with field mountable NPC-SC connector

Features

- Two large cable entry ports (1/2" diameter)
- Two small cable entry ports (1/8" diameter)
- All four ports have poke-through grommets
- Clear gasket laid into groove in base of box
- Adapter/coupling plate
- Bend radius control anchor
- Cover can be screwed on the base

Benefits

- Waterproof
- Compact
- Fits into the NPC concept
- Designed for tube anchorage

Specifications

General Product Features

- Dimensions in mm (L x W x H): 130 x 190 x 45
- Electrical insulation: totally insulated

Specifications

Materials	Polycarbonate
Gasket Material	EPDM
Base Colour	RAL 7035
Cover Colour	RAL 7035
Flammability Rating:	UL 94 5V IP54 IK08
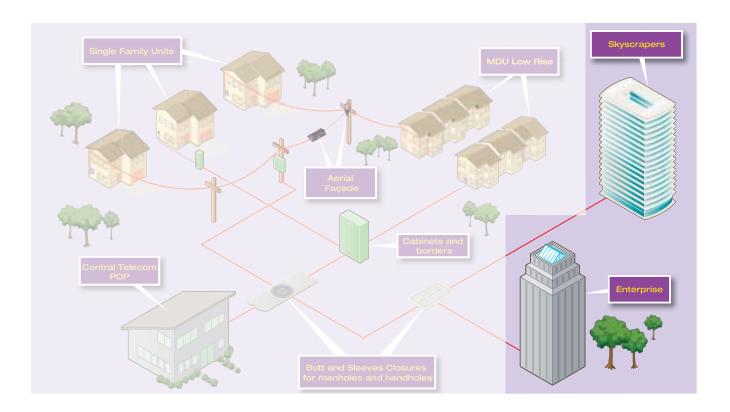
Ordering Information

Product	Ref. No.
> Fibre Termination Box	**FTB-M**

6. 3M™ Solutions for Building Risers

Single Family Units

MDU Low Rise

Skyscrapers

Aerial Façade

Cabinets and borders

Central Telecom POP

Enterprise

Butt and Sleeves Closures for manholes and handholes

Applications

> **Small buildings with up to 4 levels / average of 6 apartments**
  Unbundling OUTSIDE the building or INSIDE the basement
  Options: - 1 fibre/apartment
            - 4 fibre/apartment

> **Medium buildings with 5 - 8 levels / average of about 17 apartments**
  Unbundling OUTSIDE the building or INSIDE the basement
  Options: - 1 fibre/apartment
            - 4 fibre/apartment

> **Large buildings with at least 9 levels / average of about 32 apartments**
  Unbundling OUTSIDE the building or INSIDE the basement
  Options: - 1 fibre/apartment
            - 4 fibre/apartment

6.1 3M™ Solutions for Small Buildings

Small buildings with up to 4 levels / average of 6 apartments
Unbundling OUTSIDE the building or INSIDE the basement
Options: - 1 fibre/apartment
**   - 4 fibre/apartment**

Floor Box
3M PBPO 6-12
or
3M PBPO 12 - 24

Riser cable
with
Window cut

3M PBO Size 2
3M MDUO 12 to 24

6.1 3M™ Solutions for Small Buildings

Description

Small buildings with up to 4 levels / average of 6 apartments
Unbundling OUTSIDE the building or INSIDE the basement
Options: - 1 fibre/apartment
              - 4 fibre/apartment

Floor Box

	No. of Splices	No. of customer connections	Configuration	Cable compatibility
PBPO 6-12	12 mechanical or fusion splices	12	Wall mounted or in riser With protective cover for drops	Window cut cable
PBPO 12-24	24 mechanical or 48 fusion splices	24	Wall mounted or in riser Without protective cover for drops	Window cut and mid span cables

Building Entrance

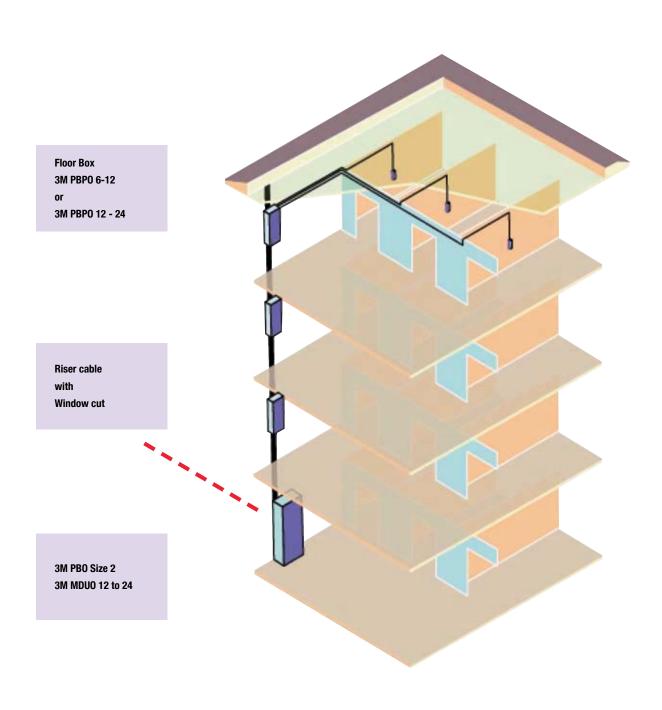|	max. No. of apartments	Type	Configuration PtP	Configuration PON
PBO Size 2	1 main cable - 18 drops	Monobloc, plastic with keylock	72 mechanical splices or 144 fusion splices	Evolution trays compatibility with bare fibre splitter up to 1x32
MDUO 12	12	Monobloc, plastic with keylock	12 connectors on customers' side, 6 connectors network side	12 connectors on customers' side, 1 to 3 splitters 1x4 or 1x8
MDUO 24	24	Monobloc, plastic with keylock	24 connectors on customers' side, 12 connectors network side	24 connectors on customers' side, 1 to 8 splitters 1x4 or 1x8

6.1 3M™ Solutions for Small Buildings

Description - PBPO/C Connection Box (Indoor)

Indoor Connection Box.

Connection interface between vertical distribution and active equipments.

Installation on standard cables and window cut cables.

Product composition

- 1 cable path with 2 strain reliefs for riser cable
- A storage area for buffered fibres and microtubes (cut or uncut).
- A 4 slot organiser from the BPEO Evolution range
- A range of splices trays for fusion splices, mechanical splices or splitters. Capacity of 12 to 48 splices.
- 1 connector panel for 12 SC type couplings.
- The PBPO is available for direct connection of drop cables.

Technical Specifications

Dimensions

- Height: 204 mm
- Width: 158 mm
- Depth: 52 mm

Protection Performance (EN 60529)

- IP 40 and IK08

Fixing

- Wall mounted 2 x M4 screws

Material

- Thermoplastic

Cable anchoring

- Main: on 2 holders (2 cable ties + 2 strain reliefs)

Cable diameters

- Main :   13.5 mm
- Drops :   4.5 mm

Cable types

- Window cut cables, termination cables, or uncut cables.

Connection

- 4 slot organiser to accept any Evolution splice tray
- Buffered fibre management
- Large storage area for fibres and microtubes
- Maximum capacity: 48 fusion splices

Couplings

- Blank ports for SC/APC or SC/PC couplings
- Compatible with duplex LC/PC and LC/APC couplings

6.1 3M™ Solutions for Small Buildings

Ordering Information

> **PBPO 24 Connection Box**
- Equipped with a 4 slot organiser
- 12 blank ports for SC/APC or SC/PC couplings

Ref. No.
N501506A

> **K7-2 slots-Universal for 12 splices**
- Accepts mechanical and fusion splices
- Tray delivered with cover

Ref. No.
N541121A

> **K7-1 slot-12 fusion**
- Compatible with 45 mm or 60 mm fusion splice protectors
- Tray delivered with cover

Ref. No.
N541106A

> **K7-1 slot-6 Fibrlok 4x4**
- Compatible with Fibrlok mechanical splice 2540G
- Tray delivered with cover

Ref. No.
N541103A

> **K7-2 slot- 12 Fibrlok 4x4**
- Compatible with Fibrlok mechanical splice 2540G
- Tray delivered with cover

Ref. No.
N541108A

> **K7-1 slot- 9 fusion and splitter**
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 9 fusion splices
- Tray delivered with cover

Ref. No.
N541113A

> **K7-2 slots-12 fusion and splitter**
- Compatible with 45 or 60 mm fusion splice protectors
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Tray delivered with cover

Ref. No.
N541104A

> **K7-2 slots- 10 Fibrlok 4x4 and splitter**
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 10 Fibrlok 2540G
- Tray delivered with cover

Ref. No.
N541110A

6.1 3M™ Solutions for Small Buildings

Description PBPO 12

Floor Distribution Box.

Interface between vertical distribution and the customer drop cables.

Installation on standard cables and window cut cables.

Product Composition
- 1 cable path with 2 strain reliefs for riser cable.
- A storage area for buffered fibres and microtubes (cut or uncut).
- A 4 slot organiser from the BPEO Evolution range.
- A range of splice trays for fusion splices, mechanical splices or splitters. Capacity of 12 to 48 splices.

PBPO 12 Model
- PBPO 12 is equipped with 12 ports for 12 drops cables. Each port is equipped with a strain relief for each drop, with anchoring for the cable strength member and a rubber gasket for sealing. These two parts are fixed on the cable first and then put into the entry port.

Technical Specifications

Dimensions
- Height: 204 mm
- Width: 158 mm
- Depth: 52 mm

Protection Performance (EN 60529)
- IP 40 and IK08

Fixing
- Wall mounted 2 x M4 screws

Material
- Thermoplastic

Cable anchoring
- Main: on 2 holders (2 cable ties + 2 strain reliefs)
- Drops : 12 entry ports with external anchoring for 1 or 2 drops by cable ties

Cable diameters
- Main: 13.5 mm
- Drops: 4.5 mm

Cable types
- Window cut cables, termination cables, or uncut cables.

Connection
- 4 slot organiser to accept any Evolution splice tray
- Buffered fibre management
- Large storage area for fibres and microtubes.
- Maximum capacity: 48 fusion splices.

6.1 3M™ Solutions for Small Buildings

Description PBPO 24

Floor Distribution Box.

Interface between vertical distribution and the customer drops cable.

Installation on standard cables and window cut cables.

Product Composition
- 1 cable path with 2 strain reliefs for riser cable
- A storage area for buffered fibres and microtubes (cut or uncut).
- A 4 slot organiser from the BPEO Evolution range
- A range of splice trays for fusion splices, mechanical splices or splitters. Capacity of 12 to 48 splices.

PBPO 24 Model
- PBPO 24 is equipped with ports for 12 to 24 drop cables. The drop cable strain relief is made outside the box before fitting into place. Anchoring is by cable ties.

Technical Specifications

Dimensions
- Height: 204 mm
- Width: 158 mm
- Depth: 52 mm

Protection Performance (EN 60 529)
- IP 40 and IK08

Fixing
- Wall mount with 2 x M4 screws

Material
- Thermoplastic

Drops Anchorage
- Main: on 2 holders (2 cable ties + 2 strain reliefs)
- Drops: 12 entry ports with external anchoring for 1 or 2 drops by cable ties

Cable diameters
- Main: 13.5 mm
- Drops: 4.5 mm

Cable types
- Window cut cables, termination cables, or uncut cables.

Connection
- 4 slot organiser to accept any Evolution splice tray
- Buffered fibre management
- Large storage area for fibres and microtubes.
- Maximum capacity: 48 fusion splices.

6.1 3M™ Solutions for Small Buildings

Ordering Information

> **PBPO 12 Floor Box**
- Equipped with a 4 slots organiser
- 12 individual cable relief system for customers branching

Ref. No.
N501505A

> **PBPO 24 Floor Box**
- Equipped with a 4 slots organiser
- 12 entry ports for 1 to 2 cables

Ref. No.
N501504A

> **K7-2 slots-Universal for 12 splices**
- Accepts mechanical and fusion splices
- Tray delivered with cover

Ref. No.
N541121A

> **K7-1 slot-12 fusion**
- Compatible with 45 mm or 60 mm fusion splice protectors
- Tray delivered with cover

Ref. No.
N541106A

> **K7-1 slot-6 Fibrlok 4x4**
- Compatible with Fibrlok mechanical splice 2540G
- Tray delivered with cover

Ref. No.
N541103A

> **K7-2 slot- 12 Fibrlok 4x4**
- Compatible with Fibrlok mechanical splice 2540G
- Tray delivered with cover

Ref. No.
N541108A

> **K7-1 slot- 9 fusion and splitter**
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 9 fusion splices
- Tray delivered with cover

Ref. No.
N541113A

> **K7-2 slots-12 fusion and splitter**
- Compatible with 45 or 60 mm fusion splice protectors
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Tray delivered with cover

Ref. No.
N541104A

> **K7-2 slots- 10 Fibrlok 4x4 and splitter**
- Can accommodate 70 x 10 x 6 mm PLC splitter
- Splice holder for 10 Fibrlok 2540G
- Tray delivered with cover

Ref. No.
N541110A

6.1 3M™ Solutions for Small Buildings

Description

The PBPO 6-12 is an indoor distribution box to splice up to 8 drops on a window cut riser cable. The splicing capacity is up to 12 fusion splices and 6 mechanical Fibrlok splices.

This box is designed with protective covers to hide the cables along the riser wireway.

Content of the kit:
- 1 box with a cover
- 1 splice tray for 6 mechanical splices
- 12 fusion splicing adapters
- 1 anti-twist cable and fan out module devices
- 2 cover extensions

Features

- Extension covers to hide riser cable and cable drops
- Double sided tray

- Width of 64 mm
- Kit of plastic parts

Benefits

- Perfect protection of fibres at the point of derivation
- Separation of connected fibres and the waiting ones in the protection tray
- Installation in narrow riser
- Easy access and fast assembly

6.1 3M™ Solutions for Small Buildings

Technical Specifications

Box
- Overall Dimensions with extension covers:
  404 x 64 x 40 mm
- Colour: white RAL 9010
- Material: Free halogen thermoplastic
- Fixation: 2 screws, Ø 3.5 mm (not supplied)
- Protection: IP40 / IK 08
- Fire resistance: UL 94 V0

Cable entries
- Main cable: 1 window cut cable, Ø 6.6 - 13.5 mm
- Drops: 16 drops, Ø 4.2 - 9 mm

Splicing Management
- 1 tray, one side for splice, one side for storage
  (capacity of 24 fibres – 1.2 m)

Splices
- 6 Fibrlok – 12 fusion splices

Packaging
- 1 kit = base and cover, plus accessories

Accessories
- 1 anti-twist cable module + 4 sets of 3 splicing
  fusion adapters + 1 tray + 2 extension covers

Ordering Information

> **PBPO 6-12 with protection cover**

Ref. No.
N501621A

6.2 3M™ Solutions for Medium Buildings

Description

Medium buildings with 5 - 8 levels / average of about 17 apartments
Unbundling OUTSIDE the building or INSIDE the basement
Options: - 1 fibre/apartment
**   - 4 fibre/apartment**

Floor Box
3M PBPO 6-12
or
3M PBPO 12 - 24

Riser cable
with
Window cut

3M VKA 2 & 4 (1 fibre)

3M MDUO 24 (unbundling 1 fibre)

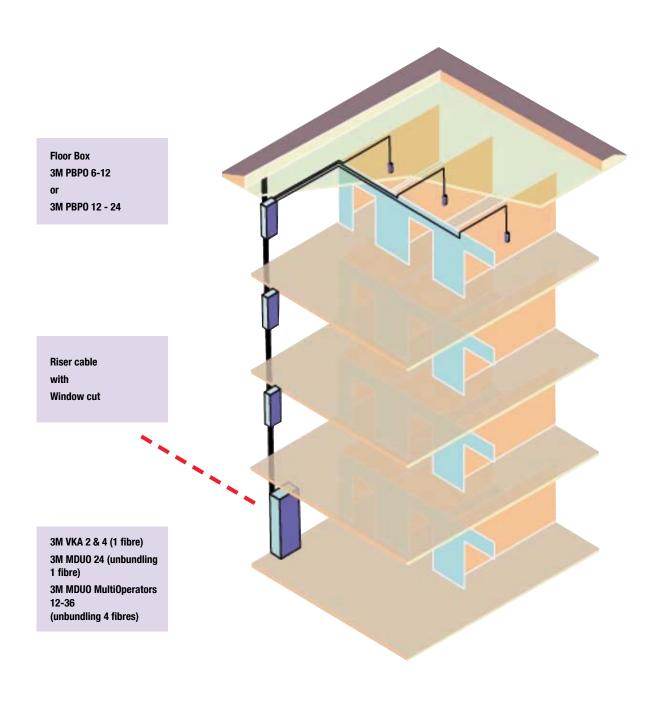**3M MDUO MultiOperators 12-36 (unbundling 4 fibres)**

6.2 3M™ Solutions for Medium Buildings

Description

Medium buildings with 5 - 8 levels / average of about 17 apartments
Unbundling OUTSIDE the building or INSIDE the basement
Options: - 1 fibre/apartment
**   - 4 fibre/apartment**

Floor Box

	No. of Splices	No. of customer connections	Configuration	Cable compatibility
PBPO 6-12	12 mechanical or fusion splices	12	Wall mounted or in riser With protective cover for drops	Window cut cable
PBPO 12-24	24 mechanical or 48 fusion splices	24	Wall mounted or in riser Without protective cover for drops	Window cut and mid span cables

Building Entrance

	max. No. of apartments	Type	Configuration PtP	Configuration PON
VKA2 & 4 HYBRID		Monobloc, metal with keylock	12 & 24 connectors	
MDUO 24	24	Monobloc, plastic with keylock	24 connectors on customers' side, 12 connectors network side	24 connectors on customers' side, 1 to 8 splitters 1x4 or 1x8

6.2 3M™ Solutions for Medium Buildings

3M VKA 2/GF

Description

3M VKA 2/GF

The VKA 2/GF optical fibre distribution box is specifically designed as an interior transfer or termination point for optical fibre runs. It is well-suited to environments where space is limited and a cost effective solution is required.
The VKA 2/GF houses two FO splicing cassettes which can hold up to 24 splice connections. With the addition of a connector mounting plate (optional) the boxes can also be used as a patch distribution frame.
If hybrid cables are used, the modular design of the VKA 2/GF makes it possible for either two 10 pair or one 20 pair copper connector blocks (3M SID-CD) to be accommodates.
Protection rating: IP 40 (DIN 40050)

- Splice or patch distribution frame for 24 splice connections (2 FO splicing cassettes)
- FO connector mounting plates for 12 connectors E2000/SC, ST/FC or 6 connectors SC duplex
- Accommodates hybrid cables using copper connector blocks, either 2x10 pair or 1x20 pair (SID-CD). Overvoltage protection can be used
- Lockable
- Remote monitoring via lid contact

Ordering Information

> VKA 2/GF for 24 splice connections

- Dimensions (H x W x D): 330 x 200 x 100 mm
- Weight: approx. 2.1 kg

  Contents:
- Base plate with earth terminal and attachment for copper connector block
- Cassette tray for FO splicing cassettes
- 2 FO splicing cassettes with splice protection holder
- Housing lid with snap closure
- Cable management, assembly instructions

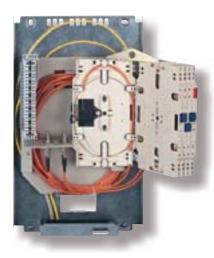|	Ref. No.
	52-303-00030

	Ref. No.
FO connector mounting plates 12 E2000/SC simplex	**52138-019 30**
FO connector mounting plates 12 ST/FC	**52138-018 30**
FO connector mounting plates 6 SC duplex	**52138-016 30**
VKA-Monitoring switch Lid contact only useable in combination with lock kit	**52096-519 00**

3M VKA 2/GF-EFM

Description

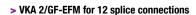### 3M VKA 2/GF-EFM with single fibre management

The VKA 2/GF-EFM serves as a final distribution or splice distribution frame in optical fibre networks and is capable of accommodating up to 12 splice connections in six FO splicing cassettes.
A feature of the VKA 2/GF-EFM is that it provides the opportunity for both single and multiple fibre management. This type of fibre management enables the storage of the splice for a connection to be separate from all other fibres. Ideally, two fibres will be stored in one splicing cassette. Using this method to manage the fibres, existing fibre connections will not be affected, even at later extensions or service work.
By using different connector mounting plates, the VKA 2/GF-EFM can be used as a patch distribution frame. It is possible to install a 10 pair copper connector block (3M SID-CT) for use with hybrid cables.
Protection rating: IP 40 (DIN 40050

- Single-fibre management for up to 12 splicing connections (24 fibres)
- FO cassette stack, completely removable
- Separate cable guide levels for incoming and outgoing sides
- Connector holders for SC, ST or FC connections
- Copper connector block for hybrid cables
- Lockable
- Remote monitoring via lid contact
- Utilises the same design as the VKA distribution frame

Ordering Information
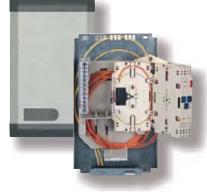

> VKA 2/GF-EFM for 12 splice connections

- Dimensions (H x W x D): 330 x 200 x 100 mm
- Weight: approx. 2.1kg

    Contents:
- Base plate with earth terminal and attachment for copper connector block
- Cassette stack with 6 FO splicing cassettes, hinges and cassette lids included
- Unlocking tools
- Cable management
- Assembly instructions

	Ref. No.
	52-303-00000

	Ref. No.
FO connector mounting plates holders 6 ST/FC	**52138-009 30**
Lock kits VKA lock kit Q2	**52096-523 00**
VKA lock kit Q3	**52096-521 00**
VKA lock kit Q15	**52096-526 00**
VKA-Monitoring switch Lid contact only useable in combination with lock kit	**52096-519 00**

6.2 3M™ Solutions for Medium Buildings

3M VKA/8GF

3M VKA/4GF

Description

3M VKA 4/GF, 3M VKA 8/GF

VKA 4/GF and VKA 8/GF are optical fibre distribution frames capable of housing upto 48 and 96 splice connections in either four or eight FO splicing cassettes, respectively. These capacities can be further expanded to 72 or 144 splice connections by the addition of a further 2 or 4 splicing cassettes. In these cases it will not be possible to install a FO connector mounting plate.
Using optional connector mounting plates, the two splice distribution frames can be converted to patch distribution frames.
The VKA 4/GF can be equipped with one, the VKA 8/GF with two connector mounting plates. For the use of hybrid cables (with copper leads), there is a provision for the installation of 10 pair copper connector blocks (SID-CT).
Protection rating: IP 40 (DIN 40050)

- Capacity as:

  Patch distribution frame, 48 (VKA 4/GF) or 96 (VKA 8/GF) splice connections

  Splice distribution frame, 72 (VKA 4/GF) or 144 (VKA 8/GF) splice connections
- Connector mounting plates for SC, E2000, FC or SC connections
- Copper termination for hybrid cables possible with overvoltage protection
- Remote monitoring via lid contact

Ordering Information

> **VKA 4/GF for 48 splice connections**

> **VKA 8/GF for 96 splice connections**

- Dimensions (H x W x D): 330 x 330 x 125 mm, 550 x 330 x 125 mm
- Weight: approx. 2.8 / 4.9 kg

  Contents:
- Base plate with earth terminal and attachment materials for copper connector blocks
- Cassette tray for FO splicing cassettes
- 4 or 8 splicing cassettes with splice protection holder
- 1 or 2 splicing cassette lids
- Plastic cable inlets and clamping
- Housing lid with snap closure
- Cable management
- Assembly instructions

	Ref. No.
	52-303-00100
	52-303-00200

	Ref. No.
FO connector holders 24 ST/FC	52138-010 30
FO connector holders 12 SC-Duplex	52138-012 30
FO connector holders 24 E2000 / SC-Simplex Installation above the FO splicing cassettes	52138-013 30
VKA-Monitoring switch Lid contact only useable in combination with lock kit	52096-519 00

6.2 3M™ Solutions for Medium Buildings

Description

MDUO 12 Configuration for PON & PtoP

- 12 SC/APC connectors
- 84 splices

MDUO 24 Configuration for PON & PtoP

- 24 SC/APC connectors
- 144 splices

Specifications

Summary Table for MDUO Connection Boxes

	No. of SC/APC connectors	Environment	Dimensions (mm)	Space* for splices & splitters
MDUO 12	12	Façade, Indoor	400 x 255 x 86	7 slots
MDUO 24	24	Façade, Indoor	400 x 255 x 116	12 slots

*No. of available slots on organiser

6.3 3M™ Solutions for Large Buildings

Description

Large buildings with at least 9 levels / average of about 32 apartments
Unbundling OUTSIDE the building or INSIDE the basement
Options: - 1 fibre/apartment
**   - 4 fibre/apartment**

Indoor Floor Box
3M PBPO 6-12
or
3M PBPO 12 - 24

Riser cable
with
mid span access

3M KA8 and CDS 200
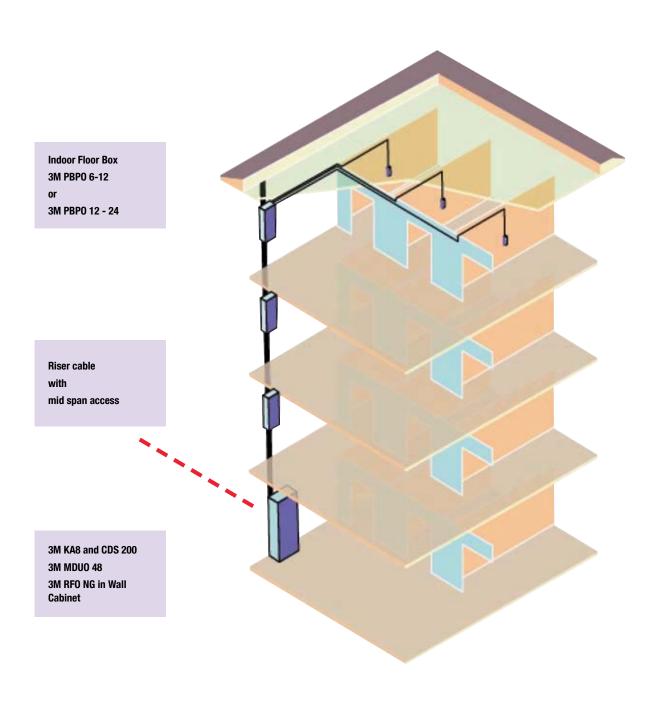**3M MDUO 48**
3M RFO NG in Wall Cabinet

6.3 3M™ Solutions for Large Buildings

Description

Large buildings with at least 9 levels / average of about 32 apartments
Unbundling OUTSIDE the building or INSIDE the basement
Options: - 1 fibre/apartment
**   - 4 fibre/apartment**

Floor Box

Refer page xx for PBPO 6-12 & PBPO 12-24 description

Building Entrance

	max. No. of apartments	Type	Configuration PtP	Configuration PON
VKA8	72	28 trays / 288 fusion splices	Splicing 4 operators cables, max. 96 fibres each	1 riser cable and 72 drops of 4 fibres each
CDS 200	72	28 trays / 288 fusion splices	Splicing 4 operators cables, max. 96 fibres each	1 riser cable and 72 drops of 4 fibres each
MDUO 48	48	Monobloc, plastic with keylock	48 connectors customers side, 24 connectors network side	48 connectors customers side, 1 to 8 splitters 1x4 or 1x8
RFO NG in Wall Cabinet with 1 cable head	72	Monobloc, metal with keylock	72 connectors customers side, 288 fusion splices	
RFO NG in Wall Cabinet with 1 cable head	144	Monobloc, metal with keylock	144 connectors customers side, 576 fusion splices	

6.3 3M™ Solutions for Large Buildings

Description - 3M VKA 8 SCM for direct splicing

The VKA 8 SCM is an indoor splicing box for building basements. It is the interface between the network and the building distribution. The organiser may be equipped with Evolution trays which are as well designed for fusion & mechanical splices as for splitter integration up to 1x32 PLC splitters.

Content of the kit:

- 1 box with a cover
- 1 key lock
- 1 organiser 28 slots for 28 splice trays with max. 12 fusion splices
- Evolution trays have to be ordered separately and allow every kind of combination

Features

- Standard box and organiser
- Minimum thickness and dimensions
- Box and cover in plastic & metal
- Removable cover
- Large cable entry ports
- Efficient locking mechanism

Benefits

- Production in big series
- Compatibility for basement application
- Strong ???
- Open access for splicing activities
- Perfect for multidrops distribution
- Vandalism proof

Technical Specifications

Box

- Overall Dimensions with extension covers: 550 x 330 x 125 mm
- Colour: Cover beige and brown
- Material: Galvanised steel and thermoplastic
- Fixation: 4 screws, Ø 6 mm (not supplied)
- Protection: IP40 / IK 08
- Fire resistance: UL 94 V0
- Security: delivered with 1 key lock

Splicing Management

- 1 Organiser with 28 slots for Evolution trays

Splices

- Whole range of Evolution trays (More information in chapter 2.1)

Ordering Information

> **VKA 8 SCM**

- 1 organiser with 28 slots

Ref. No.
N501561A

Trays have to be ordered separately
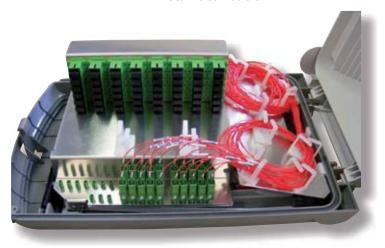
6.3 3M™ Solutions for Large Buildings

Description MDUO 48 Interface Box

Building basement box for 48 customer connections.

Multidwelling unit box.

Interface between the network and building distribution. Allows unbundling of the building fibre network between operators.

48 customer connections on SC/PC or SC/APC connectors.

Product Composition
- One BDX3000/T2H box with hinged cover
- One 12 slot organiser model BPEO Evolution
- One hinged support plate for 48 SC or SC/APC couplings
- One strain relief bar for cables
- One buffer storage device for 30 pigtails

Pre-wiring
- The MDUO 48 boxes are pre-wired in the 3M factory with:
  - Evolution trays mounted and labelled
  - SC or SC/APC couplings
  - SC or SC/APC labelled pigtails
  - Bare fibre splitters or pre-connectorised for PON application

Technical Specifications

Dimensions
- Height: 400 mm
- Width: 255 mm
- Depth: 146 mm

Protection Performance
- IP 55 and IK 06

Dielectric strength for installation on an electrical support
- Better than 4 kV

Fixing
- Wall mount - 4 x M6 screws
- Metal band (20 x 0.7 mm)
- On a metal frame

Colour:
- Cover - Light grey RAL 7035
- Box - Dark grey RAL 7037

Material:
- Thermoplastic and metal

Cable Anchoring
- On strain relief bar with cable ties

Security
- May be pre-installed by the 3M factory
- A ¼ turn triangle lock N691022A
- One lock with key (consult 3M)

Connection
- 12 slot organiser with the complete range of Evolution splice trays.
- Maximum capacity: 144 fusion splices

Couplings
- As standard, SC/APC is supplied

Passive Splitters
- As standard, PLC splitters with 250µm tails or pre-connectorised with SC/APC

6.3 3M™ Solutions for Large Buildings

MDUO 48

- MDUO 48 boxes are prepared in the 3M factory in different pre-wiring configurations.
- This table gives the options to define the right configuration (additional configurations on demand)

A - Box capacity
- Number of connectors: define the number of couplings installed on the connector support
                                           MDUO 48 : from 5 to 48
- Type of couplings   SC/APC

B - Network wiring side for point to point configuration
- Number of pigtails
- Type of coupling: SC/PC single mode or SC/APC (for LC/APC please consult 3M)
- Type of tray: for 12 fusion splices or 12 Fibrlok mechanical splices 2540G
- Number of trays: used for the network side

Or Network wiring side for PON configuration (i.e. with splitters)
- Number of splitters: PLC type
- Type of splitter: 1x2, 1x4, 1x8, 1x16
- Number of trays: splitter trays
- Type of tray: 1 slot for 9 fusion splices and 1 PLC splitter
                                           2 slots for 12 fusion splices and 1 PLC splitter
- Type of termination on incoming fibre: 250µm fibre or pre-connectorized
- Type of couplings: SC/PC or SC/APC (for LC/APC please consult 3M)
- Type of termination on outgoing fibre: 250µm fibre or pre-connectorized
- Type of couplings: SC/PC or SC/APC (for LC/APC please consult 3M)

C - Building wiring side
- Number of pigtails
- Type of coupling: SC/PC single mode or SC/APC (for LC/APC please consult 3M)
- Type of tray: for 12 fusion splices or 12 Fibrlok mechanical splices 2540G
- Number of trays: used for the building side

Preparation
- All the links are labelled
- The pigtail connections or network side splitters are placed in the buffer storage device
- The building network side pigtails are installed into the couplings
- All the pigtail terminations and splitter terminations are labelled

The configuration is on demand, please contact 3M.

6.3 3M™ Solutions for Large Buildings

Description - 3M RFO NG in Wall Cabinet

The RFO NG in Wall Cabinet is available in a 2 configurations :

- with one cable head / 144 SC/APC connectors for buildings with up to 72 apartments
- with two cable heads / 288 SC/APC connectors for buildings with up to 144 apartments

The wall cabinet is installed at first in the building basement and tray modules are added according to the fibre deployment increase.

This is the solution for max. 4 operators to share one riser in buildings with up to 32 apartments.

Content of the kit:

- One metal cabinet 800 x 600 x 300
- Frame accessories to fix components
- One break-out device for riser cable
- Four break-out devices for operator cable
- 1 or 2 cable heads with 12 swivelling drawers

Trays have to be ordered separately

Features

- Density for 288 SC/APC connectors

- Size: 800 x 600 x 300 mm
- Room reserved at first
- Modularity

Benefits

- Same components like for RFO NG without cabinet
- Compacity
- No risk of conflict with utility installation
- Progressive expense according to fibre distribution growth

This product is coming soon.

For further information, please, get in touch with your local 3M subsidiary.

3M 2552 SA Wall Mount Fibre Distribution Box

3M 8686 Termination Box

3M SC Couplings / Pigtails

3M LC Couplings / Pigtails

3M FC Couplings / Pigtails

3M E2000 Couplings / Pigtails

3M Single-mode Patchcords

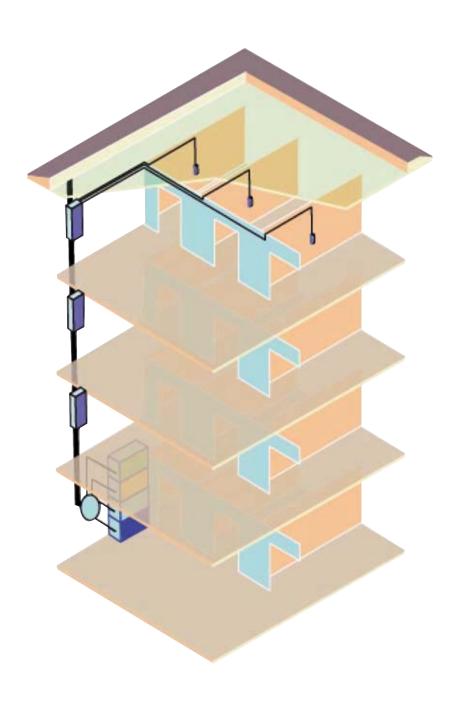**3M Fibrlok - Smart connectivity for the "Last Mile"**

3M NPC-SC and NPC-SC/ APC No Polish Connector

3M NPC-LC and NPC-LC/ APC No Polish Connector

3M PLC Optical Splitters

3M 19" Splitter Panels

3M Hotmelt and Crimplok Connector

7.1 **3M™ Wall Outlets**

Description - 3M 2552 SA Wall Mount Fibre Distribution Box

The 3M 2552 SA offers excellent fibre management in an affordable box with an attractive, low profile design able to be wall mounted anywhere in your LAN network. The box is also suitable for housing consolidation points.

The 2552 SA series brings efficient use of space as well as functionality and rugged durability. The boxes have a unique sliding lid to provide easy access to couplings and fibre management.

Interchangeable connector panels are available to accommodate:

ST simplex & duplex couplings, SC duplex couplings, FC flanged couplings, FC "D" mount couplings, and the 3M Volition VF-45 Socket.

Fibres can either be directly terminated or spliced to pigtails using either Fibrlok or fusion splicing. The 2552 SA is constructed from flame retardant material.

The 2552 SA is part of 3M's large family of fibre optic products including connectors, couplings cable assemblies splices and more.

Ordering Information

> **2552SA**

- Dimensions (H x W x D): 210 x 160 x 65 mm
- Weight: approx. 0,5 kg/ea.
- MOQ: 10 units

  Content:
  Exchangeable face plates for:
- ST simplex
- FC-"D" Mount
- SC duplex plate up to 12x fibres

Ref. No.
2552SA

7.1 3M™ Wall Outlets

Description - 3M 8686 Termination Box

8686

- Wall mount hybrid box for customer premises.
- 86 x 86 mm format for 2 SC simplex or LC duplex couplings and one RJ45 copper jack. The 8686 may be used instead of the current telecommunications outlet.
- Flexible optical installation - both splicing to pigtails or field mountable connectors 3M NPC type or equivalent may be used.
- The box contains two holders for 3M Fibrlok mechanical splices or heat shrink fusion splice protectors.

- 6 slots for incoming cables and 1 additional opening in the centre for cable entry through an underwall box.
- Compatible with all 4 mm diameter round cable.

Content

- Base
- Cover
- Holder for 2 Fibrlok splices or equivalent

Technical Specifications

Dimensions

- Height: 86 mm
- Width: 86 mm
- Depth: 35 mm

Minimum bending radius

- 30 mm for direct connector termination
- 20 mm on spliced pigtails

Fixing

- Wall mount with two screws or directly on 60 mm underwall box

Optical connection

- Round customer cable 4 mm diameter
- Anchoring point for cable

Connection Compatibility

- SC simplex or LC duplex coupling
- Field mountable simplex SC or LC termination with 3M NPC type or equivalent
- SC or LC pigtails with Fibrlok splices
- Cat 5 RJ45 keystone copper connection

Ordering Information

> **8686 FTTH Wall Outlet**

	Ref. No.
	8686

7.1 3M™ Wall Outlets

Description - 3M VOL-0255 FTTX Wall Outlet and Keystone adapter

The 8687 is an adapter that converts outlet ports with keystone latching to allow the implementation of SC simplex couplings.

This adapter can be used in patch panels as well as other outlets, like the 3M VOL-0255 or VOL-0256 Wall outlets.

An integrated spring loaded flap closes the port after unplugging the SC connector and protects against laser radiation as well as dust.

This adapter is the ideal product for FTTH wall outlets on customer premise, like apartments etc. and accommodates all SC simplex flanged couplings which are according to IEC 60874-14.
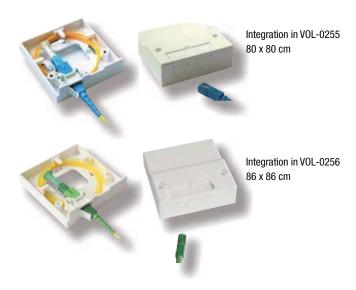
Features

- Keystone latching
- Spring loaded dust flap

Benefits

- Converts most keystone ports to SC simplex
- Protects against laser radiation and dust

Applications

Integration in VOL-0255
80 x 80 cm

Integration in VOL-0256
86 x 86 cm

Ordering Information

> Keystone SC Adapter
- PU: 100 ea / box (10 ea. / bag; 10 bags / box)

	Ref. No.
	8687

7.2 3M™ Couplings / Connectors / Pigtails

Description

3M SC-Connectivity

SC connectivity still is the master of choice for the majority of FTTH network concepts. The proven reliability and broad availability gives every network consultant the security and planning safety without any need for approval tests.
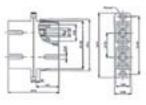
3M offers a variety of SC products, as SC/NPC connectors, SC pigtails, patch cords and couplings for PC and APC endface technology.
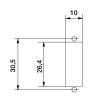
Ordering Information

3M SC Couplings / Pigtails

	Ref. No.
> **SC Duplex Coupling, multimode** Plastic housing, grey, mounting bracket included, PU: 60 pcs	**6313**
> **SC Duplex Coupling, single-mode** Plastic housing, blue, mounting bracket included, PU: 60 pcs	**8313**
> **SC Coupling, multimode** Simplex, grey, mounting springs included, PU: 60 pcs	**6310**
> **SC Coupling, single-mode** Simplex, blue, mounting springs included, PU: 60 pcs	**8310-E**
> **SC/APC Coupling, single-mode** Simplex, green, mounting springs included, PU: 60 pcs	**8310-GE**

10

30,5 26,4

1,6 mm max. for quick assembly spring
12,0 mm max. for Screw installation

9,6

13,6 18,0
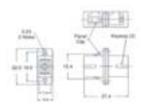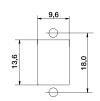
SC duplex coupling   **Hole pattern**   **Sheet thickness**   **SC duplex coupling**   **Hole pattern**

Coupling/Connector type	6313	8313	6310	8310-E	8310-GE
Type	Multimode	Single-mode	Multimode	Single-mode	Single-mode
Simplex/Duplex	for duplex	for duplex	simplex	simplex	simplex
Sleeve	Phosphor bronze	Zirconia ceramic	Zirconia ceramic	Zirconia ceramic	Zirconia ceramic
Housing	Plastic, gray	Plastic, blue	Plastic, gray	Plastic, blue	Plastic, green
Operating temp.	-40°C to 75°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C

7.2 3M™ Couplings / Connectors / Pigtails

SC/APC 8°-SC/PC Patch Cord

SC/APC 8°-SC/APC 8° Patch Cord

Description

Patch Cords SC/APC 8°-SC/PC SC/APC 8°-SC/APC 8°

Only standard length patch cords are available from stock. Please contact your local 3M customer service first for stock status.

Specifications

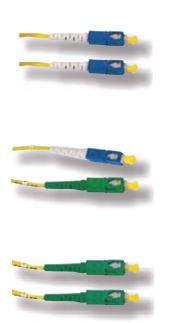|	
Adhesive type:	Epoxy
Fibre type:	9/125
Insertion Loss:	< 0,2 dB typ.
Return Loss:	≥ 70 dB typ.
Ferrule:	Zirconia Ceramic
Housing:	Plastic, blue (SC/PC) Plastic, green (SC/APC)
Boot colour:	Green (APC) White (SC)
Operating Temperature:	-40°C to 85°C
Storage Temperature:	-40°C to 80°C
Cable Type:	I-VH 19/125, LSZH
Jacket colour:	yellow
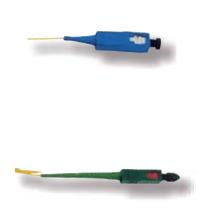
Ordering Information

	Ref. No.
> SC-SC Patch cords, single-mode, simplex	
9/125µm, yellow jacket colour	
Length: 1 m PU: 12 pcs	**ADADA-AT0001**
Length: 2 m PU: 12 pcs	**ADADA-AT0002**
Length: 3 m PU: 12 pcs	**ADADA-AT0003**
Length: 5 m PU: 12 pcs	**ADADA-AT0005**
> SC/APC 8°-SC/PC Patch cords, single-mode, simplex	
9/125µm, yellow jacket colour	
Length: 1 m PU: 12 pcs	**AEPDA-AT0001**
Length: 2 m PU: 12 pcs	**AEPDA-AT0002**
Length: 3 m PU: 12 pcs	**AEPDA-AT0003**
Length: 5 m PU: 12 pcs	**AEPDA-AT0005**
> SC-SC Patch cords, single-mode, simplex	
9/125µm, yellow jacket colour	
Length: 1 m PU: 12 pcs	**AEPEP-AT0001**
Length: 2 m PU: 12 pcs	**AEPEP-AT0002**
Length: 3 m PU: 12 pcs	**AEPEP-AT0003**
Length: 5 m PU: 12 pcs	**AEPEP-AT0005**

7.2 3M™ Couplings / Connectors / Pigtails
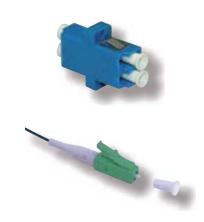
Ordering Information

3M SC Pigtails

	Ref. No.
> SC Pigtail 9/125, single-mode fibre, easy stripp Length: 2 m, PU: 12 pcs	**ADA00-AU0002**
> SC Pigtail 9/125, single-mode fibre tight buffer Length: 2 m, PU: 12 pcs	**ADA00-AU0002**
> SC/UPC Pigtail 9/125, single-mode fibre, easy stripp Length: 3 m, PU: 12 pcs	**AEQ00-AU0003**
> SC APC 8° Pigtail 9/125, single-mode fibre, easy stripp Length: 2 m, PU: 12 pcs	**ADE00-AU0002**
> SC APC 9° Pigtail 9/125, single-mode fibre, easy stripp Length: 2 m, PU: 12 pcs	**ABP00-AU0002**

3M LC Couplings / Pigtails
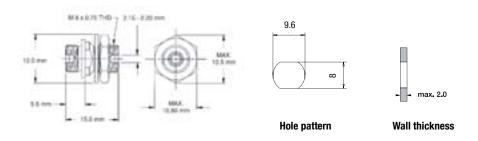
	Ref. No.
> LC-Coupling, single-mode Duplex, blue plastic housing in SC-Simplex format, PU: 60 pcs	**8661-DC**
> LC Pigtail 9/125, single-mode Yellow, length: 2 m, PU: 12 pcs	**ADV00-AU0002**
> LC/APC Pigtail 9/125, single-mode Yellow, length: 2 m, PU: 12 pcs	**ADW00-AU0002**

Ordering Information

3M FC Couplings / Pigtails
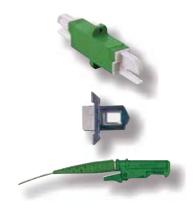
	Ref. No.
> FC-Coupling, single-mode for D hole mounting spacers and nut included, PU: 60 pcs	**8211**
> FC-APC-Coupling, single-mode for D hole mounting spacers and nut included, PU: 60 pcs	**8211-APC**
> FC-Pigtail 9/125, single-mode Fibre Length: 2 m, PU: 12 pcs	**AEN00-AU0002**
> FC-APC 8° Pigtail 9/125, single-mode Fibre Length: 2 m, PU: 12 pcs	**AEX00-AU0002**

Hole pattern   **Wall thickness**
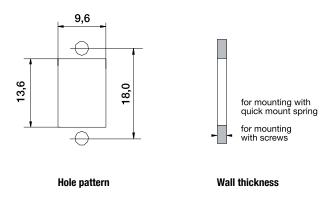
Connector	8211	8211-APC
Type	Single-mode	Single-mode
Sleeve	Zirconia ceramic	Zirconia ceramic
Housing	Metal	Metal
Operating temperature	-40°C to 85°C	-40°C to 85°C

7.2 3M™ Couplings / Connectors / Pigtails

Ordering Information

E2000 Couplings / Pigtails

	Ref. No.
> E2000/APC coupling, single-mode Simplex, green, 2 mounting screws included, PU: 1 pc	**05-751-13400**
> E2000 Simplex, metal mounting clamp for screw-less mounting of E2000 connectors, PU: 10 pcs	**05-750-14100**
> E2000/APC 8° Pigtail 9/125, single-mode Fibre for screw-less mounting of E2000 connectors, PU: 1 pc	**05-706-03900**

9,6

13,6

18,0

for mounting with
quick mount spring

for mounting
with screws

Hole pattern   **Wall thickness**

Connector type	E2000/APC
Type	Single-mode
Sleeve	Zirconia ceramic
Housing	Plastic, green
Adhesive type	Epoxy
Fibre Type	9/125
Insertion loss	< 0.2 dB typ.
Return loss	> 75 dB typ.
Ferrule	Zirconia ceramic
Housing / Body	Plastic
Boot	green
Operating temperature	-40°C to 85°C
Storage temperature	-40°C to 85°C

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

3M Fibrlok II Universal Optical Splice 2529

Description

The right splice for today's applications.

The 3M Fibrlok II Optical Fibre Splice 2529 has a proven record of consistent performance that makes it the right choice for FTTX metro and enterprise network applications ranging from one gigabit to 10 gigabit data rates. The simplicity of the splice tool is the reason that the Fibrlok is so relevant to today's need for low cost rugged splicing equipment at multiple locations. The simple process minimizes the need for training and highly skilled technicians. The ability to reposition the fibres within the splice provides a high yield. All these features add up to faster installations and increased productivity in both restoration and construction applications.

Since the Fibrlok was released in 1988, 10 millions of Fibrlok splices have been installed around the world in many different types of applications, both indoor and outdoor. A global list of customer approvals for both restoration and construction is available upon request from your local representative. The Fibrlok II Splice 2529 uses a metallic splicing element held inside a molded plastic body and cap that is designed for splicing any combination of 250 to 900µm coated fibres. The Fibrlok splice can be used with either single-mode or multimode fibres with a nominal glass cladding of 125µm and the splice insertion loss averages less than 0.1 dB. Fibre retention is greater than one pound. The splice provides stable performance from -40° to 80° C.

The Fibrlok II Universal Optical Fibre Splice 2529 can be used with either single-mode or multimode fibres with a (nominal) glass cladding diameter of 125µm.

The 3M Fibrlok splice can be used in aerial, buried, underground, pedestal applications, inside or outside buildings, or as a high-density substitute for Fibre optic connectors in FTTH (Fibre-to-the-Home).

Features

- Universal splice for single- and multimode fibres
- Installation time less than 30 seconds
- For all 250µm and 900µm coated fibres
- Identical strip lengths for all coatings
- Repositioning of the two fibres possible
- Extended live cycle (> 30 years)
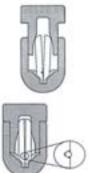- Complies to international standards

Benefits

- For all fibre connections (125µm)
- Quick and cost effective
- Universal applications
- Installer friendly
- Optimized insertion loss
- Reliable
- Saves investment

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Specifications

Technical		Environmental	
Fibre diameter:	125µm	Operating temperature:	0 mm
Coating diameter:	250 to 900µm	Thermal cycling:	Change in insertion loss <0.5 dB, -40° to 80° C
Shelf life:	> 30 years		
Installation time	< 30 seconds after fibre preparation	Fungus resistance:	ASTM G-21-70; rating 0
		Vibration:	EIA standard FOTP-11, test condition 1
Mean insertion loss:	< 0,1 dB	Water immersion:	7 Days @ 43° C; change in insertion loss 0.05 dB
Reflectance:	> 35 dB from –40°C to +80°C > 60 dB typical at room temperature		
Tensile strength:	> 4,5 N, typical 13 N		
Material:	Engineering thermoplastic with aluminum alloy element; UL 94, V-0 rating		

Fibre Diameter:	125µm
Coating Diameter:	250µm or 900µm Tight Buffer
Operating temperature	-40ºC to 75ºC (-40ºF to 167ºF)
Mean insertion loss:	< 0.1dB
Return loss:	< -40dB Typical
Dimensions (W x H x L):	12.9 mm x 12.0 mm x 66 mm

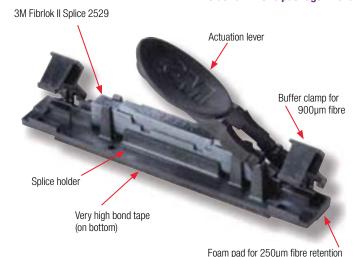**Cross-sectional view of open and actuated 3M Fibrlok II Splice 2529**

After preparation, the fibres are inserted into the Fibrlok II splice element. The actuation lever is then used to close the cap, forcing the clamping and locating surfaces against the fibres and aligning the fibres precisely and permanently in place.

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Ordering Information

> **3M Fibrlok Universal Splice**

Ref. No.
2529

> **3M Fibrlok Universal Spliceholder**
- For 6 seperate Fibrlok 2529 within the DIN Splicetray

Ref. No.
2599-H

> **DIN Universal Splice Tray**

Ref. No.
29026-500 31

> **Fibrlok II Splice/Holder**
- 60/package

Ref. No.
2539

> **Fibrlok II Splice/Holder with SC/APC Pigtail**
- 12/package

Ref. No.
2539 SC/APC

> **Fibrlok II Splice/Holder with SC/UPC Pigtail**
- 12/package

Ref. No.
2539 SC/UPC

> **Fibrlok Splice Preparation Kit with Cleaver**
- 1 each

Ref. No.
2504

> **Fibrlok Splice Preparation Kit without Cleave**
- 1 each

Ref. No.
2559

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Description

3M Fibrlok II splice/holder integrates the 3M Fibrlok II splice 2529, actuation tool, and holder all in one package. It enables

3M Fibrlok II Splice 2529

Actuation lever

Buffer clamp for 900µm fibre

Splice holder

Very high bond tape (on bottom)

Foam pad for 250µm fibre retention

fast, on-site installation without a separate assembly tool or splice tray.

Designed for restoration of broken fibre and the final Fibre-to-the-Premise (FTTP) drop connection, it can be easily used with singlemode or multimode fibres with 250µm or 900µm tight buffer.*

Clamps on each side of the splice provide strain relief for the 900µm tight buffer for long-term stability and reliability. Very high bond tape on the bottom of the splice/holder permanently holds it at the splice location, which is especially useful at optical network terminals.

SC/UPC

SC/APC

The Fibrlok II splice/holder is also available with a pre-terminated SC/APC or SC/UPC pigtail (0.75 m / 30 inches) for easy installation. Pigtail is fabricated with 10 mm radius, bend insensitive, zero water peak fibre.

Applications
- Inside or outside buildings
- Terminals
- Network interface devices (NIDs)
- Fibre distribution units
- Wall outlets

Features

- Integrated splice, holder & actuator
- Push button actuation
- Buffer clamps
- Foam retention pad
- Adhere with VHB tape
- Pre-terminated SC pigtail

Benefits

- No need for separate tray or actuation tool
- Easy splice operation
- Provide 900µm fibre strain relief
- Used for 250µm fibre splicing
- Flexible placement within terminal box
- Only one fibre needs to be prepared

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Description - Fibrlok 2540G Fibre Splice

3M Fibrlok 250μm Fibre Splice enables fast, easy splicing of 250μm single-mode fibre in Fibre-to-the-Premises (FTTP) installations. It can also be used in multi-mode LAN installations or any other application where 250μm coated fibre is spliced. This low-loss reliable splice can be installed by non-specialized technicians.

A Fraction of the Tooling Cost

The simple rugged splicing tool is inexpensive, portable, requires no power and can be used in any environment. Several crews can be equipped for less than the cost of a fusion splicer.

Fast Installation Time

Installation rate is generally twice as fast as a fusion splicer for FTTP applications where only one or two splices are required. No wait time for warm up needed.

Applications
• Inside or outside buildings
• Fibre Closures and Terminals
• FTTP Drop Cables

Features

• Low loss and back reflection
• Simple splicing process
• Strong fibre retention
• Superior matching gel
• Rugged portable splice tool

Benefits

• Reliable high yield splices
• Increased installation rate
• Prevents fibre movement for stable performance
• Maintains quality of transmission over time
• Low expense to equip crews

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Specifications

Fibre type:	125µm fibre, 250µm coating
Operating temperature:	-40ºC to 75ºC (-40ºF to 167ºF)
Pull out strength:	4.4N (1.0 lbf)
Insertion loss:	0.06 dB mean (1310 nm)
Wavelengths:	1310 nm, 1490 nm, 1550 nm, 1625 nm
Reflection:	< -40dB typical (-55dB mean at room temperature)
Dimensions (W x H x L):	4 mm x 4 mm x 36 mm (0.16" x 0.16" x 1.42")

Ordering Information

> **Fibrlok 250µm Fibre Splice**
- 5/pkg, 50 MOQ

Ref. No.
2540G

> **Fibre Splice Assembly Tool**
- 1/pkg

Ref. No.
2504G

> **Fibre Splice Preparation Kit without Cleaver**
- 1/pkg

Ref. No.
2559

> **Fibrlok Splice Preparation Kit with Cleaver**
- 1/pkg

Ref. No.
2504

> **Cleaver CT-01A**
- 1/pkg

Ref. No.
2534

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Description - Fibrlok AS Angle Fibre Splices

3M Fibrlok II Angle Fibre Splice 2529-AS

3M Fibrlok 250μm Angle Fibre Splice 2540-AS

Holder 1

Fibrlok Splice

Holder 2

3M Fibrlok Angle Splice Assembly Tool 2501-AS

3M Fibrlok AS series is specifically designed for the splicing of optical fibres in analog video networks, which require excellent optical reflection performance across temperature extremes. Utilizing keyed, angle cleaves, these Fibrlok splices direct reflected light outside of the fibre while maintaining a very low mean insertion loss of < 0.1 dB.

The 3M Fibrlok II Angle Fibre Splice 2529-AS splices any combination of 250μm and 900μm fibres while the 3M Fibrlok 250μm Angle Fibre Splice 2540-AS specifically splices 250μm fibre with a smaller form factor. These angle fibre splices have splice elements that have been optimized for keyed, angle cleaves and have green end caps, so they can be identified after installation. The 2529-AS and 2540-AS splices have the same size and shape as the 3M Fibrlok II Universal Optical Fibre Splice 2529 and 3M Fibrlok 250μm Fibre Splice 2540G splices; respectively, and can be used in the same splice trays.

These splices are ideal for restoration or permanent splice applications, in particular for cable television or Fibre-to-the-Home (FTTH) networks. With field proven, stable Fibrlok technology, theses splices can be installed in indoor or outdoor locations where temperatures range from -40 ºC to 70 ºC (-40 ºF to 158 ºC) and maintain their excellent reflection performance.

To fabricate an angle mechanical splice, the Fibrlok Angle Fibre Splices are used in conjunction with the 3M Fibrlok Angle Splice Assembly Tool 2501-AS and the 3M Fibre Optic Angle Cleaver 2535. The 3M Angle Cleave Kit 2565 contains these tools and all of the fibre preparation tools necessary to terminate angle splices.

The Fibrlok 2529-AS splice and 2540-AS splice can also splice fibres with standard, flat cleaves using the 2501 Fibrlok assembly tool and 3M Fibrlok 250μm Assembly Tool 2504G, respectively. The performance of these splices is comparable to the 3M Fibrlok II Universal Optical Fibre Splice 2529 and the 3M Fibrlok 250μm Fibre Splice 2540G.

Whether the application is aerial, buried, underground or pedestal; outside plant or inside building; these RoHS compliant* Fibrlok splices will meet the needs for analog video networks.
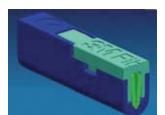
Features

- Keyed, angle cleave splice

- Simple assembly tools
- Separate cleaver and assembly tool

- Long-term reliability
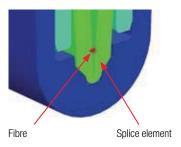
Benefits

- Low reflection for excellent analog video performance
- Fast, easy installation
- Same cleaver used for Fibrlok splice and 3M NPC No Polish Connector

- Stable optical performance across temperature extremes

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Before actuation   Cap

After actuation

Fibre   Splice element

Cross-sectional view of actuated splice

After preparation, the fibres are inserted into the 3M Fibrlok II Angle Fibre Splice 2529-AS splice element. The assembly tool is then used to close the cap, forcing the clamping and locating surfaces against the fibres and aligning the fibres precisely and permanently in place.
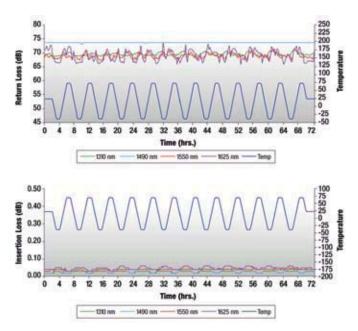
Optical Stability of Fibrlok Splice -40°C to 75°C

A total of 300 Fibrlok angle fibre splices were tested to Fibrlok Splice -40°C to 75°C IEC 61753-131-3 Ed. 1/CDV "Singlemode Mechanical Fibre Splice for Category U – Uncontrolled Environment".

The initial insertion loss and return loss were measured with the following configurations with Corning® SMF-28e® fibre.

- 100 3M Fibrlok 250μm Angle Fibre Splices 2540-AS with 250μm fibre
- 100 3M Fibrlok II Angle Fibre Splices 2529-AS with 250μm fibre
- 100 3M Fibrlok II Angle Fibre Splices 2529-AS with 900μm fibre

As shown in the histograms, the splices exhibited excellent optical performance with an average insertion loss of <0.1 dB and return loss of > 65 dB.

Specifications
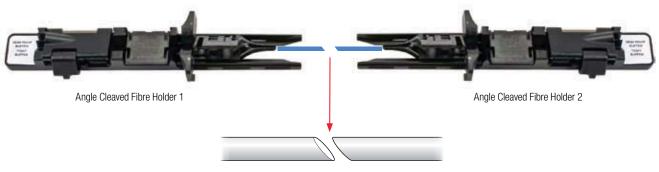
Size	
2540-AS	4.0 x 4.0 x 40.0 mm (0.16 x 0.16 x 1.42 in.)
2529-AS	3.8 x 6.4 x 38.1 mm (0.15 x 0.25 x 1.50 in.)
Coating diameter	
2540-AS	250μm
2525-AS	250 and 900μm
Fibre diameter	125 μm
Wavelengths	1310, 1490, 1550, 1625 nm
Insertion loss	< 0.1 dB typical < 0.25 dB max per IEC 61753-131-3
Return loss	65 dB typical at room temperature > 60 dB for -40 ºC to 70 ºC (-40 ºF to 158 ºF) per IEC 61753-131-3

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Specifications

Operating temperature	-40 ℃ to 70 ℃ (-40 ℉ to 158 ℉)
Vibration	IEC 61300-2-1, 10-55 Hz in all 3 axes
Torsion	IEC 61300-2-5, Twist fibre +/- 180º for 10 cycles at 0.2 m (8 in.) from splice
Fibre retention	IEC 61300-2-4, > 5N (1.1 lbf) min and > 10 N (2.2 lbf) typical
Dust – laminar flow	IEC 61300-2-27, 10 minutes at 35 ℃ (95 ℉)
Salt mist	IEC 61300-2-26, 96 hours at 35 ℃ (95 ℉) with 5% salt solution
Material	Engineering thermoplastic with aluminum alloy element; UL 94, V-O rating
Fungus resistance	ASTM G-21-70; rating 0

Keyed, Angle Cleave Splices

The 3M Fibre Optic Angle Cleaver 2535 precisely forms a 7º cleave on the fibre end face. The fibre holder in the 3M Fibrlok Angle Splice Assembly Tool maintains the fibre angle orientation. The fibres in Holder 1 and Holder 2 are cleaved exactly in the same manner and the fibre holders automatically key the angle cleaves in the splice as shown below. This garantees > 60dB return loss over the entire temperature range between -40°C and +70°C.

Angle Cleaved Fibre Holder 1   Angle Cleaved Fibre Holder 2
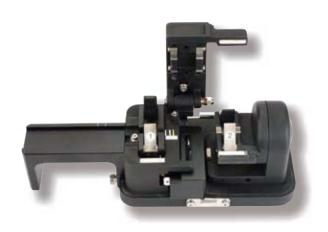
Keyed, Angle Cleave Splice

7.3 3M™ Fibrlok - Smart connectivity for the "Last Mile"

Ordering Information

Product Description	Ref. No.
3M Fibrlok II Angle Fibre Splice	**2529-AS**
3M Fibrlok II Angle Fibre Splice Bulk Pack	**2529-AS/B**
3M Fibrlok 250µm Angle Fibre Splice	**2540-AS**
3M Fibrlok Angle Splice Assembly Tool	**2501-AS**
3M Fibre Optic Angle Cleaver	**2535**
3M Fibre Optic Angle Cleaver Kit	**2565**

3M Fibre Optic Angle Cleaver Kit 2565 includes 3M Fibre Optic Angle Cleaver 2535, 3M Fibrlok Angle Splice Assembly Tool 2501-AS and all tools necessary for Fibrlok angle splice

Angle cleave fibre using 3M Fibre Optic Angle Cleaver 2535

7.4 3M™ No Polish Connector

Cap   Fibre   Splice Element

Cross-sectional view of actuated splice: After the fibre is inserted, the assembly tool depresses the cap to force clamping and locating surfaces against the fibre, looking and aligning the fibre place.

Description

3M No Polish Connector (NPC) enables fast, on-site installation of 250µm and 900µm connections utilizing a one piece, pre-assembled design.

The SC compatible connector consists of a factory-polished ceramic ferrule, fibre stub and a mechanical splice that is installed with a simple field tool. A bell-shaped boot is attached to the connector body, minimizing the chance of losing or forgetting to install the boot during the connection.

The No Polish Connector is tested for Premises and FTTP applications for indoor and out-door locations and is available in SM, 62.5µm, 50µm and also 50µm LOMMF (laser optimised multimode fibre) for 10 Gb applications.

The NPC-SC is RoHS compliant.

3M No Polish Connector Assembly Tool

Features

- Field installation

- One piece, pre-assembled design
- Simple assembly tool
- 900µm buffer strain relief
- Fibre holder for assembly
- Factory-polished fibre stub in ferrule
- Bell-shaped boot

Benefits

- Always right cable length with no cable slack to store
- No small, loose parts
- Fast, easy installation
- Excellent pull out strength
- Designed to eliminate the need to touch bare fibre
- No on-site polish or adhesives required
- Helps prevent fibre from bending below minimum bend radius

7.4 3M™ No Polish Connector
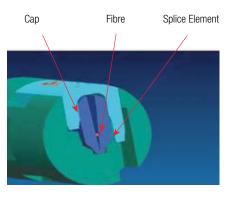
Specifications

	6800-50	Multimode 6800-50/LOMMF	6800-62.5	Singlemode 8800
Insertion loss typical @ 1300nm	0.2	0.2	0.2	0.3
Reflection typical (dB)	<-30	<-30	<-25	<-40
Connector Durability after 500 matings (dB)	<0.1 change	<0.1 change	<0.1 change	<0.2 change after 100 matings
Operating Temperature	0°C to 60°C (32°F to 140°F)	0°C to 60°C (32°F to 140°F)	0°C to 60°C (32°F to 140°F)	-40°C to 75°C (-40°F to 167°F)
Cable tension (in service)	< 0.1 dB decrease at 0.5 lbs for 900µm	< 0.1 dB decrease at 0.5 lbs for 900µm	< 0.1 dB decrease at 0.5 lbs for 900µm	< 0.5 dB increase at 4.8 N (1.10lbf) for 250µm < 0.5 dB increase at 6.9 N (1.54lbf) for 900µm
Testing Specifications	TIA*	TIA*	TIA*	TIA*
Material Connector Ferrule Connector housing and body Boot	Zirconia ceramic Engineered resin Thermoplastic elastomer	Zirconia ceramic Engineered resin Thermoplastic elastomer	Zirconia ceramic Engineered resin Thermoplastic elastomer	Zirconia ceramic Engineered resin Thermoplastic elastomer
Flame retardancy	UL-94 V-0	UL-94 V-0	UL-94 V-0	UL-94 V-0
Connector Identification Backbone Housing Boot	Black Black White	Black Aqua White	Black Beige White	Black Blue White
Field Termination Kit	8865-C	8865-C	8865-C	8865-C

*TIA = TIA/EIA 568-B.3

Ordering Information

Product Description	Ref. No.
3M No Polish SC Connector SM Plug 250/900 (blue housing)	**8800**
3M No Polish SC Connector MM 50µm 250/900 (black housing)	**6800-50**
3M No Polish SC Connector MM 50µm LOMMF 250/900 (aqua housing)	**6800-50/LOMMF**
3M No Polish SC Connector MM 62.5µm 250/900 (beige housing)	**6800-62.5**

7.4 3M™ No Polish Connector

Cap   Fibre   Splice Element

Cross-sectional view of actuated splice: After the fibre is inserted, the assembly tool depresses the cap to force clamping and locating surfaces against the fibre, looking and aligning the fibre place.

Description

3M No Polish Connector SC/APC Angle Splice, 250µm/900µm

3M No Polish Connector (NPC) SC/APC provides fast, on-site installation of 250µm and 900µm singlemode fibre.

The SC/APC compatible connector consists of a factory-polished ferrule assembly and a mechanical splice that is installed with a simple, field tool. It is available with a standard, flat splice configuration or with a keyed, angle splice for excellent back reflection of <-60 dB.

NPC has a bell-shaped boot that is attached to the connector body, virtually minimizing the chance of losing or forgetting to install the boot during the connection. After in-stallation, the boot keeps the fibre from kinking, even during side pull.

The no polish connector is tested for premises and FTTP applications for indoor and outdoor locations.

The NPC-SC/APC is RoHS compliant.

Features

- Field installation

- One piece, pre-assembled design
- Simple assembly tool
- Keyed, angle cleave splice

- 900µm buffer strain relief
- Factory polished stub in ferrule

Benefits

- Always the right cable length with no cable slack to store
- No small, loose parts
- Fast, easy installation
- Low reflection, < -60 dB across temperature extremes

- Excellent pull out strength
- No on-site polish or adhesives required

7.4 3M™ No Polish Connector

Flat Splice Connectors

NPC SC/APC flat splice connectors provide excellent performance for digital transmission networks that require a SC/APC termination, such as an Optical Network Terminal that is pre-installed with a SC/APC interface.
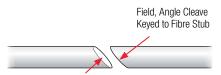
SC/APC flat splice connectors provide acceptable analog video performance for indoor applications since the flat splice has a typical reflection of -55 dB for room temperatures.

Flat Cleave Splice
Uses standard fibre cleaver for field termination

Angle Splice Connectors

3M No Polish Connector SC/APC Keyed, Angle Splice Connectors are specifically designed for analog video transmission with very low optical reflection of < -60 dB across temperature extremes.

Based upon 3M laboratory testing, keying of the angle cleaves is important for optical reflection performance.

Field, Angle Cleave
Keyed to Fibre Stub

Factory Formed Angle
Inside Connector

Keyed, Angle Cleave Splice
Using the 3M Fibre Optic Angle Cleaver 2535, a precise angle can be formed on the field fibre end. With the assembly tool, angles of the field fibre and connector fibre are aligned to optimize optical coupling and minimize back reflections.

Assembly Tool for 250/900 μm

3M No Polish Connector Assembly Tool is included in every box of 60 connectors. Keeps angle cleaves aligned during installation process.
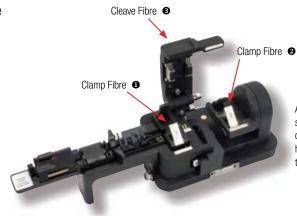
Specifications

Fibre diameter		125μm
Insertion loss		0.3 dB typical
Reflection	(Flat splice)	-55 dB typical at room temperature < -35 dB for -40ºC to 75ºC (-40ºF to 167ºF)
	(Angle splice)	-65 dB at room temperature < -60 dB for -40ºC to 75ºC (-40ºF to 167ºF)
Connection durability, after 100 matings		< 0.2 dB change
Operating temperature		-40ºC to 75ºC (-40ºF to 167ºF)
Cable tension (in service)		< 0.5 dB increase at 4.8N (1.10 lbf) for 250μm < 0.5 dB increase at 6.9N (1.54 lbf) for 900μm
Side pull (in service)		< 0.5 dB increase at 6.9N (1.54 lbf) for 900μm
Water immersion, 43ºC (109ºF), 3 days		< 0.2 dB increase after 24 hour dry time
Dimensions		12.7 x 12.7 x 49 mm (0.5" x 0.5" x 1.9")

7.4 3M™ No Polish Connector
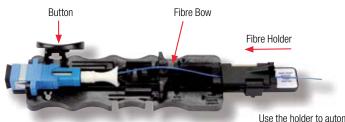
Simple Installation Process

The 3M™ No Polish Connector is easy to install, even for the SC/APC connector with angle splice.

Step 1: Angle Cleave Fibre

Cleave Fibre ❸

Clamp Fibre ❷

Clamp Fibre ❶

After stripping the coating and cleaning the glass, secure the fibre with the two clamps and activate the cleaver in one step by pressing the lever. The fibre holder maintains the angle orientation from the cleaver to the connector in the assembly tool.

Step 2: Assemble Connector

Button   Fibre Bow

Fibre Holder

Use the holder to automatically align and to guide the fibre into the connector. Once there is a fibre bow to indicate the fibre is fully inserted, activate the connector by depressing the button.

Ordering Information

Product Description	Ref. No.
3M No Polish Connector SC/APC SM Angle Splice 250/900	8800-APC/AS
3M No Polish Connector SC/APC SM Flat Splice 250/900	8800-APC/FS

7.4 3M™ No Polish Connector

Description - 3M Tools for NPC-SC and NPC-SC/APC

3M Fibre Optic Angle Cleave Kit 2565

The 3M Fibre Optic Angle Cleave Kit 2565 includes the 3M Fibre Optic Angle Cleaver 2535 and all tools necessary for 8800-APC/AS.
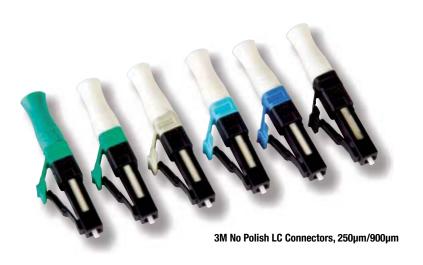
3M No Polish Connector Kit 8865-C for 8800-APC/FS flat splice connectors.

Ordering Information

Product Description	Ref. No.
3M No Polish Connector Kit	8865
3M No Polish Connector Preparation Kit with Flat Cleaver	8865-C
3M No Polish Connector Assembly Tool	8865-AT
3M Fibre Optic Angle Cleaver	2535
3M Fibre Optic Angle Cleave Kit with Angle Cleaver	2565

7.4 3M™ No Polish Connector

Description

3M No Polish LC Connectors, 250µm/900µm

As the LC connector type becomes more and more the connector of choice in several FTTH concepts as well as for enterprise networks , 3M has developed a whole range of LC NPC connectors.

Same as for the SC range we offer single-mode versions with UPC and APC endface geometry. Multimode LC NPC connectors are available for all common fibre types, like 50/125µm OM2 and OM3, as well as for 62,5/12µm fibre.

Features

- Field installation

- One piece, pre-assembled design
- Simple assembly tool
- 900µm buffer strain relief
- Fibre holder for assembly
- Factory-polished fibre stub in ferrule

Benefits

- Always right cable length with no cable slack to store
- No small, loose parts
- Fast, easy installation
- Excellent pull out strength
- Designed to eliminate the need to touch bare fibre
- No on-site polish or adhesives required

Ordering Information

> LC NPC Connectors, Single-mode

	Ref. No.
• 8830 No Polish Connector LC SM Plug 250/900UM W/Tool	**8830**
• 8830-APC/AS No Polish Connector LC/APC SM Angle Splice 250/900µm	**8830-APC/AS**
• 8830-APC/FS No Polish Connector LC/APC SM Flat Splice 250/900µm	**8830-APC/FS**

> LC NPC Connectors, Multimode

	Ref. No.
• 6830-50 No Polish Connector LC MM 50UM 250/900UM W/Tool	**6830-50**
• 6830-50/LOMMF No Polish Connector LC MM 50UM 250/900UM W/Tool	**6830-50/LOMMF**
• 6830-62.5 No Polish Connector LC MM 62.5UM 250/900UM W/Tool	**6830-62.5**

> LC/NPC Termination Kit and Tools

	Ref. No.
• 8835-AT LC No Polish Connector Assembly Tool 250/900UM	**8835-AT**

7.5 3M™ PLC Optical Splitters

3M PLC Splitter Family

Description

3M planar light circuit splitters are fully passive optical branching devices that exhibit uniform signal splitting for the most advanced optical networks. These planar silica waveguide devices are packaged in small form factor housings to offer compact management into 3M modules and splice trays.

Bend insensitive, reduced water peak single-mode fibre is used to assure low bending loss in applications which require tight radius or significant handling by the technician. These splitters are manufactured and tested to GR-1209/1221 to provide the high performance and reliability needed in the outside plant environment.

Applications for the PLC splitters include all FTTH network architectures (GPON, BPON, EPON), CATV and data communications.

Available with factory terminated pigtails
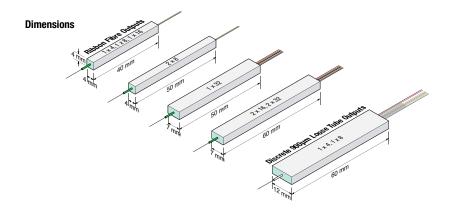
Specifications

Operating Conditions	
Wavelength	1260 ~ 1360 nm & 1450 ~ 1650 nm
Temperature Range	-40°C to 85°C
Humidity Range	5% to 85% RH
Telecordia GR-1209 & GR-1221 compliant	

Available in various splice trays to accommodate 3M enclosures

Features	
Low insertion loss	
High uniformity	
Standard input	250µm bend insensitive SM fibre (ITU G.652D and G.657A)
Standard output	250µm bend insensitive SM ribbon or discrete fibres
Optional Input & Output for 1x4, 1x8	900um Loose Tube bend insensitive SM Fibre
Outputs colour coded per TIA/EIA 598-B	Blue, Orange, Green, Brown, Grey, White, Red, Black

Dimensions

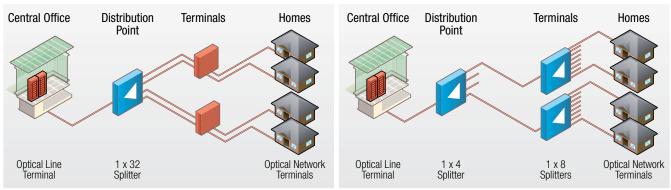## 7.5 3M™ PLC Optical Splitters

Specifications

Parameters	1x2	1x4	1x8	1x16	1x32	2x2	2x4	2x8	2x16	2x32
Insertion Loss (dB)	3.7	7.2	10.5	13.5	16.5	3.9	7.5	10.8	14.1	17.4
Uniformity (dB)	≤0.6	≤0.6	≤0.8	≤1.2	≤1.7	≤0.8	≤1.2	≤1.5	≤2.0	≤2.5
PDL (dB)	≤0.2	≤0.3	≤0.3	≤0.3	≤0.3	≤0.2	≤0.3	≤0.4	≤0.4	≤0.4
Return Loss (dB)	≥55	≥55	≥55	≥55	≥55	≥55	≥55	≥55	≥55	≥55
Directivity (dB)	≥55	≥55	≥55	≥55	≥55	≥55	≥55	≥55	≥55	≥55

Configuration Guide · ADD FOR FANOUT:

PLC	-	XXX	-	XX	-	XX	-	XX	-	X	-	X	-	XXXX
Splitter Type		Ports		Fibre Type (Input/Output)		Connectors (Input/Output)		Pigtail Length** (Input & Output)		Grade		Tray or Cassette		Length Ribbon (L1)/ Breakout (L2)
		102 = 1x2												
PLC =Planar Light Circuit		104 = 1x4		2 = 250µm		0 = none		15 = 1.5 m		S = Standard		0 = none		0312=.03 m/1.2 m
		108 = 1x8		R = 250µm Ribbon		1 = SC UPC								
		116 = 1x16		9 = 900µm loose tube		2 = SC APC								
		132 = 1x32												
		202 = 2x2												
		204 = 2x4												
		208 = 2x8												
		216 = 2x16												
		232 = 2x32					** Inputs & outputs equal length							

Example: PLC-104-29-22-15-S-0-0312
(1x4, 250µm input, 900µm loose tube output, SC APC to SC APC, 1.5 m legs, Standard grade, no tray, with fanout of .3 m ribbon and 1.2 m of 900µm loose tube)

> **PON Architectures Utilizing PLC Splitters**

Central Office — Distribution Point — Terminals — Homes

Optical Line Terminal · 1 x 32 Splitter · Optical Network Terminals

Centralized Splitting with 1x32 PLC

Central Office — Distribution Point — Terminals — Homes

Optical Line Terminal · 1 x 4 Splitter · 1 x 8 Splitters · Optical Network Terminals

Distributed Splitting with combination of 1x4 and 1x8 PLC

7.6 3M™ 19" Splitter Panels

Description

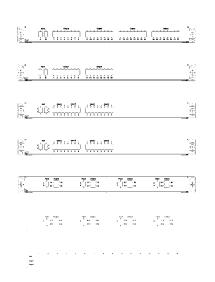FTTH networks, which are laid out in PON structure often require ruggedised last mile splitter modules. Especially for small POP´s (Point Of Presence) or medium size apartment buildings, providers prefer splitter panels, which can easily be mounted in 19" racks or even on the wall.

The 3M 19" Splitter Panels are pre-assemb-led with a customisednumber of PLC-splitters and are completely closed. The splitters are

equipped with 900 µm buffered single-mode fibre (ITUG657A) and terminated with either SC/APC or LC/APC connectors. Both, input and output ports are clearly labelled and accessible from the front-plate of the 19" panel. Unused ports maybe closed with blind covers.

The internal fibre/splitter management is realised in a special storage tray.

Additional brackets, which are part of the standard delivery, can be fixed locally for wall mounting of the panel.

Ordering Information

Splitter Panel	Ref. No.
19" Splitter Panel 1x 2:32 SC/APC, simplex	43138-677 30
19" Splitter Panel 1x 2:16 SC/APC, simplex	43138-678 30
19" Splitter Panel 4x 1:8 LC/APC, duplex	43138-684 30
19" Splitter Panel 1x 1:8 LC/APC, duplex	43138-684 31
19" Splitter Panel 8x 1:2 LC/APC, duplex	43138-679 30
19" Splitter Panel 4x 1:4 LC/APC, duplex	43138-680 30
19" Splitter Panel 16x 1:2 SC/APC, simplex	43138-685 30

7.7 3M™ Hotmelt and Crimplok Connector

Description

3M Hotmelt optical fibre connector assembly system

The 3M Hotmelt system offers most convenient field connectivity for fibre optic connectors. From direct termination of breakout cables in patchpanels over pigtails up to patchcords, Hotmelt connectors fit every application. The connectors are pre-filled with Hotmelt adhesive which just needs to be heated for easy termination.

All connectors have ceramic ferrules and different coloured boots enable clear port identification. A universal termination kit plus different upgrade kits enable to install all type of 3M Hotmelt connectors.

- Quick, simple and safe assembly in the field or factory
- Connector, adhesive and polishing film from one manufacturer guarantees a high quality connector
- Simple polishing process, either manually or with a polishing machine
- All connectors contain a zirconia ferrule and Hotmelt adhesive
- Boots are available in various colours for definite channel separation
- Suitable for all LAN and CATV applications
- Suitable for internal or external applications

Ordering Information

> **Universal Hotmelt Termination Kit**

The Hotmelt Termination Kit for ST, SC, FC and LC-Connectors contains all tools and consumeables, which are neccesary to terminate 3M Hotmelt Connectors in the field.

Ref. No.
6362

7.7 3M™ Hotmelt and Crimplok Connector

Ordering Information

> **Extension kit LC Hotmelt**
- Polishing pad 11,5 x 14 mm (1 ea)
- LC connector holder (4 ea)
- LC polishing jig (2 ea)
- Polishing film starter kit
- LC crimp dies (1 set)
- LC adapter for microscope 200x (1 ea)
- Heat shrink asdapter (1 ea)
- Cleaning wires for connector holder (1 set)
- Instruction manual LC Hotmelt

Ref. No.
6650-LC

> **Classic Hotmelt consumeables kit**
- Polishing film 2µm (200 ea)
- Polishing film 0,05µm (50 ea)
- Lint free tissues (200 ea)
- Universal polishing jig (1 ea)

Ref. No.
6365-CC

> **LC Hotmelt single-mode polishing film set**
- Polishing film 2µm, "One Step" (100 ea)
- Polishing film 9µm (20 ea)
- Polishing film 0,5 µm (40 ea)
- Polishing film, final polish, 0,02µm (80 ea)

Ref. No.
6650-LS

> **LC Hotmelt single-mode polishing film set**
- Polishing film 2µm, "One Step" (100 ea)
- Polishing film 9µm (20 ea)

Ref. No.
6650-LM

Accessories/Consumeables

> **Polishing pad, round, handpolish, Classic Hotmelt**

Ref. No.
6365-PP

> **Polishing pad 11,5 x 14 cm, for LC Hotmelt connectors**

Ref. No.
6650-LP

> **Polishing jig Hotmelt, handpolish, ST, SC, FC**

Ref. No.
8892

> **Polishing jig, handpolish, Hotmelt LC**

Ref. No.
6650-LJ

7.7 3M™ Hotmelt and Crimplok Connector

Ordering Information

Accessories/Consumeables

> **Weight for polishing jig, handpolish, Hotmelt LC**

Ref. No.
6650-JW

> **Hotmelt oven, 230V**
  with UK and EU power cord

Ref. No.
6324

> **Lintfree tissues**

Ref. No.
05-00017

> **Bottel for isoprophyl alcohol**

Ref. No.
VOL-0560R

> **Connector holder for ST Hotmelt connectors**

Ref. No.
6190

> **Connector holder for SC Hotmelt connectors**

Ref. No.
SP-00504

> **Connector holder for FC Hotmelt connectors**

Ref. No.
SP-00505

> **Connector holder for LC Homtelt connectors**

Ref. No.
6650-LH

7.7 3M™ Hotmelt and Crimplok Connector

ST Connector

SC Connector

Crimplok

The Crimplok connector combines the speed of non-adhesive connectors with the performance characteristics of epoxy and Hotmelt connectors. Crimplok Connectors are the ideal solution for emergency restoration work or for quickly making fibre connections at the desk.

Crimplok connectors were designed to:

- Save time in installation
- Provide rugged, reliable performance, meeting or exceeding current EIA/TIA 568, ISO 11801 and EN 50173 specifications.
- Install cleanly and simply with fewer parts and tools.

Available in both SC and ST, single mode and multimode connector versions, Crimplok connectors are faster to install than epoxy connectors since there is no set-up or curing time. Crimplok connectors do not require special heating tools or ovens, so time spent searching for electrical outlets is eliminated. Polishing the connector is also a simple process that can be performed in seconds.

The Crimplok connector incorporates proven 3M malleable metal element fibre gripping technology. There is no fibre splice or second joint inside the connector, so there is no added attenuation at the connection. When the conformable metal element closes, it grips a length of the fibre, eliminating fibre movement associated with other crimp-style connectors. The strength of the metallic element ensures that Crimplok connectors meet industry standards for temperature and humidity.

Ordering Information

> **Crimplok assembly case**

The Crimplok assembly kit for ST and SC connectors, contains all the tools and consumables needed for assembly. Supplied in a convenient carrying case.	Ref. No.
	6955

Contents of case:

1. Crimping pliers, universal
2. 6955-T Activation Tool
3. Polishing film 2µ, 200 discs
4. Polishing film 0,05µ, 50 discs
5. Polishing pad
6. Plastic bottle, empty
7. Special scissors
8. Stripping tool for cable sheath
9. Stripping tool for coating
10. Microscope, illuminated, 100X
11. Cleaning cloth, 100-pieces
12. Polishing puck
13. Assembly instructions
14. Carrying case

> **Activation Tool, ST/SC**	Ref. No.
	6955-T
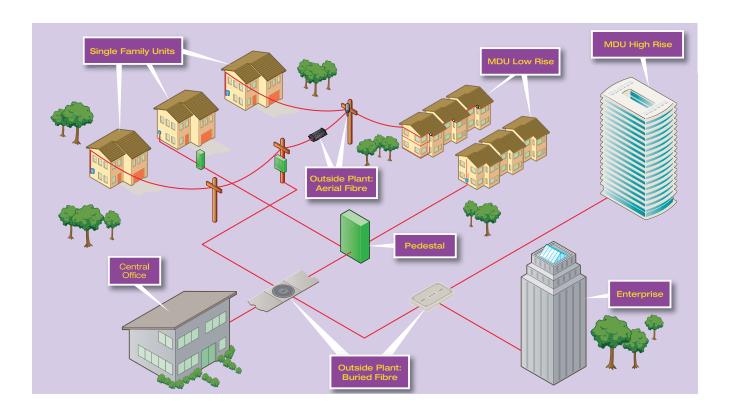
> **Polishing film 2µm, oval with adhesive back**	Ref. No.
	SP-00503

8. Tracking, Marking & Locating your FTTx Network

3M Telecommunications provides you with solutions to distribute your complete fibre network from Central Office and Point of Presence (POP) to Customer Premises.

Moreover, the 3M Telecommunications portfolio offers you products and opportunities to trace connections and lines, mark and identify splices within your complete network architecture.

8.1 3M™ Marking & Locating Products

3M Electronic Marker System for the Telecommunications Industry

Markers that last

With our Full-Range, Ball and Near-Surface Markers, there is a marker to meet almost every need. Markers are passive antennas with no internal power source to run down. Their water-resistant, polyethylene shells are impervious to minerals, chemicals and the temperature extremes normally found underground. A four-inch Disk marker is also available for marking handholes. These markers easily attach to lids or covers over flush-mounted facilities.

3M iD Markers

3M iD markers are designed to provide an accurate, convenient, long-lasting method of marking underground assets. In addition, these markers may be programmed to include customer-specific information such as facility data, type of application, material type and size, placement date and other important details.

Ball Marker
Ideal for most applications, with a unique self-leveling feature. The core of the marker floats in a non-toxic, nonfreezin liquid inside the ball; so the marker can be dropped in a trench, and the self-leveling feature will assure a correct orientation.

Near-Surface Marker
A small marker which is well suited for bore holes in concrete or asphalt for marking flush mount facilities prior to repaving.

Full-Range Marker
Designed for deep underground applications. Its large size makes it ideal for use as a digging shield over sensitive underground facilities.

The Safe Choice

There is no guesswork with the 3M Electronic Marker System. 3M markers operate even in the presence of metal conduit or pipe, metallic conductors, fences, AC power lines and electronic markers of other utilities. All EMS markers are colour-coded to APWA standards for visual reference and each utility has its own frequency. For telephone utilities, all markers are orange in colour. EMS signals provide positive identification of each utility, thus helping to reduce the risk of accidentally locating and excavating other buried facilities.

The EMS telecommunications series can be used to mark

- Buried splices
- Load coils
- Fibre optic facilities
- Handholes
- Manholes

- Service drops
- Conduit stubs
- Bends
- Cable paths — fibre
- Slack loops

8.1 3M™ Marking & Locating Products

3M EMS Telecommunication Markers

The 3M Electronic Marker System (EMS) helps save telecommunications companies time and money by enabling field crews to quickly pinpoint the location of buried facilities including buried splices, fibre optic facilities, service drops and manholes. Using EMS markers during construction, installation and maintenance virtually eliminates the time consuming search for hard-to-locate facilities.

Applications

3M Electronic Marker System

Telephone	Cable paths, buried splices, buried service drops, load coils, conduit stubs, fibre optic facilities, all types of splices, bends, depth changes, manhole covers, road crossings
Power	Cable paths, service drops, conduit stubs, road crossings, all types of splices, buried transformers, service loops, street lighting, bends, man hole covers, distribution loops
CATV	Cable paths, fibre optic facilities, buried service drops, road crossings, buried splices, bends
General Purpose	Reclaimed water, private campuses, valve boxes, road crossings, path marking, buried valves, tees, meter boxes, main stubs, service stubs
Water	Pipeline paths, service stubs, PVC pipeline, all types of valves, road crossings, tees, clean-outs, casing ends
Waste Water	Valves, all types of fittings, clean outs, service stubs, laterals, pathmarking of non-metallic facility
Gas	Pipeline paths, main stubs, service stubs, tees, road crossings, all types of valves, meter boxes, stopping fittings, depth changes, transition fittings, squeeze points, pressure control fittings, electro fusion couplings, all types of fittings and joints

8.1 3M™ Marking & Locating Products

Specifications

Features	Telephone	Power	CATV	General Purpose	Water	Wastewater	Gas	Read Range*
Colour	orange	red	black/orange	purple	blue	green	yellow	n/a
Active								
EMS iD Ball Marker Product Number	1421-XR/iD	1422-XR/iD	1427-XR/iD	1428-XR/iD	1423-XR/iD	1424-XR/iD	1425-XR/iD	5 ft. (1.5 m)
EMS iD Near-Surface Product Number	1432-XR/iD	1433-XR/iD	N/A	1438-XR/iD	1434-XR/iD	1435-XR/iD	1436-XR/iD	2 ft. (0.6 m)
EMS iD Full-Range Product Number	1250-XR/iD	1251-XR/iD	N/A	1248-XR/iD	1252-XR/iD	1253-XR/iD	1254-XR/iD	8 ft. (2.4 m)
Passive								
Ball Marker Extended Range Product Number	1401-XR	1402-XR	1407-XR	1408	1403-XR	1404-XR	1405-XR	5 ft. (1.5 m)
Near-Surface Marker Product Number	1432	1433	N/A	N/A	1434	1435	1436	2 ft. (0.6 m)
Mini-Marker Product Number	1255	1256	N/A	N/A	1257	1258	1259	6 ft. (1.8 m)
Full-Range Product Number	1250	1251	N/A	N/A	1252	1253	1254	8 ft. (2.4 m)

* Read range specifies maximum distance from locator probe using 3M™ Dynatel™ Locator 1420.

 Read range may vary on export models for water and power frequencies–refer to product bulletins.
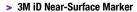
8.1 3M™ Marking & Locating Products

Ordering Information

Application: Telecommunication

> **3M EMS Near-Surface Marker**

- Near-Surface Marker - designed to provide an accurate, convenient, long-lasting method of marking underground and street-access facilities.

Ref. No.
1432

> **3M iD Near-Surface Marker**

- 3M iD markers may be programmed to include customerspecific information such as facility data, type of application, material type and size, placement date and other important details.

Ref. No.
1432-XR/ID

> **3M Disk Marker**

- 3M iD markers may be programmed to include customerspecific information Extended Range Disk Marker - designed to provide an easy, accurate method of locating flush-mounted facilities which become covered by backfill or other obstructions, such as snow or overgrown vegetation. (Do Not Direct Bury)

Ref. No.
1411-XR

> **3M iD Disk Marker**

- 3M iD markers may be programmed to include customerspecific information such as facility data, type of application, material type and size, placement date and other important details. (Do Not Direct Bury)

Ref. No.
1411-XR/ID

> **3M EMS 4" Ball Marker**

- Extended Range Ball Marker - provides self-levelling design providing accurate, horizontal position regardless of how it is placed in the ground and making the job of precisely locating easier.

Ref. No.
1401-XR

> **3M iD Ball Marker**

- 3M iD markers may be programmed to include customerspecific information such as facility data, type of application, material type and size, placement date and other important details.

Ref. No.
1421-XR/ID

> **3M EMS Full-Range Marker**

- Full-Range Marker - designed to provide an accurate, convenient, long-lasting method of marking underground communications facilities.

Ref. No.
1250

> **3M iD Full-Range Marker**

- 3M iD markers may be programmed to include customerspecific information such as facility data, type of application, material type and size, placement date and other important details.

Ref. No.
1250-XR/ID

	3M iD Markers Read Range		3M Passive Markers Range*
	With a 'U' Model (U.S.) Locator	With an 'E' Model (Europe, CE) Locator	
Near-Surface	0.9 m	0.6 m	0.6 m
Ball and Disk	1.5 m 1.5 m	1.2 m (Tel, Gas, WW, Comm) 1.0 m (Pwr, Wtr)	1.5 m 1.5 m
Full-Range	2.7 m	2.0 m	2.4 m

8.1 3M™ Marking & Locating Products

Ordering Information

Application Cable TV and Communication	Ref. No.
3M iD Near-Surface Marker	**1437-XR/iD**
3M iD Disk Marker	**1417-XR/iD**
3M EMS Ball Marker	**1407-XR**
3M iD Ball Marker	**1407-XR/iD**

8.1 3M™ Marking & Locating Products

Description - Marker Locator 1420-iD

3M Dynatel Electronic Marker System (EMS) Marker Locators 1420-iD/1420E-iD are micro-processor-based systems that incorporate advanced digital signal processing techniques to quickly and efficiently locate underground facilities – even years after construction or maintenance.

Designed to be more accurate, faster and more integrated, the 1420-iD/1420E-iD EMS marker locators allow you to accurately and easily:

• Locate, read and write to 3M RFiD markers

• Pinpoint the depth and location of all existing models of properly installed underground passive EMS markers

• Conduct direct depth reading of markers

• Locate two different marker frequencies simultaneously

A feature exclusive to the 1420-iD/1420E-iD locators is the ability to read, write and lock programmed information into the 3M Electronic Marker System iD Ball Markers 1400 Series. Information such as a pre-programmed unique identification number, facility data, owner information, application type, placement date and other details from up to 100 markers can all be stored with date/time stamp and GPS coordinates*, and transmitted back to your PC through a standard RS232 serial port for enhanced resource management.

The 1420-iD/1420E-iD locators are unaffected by metal conduit or pipe, metallic conductors, fences, AC power or electronic markers for other utilities. Multiple markers located at close proximity can be read individually using this system.

* When connected to standard NMEA compliant GPS devices.

Lightweight and compact, the locators are rugged, ergonomic and require very little operator training. A large bright backlit digital liquid crystal display screen and soft-key operation make them easy to understand and use for more precise locates. A "memory" feature remembers operator set-up from the previous use. A standard RS232 communications port allows interface to an external computer for uploading/downloading of data, unit configuration and remote software upgrades. The system is estimated to operate for more than 25 hours on eight AA alkaline batteries.

The 3M Dynate Electronic Marker System Marker Locators 1420-iD/1420EiD are now compatible with select GPS/GIS field mapping instruments for real-time mapping of marker placement. The customized Dynatel interface commands the GPS/GIS device allowing even a generalist field technician to perform real-time mapping. It's a simple system for mapping marker placement and saving information directly into CAD and GIS systems. The electronic export of this information in GIS format creates an automated paperless system for records updating, making positive locates in the field easier than ever.

**3M Dynatel Electronic Marker System
Marker Locator 1420-iD**

Technical Specifications

Large backlit, high-resolution graphic display

PC interface via standard RS232 serial port

User-configurable features and interface

Detects all seven EMS marker frequencies

Locator PC tools software

RFiD marker read/write capability

Dual marker frequency search-simultaneous

RFiD Marker depth estimation

8.1 3M™ Marking & Locating Products

Physical Specifications

	Size (H X W X D) cm	Weight (Including Batteries)
Receiver	26.7 x 11.8 x 76.2	1.9 kg

Environmental Specifications

Feature	Specifications
Operating temperature	-20° C to 50° C
Storage temperature	-20° C to 70° C
Regulatory	CE
Standard	IP54

Electrical Specifications

Functions	Specifications
Marker compatibility	All 3M EMS- and iD-markers mentioned before
Dual marker mode	Any two marker frequencies simultaneously
Detection range	Exceeds maximum marker depth specifications
Marker read range	1420 - 1,5 m to all iD ball markers 1420E - 1,2 m telephone, gas, CATV, wastewater 1,0 m water, power
Marker write range	30 cm
RFiD Marker depth measurement accuracy	+/- 10% +/- 5 cm up to marker depth specifications
Memory storage with date/time stamp	Read marker records 100 Written marker records 100 User defined iD templates 32
Marker depth memory storage	Five with date/time stamp
Power	Battery type: eight AA size, alkaline Typical battery life: 25 hours
Display	Large graphic high-contrast LCD with backlight
Speaker	0.25W
Headphone jack	Standard mini-jack
Serial port	Standard RS232 serial with DB9 connector

Ordering Information

Description	Ref. No.
EMS-iD marker locator with iD read/write	1437-XR/iD
EMS-iD marker locator with iD read/write (CE Approved Export Model)	1417-XR/iD

8.1 3M™ Marking & Locating Products

3M 1420EZ-Writer Station

The 3M 1420EZ-Writer Station is designed to save time, field labor costs and complexity when writing data to 3M iD Ball, Near-Surface or Disk Markers.

The 1420 EZ-Stand can hold 10 Ball, Near-Surface or Disk Markers at a time. Using the 1420EZ-Writer – a special 1420E locator with special software – and a PC, all markers can be programmed at once. Now the process of writing to 3M iD markers is simplified by:

- Reducing the time spent in writing to markers is reduced from an average of 30 seconds per marker to an average of 12 seconds per marker
- Removes the requirement for specialized training to write 3M iD markers and simplifies the process for new users
- Offers a low-cost alternative to field writing of 3M iD markers

3M 1420EZ-Writer Station

Ordering Information

Description	Ref. No.
Writer and stand	**1420EZ-Writer Station**
Stand only	**1420EZ-Writer Stand**
Writer only (for use with 1420EZ-Stand)	**1420EZ-Writer**

3M 1420EZ-Writer Stand

The 3M 1420EZ-Writer Station can be used to program up to 10 3M iD Ball or Near-Surface Markers at a time