# GENERAL CATALOG OF FTTH PRODUCTS FOR FIBER OPTIC NETWORKS

VER. ENG
REV. 04
EDT. RR

# INDEX

# CPE GROUP

CPE Italia was born in Milan back in 1978 and is a family-owned company.

From the start we focused and specialized on the manufacturing of interconnect components for defense, railway, subsea, transportation and TLC sectors.

We are worldwide spread with 7 plants and 3 R&D centers.

**Our mission is to fully comply our clients' needs by developing and offering customized and 100% tailored solutions.**

# PATCHCORDS AND PIGTAILS

## CONFIGURATION

| | |
|---|---|
| AVAILABLE CONFIGURATION | **SIMPLEX INDOOR-DUPLEX INDOOR-SIMPLEX I/O-DUPLEX I/O-DUPLEX DOUBLE JACKETED** |

## GENERAL SPECIFICATIONS

| | |
|---|---|
| FIBER TYPE | **G657A2-G657A1-G657B3-OM1-OM2-OM3-OM4-OS1-OS2** |
| OUTER DIAMETER | **BARE FIBER-0,9 MM-1,6 mm-1,8 mm-2,0 mm- 2,4 mm-2,6 mm-2,8 mm - 3,0 mm** |
| JACKET TYPE | **BARE FIBER – OFNR DUAL RATED-LSZH-PLENUM-RISER-PUR-PVC** |
| JACKET COLOR | **BARE-AQUA (OM3)-BLU (SM)-GREEN(OM2)-ORANGE (OM1/OM2)-VIOLET(OM4)-YELLOW(SM)-WHITE (SM 0,9 mm)<br>GREEN-PINK-TURQUOISE** |
| OPERATING TEMPERATURE | **-40°C TO +85°C** |

## OPTICAL CHARACTERISTICS

| | |
|---|---|
| OPERATIVE WAVELENGTHS | **1260 ~ 1625 nm (SM) - 850 & 1300 nm (MM)** |
| TYPICAL ATTENUATION | **0.32 DB @ 1310 e 1383 nm<br>0.18 DB @ 1550 n** |

## CONNECTORS PARAMETERS

| | |
|---|---|
| CONNECTOR TYPE | **SC-LC-ST-FC-E2000-DIN-LX.5-SMA** |
| FIBER HEIGHT | **≤ 100 nm** |
| FIBER PROTRUSION | **≤ 100 nm** |
| RADIUS OF CURVATURE | **7 -10 mm** |
| APEX OFFSET | **< 50 mm** |
| INSERTION LOSS | **< 0.20 dB** |
| RETURN LOSS | **> 60 dB** |
| POLARIZATION DEPENDENT LOSS (PDL) | **< 0,05 DB** |
| MAXIMUM INPUT POWER | **+30 dBm** |
| CONNECTOR DURABILITY | **1.000 MATING** |
| CONNECTOR REPEATABILITY | **0.20 dB** |

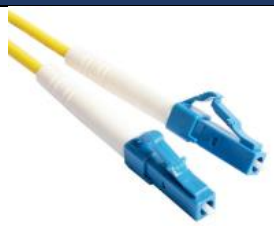
## PACKAGING

| | |
|---|---|
| PACKING DETAIL | **PLASTIC BAG WITH ADHESIVE LABEL CONTAINING PART NUMBER, ITEM DESCRIPTION AND BATCH NUMBER.<br>TEST REPORT WITH CHECK OF THE GEOMETRY OF THE INTERNAL FERRULE** |

## COMPLIANCE

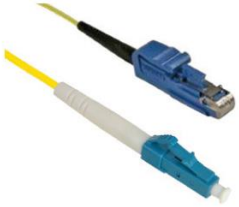
| | |
|---|---|
| SPECIFICATIONS | **ISO/IEC 11801, TIA 568A, IEC 61755-4, EN-50377-4**<br>**DIRECTIVE ROHS III (EU) 2016/863**<br>**REGULATION REACH (EU) NO.1907/2006** |

## CONNECTOR TYPES

| LC-LC | LC-SC |
|---|---|
|  |  |

| FC-LC | LC-MU |
|---|---|
|  |  |

| E2000-LC | LC-ST |
|---|---|
|  |  |

| DIN-LC | LC-LX.5 |
|---|---|
|  |  |

| | |
|---|---|
| FERRULE GEOMETRY | **UPC-APC** |
| FERRULE MATERIAL | **CERAMIC ZIRCONIA** |
| CONNECTOR HOUSING COLOR | **BLUE (UPC) GREEN (APC)** |

## KEY ORDER CODE

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | CONTINUES |
|---|---|---|---|---|---|---|---|---|
| F | | | | | | | | -> |

**F=FIBER OPTICS**

| 2 | |
|---|---|
| CONFIGURATION | |
| **S** | SIMPLEX INDOOR |
| **D** | DUPLEX INDOOR |
| **1** | SIMPLEX I/O |
| **2** | DUPLEX I/O |
| **3** | DUPLEX DOUBLED JACKETD |

| 3 | |
|---|---|
| FIBER TYPE | |
| **7** | G657A2 |
| **6** | G657A1 |
| **8** | G657B3 |
| **D** | G652D |
| **1** | OM1 |
| **2** | OM2 |
| **3** | OM3 |
| **4** | OM4 |
| **A** | OS1 |
| **B** | OS2 |

| 4 | |
|---|---|
| EXTERNAL DIAMETER | |
| **0** | BARE FIBER |
| **1** | 0,9 mm |
| **2** | 1,6 mm |
| **3** | 1,8 mm |
| **4** | 2,0 mm |
| **5** | 2,4 mm |
| **6** | 2,6 mm |
| **7** | 2,8 mm |
| **8** | 3,0 mm |

| 5 | |
|---|---|
| JACKET TYPE | |
| **B** | BARE FIBER |
| **D** | OFNR DUAL RATED |
| **L** | LSZH |
| **P** | PLENUM |
| **R** | RISER |
| **U** | PUC |
| **V** | PVC |
| **T** | **PIGTAIL TIGTH BUFFERED*** |
| **S** | **PIGTAIL SEMITIGHT *** |
| **D** | **PIGTAIL EASY STRIP*** |

***SINGLE STRIPPING LENGTH:**
**Tight buffered: 10 cm**
**Semi-tight: 30 cm**
**Easy strip: 100 cm**

| 6 | |
|---|---|
| JACKET COLOR | |
| **0** | BARE |
| **A** | AQUA (OM3) |
| **B** | BLUE (SM) |
| **0** | ORANGE (OM1/OM2) |
| **V** | VIOLET (OM4) |
| **Y** | YELLOW (SM) |
| **W** | WHITE |
| **K** | BLACK |
| **M** | BROWN |
| **R** | RED |
| **T** | GREY |
| **C** | GREEN |
| **D** | PINK |
| **E** | TURQUOISE |

| 7 | |
|---|---|
| CONNECTOR LEFT SIDE | |
| **D** | DIN |
| **B** | E2000/APC |
| **R** | E2000/APC DUPLEX |
| **E** | E2000/UPC |
| **V** | E2000/UPC DUPLEX |
| **7** | FC/APC |
| **F** | FC/UPC |
| **1** | LC/APC |
| **3** | LC/APC DUPLEX |
| **L** | LC/UPC |
| **2** | LC/UPC DUPLEX |
| **C** | LX.5/APC |
| **G** | LX.5/APC DUPLEX |
| **H** | LX.5/UPC |
| **N** | LX.5/ UPC DUPLEX |
| **8** | MU/APC |
| **U** | MU/APC DUPLEX |
| **M** | MU/UPC |
| **9** | MU/UPC DUPLEX |
| **4** | SC/APC |
| **6** | SC/APC DUPLEX |
| **S** | SC/UPC |
| **5** | SC/UPC DUPLEX |
| **A** | SMA |
| **T** | ST/UPC |

| 8 | |
|---|---|
| BOOT LEFT SIDE | |
| **R** | REGULAR* |
| **S** | SHORT WHITE BOOT (available only for LC-SC) |
| **L** | SHORT BLACK BOOT (available only for LC) |
| **4** | 45° ANGLE WHITE BOOT (available only for LC) |
| **N** | 90° ANGLE WHITE BOOT (available only for LC) |
| **F** | FLEX WHITE BOOT (available only for LC-SC) |
| **E** | FLEX BLACK BOOT (available only for LC-SC) |
| **C** | RED & BLUE BOOT |
| **K** | BLACK |
| **B** | BLUE |
| **W** | WHITE |

*SM:
-WHITE per LC
-BLUE per SC
-BLACK per FC, DIN, SMA, ST
-GREEN for all APC

MM:
-WHITE per LC, SC (OM3/OM4)
-BLACK per FC, DIN, MU, E2000
-BEIGE per LX.5, SC (OM1/OM2)

***EXAMPLE***

**F-S-7-3-L-A-4-T-4-R** **-> continues**

Patchcord simplex indoor fiber type G657A2, DE 1,8 mm, LSZH jacket grigio with left connector SC/APC regular type boot …

| 9 | 10 | 11 | 12 | 13 | | | | 14 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | **M** |

| 9 | |
|---|---|
| RIGTH SIDE CONNECTOR | |
| **P** | **PIGTAIL** |
| **D** | DIN |
| **B** | E2000/APC |
| **R** | E2000/APC DUPLEX |
| **E** | E2000/UPC |
| **V** | E2000/UPC DUPLEX |
| **7** | FC/APC |
| **F** | FC/UPC |
| **1** | LC/APC |
| **3** | LC/APC DUPLEX |
| **L** | LC/UPC |
| **2** | LC/UPC DUPLEX |
| **C** | LX.5/APC |
| **G** | LX.5/APC DUPLEX |
| **H** | LX.5/UPC |
| **N** | LX.5/ UPC DUPLEX |
| **8** | MU/APC |
| **U** | MU/APC DUPLEX |
| **M** | MU/UPC |
| **9** | MU/UPC DUPLEX |
| **4** | SC/APC |
| **6** | SC/APC DUPLEX |
| **S** | SC/UPC |
| **5** | SC/UPC DUPLEX |
| **A** | SMA |
| **T** | ST/UPC |

| 10 | |
|---|---|
| BOOT LEFT SIDE | |
| **E** | NO ONE (PIGTAIL) |
| **R** | REGULAR* |
| **S** | SHORT WHITE BOOT (available only for LC-SC) |
| **L** | SHORT BLACK BOOT (available only for LC) |
| **4** | 45° ANGLE WHITE BOOT (available only for LC) |
| **N** | 90° ANGLE WHITE BOOT (available only for LC) |
| **F** | FLEX WHITE BOOT (available only for LC-SC) |
| **E** | FLEX BLACK BOOT (available only for LC-SC) |
| **C** | RED & BLUE BOOT |
| **K** | BLACK |
| **B** | BLUE |
| **W** | WHITE |

*SM:
-WHITE per LC
-BLUE per SC
-BLACK per FC, DIN, SMA, ST
-GREEN for all APC

MM:
-WHITE per LC, SC (OM3/OM4)
-BLACK per FC, DIN, MU, E2000
-BEIGE per LX.5, SC (OM1/OM2)

| 11 | |
|---|---|
| CONNECTOR GRADE | |
| **A** | GRADE A |
| **B** | GRADE B |
| **C** | GRADE C |

| 12 | |
|---|---|
| CUSTOM SOLUTION | |
| **E** | NO ONE |
| **A** | ARMORED |
| **P** | PRYSMIAN |

| 13 |
|---|
| LENGTH (4 DIGITS) |

| 14 | |
|---|---|
| UNIT OF LENGTH | |
| **M** | METER |

***EXAMPLE***
**4-R-A-E-0025-M**
… and right connector SC/APC regular type boot grade A, no custom solution, total length 25 meters

## ORDER LENGTH INFORMARTION

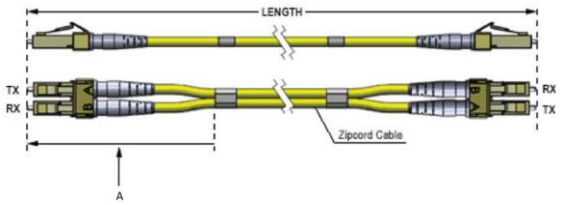
| 13 | | | |
|---|---|---|---|
| 0 | 0 | 0 | 0 |

| 14 | |
|---|---|
| UNIT OF LENGTH | |
| **M** | METER |

LENGTH OF PATCHCORDS ARE REALIZED BY STEP OF 0.5 METERS

IF THE DESIRED LENGTH USES METERS DECIMALS, PLEASE USE THE FORMAT XX.XX (EX. **09.95-M** or **99.50-M** for length of 9.95 meter and 99.50 meter respectively)

**ARMS LENGTHS DETAIL**




| TOTAL LENGTH | ARM LENGTH "A" |
|---|---|
| ≥ 1 meter | 0,2 meter each side |
| < 1 meter | 0,15 meter each side |

# REFLECTORS

## REFLECTORS FOR OPEN FIBER NETWORK ARCHITECTURE

The optical reflector is a device that inserted into the FTTH network allows to realize monitoring measures using instruments such as the *O.T.D.R. (Optical Time Domain Reflectometer)* by reflecting the signal at a wavelength between 1644.5 and 1655.5 nm.

The reflectors can be both unidirectional and bidirectional.

Thanks to its small size, the device can be placed inside the user box, a small box placed inside the apartments, in which the customer's single fiber is managed.

## TECHNICAL SPECIFICATIONS MONODIRECTIONAL REFLECTORS

| | |
|---|---|
| DIRECTION | **B -> A** |
| OPERATIVE WAVELENGTH | **Pass Band:1260 nm ~ 1625 nm**<br>**Reflect Band: 1644.5 nm ~ 1655.5 nm** |
| INSERTION LOSS | **≤ 1.0 dB (TYP. 0.8 dB) @ (1260- 1360 nm)*1**<br>**≤ 1.0 dB (TYP. 0.8 dB) @ (1460- 1610 nm)*1**<br>**≤ 1.0 dB (TYP. 0.8 dB) @ (1610- 1625 nm)*1**<br>**≥ 25 dB (TYP. 29 dB) @ REFLECT BAND*1** |
| RETURN LOSS | **≥ 32 dB @ (1260- 1360 nm)*1**<br>**≥ 32 dB @ (1460- 1610 nm)*1**<br>**≥ 25 dB @ (1610- 1625 nm)*2**<br>**≤ 1.0 dB @ REFLECT BAND*1** |
| CONNECTOR TYPE | **SC/APC MALE & SC/APC FEMALE** |
| APPLICABLE FIBER | **SM FIBER** |
| CONNECTOR COLOR | **GREEN (RAL 6018)** |
| *1 Measured at arbitrary wavelength<br>*2 Design guarantee | |

## TECHNICAL SPECIFICATIONS BIDIRECTIONAL REFLECTORS

| | |
|---|---|
| DIRECTION | **A -> B (BACKWARD) B -> A (FORWARD)** |
| OPERATIVE WAVELENGTH | **Pass Band:1260 nm ~ 1625 nm**<br>**Reflect Band: 1644.5 nm ~ 1655.5 nm** |
| INSERTION LOSS | **≤ 1.0 dB (TYP. 0.8DB) @ (1260- 1360 nm)*1**<br>**≤ 1.0 dB (TYP. 0.8DB) @ (1460- 1610 nm)*1**<br>**≤ 1.0 dB (TYP. 0.8DB) @ (1610- 1625 nm)*1**<br>**≥ 25 dB (TYP. 29DB) @ REFLECT BAND*1** |
| RETURN LOSS | **≥ 32 dB @ (1260- 1360 nm)*1**<br>**≥ 32 dB @ (1460- 1610 nm)*1**<br>**≥ 25 dB @ (1610- 1625 nm)*2**<br>**≤ 1.0 dB @ REFLECT BAND*1** |
| CONNECTOR TYPE | **SC/APC MALE & SC/APC FEMALE** |
| APPLICABLE FIBER | **SM FIBER** |
| CONNECTOR COLOR | **PINK (RAL 4010)** |
| *1 Measured at arbitrary wavelength<br>*2 Design guarantee | |

## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **27.080.604.053** | MONODIRECTIONAL REFLECTORS |
| **27.080.604.054** | BIDIRECTIONAL REFLECTORS |

## REFLECTORS FOR TELECOM ITALIA NETWORK ARCHITECTURE
**CPE CODE 27.080.604-056**

The **plug-style** reflector filter is made up of a body having the geometrical and mechanical characteristics of the SC/APC connector plug on one side and the adapter of the same connector on the other side. This allows the device to be inserted between the plug of the splitter and the adapter housing type SC.


## PLUG-STYLE REFLECTORS TECHNICAL CHARACTERISTICS

| | |
|---|---|
| OPERATIVE WAVELENGTH | **Pass Band:1260 nm ~ 1360 nm, 1460 nm~ 1625 nm**<br>**Reflect Band: 1645 nm ~ 1655 nm** |
| INSERTION LOSS | **≤ 1.0 dB @ (1260~ 1360 nm)*1**<br>**≤ 1.0 dB @ (1460~ 1625 nm)*1**<br>**≥ 20 dB @ Reflect Band** |
| RETURN LOSS | **≥ 32 dB @ (1260~ 1360 nm)*1**<br>**≥ 32 dB @ (1460~ 1600 nm)*1**<br>**≥ 22 dB @ (1610~ 1625 nm)*2**<br>**≤ 1.5 dB @ REFLECT BAND**<br>**ONLY AS A CONDITION THAT THE SIGNAL COMES FROM AN INPUT FIBER** |
| CONNECTOR TYPE | **SC/APC MALE & SC/APC FEMALE** |
| APPLICABLE FIBER | **SM FIBER** |
| CONNECTOR COLOR | **GREEN (RAL 6018)** |
| *1 Measured at arbitrary wavelength<br>*2 Design guarantee | |

# F.O. ATTENUATORS

## KEY ORDER CODE

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| **A** | | | | | | |

**A=ATTENUATORS**

| 2 | |
|---|---|
| FIBER TYPE | |
| **S** | SINGLE MODE (SM) |
| **M** | MULTI MODE (MM) |

| 7 | |
|---|---|
| ATTENUATION VALUE | |
| **01** | 1 dB |
| **02** | 2 dB |
| **03** | 3 dB |
| **04** | 4 dB |
| **05** | 5 dB |
| **06** | 6 dB |
| **07** | 7 dB |
| **08** | 8 dB |
| **09** | 9 dB |
| **10** | 10 dB |
| **11** | 11dB |
| **12** | 12 dB |
| **13** | 13 dB |
| **14** | 14 dB |
| **15** | 15 dB |
| **16** | 16 dB |
| **17** | 17 dB |
| **18** | 18 dB |
| **19** | 19 dB |
| **20** | 20 dB |

| 3 | |
|---|---|
| HOUSING COLOR | |
| **B** | BLUE (available only for SM LC, SC e E2000) |
| **C** | BEIGE (available only for MM LC, SC) |
| **G** | GREEN (available only for SM LC, SC e E2000) |
| **K** | BLACK (available only for MM E2000) |
| **M** | BROWN (available only for MU) |
| **S** | METALLO (available only for FC, ST) |

| 4 | |
|---|---|
| DESIGN TYPE | |
| **M** | MALE-MALE |
| **F** | FEMALE-FEMALE |

| 5 | |
|---|---|
| CONNECTOR TYPE | |
| **E** | E2000 |
| **F** | FC |
| **L** | LC |
| **M** | MU |
| **S** | SC |
| **T** | ST |

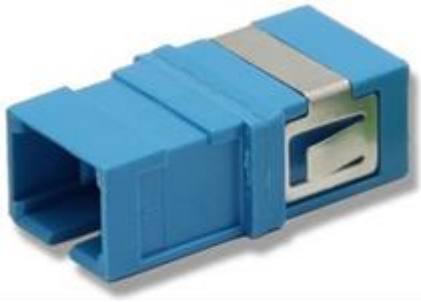
| 6 | |
|---|---|
| FERRULE TYPE | |
| **E** | NO ONE |
| **A** | APC |
| **U** | UPC |

***EXAMPLE***
**A-S-G-M-S-A-05**
SC/APC male-to-male green single-mode (SM) attenuator connector with 5dB attenuation

# ADAPTERS

## AVAILABLE TYPES

### SC



### LC

### FC

### MPO

## KEY ORDER CODE

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | CONTINUES -> |
|---|---|---|---|---|---|---|---|---|
| A | | | | | | | | |

**A=ADAPTERS**

| 2 | |
|---|---|
| FIBER TYPE | |
| **S** | SINGLE MODE (SM) |
| **M** | MULTI MODE (MM) |

| 3 | |
|---|---|
| HOUSING MATERIAL | |
| **M** | METALLIC |
| **P** | PLASTIC |

| 4 | |
|---|---|
| CONFIGURATION | |
| **0** | NO ONE (available only for MPO/MTP) |
| **S** | SIMPLEX |
| **D** | DUPLEX |
| **4** | QUAD (available only for LC) |
| **8** | 8 PORTS (available only for MU) |

| 5 | |
|---|---|
| SLEEVE TYPE | |
| **E** | BARE FIBER |
| **Z** | ZIRCONIA |
| **P** | PHOSPHORE BRONZE |
| **C** | CERAMIC |

| 6 | |
|---|---|
| FLANGE | |
| **E** | FLANGLESS |
| **F** | TWO HOLE RECTANGULAR FLANGE |
| **S** | TWO HOLE SQUARE FLANGE (only for FC configurations) |
| **0** | TWO HOLE OVAL FLANGE (only for FC configurations) |
| **B** | BULKHEAD - ASSEMBLY WITH NUT |

| 7 | |
|---|---|
| CONNECTOR LEFT AND RIGTH SIDE | |
| **B** | BARE FIBER |
| **E** | E2000 |
| **F** | FC |
| **L** | LC |
| **S** | SC |
| **T** | ST |
| **M** | MPO |

| 8 | |
|---|---|
| HOUSING COLOR | |
| **A** | ACQUA (available only for LC e SC) |
| **B** | BEIGE (MM) |
| **K** | BLACK |
| **B** | BLU |
| **M** | BROWN |
| **G** | GREEN |
| **S** | METAL (available only for metallic body) |
| **R** | RED |
| **V** | VIOLET |

***EXAMPLE***

**A-S-P-S-Z-E-S-G**

Adapter single mode plastic simplex with zirconia sleaves flangeless for connector SC type green color

# MATERIALS FOR DELIVERY

The term ***delivery*** refers to all activities aimed at creating vertical fiber optic systems in existing buildings for the development of the FTTH network. This is the terminal part of the interface network with the end user.

This category includes all the elements of the building network, starting from the termination box in the building (PTE or ROE) up to the optical socket which will be placed on the wall at the closest point, accessible to the existing infrastructure, by the needs of the customer.

## PATCHORDS

### OPTICAL PATCHORD SIMPLEX G657.A1 Ø3mm LSZH WHITE SC/APC-SC/APC L=60m

**CPE CODE: FS68LW4R4RCE0060M**


SIMPLEX G.657.A1 fiber optical patch cord with LSZH sheath used for delivery activities. Supplied SC/APC connectorized in 60 meter lengths.

| | |
|---|---|
| SHEATH TYPE | **LSZH** |
| SHEATH COLOR | **WHITE** |
| FIBER TYPE | **G.657 A1** |
| CONNECTOR | **SC/ APC** |
| TYPICAL INSERTION LOSS | **0.15 dB** |
| TYPICAL RETURN LOSS | **>65 dB** |
| DIAMETER | **3 MM** |
| LENGTH | **60 M** |

## OPTICAL SOCKET

### FIBER WALL OUTLET 1 PORTS 2 SPLICE WHITE

**CPE CODE: FAEWW12E**

Optical socket for user connection. It is equipped with a splice tray to accommodate up to two fusion splices and a base module for dissipation of the fiber richness. It has a housing on the base module useful for hosting an SC adapter. An interlocking cover protects the internal wiring.

| | |
|---|---|
| BOX DIMENSIONS | **80 X 100 X 20 MM** |
| MATERIALS | **ABS** |
| COLOR | **WHITE RAL 9016** |

## FIBER WALL OUTLET 1 PORT 2SPLICE OPENFIBER

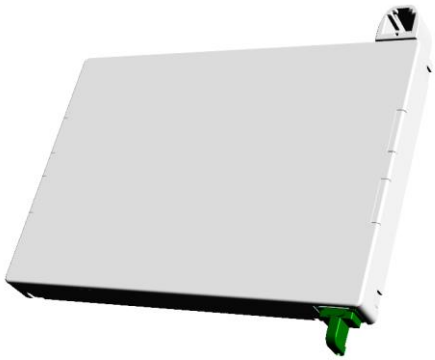
**CPE CODE: 17.150.500-E67**

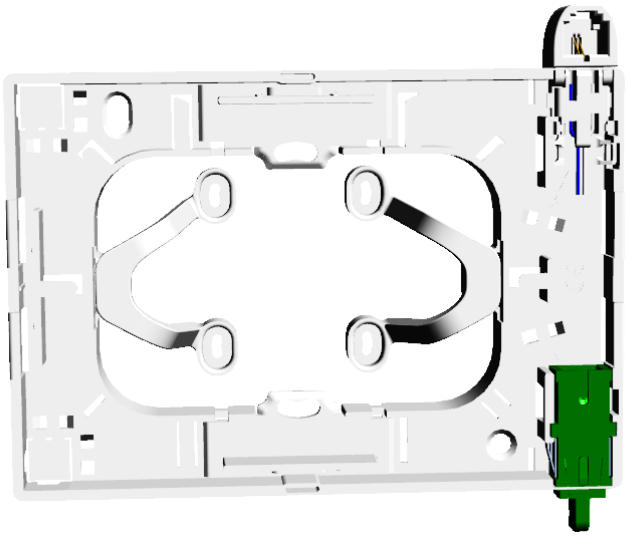
Optical socked supplied with Open Fiber adhesive. It is equipped with a splice tray, a base module and a lower transparent front panel corresponding to the inputs. The termination inside the socket is made by a 900 µm pigtail with a SC/APC connector that can be fusion spliced with the optical cable, or with a SC/APC connector that can be installed on field. There is a housing for the connector and for a monodirectional optical reflector.


| | |
|---|---|
| BOX DIMENSIONS | **85 X 115 X 22 MM** |
| MATERIAL | **ABS** |
| COLOR | **BIANCO RAL 9016** |

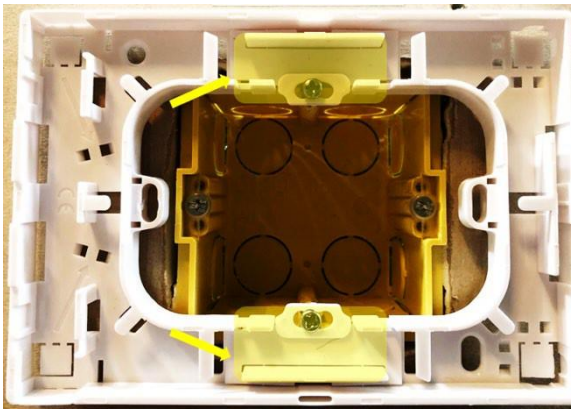
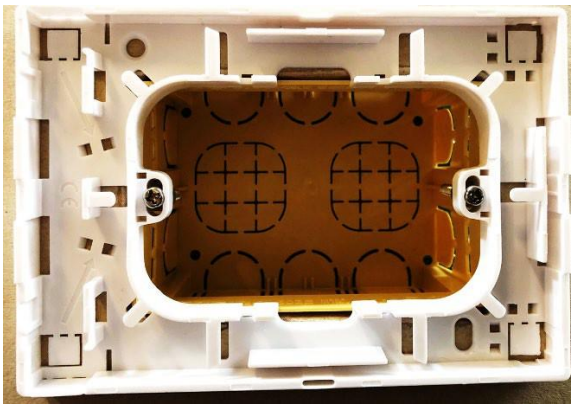
# OPTICAL WALL OUTLET

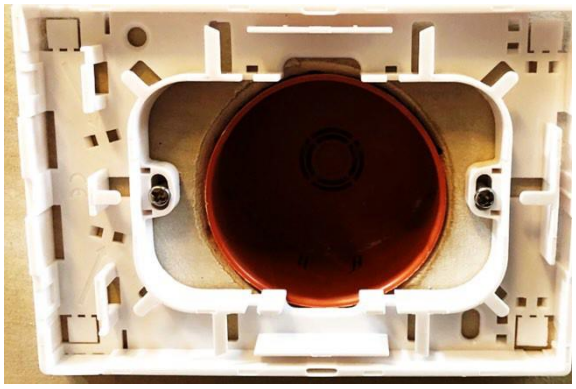
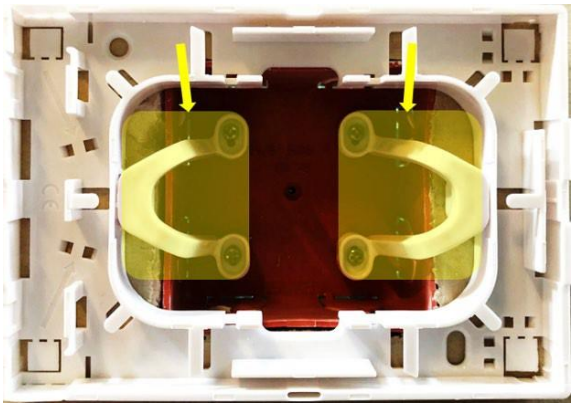
**CPE CODE: 17.150.500-F85**



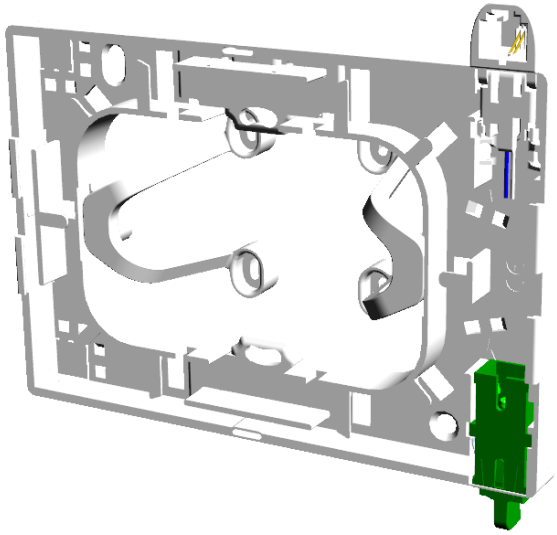


The optical wall outlet is a hybrid optical socket specific to **Telecom Italia** and is made up of a socket body with a rectangular geometric structure with a perimeter development, i.e., a frame created to adapt to different models of electrical boxes.

| | |
|---|---|
|  |  |
| **INSTALLATION ON UNI 502 SOCKET TYPE** | **INSTALLATION ON UNI 503 SOCKET TYPE** |

| | |
|---|---|
|  |  |
| **INSTALLATION ON ROUND SOCKET TIM DIAM. 60 MM** | **INSTALLATION ON SQUARE SOCKET TIM DIMENSION 80x80 MM** |

The socket provides slots that can be used for fusion/mechanical splice covers on two opposite sides, optical cable fastening systems and a slot for SC/APC connectors.



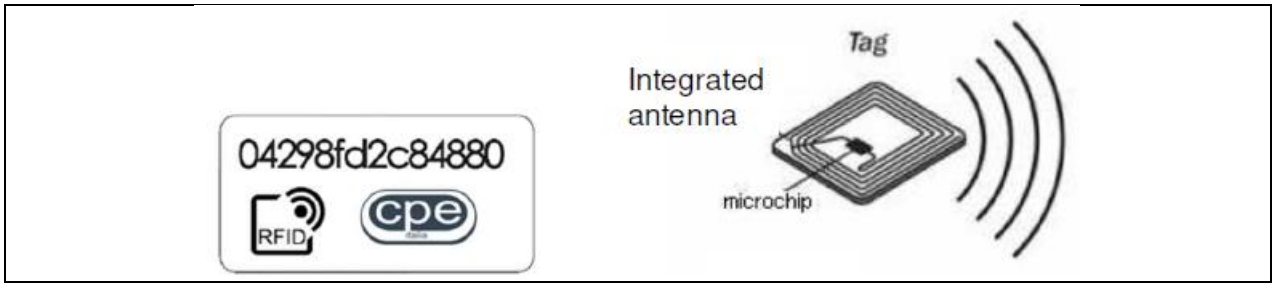
The socket also has the predisposition for the assembly of a specific connectivity module equipped with a bipolar termination in IDC technology and a *Registered Jack RJ11 2p2c* connector, to allow the recovery of the user system on copper twisted pair.

| | |
|---|---|
| MATERIAL | **ABS** |
| COLOR | **WHITE RAL 9016** |
| DIMENSIONS | **138 X 96 X 13 MM** |

# RFID TAG


CODICE OPEN FIBER:
RO0241000
ROE INTERRATO DA24 F.O.
CODICE CPE:
17.190.500-D99
LOTTO 012023
041BEFCA621291

With **RFID (Radio-Frequency Identification)**, we mean a technology for the automatic identification and/or data storage of objects based on the data storage capacity of electronic labels, called Tags, and on the ability of these to respond to remote scan by special fixed or portable devices, called Readers.
This identification takes place via radio frequency, thanks to which a Reader can read and write the information contained in the Tag under scanning.
RFID devices can therefore be assimilated to wireless reading and/or writing systems with an NFC (Near Field Communication) standard, which also allows the exchange of information between Readers.




Such systems are installed into network elements such as:

- Shelves
- Closures
- Optical Boxes
- Splitters
- Microcables
- Miniducts
- Street Cabinets

## TAG FOR OPEN FIBER NETWORKS

**CPE CODE: 2001-F19**


- Material: pet/pvc for installation on plastic elements
- Dimensions: 33 x 18 mm
- Memory: 1 Kb Read/Write/Lockable
- Frequency: HF 13,56 MHz
- RF protocol: ISO 14443
- IC Type: NTAG 213
- RFID type: passive
- NFC read/write protocol

## TAG FOR TELECOM ITALIA NETWORKS

## TECHNICAL DATA

- Frequency: 13,56 MHz
- RF Protocol: ISO 14443A
- IC Type: NTAG 213
- User memory: 1.152 bits (144 byte) Read/Write/Lockable
- UID: 56 bits (7 byte)
- Operating distance: 10-30 mm
- Compatible materials/applications: plastic/metal surfaces, microcables/miniducts

| APPLICATION | PICTURE | MATERIAL | DIMENSION [MM] |
|---|---|---|---|
| PLASTIC ELEMENTS |  | PLASTIC TAG:<br>PET | 15X30X0.4 (TAG) |
| MICROCABLES-MINITUBES |  | PLASTIC TAG:<br>PET<br><br>PROTECTION:<br>PVC OUTDOOR | 15X30X0.4 (TAG)<br><br>(ADHESIVE TRASP. PROT. 45x80mm) |
| METALLIC ELEMENTS |  | SUPPORT: ABS<br><br>PLASTIC TAG:<br>PET | 15x30x0,4 (TAG)<br><br>17x32x3.3 (SUPPORT) |

## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.150.500-L34** | TAG RFID FOR PLASTIC ELEMENTS |
| **17.150.500-L35** | TAG RID FOR MICROCABLES-MINITUBES |
| **17.150.500-L36** | TAG RFID FOR METALLIC ELEMENTS |

# TAG FOR FASTWEB NETWORKS ARCHITECTURE

## TECHNICAL DATA

| APPLICATION | CHARACTERISTICS | PACKAGING |
|---|---|---|
| **TAG NFC – PLASTIC ELEMENTS** | • dimensions: 30x15x0,4 mm.<br>• material: plastic tag PET<br>• fixation: adhesive on plastic elements<br>• operating distance: 10-30 mm<br>• compatible materials: plastic – wood – NO METAL | • bag 50 pcs.<br>• box 2.000 pcs. |
| **TAG NFC – METALLIC ELEMENTS** | • dimensions: 32x17x 3,3 mm<br>• material of support: ABS<br>• material: plastic tag PET<br>• fixation: adhesive on metal elements<br>• operating distance: 10-30 mm<br>• compatible materials: plastic – wood – metal<br>• adhesive on rear side | • bag of 50 pcs.<br>• box 2.000 pcs. |
| **TAG NFC - CABLES/MINITUBES** | • dimensions: 30x15x0,4 mm.<br>• material: plastic tag PET<br>• fixation: adhesive on plastic elements<br>• operating distance: 10-30 mm<br>• compatible materials: plastic – wood – NO METAL<br>adhesive transp. Protection 80x45 mm included | • bag of 50 kits<br>• box 2.000 pcs. |
| **TAG NFC - CLOSURES** | • dimensions: 30x15x0,4 mm.<br>• material: plastic tag PET<br>• operating distance: 10-30 mm<br>• compatible materials: plastic – wood – NO METAL<br>adhesive transp. Protection 80x45 mm included | • bag of 50 kits<br>• box 2.000 pcs. |

## PRODUCT CODES

| CPE CODE | PRODUCTS DESCRIPTION | PICTURE |
|---|---|---|
| **17.150.500-L55** | TAG NFC FOR PLASTIC ELEMENTS |   |
| **17.150.500-L56** | TAG NFC FOR METALLIC ELEMENTS |   |
| **17.150.500-L57** | TAG NFC FOR MICROCABLES/ MINIDCUTS 6-12 mm |   |
| **17.150.500-L58** | TAG NFC FOR ENCLOSURES |   |

# FDC – OPTICAL CLOSURES

## TECHNICAL DATA

**FDC (Fiber Distribution Closures)** is a family of boxes for aerial, underground and central office installation, designed to efficiently manage the splicing and parking of fiber optical cable.

Main applications:

- **inline joint or pot-head:** The inline joint allows the joining of two contiguous lengths of cable to create a continuous section. These joints can normally be located on poles, in chambers, existing or newly laid 80x125 cm manholes.
- **Spur joint – type 1**: allows to extract some fibers in an intermediate section of cable, without interrupting the remaining backbone fibers not involved in the extraction which therefore remain continuous without additional splices. These joints can normally be located on poles, in small chambers, existing or newly laid 80x125 cm manholes.
- **Spur joint – type 2**: it is the point in which the extraction of a certain number of fibers takes place in an intermediate section of an existing cable section, with the junction of the remaining backbone fibers not involved in the extraction. These joints can normally be located on poles, in small chambers, existing or newly laid 80x125 cm manholes.

The FDCs allow the separate management of the fibers, through suitable splice modules, thus eliminating the possibility of interfering with fibers already active during the operations of re-intervention or network configuration. In all the internal paths, the fibers are directed and conveyed always with respect to the **minimum curvature radius of 30 mm** to avoid unwanted stress and attenuations.

| EXTERNAL PARTS | INNER PARTS |
|---|---|
| • dome with pressure test valve in plastic material<br>• base with through earth connection and inlets for sealing incoming and/or outgoing cables<br>• locking clamp with gasket | • frame that allows the various junction modules to be assembled in a modular and flexible way<br>• splice modules supports<br>• splice modules<br>• cable fixation kits for different cable diameters and type |

Available in 4 different heights with a maximum capacity of 2880 joints, with µ-SMOUV splice protectors. They are suitable for outdoor use thanks to the wall and pole mounting kits and support the installation of PLC splitters too.

UV resistant, compliant with the RoHS standard and IP68 certified FDCs have wide application within the network topologies of Telecom Italia and Open Fiber.

## ENCLOSURES CONFIGURATIONS

| DOME DIMENSIONS / BASE TYPE | | A | B | C | D |
|---|---|---|---|---|---|
| | |  |  |  |  |
| **A** |  **1 OVAL 32x80 MM**<br>**6 ROUNDS ø 32 MM** | **FDC-AA**<br>**no. splice module kits: 6**<br>**no. of splices: 432*** | **FDC-AB**<br>**no. splice modules kits: 10**<br>**no. of splices: 720*** | **FDC-AB**<br>**no. splice modules kits: 14**<br>**no. of splices: 1008*** | **FDC-AD**<br>**no. splice modules kits: 22**<br>**no. of splices: 1584*** |
| **B** |  **1 OVAL 32x80 MM**<br>**8 ROUNDS ø 21 MM**<br>**8 ROUNDS ø 16 MM** | **FDC-BA**<br>**no. splice modules kits: 6**<br>**no. of splices: 432*** | **FDC-BB**<br>**no. splice modules kits: 10**<br>**no. of splices: 720*** | **FDC-BB**<br>**no. splice modules kits: 14**<br>**no. of splices: 1008*** | **FDC-BD**<br>**no. splice modules kits: 22**<br>**no. of splices: 1584*** |
| **C** |  **2 OVALS 32x80 MM**<br>**8 ROUNDS ø 21 MM** | **FDC-CA**<br>**no. splice modules kits: 6**<br>**no. of splices: 432*** | **FDC-CB**<br>**no. splice modules kits: 10**<br>**no. of splices: 720*** | **FDC-CB**<br>**no. splice modules kits: 14**<br>**no. of splices: 1008*** | **FDC-CD**<br>**no. splice modules kits: 22**<br>**no. of splices: 1584*** |

*** with splice module SC (Single Circuit) up to 12 standard splice each**

## GENERAL DATA

| | |
|---|---|
| IP PROTECTION DEGREE | **IP68 (EN 60529)** |
| IK IMPACT DEGREE | **IK10 (EN 50102)** |
| MINIMUM BENDING RADIUS | **30 mm** |

## MATERIALS

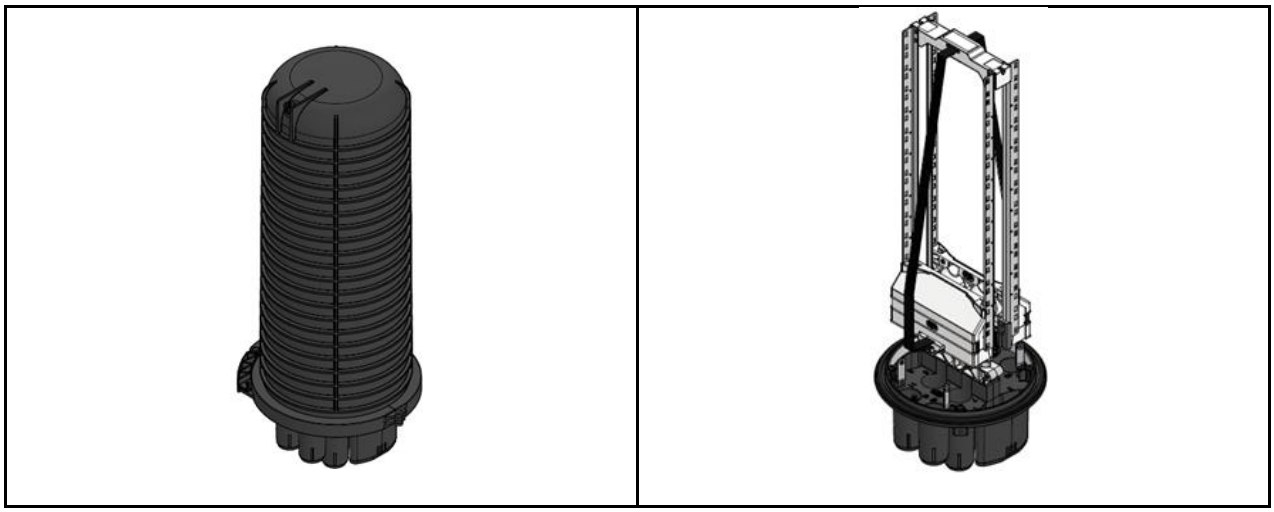
| | |
|---|---|
| BASE | **PP SELF-EXTINGUISHING UL94-V0** |
| DOME | **PP SELF-EXTINGUISHING UL94-V0** |
| LOCKING CLAMP | **PA66 FIBERGLASS REINFORCED – SELF-EXTINGUISHING UL94-V0** |
| O-RING | **SILICON RUBBER** |
| INNER FRAME | **ABS-PC FLAME RETARDANT UL94-V0** |
| FIBER MANAGEMENT SYSTEM | **ABS-PC FLAME RETARDANT UL94-V0** |
| SPLICE MODULES | **ABS-PC FLAME RETARDANT UL94-V0** |
| METALLIC PARTS | **INOX STEEL** |

## AVAILABLE CONFIGURATIONS

| NOME | FDC-XA | FDC-XB | FDC-XC | FDC-XD |
|---|---|---|---|---|
| TOTAL HEIGHT | **392 mm** | **467 mm** | **536 mm** | **680 mm** |
| MAXIMUM DIAMETER | **300 mm** | **300 mm** | **300 mm** | **300 mm** |
| SPLICE MODULES (MAX No.) | **6X6** | **10X6** | **14X6** | **22X6** |
| MAX No. OF SPLICES - STANDARD SMOUVs | **432** | **720** | **1008** | **1584** |
| MAX No. OF SPLICES - MICRO SMOUVs | **864** | **1440** | **2016** | **3168** |

The basic versions of the closures are supplied complete with:

- dome with pressure test valve
- base with nr. 1 oval port and nr. 6 round ports and grounding
- locking clamp with gasket
- inner frame
- fiber management system with cover



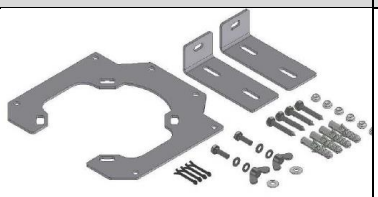
## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.190.500-G97** | FDC-AA BASIC |
| **17.190.500-G98** | FDC-AB BASIC |
| **17.190.500-G99** | FDC-AC BASIC |
| **17.190.500-L08** | FDC-AD BASIC |
| **17.190.500-L09** | FDC-CA BASIC |
| **17.190.500-L10** | FDC-CB BASIC |
| **17.190.500-L11** | FDC-CC BASIC |
| **17.190.500-L12** | FDC-CD BASIC |

**NOTE: closures can be configured with all the accessories contained in the following sections**

## FDC ACCESSORIES

### FIXATION KIT

| CPE CODE | DESCRIPTION | IMMAGINI | NOTES |
|---|---|---|---|
| **17.150.500-654** | **FDCKIT-WMB** WALL MOUNTING KIT |  | • base plate + nr. 2 brackets and mounting screws<br>• complete kit with PA washers and insulators, Fisher plugs, wing nuts and cotter pins |

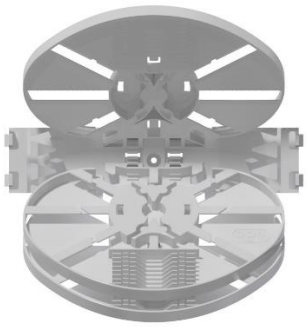
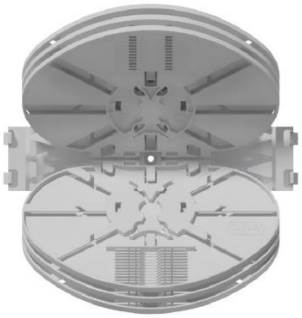
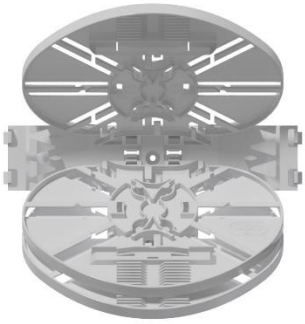
## SPLICE MODULES

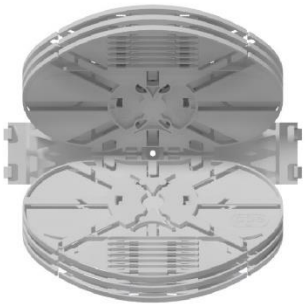
The splice modules can be assembled and disassembled individually, through a hinge system, on the appropriate support base inside the closure.

The hinge rotates the module to allow easy and immediate access to the splices and/or the slack of fibers of specific loose tube without interfering with the other circuits.

SPLICE modules are divided into three distinct types:

- **SE (Single Element)**
  thickness of 8 mm, allows to manage fibers of a single tube and hold of up to 24 fusion splices
- **SC (Single Circuit)**
  thickness of 4 mm, and allows the arrangement of up to 12 fusion splices
- **N**
  thickness of 8 mm, allows the allocation of primary splitters and up to 24 fusion splices

| CPE CODE | DESCRIPTION | PICTURE | NOTE |
|---|---|---|---|
| **17.150.500-702** | **STP6-8S**<br>SC - SINGLE CIRCUIT SPLICE MODULES |  | • no. 6 splice modules + holding base support<br>• up to 48 fusion splices*<br>• length of fiber 250 µm ≤ 2m for each side |
| **17.150.500-703** | **STP3-24S**<br>SE - SINGLE ELEMENT SPLICE MODULES |  | • no. 3 splice modules + holding base support<br>• up to 72 fusion splices*<br>• length of fiber 250 µm ≤ 2m for each side |
| **17.150.500-700** | **STP6-24M**<br>SE - SINGLE ELEMENT SPLICE MODULES |  | • no. 6 splice modules + holding base support<br>• up to 144 micro-fusion splices **<br>• up to 72 ANT splices<br>• length of fiber 250 µm ≤ 0,75m for each side |
| **17.150.500-701** | **STP3-PLC**<br>SPLICE MODULES - TYPE N |  | • no. 3 splice modules + holding base support<br>• up to 48 micro-fusion splices **<br>• up to 16 ANT splices<br>• splitter holders for max. 6 splitter PLC dim. 40x4x4 mm<br>• length of fiber 250 µm ≤ 1,2m for each side |

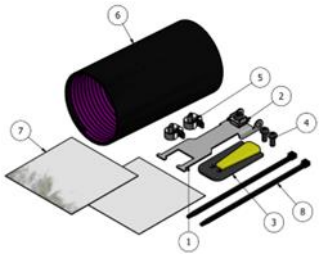
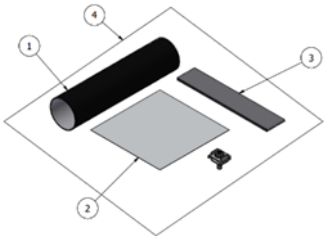
| | | | |
|---|---|---|---|
| **17.150.500-869** | **STP-6-2X6S**<br>SC - SINGLE CIRCUIT SPLICE MODULES |  | • no. 6 splice modules + holding base support<br>• up to 72 fusion splices (12 for each module, 6 for each side)*<br>• length of fiber 250 µm ≤ 1,5m for each side |
| **17.150.500-A18** | **STP-6-12S**<br>SC - SINGLE CIRCUIT SPLICE MODULES |  | • no. 6 splice modules + holding base support<br>• up to 72 fusion splices***<br>• length of fiber 250 µm ≤ 1,5m for each side |
| * **smouv standard type dimension: 2,5 x 45 mm**<br>** **µicro-smouv dimension: 1,4 x 40 mm**<br>*** **smouv standard type dimension: 2,2 x 45 mm** | | | |

**NOTE:**
**STP-0-00S/M/PLC**
**0 = number of modules provided with the kit together with the base**
**00 = number of fusion splices per module**
**S/M/PLC = standard splices / micro splices / housing for splitter module PLC**

**COMPATIBILTY WITH TERMOSLEEVE (*SMOUVE*)**

| CODE CPE | DESCRIPTION | SMOUVE DIMENSION DxL [mm] | COMPATIBLE MODULE |
|---|---|---|---|
| **17.250.500-750** | HSP 2.5 x 45 mm | 2,5x45 | **STP-6-8S, , STP3-24S, STP-6-2X6S** |
| **17.250.500-P24** | HSP 2,2 x 45 mm | 2,2x45 | **STP-6-8S, , STP3-24S, STP-6-2X6S STP-6-12S** |
| **17.250.500-693** | HSP 1.4 x 40 mm | 1,4x40 | **STP-6-24M, STP3-PLC** |
| **17.250.500-F56** | HSP 1.5 x 35 mm | 1,5x35 | **STP3-PLC** |
| **17.250.500-786** | HSP 1.4 x 35 mm | 1,4x35 | **STP3-PLC** |
| **provided in 100 units** | | | |

## CABLE SEALING KITS - HEATSHRINK

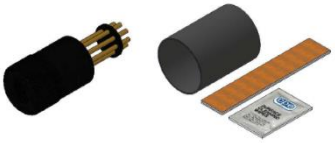
| CODICI CPE | DESCRIZIONE | IMMAGINI | DETTAGLI |
|---|---|---|---|
| **17.750.500-789** | **FDCKIT-OPHS**<br>OVAL PORT HEATSHRINK CABLE SEALING KIT |  | • oval port heatshrink cable sealing kit, 45x150 mm<br>• cable range OD **10÷ 27 mm**<br>• included: sandpaper, aluminum foil cable protector, tie-wraps, cable fixation bracket and strength member fixation |
| **17.750.500-789** | **FDCKIT-RPHS**<br>ROUND PORT HEATSHRINK CABLE SEALING KIT |  | • round port heatshrink cable sealing kit, diam. 80 mm, length 150 mm<br>• cable range OD **10÷30 mm**<br>• included: sandpaper, aluminum foil cable protector, tie-wraps, cable fixation bracket and strength member fixation |

## CABLE SEALING KITS - COLD

| | | | |
|---|---|---|---|
| **17.750.500-633** | **OPCS-2X16mm**<br>OVAL PORT COLD SEALING KIT |  | • oval port cold sealing kit, silicon rubber<br>• cables range **OD 7 ÷16,5 mm**<br>• kit including tie-wraps, cable/strength member fixation brackets |
| **17.750.500-A19** | **OPCS-2X20mm**<br>OVAL PORT COLD SEALING KIT |  | • oval port cold sealing kit, silicon rubber<br>• cables range **OD 14 ÷20,5** mm<br>• kit including tie-wraps, cable/strength member fixation brackets |
| **17.750.500-A20** | **RPCS-1X20mm**<br>ROUND PORT COLD SEALING KIT |  | • round port cold sealing kit, silicon rubber for 1 cable<br>• cable range **OD 15 ÷20,5 mm**<br>• kit including tie-wraps, cable/strength member fixation brackets |

| | | | |
|---|---|---|---|
| **17.750.500-862** | **RPCS-1X16mm**<br>ROUND PORT COLD SEALING KIT |  | • round port cold sealing kit, silicon rubber for 1 cable<br>• cable range **OD 10 ÷16,5 mm**<br>• kit including tie-wraps, cable/strength member fixation brackets |
| **17.750.500-861** | **RPCS-2X12mm**<br>ROUND PORT COLD SEALING KIT |  | • round port cold sealing kit, silicon rubber for 2 cables<br>• cable range **OD 8 ÷12,5 mm**<br>• kit including tie-wraps, cable/strength member fixation brackets |
| **17.750.500-A00** | **RPCS-4X10mm**<br>ROUND PORT COLD SEALING KIT |  | • round port cold sealing kit, silicon rubber for 4 cables<br>• cable range **OD 6÷10,5 mm**<br>• kit including tie-wraps, cable/strength member fixation brackets |
| **17.750.500-634** | **RPCS-4X8mm**<br>ROUND PORT COLD SEALING KIT |  | • round port cold sealing kit, silicon rubber for 4 cables<br>• cable range **OD 5 ÷8,5 mm**<br>• kit including tie-wraps, cable/strength member fixation brackets |
| **17.150.500-B02** | **RPCS-8X7mm**<br>ROUND PORT COLD SEALING KIT |  | • round port cold sealing kit, silicon rubber for 8 cables<br>• cable range OD **up to 7,5 mm**<br>• kit including tie-wraps, cable/strength member fixation brackets |
| **17.750.500-761** | **RPCS-8X6mm**<br>ROUND PORT COLD SEALING KIT |  | • round port cold sealing kit, silicon rubber for 6 cables<br>• cable range **OD 3 ÷6,5 mm**<br>• kit including tie-wraps, cable/strength member |
| **17.750.500-B03** | **RPCS-12X4mm**<br>ROUND PORT COLD SEALING KIT |  | • round port cold sealing kit, silicon rubber for 12 cables<br>• cable range **OD up to 4,5 mm**<br>• kit including tie-wraps, cable/strength member fixation brackets |

## OTHER ACCESSORIES

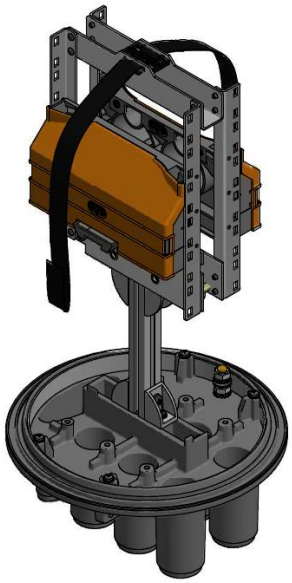
| CPE CODE | DESCRIPTION | PICTURE | NOTES |
|---|---|---|---|
| **2001-F19** | **FDC-TAG RFID**<br>RFID ADHESIVE TAG |  | • RFID adhesive plastic tag, NFC type (ISO-IEC 14443A)<br>• usually placed on the top of the internal frame (readable/ writable with the closed enclosure) |
| **17.650.500-F91** | **ELECTRICAL CONTINUITY TEST KIT** |  | • for metal continuity measures on Telecom Italia underground closures<br>• kit complete with sandpaper, cleaning wipe tissue and heat-shrink tubing |
| **17.150.500-G35** | **METAL TIE-WRAPS**<br>METALLIC SCREW TYPE TIES 940X14 mm |  | • for aerial installation of closure on poles |

**NOTE: all closures can be 100% customized according to the customer's requests in terms of capacity, splice modules and necessary accessories**

## FDC CUSTOM KITS

These FDC versions are custom solutions that differ from traditional FDC products for:

- the frame entirely in metal
- a lifted geometry of the same frame



**GENERAL DATA**

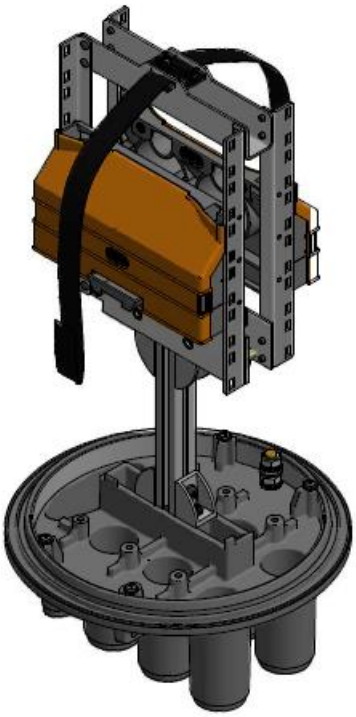
| | |
|---|---|
| DIMENSIONS | **300x300x505 (H) mm** |
| IP WATER/DUST PROTECTION GRADE | **IP68 (EN 60529)** |
| IMPACT IK GRADE | **IK10 (EN 50102)** |
| MINIMUM BENDING RADIUS | **30 mm** |

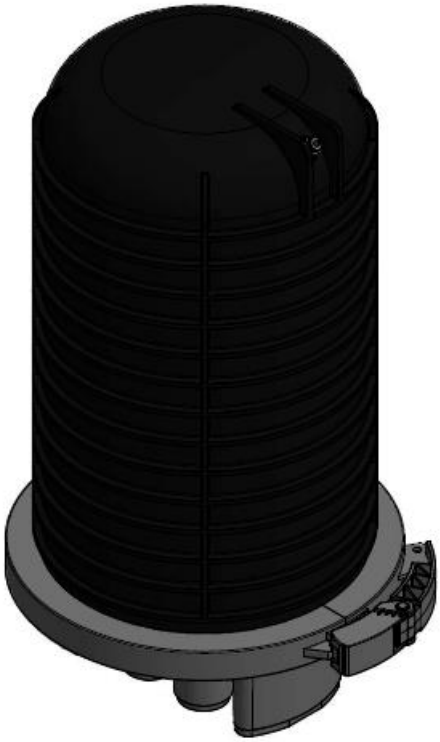
**MATERIALS**

| | |
|---|---|
| BASE | **PP SELF-ESTINGUISHING UL94-V0** |
| DOME | **PP SELF-ESTINGUISHING UL94-V0** |
| LOCKING CLAMP | **PA66 SELF-ESTINGUISHING REINFORCED WITH FIBREGLASS UL94-V0** |
| O-RING | **SILICON RUBBER** |
| INNER FRAME | **INOX STEEL** |
| FIBER MANAGEMENT SYSTEM | **ABS-PC FLAME RETARDANT UL94-V0** |
| SPLICE MODULES | **ABS-PC FLAME RETARDANT UL94-V0** |
| METALLIC PARTS | **INOX STEEL** |

The *basic* version comes complete with:

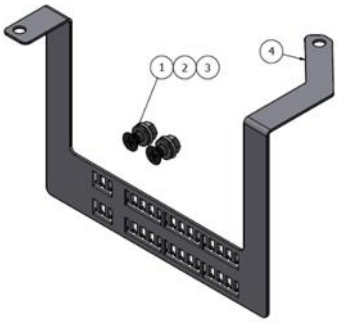
- dome with pressure test valve
- base with nr. 1 oval port and nr. 6 round ports and grounding bolt
- locking clamp with gasket
- inner frame
- fiber management system with cover



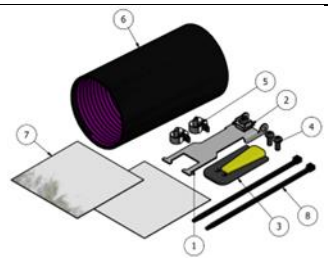
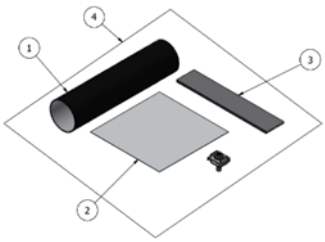


FDC-ABT-NN-DE01
**CPE CODE: 17.190.500-969**

## FIRST SUPPLYING KIT

| CPE CODE | Q.TY | DESCRIPTION | PICTURE |
|---|---|---|---|
| **17.150.500-654** | 1 | **FDCKIT-WMB**<br>WALL MOUNTING KIT |  |
| **17.150.500-A01** | 1 | **FDCKIT-EFB**<br>EXTERNAL FIXATION BRACKETS FOR MINITUBES |  |
| **17.150.500-700** | 1 | **STP6-24M**<br>SE SPLICE MODULES |  |
| **17.750.500-633** | 1 | **OPCS-2X16mm**<br>OVAL PORT COLD SEALING KIT |  |
| **17.750.500-861** | 1 | **RPCS-2X12mm**<br>ROUND PORT COLD SEALING KIT 2 HOLES |  |

## FIRST SUPPLYING KIT

| CPE P/N | Q.TY | DESCRIPTION | PICTURE |
|---|---|---|---|
| **17.150.500-700** | 1 | **STP6-24M**<br>SE SINGLE ELEMENT SPLICE MODULES |  |
| **17.750.500-770** | 1 | **FDCKIT-OPHS**<br>OVAL PORT HEATSHRINK SEALING KIT |  |
| **17.750.500-789** | 1 | **FDCKIT-RPHS**<br>ROUND PORT HEATSHRINK SEALING KIT |  |

# COMPACT OPTICAL CLOSURES – CFDC

The **CFDCs** are the compact rectangular dome version of the FDCs. Two configurations are available with the following technical specifications.

## GENERAL DATA

| | |
|---|---|
| IP WATER/DUST PROTECTION GRADE | **IP68 (EN 60529)** |
| IMPACT IK GRADE | **IK10 (EN 50102)** |
| MINIMUM BENDING RADIUS | **30 mm** |

## MATERIALS

| | |
|---|---|
| BASE | **PP SELF-EXTINGUISHING UL94-V0** |
| DOME | **PP SELF-EXTINGUISHING UL94-V0** |
| LOCKING CLAMP | **PA66 FIBERGLASS REINFORCED – SELF-EXTINGUISHING UL94-V0** |
| O-RING | **SILICON RUBBER** |
| INNER FRAME | **ABS-PC FLAME RETARDANT UL94-V0** |
| FIBER MANAGEMENT SYSTEM | **ABS-PC FLAME RETARDANT UL94-V0** |
| SPLICE MODULES | **ABS-PC FLAME RETARDANT UL94-V0** |
| METALLIC PARTS | **INOX STEEL** |

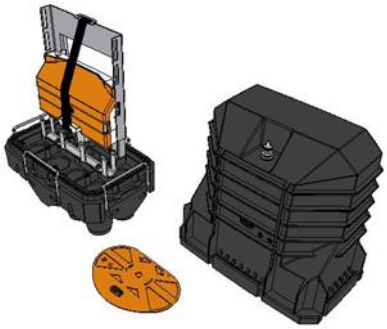
## AVAILABLE CONFIGURATIONS

| **PRODUCT NAME** | **CFDC-A** | **CFDC-B** |
|---|---|---|
| DIMENSIONS | **240x150xH320 mm** | **240x150xH400 mm** |
| SPLICE MODULES (MAX NO.) | **2X6 SC** | **4X6 SC** |
| MAX NO. OF SPLICES - STANDARD SMOUVs | **144** | **288** |
| MAX NO. OF SPLICES - MICRO SMOUVs | **288** | **576** |

## PRODUCT CODES

The *basic* versions come complete with:

- dome with pressure test valve
- base with nr. 1 oval port and nr. 6 round ports, grounding bolt and metal closing clips
- inner frame
- fiber management system with cover



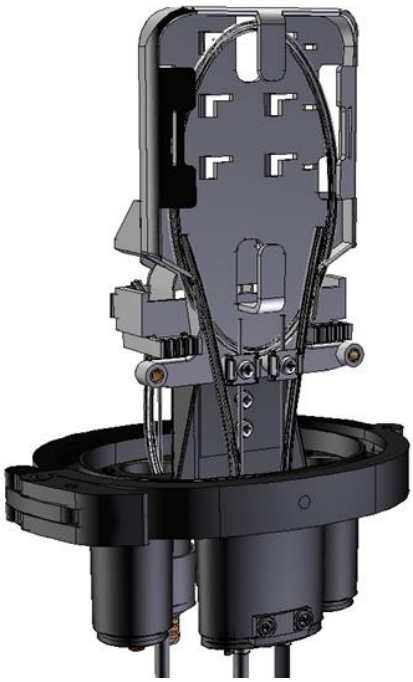
| CPE CODE | DESCRIPTION |
|---|---|
| **17.190.500-A67** | CFDC-AA BASIC |
| **17.190.500-A68** | CFDC-AB BASIC |

**NOTE: the CDFC enclosures can be supplied on request with all the accessories required for the FDC closures (except for the dedicated wall mounting bracket CPE CODE 17.150.500-C25)**

# COMPACT OVAL ENCLOSURES

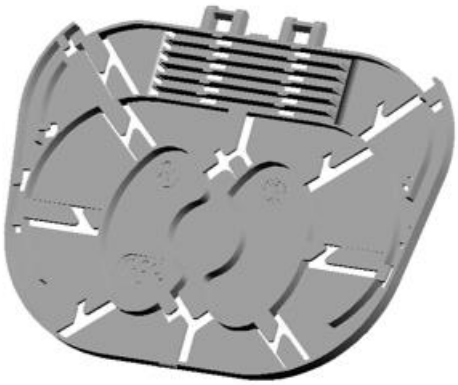
The oval compact CPE enclosures are highly versatile enclosures designed for FTTH networks which present a series of peculiar characteristics able to satisfy the new market needs:

- high capacity: up to 432 f.o. with MEDIUM size version
- compact dimensions: only 296 (H) X 233 X160 mm for EXTRA SMALL size version
- mechanical protection with the revolutionary sloping-shape dome
- cable ports knock out breakable with percussion using a simple hammer
- oval base with relief valve to allow excess air to escape
- water-tight (IP68, up to 5 m below water)
- outdoor flexible use (into manholes, direct buried, aerial installation)



Dedicated splice modules, available in several types, are used for fibers splicing:

- standard splice modules "**SC": 12 splices per module**
- ribbon fiber splice modules "**RIB": 3 ribbon splices per module (36 fibers)**
- hybrid splice modules "**HYB": 3 ribbon splices per module (36 fibers) + 6 standard splices per module**



**MODULE *SC* STANDARD**

**MODULE *RIB* RIBBON**

**MODULE *HYB* HYBRID**

## TECHNICAL SPECIFICATIONS

| FEATURES | EXTRA SMALL | SMALL | MEDIUM |
|---|---|---|---|
| MAX CAPACITY | **96 F.O. WITH SF MODULES** | **144 F.O. WITH SF MOD. 216 F.O. WITH SE RIBBON** | **288 F.O. WITH SF MOD. 432 F.O. WITH SE RIBBON** |
| DIMENSIONS | **298 (H)X234X 160 mm** | **328(H)X 234 X160 mm** | **418(H)X234X160 mm** |
| BASE | **4 ROUND PORTS + 1 OVAL (LOOP CABLE)** | | |
| EXTERNAL MATERIALS | **PP (POLYPROPYLENE) FIBREGLASS REINFORCED** | | |
| INNER MATERIALS | **PC+ABS** | | |
| REALISING VALVE | **BRASS** | | |
| O-RING | **NBR 70 SHORE A** | | |
| IP RATING EN 60529 (DUST, WATER) | **IP 68** | | |
| IK RATING EN 50102 (IMPACT) | **IK 09** | | |

## ACCESSORIES

## FIXATION SYSTEM

| CPE CODE | DESCRIPTION | PICTURE | NOTES |
|---|---|---|---|
| **TBD** | **UMB (UNIVERSAL MOUNTING BRACKET)** |  | enclosure anchoring bracket |
| **17.250.500-H49** | **UMB ADAPTER** |  | adapter for UMB enclosure |
| **17.150.500-P91** | **FDCKIT-WMB SMALL NODE** |  | bracket for pole installation |

## COLD SEALINGS

| CPE CODE | DESCRIPTION | PICTURE | NOTES |
|---|---|---|---|
| **17.750-500-G32** | **OVAL COLD SEALING KIT 2x14** |  | cable range **OD= 5÷14 mm** |
| **17.750-500-H17** | **ROUND COLD SEALING KIT 1x20** |  | cable range **OD= 15÷20.5 mm** |

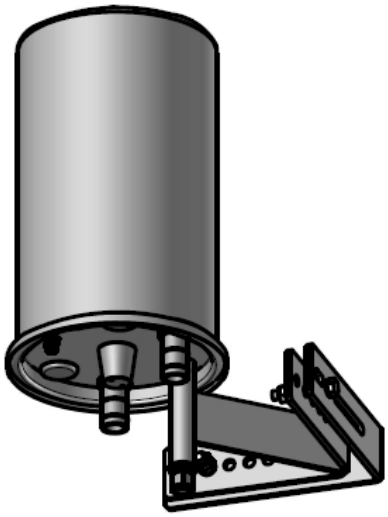
| | | | |
|---|---|---|---|
| **17.750.500-H15** | **ROUND COLD SEALING KIT 1x16** |  | cable range **OD= 10÷16.5 mm** |
| **17.750.500-H14** | **ROUND COLD SEALING KIT 2x12** |  | cable range **OD= 8÷12.5 mm** |
| **17.750.500-G59** | **ROUND COLD SEALING KIT 4x10** |  | cable range **OD= 6÷10.5 mm** |
| **17.750.500-H12** | **ROUND COLD SEALING KIT 4x8** |  | cable range **OD= 5÷8.5 mm** |
| **17.750.500-H13** | **ROUND COLD SEALING KIT 8x6** |  | cable range **OD= 3÷6.5 mm** |
| **17.750.500-H16** | **ROUND COLD SEALING KIT 12x4** |  | cable range **OD= 0÷4.5 mm** |

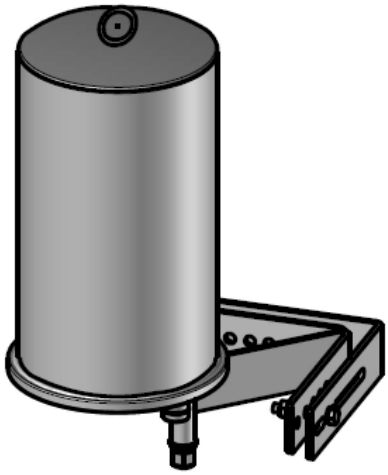
## CPE CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-G29** | OVAL ENCLOSURE EXTRA SMALL |
| **17.250.500-G30** | OVAL ENCLOSURE SMALL |
| **17.250.500-G31** | OVAL ENCLOSURE MEDIUM |

# JOINT STEEL BOX

**CPE CODE: TBA**





The JOINT STEEL BOX enclosure is specifically designed for the management of optical lines located on HV and M.T. overhead lines.

The solution consists of a base and a protective casing to be applied to it, completely made of stainless steel (1.5 mm thick for the dome and 3 mm for the base). The overall solution can ensure an **IP68** degree of protection in accordance with the CEI EN 60529 standard.

The removable cover is equipped with a ring on the upper side which allows it to be lifted during installation, assembly, or maintenance operations.

The main functional characteristics are also:

- the maintenance over time of the mechanical, physical, and chemical characteristics of the materials contained
- the stability of the entry and exit fixing points of the optical cables and dielectric optical cables
- the mechanical resistance of the box and its contents to stresses induced by climatic agents
- structural resistance against vandalism
- the possibility of carrying out the ground connection operations and the consequent raising of the box to the anchoring point

The enclosure allows the management of optical fibers of **Optical Guard Ropes (OPGW**) and optical cables. It has a maximum capacity of **144 fibers** and allows simple splices (48 input fibers, 48 output fibers) and splices with extraction (junction of some backbone fibers).

The enclosure can be configured according to three uses:

- **line (type L)** to allow the cable-cable junction of 2 successive optical sections (with or without extractions)
- **terminal (type E)** to allow the rope-cable junction of the OPGW cables with one or more optical cables
- **insulated terminal (type E-I)** to allow the rope-cable junction with an electrically insulated optical descent on the station portal

The enclosure has no. 4 inputs at the base capable of simultaneously managing diverse types of OPGW cables, diverse types of dielectric cables as well as feed-through insulators using ad hoc kits.

| | |
|---|---|
| ENCLOSURE MATERIAL | **INOX STEEL** |
| MAX DIMENSIONS | **600x250 MM** |
| WEIGTH | **10.5 KG** |

# OPEN FIBER NETWORK ELEMENTS

## OPEN FIBER NETWORK HIERARCHIES

**PON (Passive Optical Network)** technology allows the creation of FTTH fiber optic network infrastructures in point-to-multipoint mode, using exclusively fiber and passive components, such as optical splitters and splices, which, installed along the entire transmission stretch, do not require to be powered by the electricity grid.

These aspects translate into an important advantage of the technology, reducing costs and the possibility of failures, unlike what happens with copper networks.

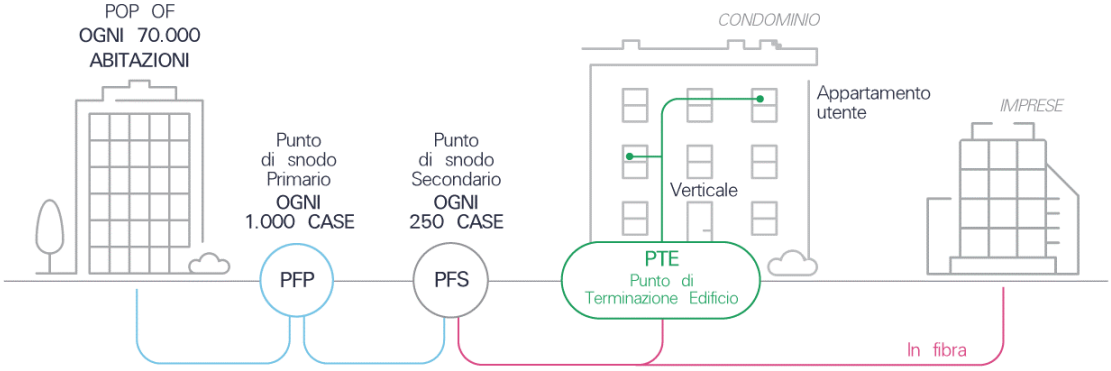
**In the Open Fiber network hierarchy, the entire national territory of Italy has been divided into 4 zones or clusters:**

- **A&B clusters:** areas with a high population density
- **C&D clusters:** areas with low population density: rural or expansion areas

| |
|---|
| **Cluster A: profitable areas**<br>**It includes 15 "black" cities (the most populous in Italy) and the main industrial areas. It concerns 15% of the national population (around 9.4 million inhabitants). However, limited public stimulus interventions are necessary (through tax exemptions or state guarantees of debt investments).** |
| **Cluster B: areas for which an investment at 100 Mbs is not envisaged**<br>**It includes 1120 municipalities in which 45% of the population resides (approximately 28.2 million). It is made up of the areas for which initiatives for 30 Mbps connections are planned by private operators. Market conditions are not sufficient to guarantee the minimum returns necessary for operators who invest in a 100 Mbps connection. Divided into two sub-clusters, depending on whether or not a public intervention has been launched for the development of connectivity at at least 30 Mbps.** |
| **Cluster C: marginal areas**<br>**It includes approximately 2,650 municipalities and some rural areas not covered by networks at more than 30 Mbps. Approximately 15.7 million people live there (25% of the population). These are areas for which operators can only become interested in investing in 100 Mbps networks thanks to state support. Public intervention in this cluster is greater than that of cluster B.** |
| **Cluster D: market failure areas**<br>**It includes the remaining approximately 4,300 municipalities, especially in the South, including some rural areas. It concerns 15% of the population due to their characteristics of low population density and jagged location across the territory for which only direct public intervention can guarantee the resident population a connectivity service at more than 30 Mbps.** |

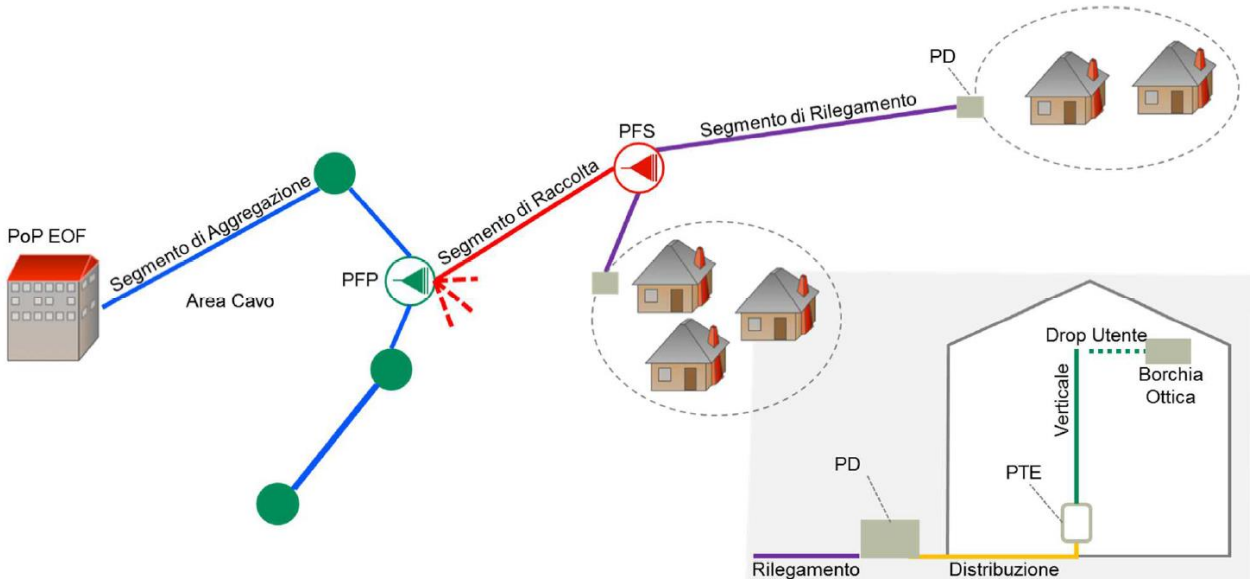
# ARCHITETTURA DI RETE

Cluster a & b




The network architecture of the A&B clusters provides for a multi-operator passive network that supports the use of "**Point-to-Multipoint**" (with splitting) and "**Point-to-Point**" (without splitting) technologies.

It is a GPON (GigaPON) with a total split ratio of **1:64** between **POP (Point of Presence)** and cabinet **PFS (Secondary Flexibility Point)** while the connection between PFS and the network users is P2P (Point to Point) Point-to-Point.




POP=Point of Presence. Located at the Enel primary cabins. Contains each Operator's OLT equipment and the OTDR monitoring system

PFP=Primary Flexibility Point (buried enclosure). Node in which the first level of 1:4 splitting occurs

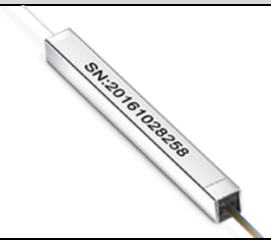
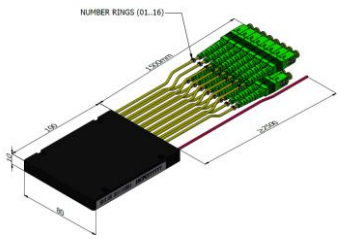
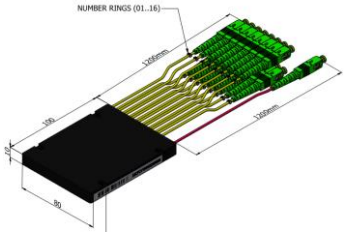
PFS=Secondary Flexibility Point (road cabinet). Node at which the second level of 1:16 splitting takes place

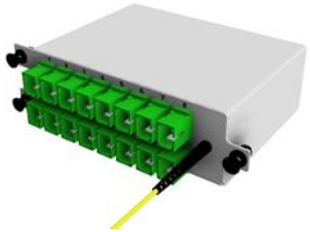
PD= Distribution Point (underground enclosure). Node that collects the fibers coming from each building

PTE=Building Termination Point (plastic box). Horizontal network termination node.
It is located near the electricity meter room inside each building

To cover the gray areas, a new brand called **OPEN FIBER|NEXT** was recently introduced within the Open Fiber network. The elements present within this architecture follow those of the A&B and partly C&D clusters and differ from these exclusively in terms of labeling and therefore identification and visibility.

## SPLITTERS FOR OPEN FIBER NETWORK ARCHITECTURE

| CPE CODE | DESCRIPTION | PICTURES | DETAILS |
|---|---|---|---|
| **45.120.150-U88** | PRIMARY SPLITTER 1x4 FOR **PFP** ENCLOSURE |   | • primary splitter 1x4 **PFP** enclosure<br>• metallic case dimensions: 40x4x4 mm<br>• 250 µm fiber, 1 meter length |
| **45.120.150-V01** | SECONDARY SPLITTER 1X16 FOR CABINET **PFS3** |   | • secondary splitter 1x16 BUTT type for cabinet **PFS3**<br>• plastic case dimensions: 100x80x10 mm<br>• patchords OD = 1, 8 mm pre-connectorized on the exits SC/APC<br>• **input not connectorized** |
| **45.120.150-AP1** | SECONDARY SPLITTER 1x16 FOR CABINET **CNO** |   | • secondary splitter 1x16 for cabinet **CNO**<br>• case dimensions: 144x40x90 mm in steel thickness 1,25 mm<br>• input with reinforced fiber OD=1,8 mm; exits realized with SC/APC sleaves on two horizontal rows of 8 ports each<br>• input **SC/APC connectorized** |

| | | | |
|---|---|---|---|
| **45.120.150-Z01**<br><br>**45.120.150-BA9 (PLASTIC CASE)** | SECONDARY SPLITTER FOR 1x16 CABINET **PFS HLGX (PFS4)** |  | • secondary splitter 1x16 for cabinet **PFS4**<br>• case dimensions 144x40x90 m<br>• steel thickness 1,25 mm<br>• input with connectorized reinforced fiber DE=1,8 mm<br>• exit s realized with connectorized SC/APC adapters on two horizontal rows with 8 ports each |

## CLUSTER A&B NETWORK ELEMENTS

### LINE JOINT ENCLOSURE
**CPE CODE 17.190.500-H30**

The LINE JOINT enclosure is designed to manage fiber optic cables with tubes structure (with capacity up to **396 fibers**). The enclosure was created to give optical continuity to a certain section in which the distance between two nodes is greater than the length of a reel of cable, or to give continuity to a damaged cable in service.

## MAIN FEATURES

| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 18 MODULE SE (SPLICES: 18X24 FO)** |
| DIMENSIONS | **400X300X300 mm** |
| ENCLOSURE BASE | **6 CIRCULAR PORTS + 1 OVAL (LOOP CABLE)** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## FIRST SUPPLYING KIT

| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing)<br>code **17.750.500-633** |  |
| • Kit for wall fixing and inside manholes installation<br>code **17.750.500-641** |  |

PFP

**CPE CODE: 17.190.500-E12**

The **PFP (Primary Flexibility Point)** enclosure is designed for the management of the incoming primary network cable with **144/192 optical fibers** (with 24 f.o. x tube modularity), and for the connection of the fibers contained within it to the inputs of the 1x4 optical splitters. The outputs of the splitters will be collected to the 96 f.o. secondary cables, directed towards the cabinet PFS.

Inside the enclosures, by extracting the dome, the splice modules useful for parking, the fusion junction using *microsmouv* type joint protectors (30x0.5x1.3 mm and 40x0.5x1.3 mm) and the management are made immediately accessible.

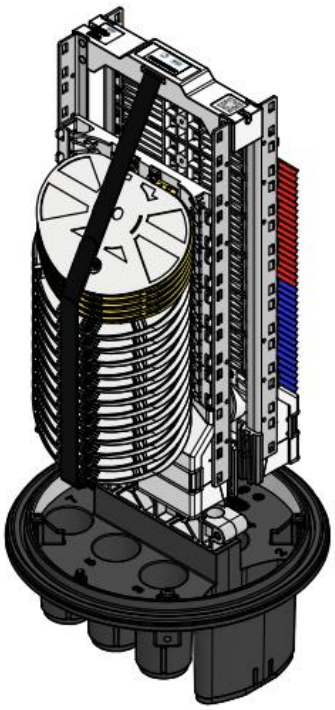
All the management of the fibers is realized with respect to the minimum bending radius of **30 mm.**

Available splice modules:

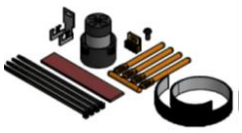
- SC splice modules (Single Circuit, 4 mm high) for parking up to 24 f.o. and the splice up to 12 fibers
- N modules (for splitters, height 8 mm) for the arrangement of no. 2 PLC splitters 1:4 and the splice of up to no. 16 fibers

| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 84 SC MODULE (SPLICES: 84X12 FO)** |
| DIMENSIONS | **536X300X300 mm** |
| ENCLOSURE BASE | **6 CIRCULAR ENTRANCE + 1 OVAL (LOOP CABLE)** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## ORGANIZATION OF THE SPLICE MODULES PACK

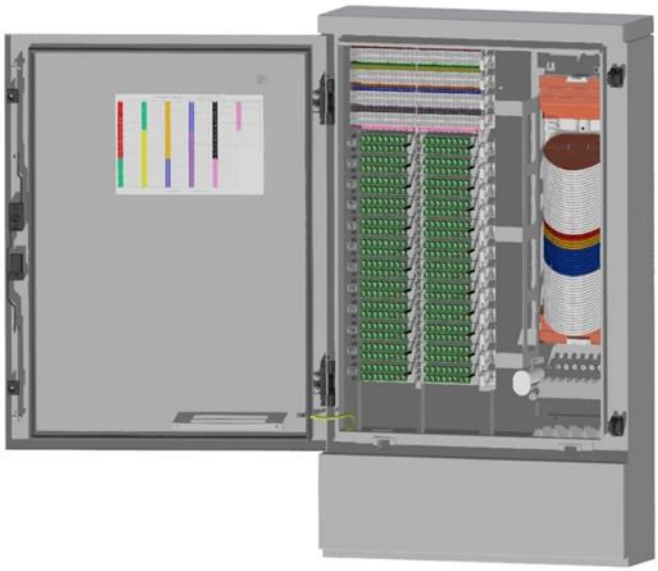
| | |
|---|---|
| • no. 12 SE Splice Modules where to put inside each module no. 2 Splitter 1x4 and no. 16 splices (entrance end exits of the splitters) numbered from 1 to 12, GREY colored<br>• no. 1 SC Splice Module to positioning the 24 f.o. coming from the utilized tube of the 144/192 f.o. feeder cable in which the POP side is utilized for the primary splitter network and the opposite side is not yet utilized, numbered no. 13, YELLOW colored<br>• no. 4 SC Splice Module to positioning the 24 continuous f.o. each., coming from tubes of the 144/192 f.o., numbered from no. 14 to no. 17, YELLOW colored<br>• no. 16 SC Splice Module for the parking of 24 f.o. each coming from the tubes of the 96 f.o. cable (exit cables) not immediately utilized, numbered from no. 18 to no. 33, **BLUE** colored<br>• no. 18 SC Splice Modules to realize the extra Gpon circuit, numbered from no. 34 to. no. 51, **RED** colored |  |

## FIRST SUPPLYING KIT

| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing)<br>code **17.750.500-633** |  |
| • Kit for no. 4 exit of 96 f.o. microcables (cold circular sealing)<br>code **17.750.500-A00** |  |
| • Kit for wall fixing and inside the manholes<br>code **17.750.500-641** |  |
| • no. 4 primary splitter 1:4<br>code **45.120.150-U88** |  |

## PFS 4 CABINET
**CODE: 17.150.500-667**

The cabinet **PFS (Primary Flexibility Point)** it is home of the second level of 1:16 splitting within the PON network dedicated to Open Fiber A&B clusters.



In this architecture each **PFP** enclosure which contains 1:4 splitters are rigidly connected to no. 4 **PFS** cabinets with a potentiality of 256 UNITS per cabinet.

The advantages of this second level of splitting are that of:

- manage the connections between the second level splitters with the PFP, which houses the first level of splitting
- simplify the operation and allow a quick activation and reconfiguration process of the end users thanks to the possibility of connecting any output of the optical splitters located inside the PFS
- house up to 24 splitters suitable to managing the second level of splitting (1:16) of the PON network
- manage Point-to-Point connections for business users

## MAIN FEATURES

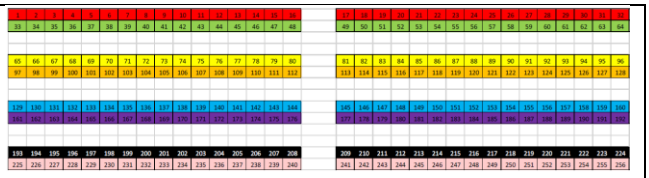
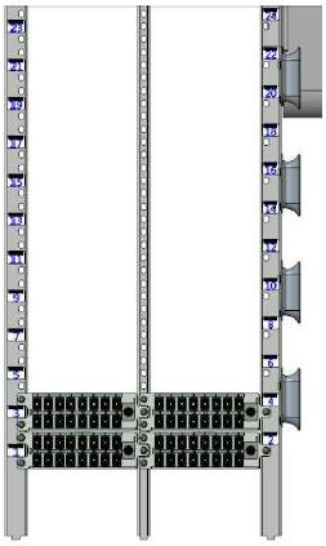
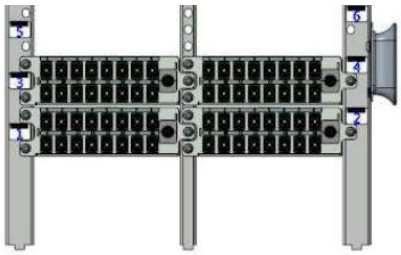
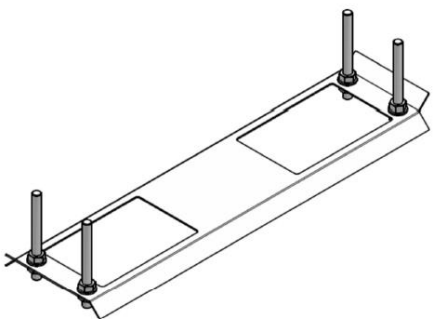
| | |
|---|---|
| MAXIMUM POTENTIALITY | **256 SPLICES BETWEEN SECONDARY NETWORK FIBERS AND THE PIGTAILS COMING FROM THE TERMINATION AREA** |
| DIMENSIONS | **110x65x20 cm** |
| EXTERNAL PARTS MATERIALS | **INOX STEEL AISI 304** |
| INTERNAL PARTS MATERIALS | **INOX STEEL AISI 430** |
| INTERNAL PLASTIC MATERIALS INCLUDING THE MODULES | **ABS-PC SELF-EXTINGUISHING UL94-V0** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 56** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## ORGANIZATION OF THE SPLICE MODULES PACK

- no. 20 SC modules to parking the fibers coming from the secondary network cables outgoing from the cabinet, **GREY** colored (numbered 1÷20)
- no. 9 SC modules for the Point-to-Point, **BLUE** colored (numbered 21÷29 )
- no. 3 SC modules to parking the primary cable fiber dedicated to Point-to-Point connections, **YELLOW** colored (numbered 30÷32)
- no. 2 SE modules for the splitter GPON splices, **RED** color (numbered 33÷34)
- no.22 SF/SE modules for the splicing of the user GPON fibers, **GREY** colored (numbered 35÷56 )

**ALL SPLICING MODULES ARE IDENTIFIED WITH LABELS BEARING PROGRESSIVE NUMBERING BY BARCODE (CODE 128)**

## FIRST SUPPLYING KIT

| | |
|---|---|
| • parking zone for **256** connectors |  |
| • installation area of the optical splitter modules, arranged on two vertical columns of 12 positions each, consisting of a metal structure made of uprights |  |
| • no. 4 HLGX splitters already installed in the first four positions |  |
| • no. 1 fixing bracket with studs for connection to the cabinet body and floor fixing clamps for installing the cabinet |  |

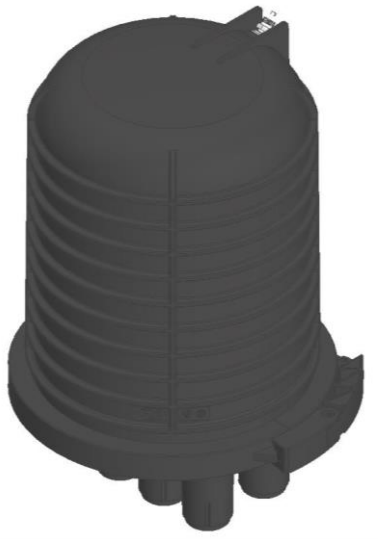
## PDA, PTA, PTE ELEMENTS

The terminal network belonging to A&B clusters is organized into various elements:

- **PD “distribution point” enclosure**: to manage the fibers coming from the various buildings
- **PTA “background termination point” enclosure:** positioned near the building
- **PTE "building termination point" box**: located inside the building, usually into the meter room

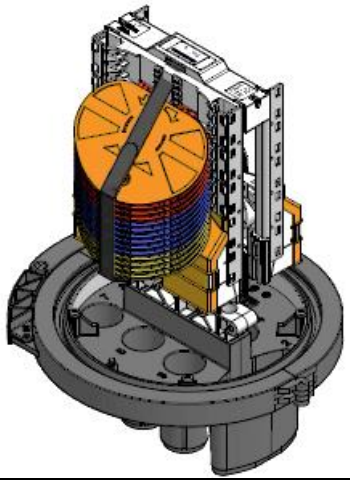
## PDA (PD type A)
**CPE CODE: 17.190.500-E08**

The **PDA (PD type A)** enclosure allows splitting the fibers contained in a medium capacity 24/48/96 f.o. termination cable, or a high capacity 144/192 f.o. through cable coming from the PFS, on several cables of equal or lower capacity directed to the buildings, through the branching of one or more tubes and the subsequent splicing to a maximum of 8 cables of 1/12/24/48 f.o. outgoing to homes or to other PD enclosures.



| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 36 SC MODULES (SPLICES: 36X12 FO)** |
| ORIGINAL EQUIPMENTS | **18 SC MODULE (SPLICES: 18X12 FO)** |
| DIMENSIONS | **400X300X300 mm** |
| ENCLOSURE BASE | **6 CIRCULAR ENTRANCES + 1 OVAL (LOOP CABLE)** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## ORGANIZATION OF THE SPLICE MODULES PACK

| | |
|---|---|
| • no. 4 SC modules for the positioning of the fibers contained in the tubes of the incoming (or through) cable that are not immediately used, numbered 1÷ 4, YELLOW colored.<br>• no. 6 SC modules which allow the creation of 24 splices each of the f.o. coming from the tubes of the outgoing cables, numbered 5÷10, **RED** colored.<br>• no. 4 SC modules that allow the creation of 8 splices each, for the creation of extra Gpon circuits, numbered 11÷6, **BLUE** colored. |  |

## FIRST SUPPLYING KIT

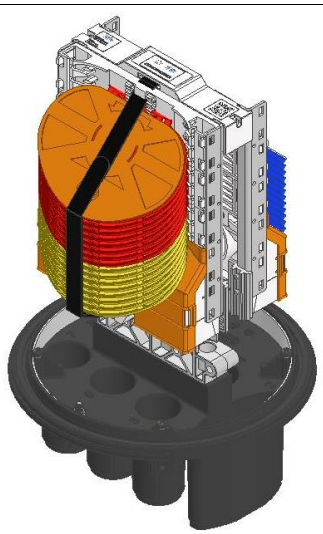
| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing)<br>code **17.750.500-633** |  |
| Kit for wall fixing/ inside manhole installation.<br>code **17.750.500-641** |  |

PDB (PD type B)
**CPE CODE: 17.190.500-E09**

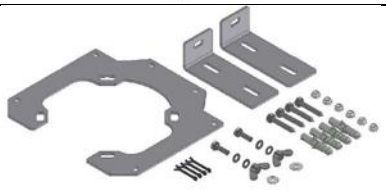
| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 36 SC MODULES (SPLICES: 36X12 FO)** |
| ORIGINAL EQUIPMENT | **28 SC MODULES (SPLICES: 28X12 FO)** |
| DIMENSIONS | **400X300X300 mm** |
| ENCLOSURE BASE | **6 CIRCULAR ENTRANCES + 1 OVAL (LOOP CABLE)** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## ORGANIZATION OF THE SPLICE MODULES PACK

- no. 8 SC modules for the positioning of the fibers contained in the tubes of the incoming (or through) cable that are not immediately used, numbered 1÷ 8, **YELLOW** colored.
- no. 8 SC modules which allow the creation of 24 splices each of the f.o. coming from the tubes of the outgoing cables, numbered no. 9÷16, **RED** colored.
- no. 12 SC modules that allow the creation of 8 splices each, for the creation of extra Gpon circuits, numbered 17÷28, **BLUE** colored.



## FIRST SUPPLYING KIT

| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing)<br>code **17.750.500-633** |  |
| • Kit for wall fixing/ inside manhole installation code **17.750.500-641** |  |

## PTA

The **PTA (backward termination point)** enclosure is used for the termination of the optical fibers in the manhole near the user sites and outside them, in a "backward" position that allows grouping several house numbers distributed and/or low density.

The characteristic element of these enclosures is the presence of a horizontal rack numbered from no. 1 to no. *N*, for the positioning of *N* SC/APC type adapters for the connection of the output fibers towards the last section of the infrastructure towards the Clients.

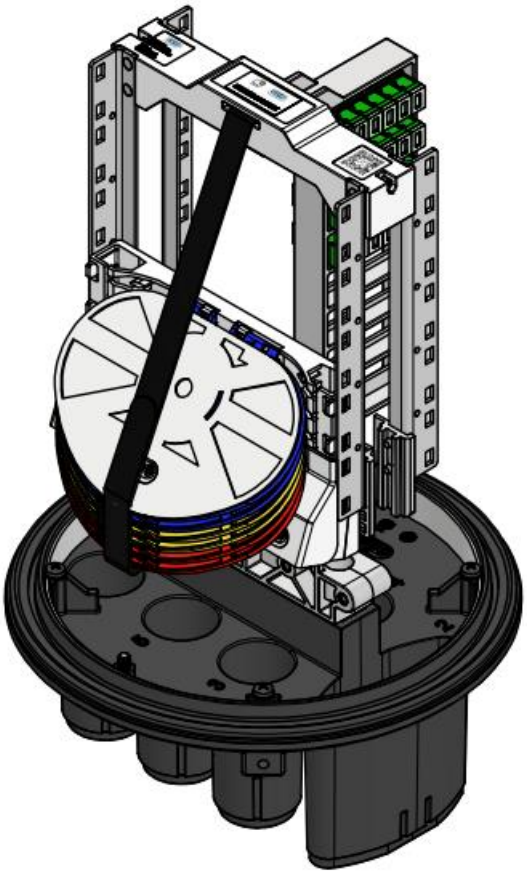
The PTA enclosure finds application:

- to collect multiple Client terminations in a single point
- where it is not possible to install a PTE box inside the building

The splicing modules of the PTAs are differentiated for use based on the color and the different numbering in the Barcode Standard CODE 128 (ISO15417) by means of labels affixed to the front edge.

PTA 24

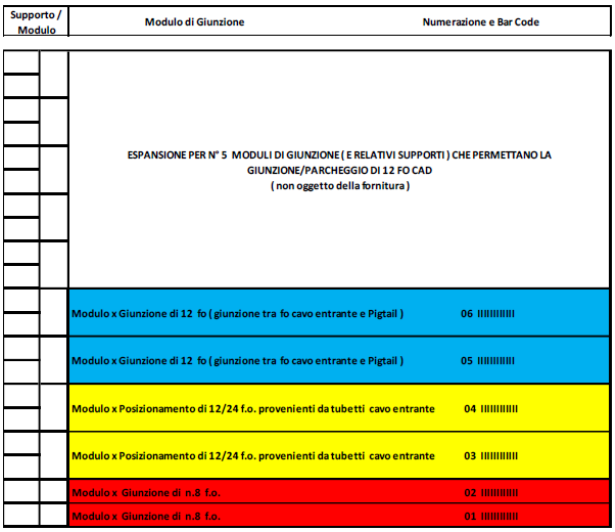
**CPE CODE : 17. 190.500-E10**



| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 11 SC MODULES (SPLICES: 11X12 FO)** |
| ORIGINAL EQUIPMENT | **6 SC MODULES (SPLICES: 6X12 FO)** |
| ADAPTER SC/APC | **24** |
| DIMENSIONS | **400X300X300 mm** |
| ENCLOSURE BASE | **6 CIRCULAR ENTRANCES + 1 OVAL (CONTINUOUS CABLE)** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## ORGANIZATION OF THE SPLICE MODULES PACK

- no. 2 SC modules, for the splicing of no. 16 optical fibers (8x2) per the Business Users **RED** colored and numbered 01 and 02.
- no. 2 SC modules for the parking of the optical fibers contained in the tubes of the incoming cable not immediately used: these modules must be **YELLOW** colored and numbered 03 and 04.
  no. 2 SC modules for the splicing of no. 24 optical fibers (12 x 2) contained in the input cable tubes, with no. 24 900 µm type patchcords terminated with SC/APC connectors: **BLUE** colored and numbered 05 and 06.

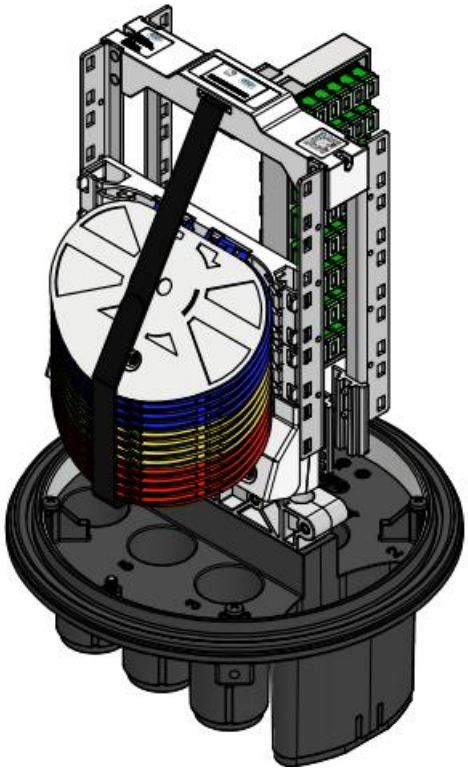



## FIRST SUPPLYING KIT

| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing) code **17.750.500-633** |  |
| • Kit for wall fixing/ inside manhole installation code **17.750.500-641** |  |

PTA 48

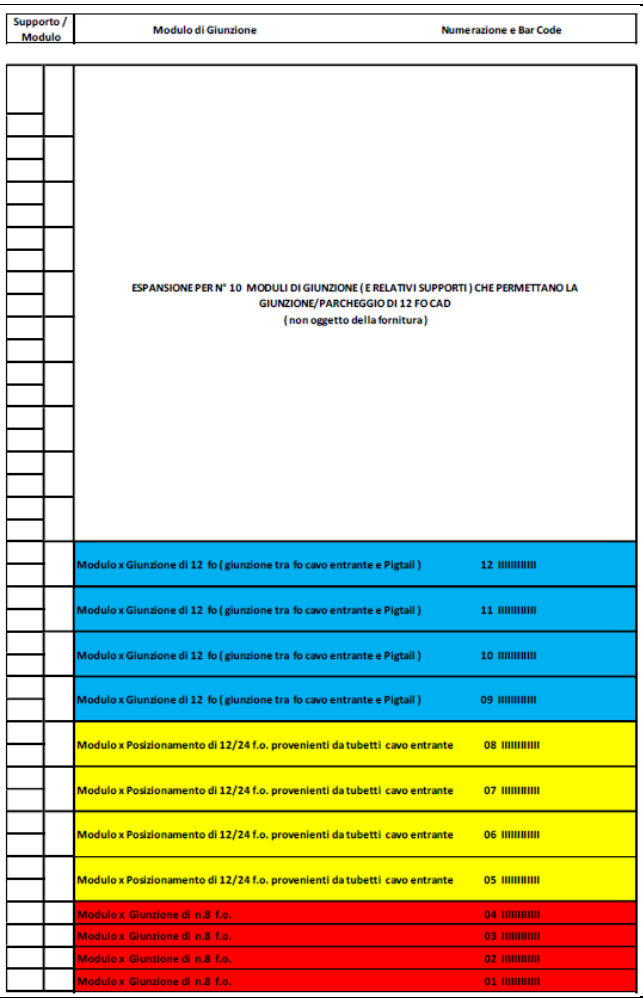
**CPE CODE: 17. 190.500-E11**



| | |
|---|---|
| MAXIMUM POTENTIALITY | **U TO 22 SC MODULE (SPLICES: 22X12 FO)** |
| ORIGINAL EQUIPMENT | **12 SC MODULE (SPLICES: 12X12 FO)** |
| No. ADAPTER SC/APC | **48** |
| DIMENSIONS | **400X300X300 MM** |
| ENCLOSURE BASE | **6 CIRCULAR ENTRANCES + 1 OVAL (CONTINUOUS CABLE)** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## ORGANIZATION OF THE SPLICE MODULES PACK

- no. 4 SC modules, for the splicing of no. 16 optical fibers (8x2) per the Business Users **RED** colored and numbered 01 ÷ 04.
- no. 4 SC modules for the parking of the optical fibers contained in the tubes of the incoming cable not immediately used: these modules must be **YELLOW** colored and numbered 05 ÷ 08.
- no. 4 SC modules for the splicing of no. 24 optical fibers (12 x 2) contained in the input cable tubes, with no. 24 900 µm type patchcords terminated with SC/APC connectors: **BLUE** colored and numbered 09 ÷ 12




## FIRST SUPPLYING KIT

| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing) code **17.750.500-633** |  |
| • Kit for wall fixing/ inside manhole installation code **17.750.500-641** |  |

## PTE

The PTE is a box designed for both wall-mounted installation (typically in the meter room/technical space of the building) and pole-mounted (optional kit required).

The first delivery kit includes dowels for wall installation, cable ties and locking key.

There are 4 types (potential) of PTE according to the number of Clients to be connected:

- **PTE 8 UNITS**
- **PTE 16 UNITS**
- **PTE 24 UNITS**
- **PTE 48 UNITS**

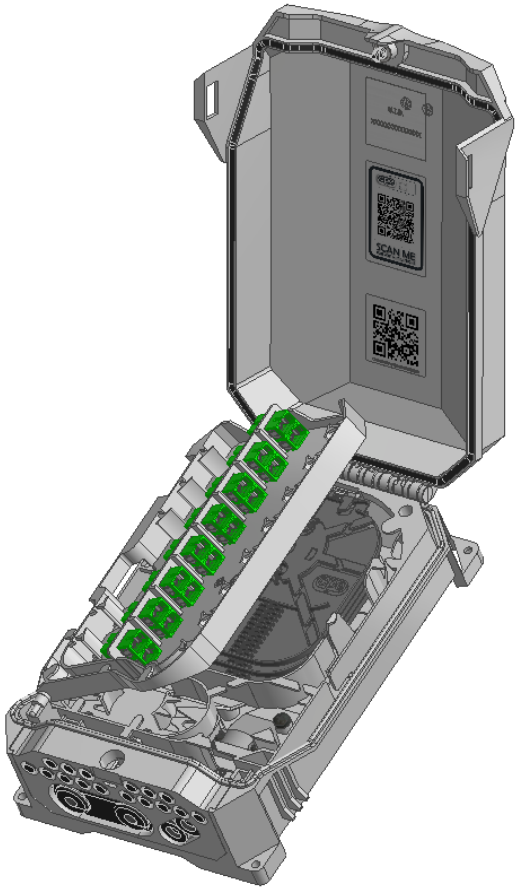
All the PTE have the internal core, which can be completely separated from the external case even in phases after the first installation, also completely wired.

## PTE 8 UNITS
**CPE CODE: 17.190.500-F61**

| | |
|---|---|
| No. ADAPTERS ON HORIZONTAL FRAME | **8 SC/APC** |
| DIMENSIONS | **257,5 x 183 x 80 mm** |
| PLASTIC MATERIALS | **PC-ABS SELF-EXTINGUISHING UL 94-V0** |
| SPLICE MODULES | **No. 4 SC (12 SPLICES EACH)** |
| AVAILABLE ENTRANCES | **1 OVAL ENTRANCE (BY 2 CIRCULAR), 2 CIRCULAR ENTRANCES FOR MULTIFIBER CABLE / PATCHCORDS, 16 CIRCOLAR ENTRANCE FOR SINGLE MONOFIBER CABLES** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 55** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 08** |

PTE 16 UNITS

**CPE CODE: 17.190.500-F62**



| | |
|---|---|
| No. ADAPTERS ON HORIZONTAL FRAME | **16 SC/APC** |
| DIMENSIONS | **257,5 x 183 x 80 mm** |
| PLASTIC MATERIALS | **PC-ABS SELF-EXTINGUISHING UL 94-V0** |
| SPLICE MODULES | **No. 4 SC (12 SPLICES EACH)** |
| AVAILABLE ENTRANCES | **1 OVAL ENTRANCE (BY 2 CIRCULAR), 2 CIRCULAR ENTRANCES FOR MULTIFIBER CABLE / PATCHCORDS, 16 CIRCOLAR ENTRANCE FOR SINGLE MONOFIBER CABLES** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 55** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 08** |

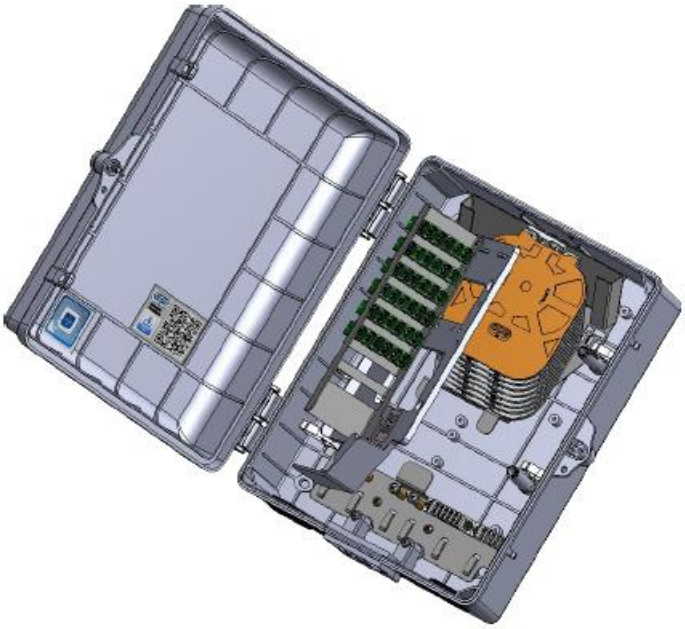
PTE 24 UNITS

**CPE CODE: 17.190.500-G73**

| | |
|---|---|
| No. ADAPTERS ON HORIZONTAL FRAME | **24 SC/APC** |
| DIMENSIONS | **288 x 223 x 100 mm** |
| PLASTIC MATERIALS | **PC-ABS SELF-EXTINGUISHING UL 94-V0** |
| SPLICE MODULES | **No. 6 SC (12 SPLICES EACH)** |
| AVAILABLE ENTRANCES | **1 OVAL ENTRANCE (BY 2 CIRCULAR), 2 CIRCULAR ENTRANCES FOR MULTIFIBER CABLE / PATCHCORDS, 16 CIRCOLAR ENTRANCE FOR SINGLE MONOFIBER CABLES** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 55** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 08** |

PTE 36 UNITS

**CPE CODE: 17.190.500-673**



| | |
|---|---|
| No. ADAPTERS ON HORIZONTAL FRAME | **36 SC/APC** |
| DIMENSIONS | **338x294x127 mm** |
| PLASTIC MATERIALS | **PC-ABS SELF-EXTINGUISHING UL 94-V0** |
| SPLICE MODULES | **No. 8 SC (12 SPLICES EACH)** |
| AVAILABLE ENTRANCES | **1 OVAL ENTRANCE (BY 2 CIRCULAR), 2 CIRCULAR ENTRANCES FOR MULTIFIBER CABLE / PATCHCORDS, 16 CIRCOLAR ENTRANCE FOR SINGLE MONOFIBER CABLES** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 55** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 08** |

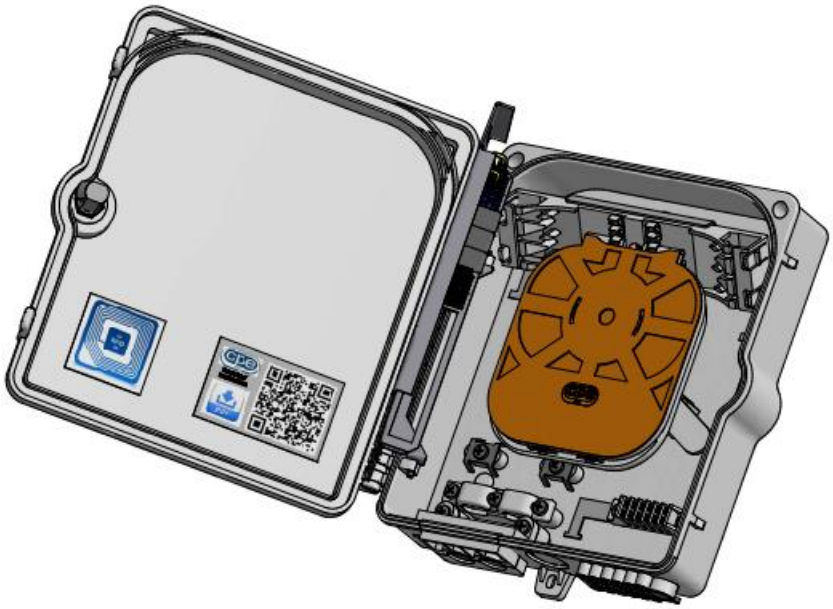
PTE 48 UNITS

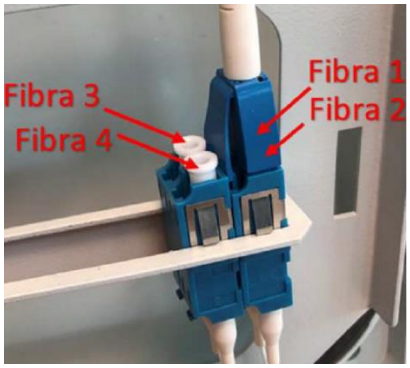
**CPE CODE: 17.190.500-674**

| | |
|---|---|
| No. ADAPTERS ON HORIZONTAL FRAME | **48 SC/APC** |
| DIMENSIONS | **338x294x127 mm** |
| PLASTIC MATERIALS | **PC-ABS SELF-EXTINGUISHING UL 94-V0** |
| SPLICE MODULES | **No. 8 SC (12 SPLICES EACH)** |
| AVAILABLE ENTRANCES | **1 OVAL ENTRANCE (BY 2 CIRCULAR), 2 CIRCULAR ENTRANCE FOR MULTIFIBER CABLE / PATCHCORDS, 16 CIRCOLAR ENTRANCE FOR SINGLE MONOFIBER CABLES** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 55** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 08** |

OPTICAL SOCKET ENEL

**CPE CODE: 17.190.500-927**






| | |
|---|---|
| No. ADAPTERS ON HORIZONTAL FRAME | **No. 2 LC/UPC DUPLEX (CONNECTED IN LOOP) + No. 2 LC/UPC DUPLEX (AVAILABLE SLOTS UP TO 16 DUPLEX IN TOTAL).** |
| DIMENSIONS | **228 x 220 x 90 mm** |
| PLASTIC MATERIALS | **PC-ABS SELF-EXTINGUISHING UL 94-V0** |
| SPLICE MODULES | **No. 2 SC (12 SPLICES EACH)** |
| AVAILABLE ENTRANCES | **No. 1 OVAL ENTRANCE (BY 2 CIRCULAR), No.1 ENTRANCE FOR MICROCABLES/ ADSS CABLE, No.1 ENTRANCE FOR EXIT CABLE, No. 12 CIRCOLAR ENTRANCE FOR PATCHCORDS** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 55** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 08** |

## C&D CLUSTER NETWORKS PRODUCTS

C&D clusters have a network hierarchy of their own in which the overall splitting factor is 1:16.

The choice is since the public tender plan require guaranteeing at least **100 Mbps in download and 50 in upload** per user, even in the case of simultaneous connections.

Therefore, there is only one level of splitting, and it is conducted in the cabinet **CNO (Optical Nodal Centre)**, connected to a POP which is always shared between several municipalities.

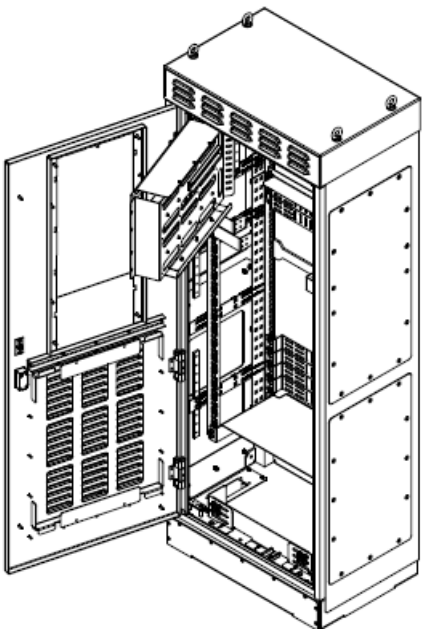
## CABINET S4

The **S4 cabinets** are outdoor street cabinets with mini-POP function, including infrastructures for TLC, power, and air cooling/heating. These cabinets serve areas with low population density connected via F.O. cable. and present the possibility of expansion.

The cabinets are installed outdoors on public land, on road surfaces, on urban sidewalks and on high-speed roads.

The cabinet is designed for outdoor installation in the following conditions:

- at "full wind", in an isolated manner without lateral supports
- "wall", next to a wall and in any case normal operation and maintenance operations can be performed.



CAB S4 are supplied in two configurations:

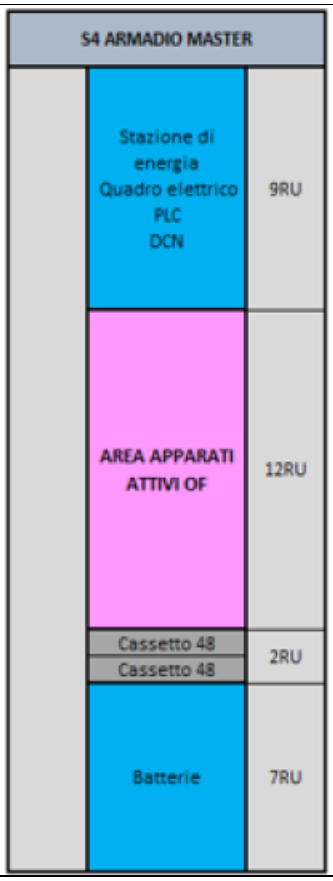
- **master:** complete
- **slave:** without active parts such as energy station, distribution of the QPM (riser protection panel)

The two cabinets can be mechanically coupled and in this case the slave version will feed thanks to the full version.

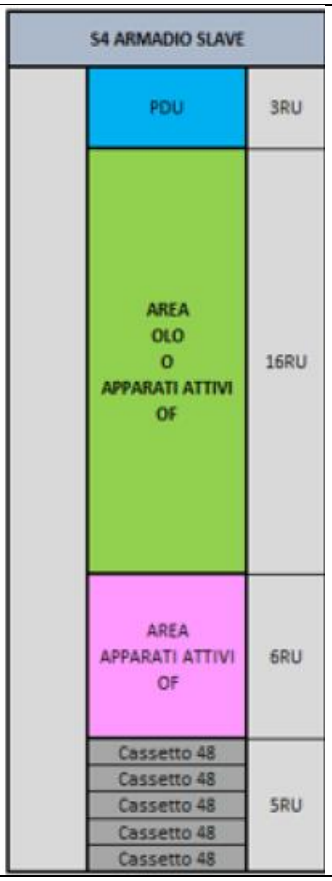
The cabinets are made by segregating the lower battery area for the backup power supply (MASTER).

At the top there are spaces for:

- mast protection panel.
- power station with distribution panels for powering in alternating and direct current all cabinet systems.
- thermostats, alarm terminals and DC user certification terminals on DIN rail
- equipment and service equipment (patch panel and optical drawer)




**INTERNAL LAYOUT OF MASTER VERSION**




**INTERNAL LAYOUT OF SLAVE VERSION**

The energy station is equipped with a local control unit (PLC) as an operator interface consisting of an alphanumeric LCD display, a keyboard and LEDs signaling the functional status of the station where the states, alarms and measurements are highlighted.

The PLC is equipped with an SNMP interface on the Ethernet network (LAN port) with a free, accessible, and unconstrained protocol through which it will be possible to receive data and send commands remotely.

## MAIN FEATURES

| | |
|---|---|
| POTENTIALITY | **240 F.O. (MASTER) 96 F.O. (SLAVE)** |
| DIMENSIONS | **H1580x600x400 mm** |
| EXTERNAL CABINET PARTS MATERIAL | **AISI 430** |
| SHEET THICKNESS | **20\10** |
| POWDER THICKNESS | **60 µm** |
| COLOR | **GREY RAL 7035** |
| LOCKING TYPE | **European type 333 EN 1303** |
| SATL FOG MIST RESISTANCE | **1000 HOURS** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 55** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

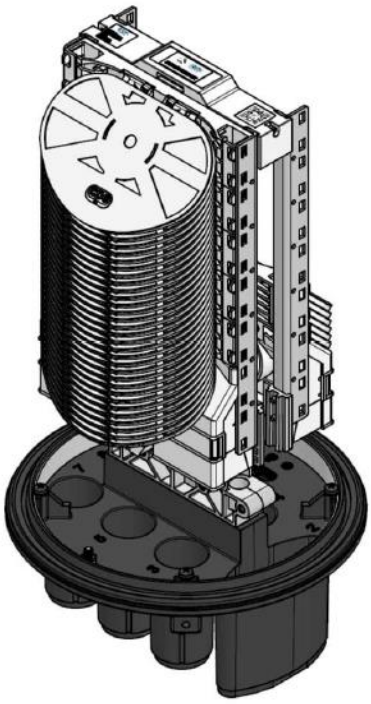
## FIRST SUPPLYING KIT

| **ORIGINAL EQUIPMENT** | **CAB MASTER** | **CAB SLAVE** |
|---|---|---|
| ROUTER (220 Vac, tunnel function mGRE, OSPF, BGP DOT1.Q. protocol) | **X** | |
| SWITCH | **X** | |
| ENERGY STATION WITH PLC | **X** | |
| RECTIFER (1000 W) | **X** | |
| BATTERIES (2,5 ore per carico apparati 1000 W) | **X** | |
| ELECTRICAL CABINET | **X** | **X** |
| FREE COOLING | **X** | **X** |
| WARMER | **X** | **X*** |
| CONDITIONER | **X** | **X*** |
| INTERNAL LAMP (220Vac/8W – IP40 LED) | **X** | **X** |
| ***optional** | | |

## PRODUCT CODES

| **CPE CODE** | **DESCRIPTION** |
|---|---|
| **10.000.000-051** | CABINET S4 MASTER |
| **10.000.000-052** | CABINET S4 SLAVE |

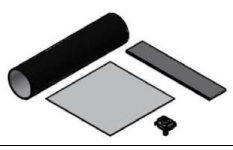
IN LINE JOINT ENCLOSURE
**CPE CODE: 17.190.500-D98**

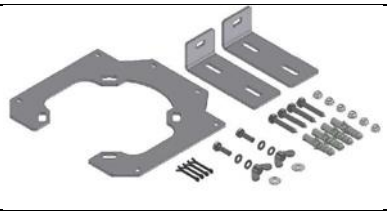


## MAIN FEATURES

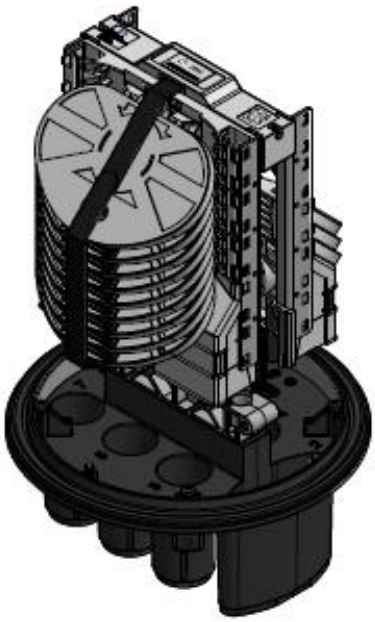
| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 60 SC MODULES (SPLICES: 60X12 FO)** |
| ORIGINAL EQUIPMENT | **36 SC MODULES (SPLICES: 36X12 FO)** |
| DIMENSIONS | **536X300X300 mm** |
| ENCLOSURE BASE | **6 CIRCULAR ENTRANCES + 1 OVAL (LOOP CABLE)** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## FIRST SUPPLYING KIT

| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing)<br>code **17.750.500-633** |  |
| • no.2 heath shrinks for no. 1 exit cables (cold circular entrance)<br>code **17.750.500-770** |  <br>  |

| | |
|---|---|
| • Kit for wall fixing/ inside manhole installation code **17.750.500-641** |  |

## ENCLOSURE UP TO 144 F.O.
**CPE CODE: 17.190.500-769**



## MAIN FEATURES

| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 16 SE MODULES (SPLICES: 16X24 FO)** |
| ORIGINAL EQUIPMENT | **12 SE MODULES (SPLICES: 12X24 FO)** |
| DIMENSIONS | **400X300X300 mm** |
| ENCLOSURES BASE | **6 CIRCULAR ENTRANCES + 1 OVAL (LOOP CABLE** |
| DOME AND BASE MATERIAL | **PP** |
| CLAMP MATERIAL | **PA66 25% GLASS FIBERS** |
| INTERNAL PLASTIC PARTS INCLUDING THE MODULES | **ABS-PC AUTO-EXSTINGUISH UL94-V0** |
| O-RING MATERIAL | **SILICONIC RUBBER** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

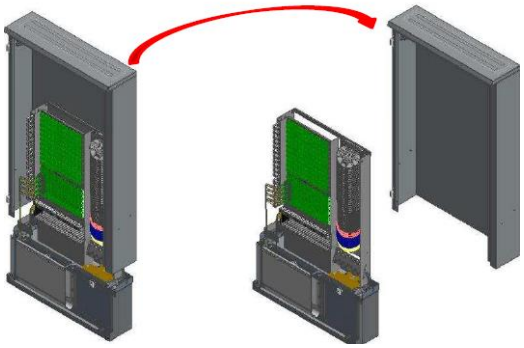
## FIRST SUPPLYING KIT

| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing) code **17.750.500-633** |  |
| • Kit for wall fixing/ inside manhole installation code **17.750.500-641** |  |

## CNO

**CPE CODE: 17.250.500-G17**

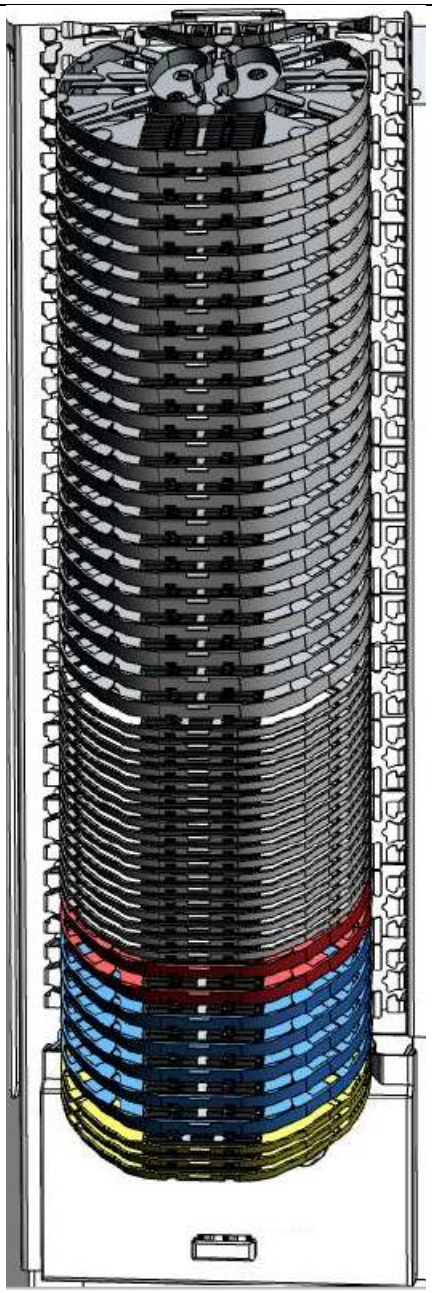
The CNO street cabinet has been designed to simplify operation and allow a quick activation and reconfiguration process for end users, thanks to the possibility of connecting any output of all the no. 24 1:16 optical splitters of the PON network with any of the secondary branches pertaining to the CNO ending on the other side on the Client Units. It also allows to manage Point-to-Point connections and connections between second-level splitters with the enclosure above mentioned *Primary Flexibility Point (PFP).*
This updated version of the CNO cabinet allows to be able to replace the external casing in the event of accidents or acts of vandalism, without interrupting active services.

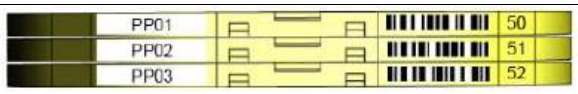


| MAIN FEATURES | |
|---|---|
| MAXIMUM POTENTIALITY | **256 SPLICES BETWEEN SECONDARY NETWORK FIBERS AND THE PIGTAILS COMING FROM THE TERMINATION AREA** |
| DIMENSIONS | **110x70x20 cm** |
| EXTERNAL PARTS MATERIALS | **INOX AISI 304 STEEL** |
| INTERNAL PARTS MATERIAL | **INOX AISI 430 STEEL** |
| INTERNAL PLASTIC PARTS INCLUDING THE MODULES | **ABS-PC AUTOEXTINGUISH UL94-V0** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 56** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

**ORGANIZATION OF THE SPLICE MODULES PACK**

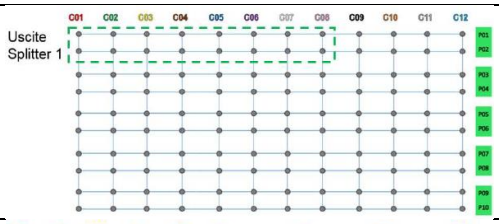
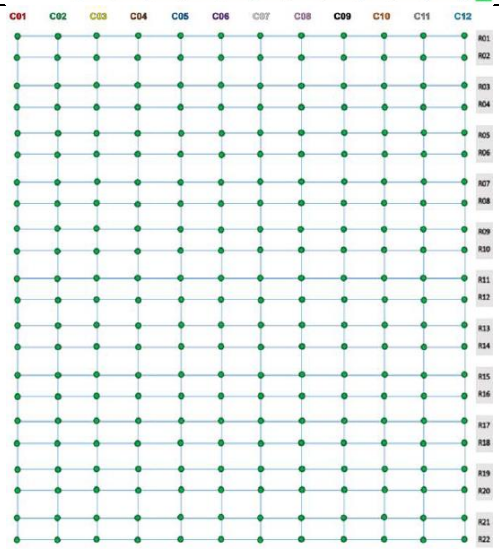
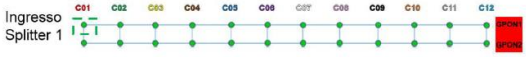
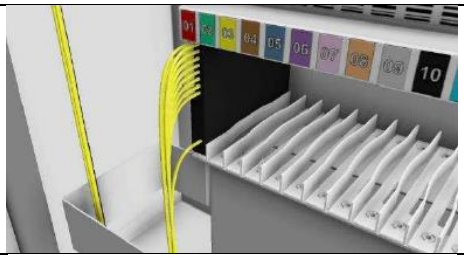
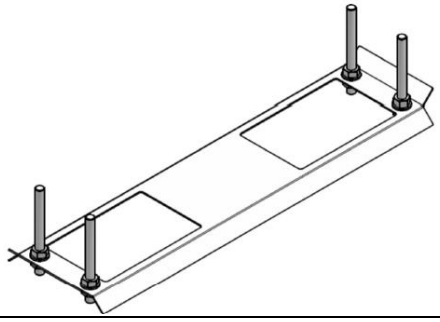
- no. 22 SE modules for the PON splices, each containing a maximum of 12 splices, for the junctions between the pigtails pre-connected to the termination matrix and the fibers of the secondary network cables leaving the cabinet towards the Clients, **GREY** colored (numbered 1÷22, identified “S00”)
- no.20 SF modules for parking the fibers of the secondary network cables leaving the cabinet each module containing a maximum of 24 fibers **GREY** colored (numbered 23÷42, identified “PS00”)
- no. 2 SE modules for GPON splices, each containing a maximum of 12 splices, for fusion splices between fibers from the primary network dedicated to the GPON network and the pigtails connected to the GPON primary network termination, **RED** colored (numbered 43÷44, identified “GPON00”)
- no.5 SE modules for Point-to-Point splices, each containing a maximum of 12 splices, for fusion splices between the fibers of the primary network dedicated to the point-to-point network and the fibers of the secondary network destined to the point-to-point network **BLUE** colored (numbered 45÷49 and identified “PtP0”
- no.3 SC modules for parking the fibers of the primary network cable dedicated to the point-to-point network each module containing 24 color fibers **YELLOW** colored (numbered 50÷52 and identified “PP0”)






**ALL THE SPLICE MODULES ARE IDENTIFIED WITH LABELS SHOWING PROGRESSIVE NUMBERING BY BARCODE (CODE 128) AND A BRIEF DESCRIPTION FOR MACROBLOCKS**

## FIRST SUPPLYING KIT

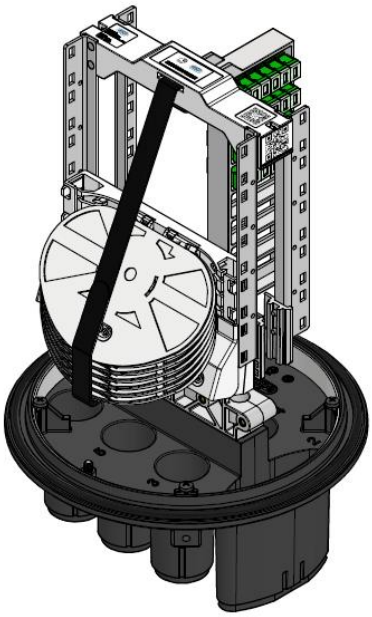
| | |
|---|---|
| • parking zone for 120 connectors |  |
| • secondary network termination module complete with 256 sleeves with the relative pigtails connected and already positioned in the respective splice modules |  |
| • primary network termination module complete with 24 sleeves with the relative pigtails connected and already positioned in the respective splice modules |  |
| • no. 1 splitter 1x16 BUTT type, already housed in the relative area of the cabinet, with the output connectors positioned in the parking area and the input Patchcord connected in the respective sleeve of the primary network **CPE code 45.120.150-AP1** |  |
| • no. 1 fixing anchor with relative screws |  |

## UNDERGROUND ROE

The **underground ROE** *(optical building allocator*) enclosures have a special frame set up with SC-ACP sleeves to manage the junctions between the primary cables coming from the CNO and the secondary ones directed towards the Client Units by pigtails.

The 48 F.O. model is intended only for underground installation in a 125x80 cm manhole while the 24 F.O. it is intended both for underground installation in a 76x40 cm manhole and for aerial installation on a pole or facade (optional kit needed).

## UNDERGROUND ROE 24 F.O.
**CPE CODE: 17.190.500-D99**



## MAIN FEATURES

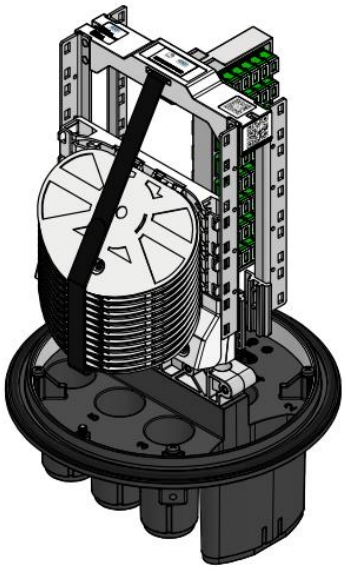
| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 18 SC MODULE (SPLICES: 18X12 FO)** |
| ORIGINAL EQUIPMENT | **6 SC MODULE (SPLICES: 6X12 FO)** |
| No. SC/APC ADAPTERS | **24** |
| DIMENSIONS | **400X300X300 mm** |
| ENCLOSURE BASE | **6 CIRCULAR ENTRANCE + 1 OVAL (LOOP CABLE)** |
| DOME AND BASE MATERIAL | **PP** |
| CLAMP MATERIAL | **PA66 25% GLASS FIBERS** |
| PLASTIC INTERNAL MATERIALS INLCUDING MODULES | **ABS-PC SELF-EXTINGUISHING UL94-V0** |
| O-RING | **SILICONIC RUBBER** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## FIRST SUPPLYING KIT

| | |
|---|---|
| • Kit for continuous cable (cold oval sealing) code **17.750.500-633** |  |
| • Kit for wall fixing/ inside manhole installation code **17.750.500-641** |  |

UNDERGROUND ROE 48 F.O.

**CPE CODE: 17.190.500-E01**



## MAIN FEATURES

| | |
|---|---|
| MAXIMUM POTENTIALITY | **UP TO 36 SC MODULES (SPLICES: 6X12 FO)** |
| ORIGINAL EQUIPMENT | **12 SC MODULES (SPLICES: 12X12 FO)** |
| No. SC/APC ADAPTERS | **48** |
| DIMENSIONS | **400X300X300 mm** |
| ENCLOSURE BASE | **6 CIRCULAR ENTRANCE + 1 OVAL (CONTIONUS CABLE)** |
| DOME AND BASE MATERIAL | **PP** |
| CLAMP MATERIAL | **PA66 25% GLASS FIBERS** |
| PLASTIC INTERNAL MATERIALS INLCUDING MODULES | **ABS-PC SELF-EXTINGUISHING UL94-V0** |
| O-RING | **SILICONIC RUBBER** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## FIRST SUPPLYING KIT

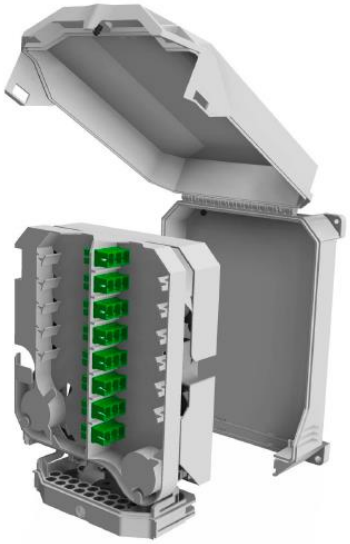
| | |
|---|---|
| • Kit for continuous cable management (cold oval sealing)<br>code **17.750.500-633** |  |
| • Kit for wall fixing/ inside manhole installation<br>code **17.750.500-641** |  |

## EXTERNAL ROE BOXES

The external box **ROE** (*optical building allocator*) can manage and terminate the vertical wiring of the users and the secondary horizontal network and is composed of two distinct units:

- an external casing
- the internal core that can be completely separated even in phases after the first installation or fully wired.

The box presents no. 6 SC splice modules, each with 12 standard type fusion splice protectors and a tilting module having a rack to house up to 12/24 SC/APC *flangeless* type sleeves.



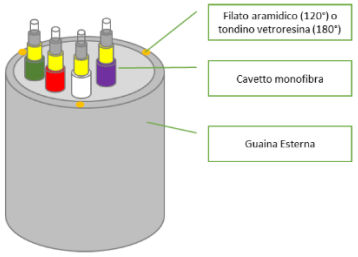
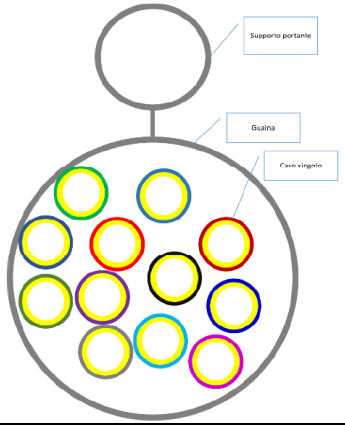
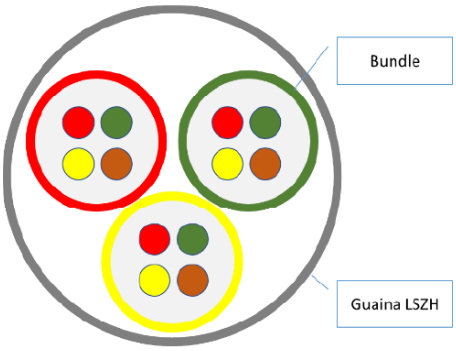
## MAIN FEATURES

| | |
|---|---|
| MAXIMUM POTENTIALITY | **No. 6 SC MODULES (12X 6 SPLICES)** |
| DIMENSIONS | **280X220X100 mm** |
| ENTRANCES | **No. 1 CIRCULAR ENTRANCE FOR BRANCH CABLE OD 6-16 mm**<br>**No. 1 CIRCOLAR ENTRANCE FOR TERMINAL CABLE**<br>**No. 1 OVAL ENTRANCE FOR CONTINOUS CABLE MANAGEMENT OD 6-16 mm**<br>**No. 16 ENTRANCES FOR MONOFIBER CABLES** |
| MATERIALS | **ABS-PC SELF-EXTINGUISHING UL94-V0 RATE** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 55** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

## CPE CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-974** | EXTERNAL ROE 12 F.O. |
| **17.250.500-975** | EXTERNAL ROE 24 F.O. |

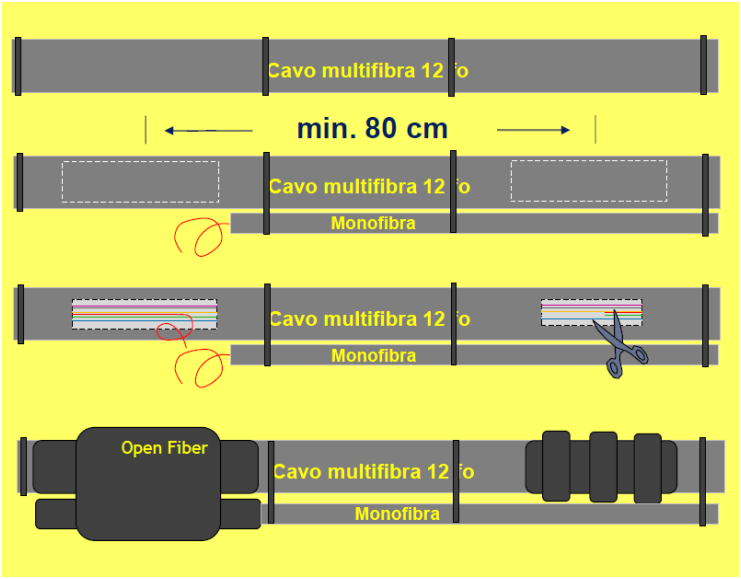
The Derivation Box is the element that allows the splicing and extraction of the fibers of the *multifiber*, *self-supporting multifiber figure 8* or *minibundle* cables coming from the ROE box to reach the customers individually by means of a reinforced single-fiber cable dedicated to outdoor installation.

| | | |
|---|---|---|
|  |  |  |
| **MULTIFIBERS CABLE** | **FIGURE 8 MULTIFIBERS CABLE** | **MONOBUNDLE CABLE** |

The installation of the derivation boxes always involves the opening of "windows", meaning operating areas created by removing the external sheath for an extension of about 8-10 cm to expose only the loose fibers contained inside at the front of *multifiber* cables.

An operating window downstream of the *ROE* box will be used to cut the fibers which will then be recovered (pulled back) on the subsequent management windows to be managed, allocated and finally spliced with the single-fiber cables outgoing towards the clients.

Note below the cutting of the red fiber managed in the box installed on the left window.

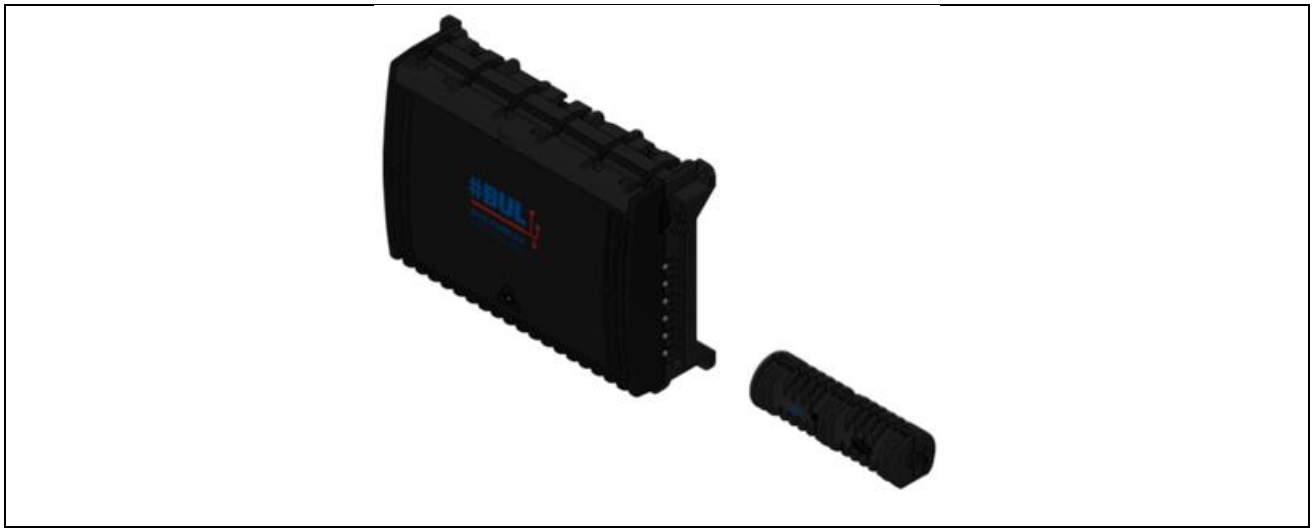


Of course, each opened window on the multifiber cable sheath will then be protected with the use of a derivation boxes: simple "caps" to be placed on the operating windows, real junction boxes with special modules and storage areas to be placed on the management windows in which to convey the fibers to serve the various clients.

The derivation boxes are therefore always supplied with a closing cap and can be installed, also according to the cable on which to operate:

- aerial, on poles and/or building facades (in floating or self-supporting mode)
- underground: inside manholes

## DERIVATION BOX 12 F.O. UNDERGROUND
**CPE CODE: 17.150.500-G06**



## MAIN FEATURES

| | |
|---|---|
| EXITS No. | **6 X 2 (No. 6 ON THE TWO SHORT SIDE)** |
| MAXIMUM SPLICES No. | **12 (IN A DEDICATE SPLICE TRAY)** |
| BOX DIMENSIONS | **214,5x152,5x60 mm** |
| CAP DIMENSIONS | **125X35 Ø mm** |
| MATERIAL | **PC+ABS INFLAMMABILITY RATE UL 94 HB** |
| SEALINGS | **SEALING GEL CO-MOLDED WITH THE PLASTIC PARTS** |
| PROTECTION RATING E EN 60529 (DUST, LIQUIDS) | **IP 68** |
| PROTECTION RATING EN 50102 (IMPACTS) | **IK 08** |

## FIRST SUPPLYING KIT

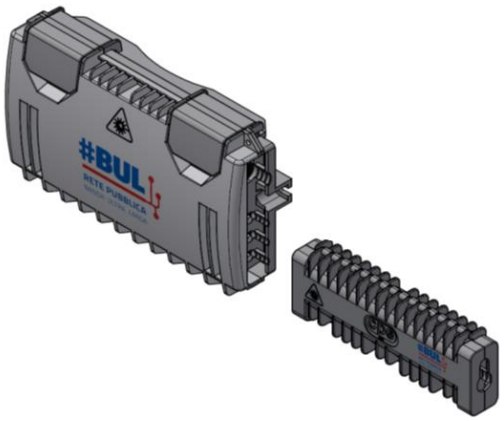
| | |
|---|---|
| • closing cap with dust/water protection and impact rating **IP 68, IK 08** |  |
| • no. 4 wall plugs and no. 10 plastic ties |  |

## DERIVATION BOX 12 F.O. AERIAL INSTALLATION
**CPE CODE: 17.150.500-H09**

**NOTE : the derivation box for floating or facade installation (aerial) 12 F.O. it is completely like the one for underground installation of equal potential. The two boxes differ only in color:**

- **BLACK RAL 9001 for underground installation**
- **GREY RAL 7001 for aerial application**

## AERIAL DERIVATION BOX 6 F.O.
**CPE CODE: 17.150.500-H08**



## MAIN FEATURES

| | |
|---|---|
| EXITS No. | **3 X 2 (No. 3 ON THE TWO SHORT SIDE)** |
| MAXIMUM SPLICES No. | **6 (IN A DEDICATE SPLICE TRAY)** |
| BOX DIMENSIONS | **167,9x102,6x42,5 mm** |
| CAP DIMENSIONS | **130x35x50 mm** |
| MATERIAL | **PC+ABS INFLAMMABILITY RATE UL 94 HB** |
| SEALINGS | **SEALING GEL CO-MOLDED WITH THE PLASTIC PARTS** |
| PROTECTION RATING E EN 60529 (DUST, LIQUIDS) | **IP 68** |
| PROTECTION RATING EN 50102 (IMPACTS) | **IK 08** |

## FIRST SUPPLYING KIT

| | |
|---|---|
| • closing cap with dust/water and impact rating **IP 55, IK 08** |  |
| • no. 4 wall plugs and no. 10 plastic ties |  |

**NOTE: regarding the derivation boxes for floating installation or on facade (aerial) with potential of 2 F.O. and for underground installation up to 4 F.O. , the dimensions have been reduced (now 167,9 x 90 x 40 mm).**

**Here too the boxes for different poses differ only in color:**

- **BLACK RAL 9001 for underground installation**
- **GREY RAL 7001 for aerial application**

## CPE PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| 17.150.500-G06 | DERIVATION BOX **12 F.O**. FOR **UNDERGROUND** INSTALLATION |
| 17.150.500-G05 | DERIVATION BOX **4 F.O**. FOR **UNDERGROUND** INSTALLATION |
| 17.150.500-H11 | DERIVATION BOX **2 F.O**. FOR **UNDERGROUND** INSTALLATION |
| 17.150.500-H09 | DERIVATION BOX **12 F.O**. FOR **AERIAL** INSTALLATION |
| 17.150.500-H08 | DERIVATION BOX **6 F.O**. FOR **AERIAL** INSTALLATION |
| 17.150.500-H10 | DERIVATION BOX **4 F.O**. FOR **AERIAL** INSTALLATION |
| 17.150.500-H07 | BOX DERIVATION BOX **2 F.O**. FOR **AERIAL** INSTALLATION |
| 17.150.500-P12 | BOX DI DERIVAZIONE **4 U.I.** FOR **AERIAL** INSTALLATION<br>**NEW VERSION** |
| 17.150.500-P14 | BOX DI DERIVAZIONE **2 U.I.** FOR **AERIAL** INSTALLATION<br>**NEW VERSION** |
| 17.150.500-P11 | BOX DI DERIVAZIONE **4 U.I.** FOR **UNDERGROUND** INSTALLATION<br>**NEW VERSION** |
| 17.150.500-P13 | BOX DI DERIVAZIONE **2 U.I.** FOR **UNDERGROUND** INSTALLATION<br>**NEW VERSION** |

# TELECOM ITALIA FTTH NETWORKS ELEMENTS

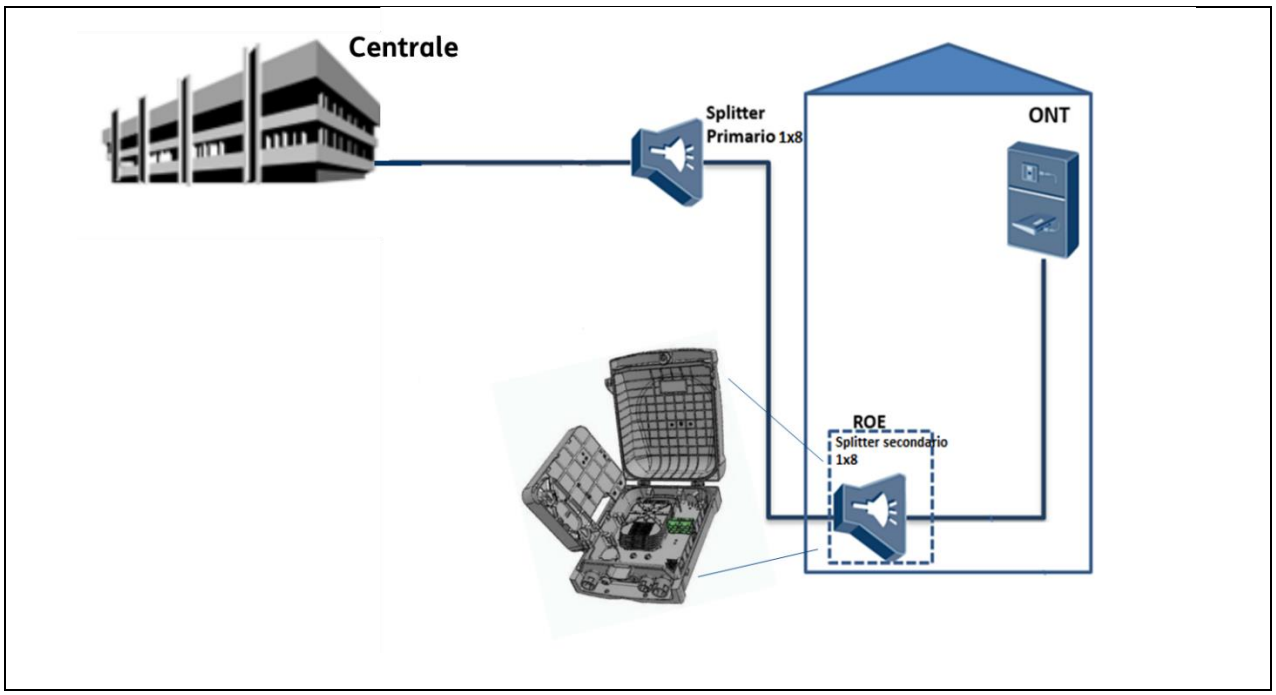
## TIM NETWORK ARCHITECTURE

The TIM FTTH GPON architecture provides for a **1:64 distributed splitting level**. The first **1:8** splitting level takes place inside the street underground enclosure **CNO (optical nodal center)** while the second **1:8** level takes place inside the box ROE.

## UNIFIED ROE

The **ROE** *(building optical allocator)* box is a network component necessary for the cabling of buildings built on the FTTH network with the development of the secondary optical network in the GPON solution.

It houses the secondary optical splitter and is the separation point between the distribution network and the user network.




For the creation of the FTTH optical network, the following types of ROE boxes have been defined:

- **ROE 16 and 32 UNITS** for indoor and outdoor use in the following ways:
  - internal or built-in installation in already installed or newly installed standard cabinets.
  - external installation on facade, on pole or inside hybrid column
- **ROE 16 UNITS** for manhole installation

**NOTE: housing in cabinet or in hybrid column is possible by installing only the internal parts of the ROE (the optical core)**

## UNIFIED ROE 32 UNITS

The **ROE 32 UNITS** consists of a plastic external casing with IP 56 and IK 10 protection degree and an internal insert or Optical Core, completely separable from the external casing, even completely wired:

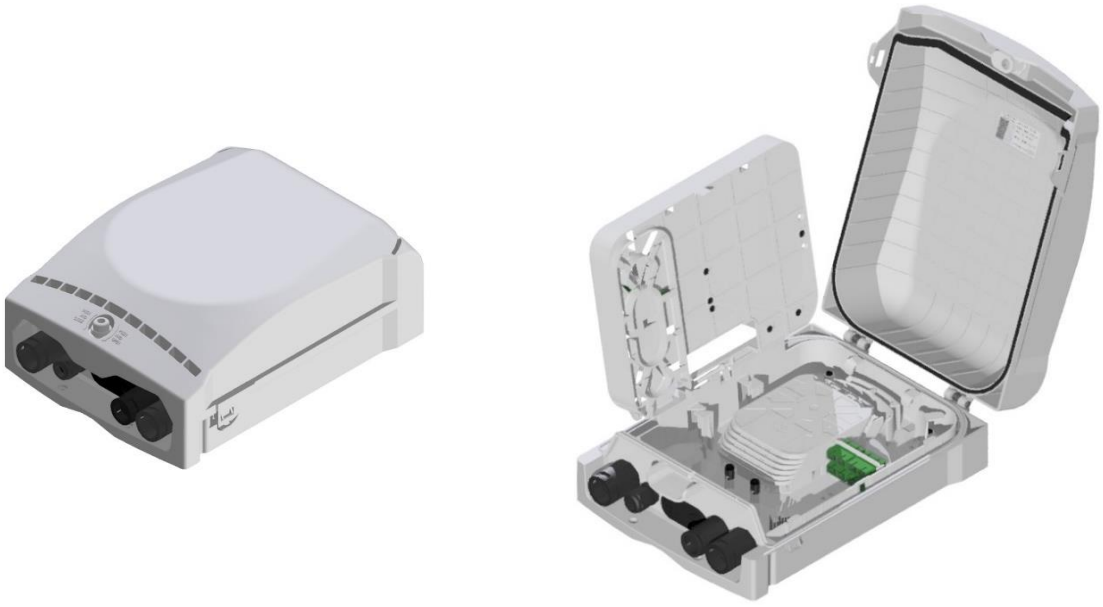
**The plastic container** to be placed directly on the wall using bolts or on a pole, suitable for internal and external installation which includes:

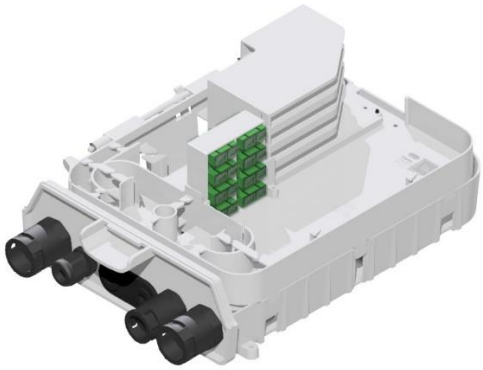
- a base for wall or pole anchoring
- a spring-loaded lid with side snaps and perimeter gasket
- a unified type of lock.

**The internal module (optical core)**, necessary for housing the internal components of the ROE, is designed, and conceived so that it can also be assembled in the field on existing cabinets.

It also features:

- a horizontal network rack for positioning 4 SC-SC sleeves for connecting the input fibers of the network cable with the connection fibers to the OLOs (transfer of secondary network fiber)
- a space designed for positioning no. **4 secondary 1:8 splitters.**
- a rack (splitter outputs) for positioning 16 SC-SC type sleeves for connecting the fibers of the vertical multi-fiber cable/single user cables.
- a vertical network rack for positioning 32 SC-SC sleeves for connecting the fibers of the vertical cable with the following fibers:
  - connection to the OLOs (vertical cabling fiber transfer)
  - connection for Point-to-Point users





## MAIN FEATURES

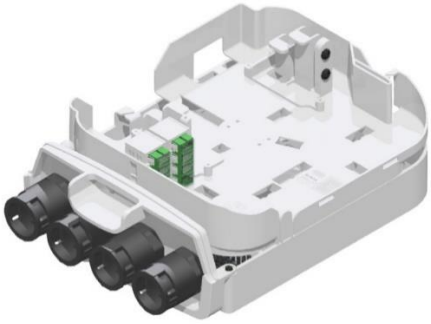
| | |
|---|---|
| ENTRANCE No. | **4 CIRCULARS AND 1 OVAL** |
| SPLICE TRAYS No. | **6 WITH 12 SPLICES HOUSING EACH** |
| DIMENSIONI BOX | **340x250x130 mm** |
| EXTERNAL PLASTIC MATERIALS | **PC** |
| INTERNAL PLASTIC MATERIALS | **ABS - DEGREE OF SELF-EXTINGUISHING UL 94 V0** |
| PROTECTION RATING EN 60529 (DUST, LIQUIDS) | **IP 56** |
| PROTECTION RATING EN 50102 (IMPACTS) | **IK 10** |

## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-H96** | UNIFIED ROE 32 UNITS |
| **17.250.500-H98** | OPTICAL CORE UNIFIED ROE 32 UNITS |

## UNIFIED ROE 16 UNITS

The **ROE 16 UNITS** shows the same characteristics as the larger version at 32 UNITS with the same purpose of use. In this case we find only one circular entrance which allow it to be used only as a terminal ROE and no longer a pass-through (inlet and outlet of the same microcables made through the oval entry).



It also features:

- a rack of the horizontal net for the positioning of no.. 4 SC-SC sleeves for connecting the input fibers of the network cable with the connection fibers to the OLOs (transfer of secondary network fibers)
- space designed for housing no. **2 secondary splitters 1x8.**
- rack (splitter outputs) for positioning 16 SC-SC type sleeves for connecting the fibers of the vertical multi-fiber cable/single user cables.
- vertical network rack for positioning 8 SC-SC type sleeves for connecting the fibers of the vertical cable with the following fibers:
    - connection to the OLOs (transfer of vertical cabling fibers)
    - connection for Point-to-Point users

## MAIN FEATURES

| | |
|---|---|
| ENTRANCE No. | **4 CIRCULARS** |
| SPLICE TRAYS No. | **4 WITH HOUSING FOR 12 SPLICES EACH** |
| DIMENSIONI BOX | **270x200x108 mm** |
| EXTERNAL PLASTIC MATERIALS | **PC** |
| INTERNAL PLASTIC MATERIALS | **ABS DEGREE OF SELF-EXTINGUISHING UL 94 V0** |
| PROTECTION RATING EN 60529 (DUST, LIQUIDS) | **IP 56** |
| PROTECTION RATING EN 50102 (IMPACTS) | **IK 10** |

## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-H97** | ROE UNIFIED 16 UNITS |
| **17.250.500-H99** | OPTICAL CORE ROE UNIFIED 16 UNITS |

## FIBERCOP NETWORK ARCHITECTURE

The FTTH FIBERCOP infrastructure is built with GPON technology, which allows to provide connections with speeds of 1 Gbps in download and hundreds of Mbps in upload, depending on the profile chosen by the operator.

The project involves the construction of only the secondary network. The primary network, for instance the one between the cabinet and the central, is instead already present thanks to the FTTC (Fiber To The Cabinet) coverage implemented by TIM over the years.

## FIBERCOP ENCLOSURES

The enclosures compliant with TIM specifications are designed to be able to manage single fiber cables with loose tubes structure and as modular systems equipped with a basic configuration that can be equipped, in the factory or directly in the field, with different modules/accessories.

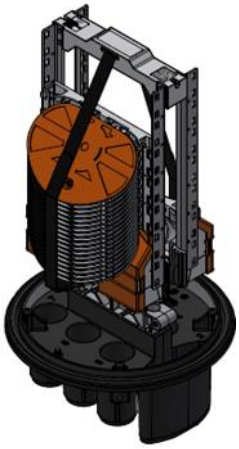
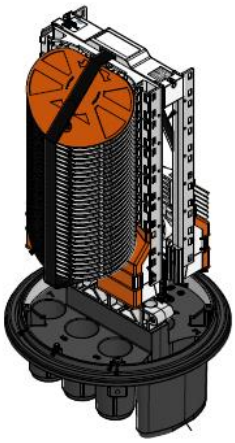
These available models of the available enclosures according to the type of installation and potentiality.

| **INSTALLATION TYPE** | **TYPE AND POTENTIALITY** | | | |
|---|---|---|---|---|
| | **REDUCED UP TO 72 F.O.** | **REDUCED UP TO 144 F.O.** | **STANDARD UP TO 72 F.O** | **STANDARD UP TO 144 F.O.** |
| **AEREAL** | **X** | **X** | | |
| **UNDERGROUND** | **X** | **X** | **X** | **X** |

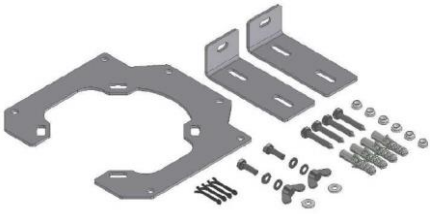
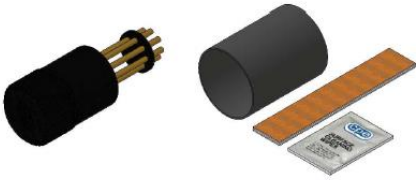
The reduced typology is made with the **FDC-AB** enclosure (dimensions 467 H x 300 mm) while the standard typology is made with the **FDC-AC** enclosure (dimensions 536 H x 300 mm).

| | |
|---|---|
|  |  |
| **REDUCED ENCLOSURE FDC-AC** | **STANDARD ENCLOSURE FDC-AC** |

The potentiality up to 72 f.o. is accomplished by installing no. 3 kits of 6 splices modules, **18 modules** in total of the CPE CODE **STP6-8S** while the capacity up to 144 f.o. provides for no. 6 kits for a total of **36 splice modules.**

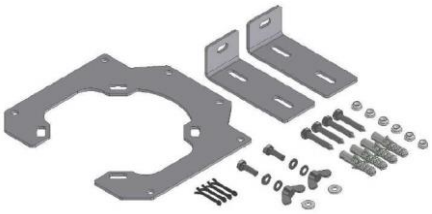
| | |
|---|---|
|  |  |
| **REDUCED ENCLOSURE UP TO 72 FO** | **REDUCED ENCLOSURE UP TO 144 FO** |

FIRST SUPPLYING KIT FOR UNDERGROUND INSTALLATION ENCLOSURES

| CPE CODE | Q.TY | DESCRIPTION | PICTURE |
|---|---|---|---|
| **17.150.500-700** | 3/6* | **STP6-24M**<br>SE SPLICE MODULES |  |
| **17.150.500-641** | 1 | **FDCKIT-WMB**<br>KIT FOR WALL INSTALLATION |  |
| **17.750.500-A00** | 1 | **RPCS-4X10mm**<br>COLD CIRCULAR ENTRY KIT WITH 4 HOLES |  |
| **17.650.500-F91** | 1 | **STP6-24M**<br>CONTINUITY SOCKET KIT |  |

***no. 3 kit for reduced enclosures up to 72 f.o. no. 6 kits for enclosure up to 144 f.o.**

## FIRST SUPPLYING KIT FOR AERIAL INSTALLATION ENCLOSURES

| CPE CODE | Q.TY | DESCRIPTION | PICTURE |
|---|---|---|---|
| **17.150.500-700** | 3/6* | **STP6-24M**<br>SE SPLICE MODULES |  |
| **17.150.500-641** | 1 | **FDCKIT-WMB**<br>KIT FOR WALL INSTALLATION |  |
| **17.150.500-G35** | 1 | METAL CLAMPS FOR POLE INSTALLATION<br>FOR AERIAL LAYING ONLY |  |

*** no. 3 kit for reduced enclosures up to 72 f.o. no. 6 kits for enclosure up to 144 f.o.**

## PRODUCT CODES

### ENCLOSURES FOR AERIAL APPLICATION

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-H89** | AERIAL ENCLOSURE FOR 96 TO 144 FIBERS |
| **17.250.500-H88** | AERIAL ENCLOSURE UP TO 72 FIBERS |

### REDUCED ENCLOSURES FOR UNDERGROUND APPLICATION

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-H87** | UNDERGROUND REDUCED ENCLOSURE FOR 96 TO 144 FIBERS |
| **17.250.500-H86** | UNDERGROUND REDUCED ENCLOSURE UP TO 72 FIBERS |

### STANDARD ENCLOSURES FOR UNDERGROUND APPLICATION

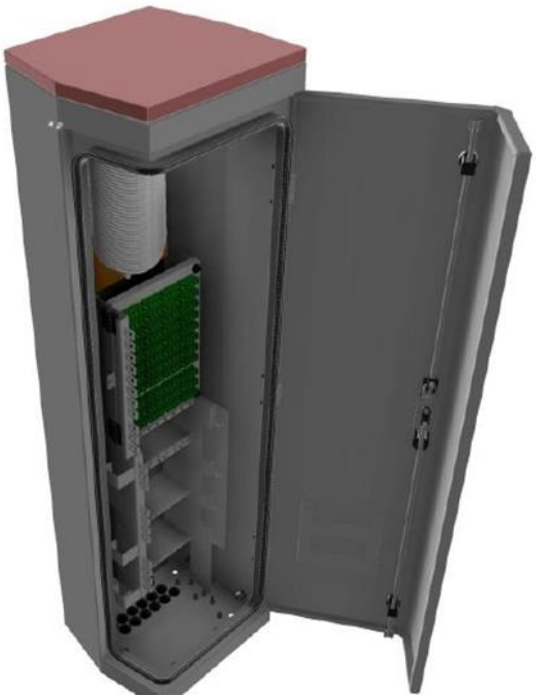
| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-H91** | UNDERGROUND STANDARD ENCLOSURE FOR 96 TO 144 FIBERS |
| **17.250.500-H90** | UNDERGROUND STANDARD ENCLOSURE UP TO 72 FIBERS |

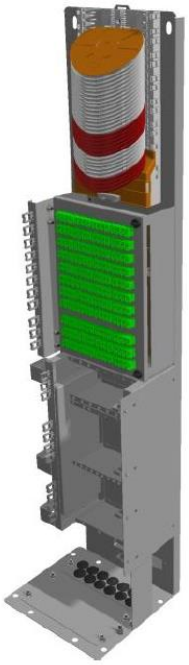
## MINI CRO CABINET 128 F.O.

**CPE CODE 17.250.500-A83**

A double level of splitting takes place inside the cabinet CRO by means of integrated pre-cabled splitter modules:

- **1:2** and **1:4** for first splitting level
- **1:16** for second splitting level



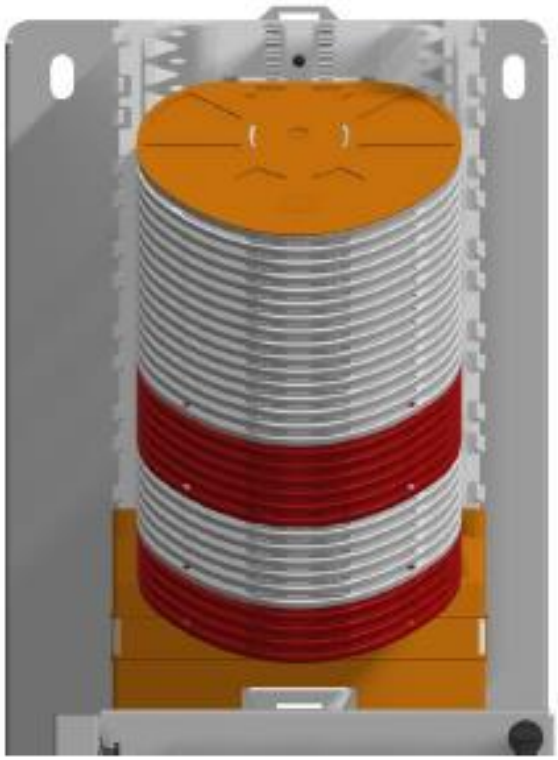


## TECHNICAL FEATURES

| | |
|---|---|
| POTENTIALITY | **128 f.o.** |
| DIMENSIONS | **1220x335x330 mm** |
| EXTERNAL STRUCTURE MATERIAL | **INOX AISI 304 STEEL** |
| INTERNAL STRUCTURE MATERIAL | **INOX AISI 430 STEEL** |
| SPLICE TRAYS MATERIAL | **PC/ABS SELF-EXTINGUISHING UL94 V0** |
| SEALING MATERIAL | **EPDM RUBBER** |
| CABINET COLOR | **GREY RAL 7037** |
| ROOF COLOR | **RED RAL 3020** |
| DEGREE PROTECTION AGAINST DUST AND LIQUIDS | **IP55 (EN 60529)** |
| DEGREE PROTECTION AGAINST THE IMPACT | **IK10 (EN 50102)** |

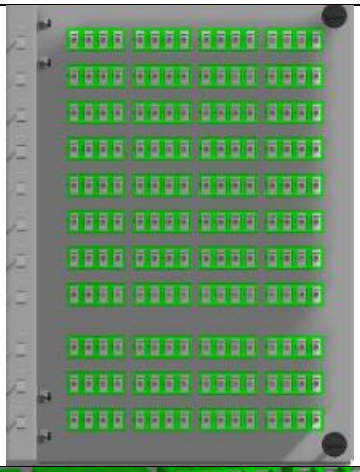
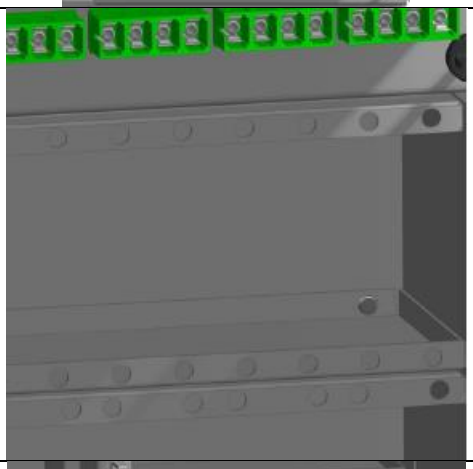
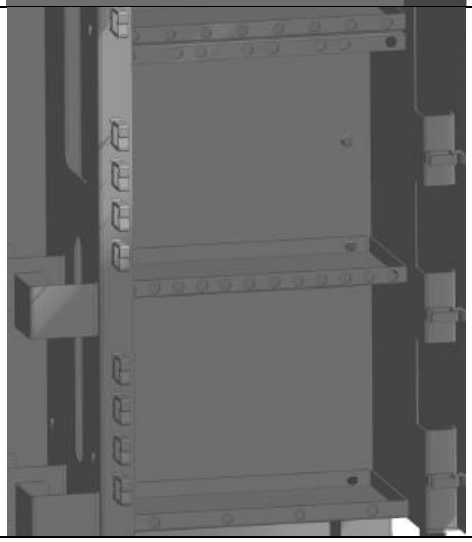
## ORGANIZATION OF THE SPLICE TRAYS MODULE PACK

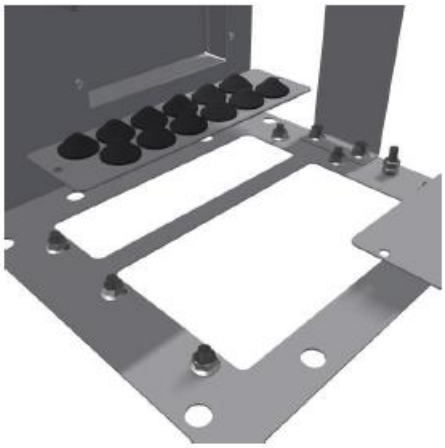
- no. 16 SC modules for the termination of the secondary network, identified in **GREY** colored.
- no. 6 SC modules for termination of the primary network, identified by the **RED** colored.
- no. 6 SC modules for parking the secondary network cables, identified by **GREY** colored.
- no. 4 SC modules for parking the primary network cables, identified by **RED** colored.



**NOTE: the splice trays allow the accommodation of nr. 8 fusion splices between the pigtails and the single fibers of the cable or the housing of up to 24 unused fibers of the cable (parking)**

## FIRST SUPPLYING KIT

| | |
|---|---|
| • mobile frame for housing:<br>- no. 128 adapters for SC/APC connectors assembled in groups of 4 (four) elements (quatrains) intended for connection of the secondary network.<br>- no. 48 adapters for SC/APC connectors assembled in groups of 4 (four) elements (quatrains) intended for the connection of the primary network |  |
| • housing for no. 8 primary splitter modules 1:2 or 1:4 |  |
| • housing for no. 8 secondary splitter modules 1x16 |  |

| | |
|---|---|
| • cable attestation area equipped with components for blocking the pulling element of primary and secondary network cables OD= 6÷16 mm and with a copper bar for the equipotential connections of the central metal elements |  |
| • cable gland diaphragm and operating slot for the passage of up to 12 cables OD= 6÷16 MM |  |

## PRODUCT CODE

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-L03** | MINI CRO 128 F.O. |

## PTE UNIFIED BOXES

The PTE box is the network component necessary for the cabling of buildings built in FTTH architecture with an optical cabinet and a secondary point-to-point section.

It represents the separation point between the distribution network and the user network.

PTE boxes have capacities of **24, 48 and 12 UNITS** for indoor and outdoor use in the following ways:

- internal cantilevered or built-in installation in cabinets already installed or newly installed
- external installation on a facade, on a pole or inside a hybrid column.

NOTE: housing in cabinet or in hybrid column is possible by installing only the internal module of the PTE (optical core).

## UNIFIED PTE LARGE 48 UNITS

The **PTE 48 UNITS** is made from a plastic container and an internal insert or Optical Core, completely separable from the external casing, even completely wired.

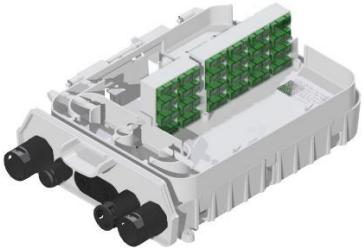
**The external plastic case**, to be placed directly on the wall using bolts or on a pole, suitable for internal and external installation which includes:

- a base for wall or pole anchoring
- a spring-loaded lid with side snaps and perimetral sealing.
- unified type lock

**The Optical Core**, necessary for housing the internal components of the PTE, is designed so that it can also be assembled inside existing Telecom Italia cabinets.

Features **a rack** for placement of:

- 32 SC-SC type sleeves for connecting the fibers of the vertical multifiber cable/single user cables.
- 16 SC-SC type sleeves for connection to the **OLO (Other Licensed Operators)** for the assignment of the fibers



## MAIN FEATURES

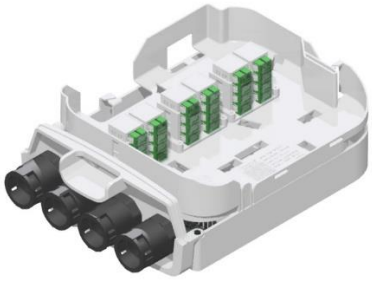
| | |
|---|---|
| ENTRANCE No. | **4 CIRCULAR AND 1 OVAL** |
| SPLICE TRAYS No. | **6 WITH 12 SPLICES HOUSING EACH** |
| DIMENSIONI BOX | **340x250x130 mm** |
| EXTERNAL PLASTIC MATERIALS | **PC** |
| INTERNAL PLASTIC MATERIALS | **ABS DEGREE OF SELF-EXTINGUISHING UL 94 V0** |
| PROTECTION RATING EN 60529 (DUST, LIQUIDS) | **IP 56** |
| PROTECTION RATING EN 50102 (IMPACTS) | **IK 10** |

## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-L00** | PTE UNIF. LARGE 48 U.I. |
| **17.250.500-L02** | OPTICAL CORE PTE LARGE UNIF. 48 U.I. |

## UNIFIED PTE SMALL 24 UNITS

The PTE 24 U.I. has the same characteristics as the larger version at 48 I.U. with the same intended uses. In this case we find only circular entries which allow it to be used only as a **terminal PTE** and no longer as a pass-through (inlet and outlet of the same microcables achieved through the oval entry).



In this case we find a rack for the placement of

- 16 SC-SC type sleeves for connecting the fibers of the vertical multi-fiber cable/single user cables.
- 8 SC-SC type sleeves for connection to the **OLO (Other Licensed Operators)** for the assignment of the fibers

## MAIN FEATURES

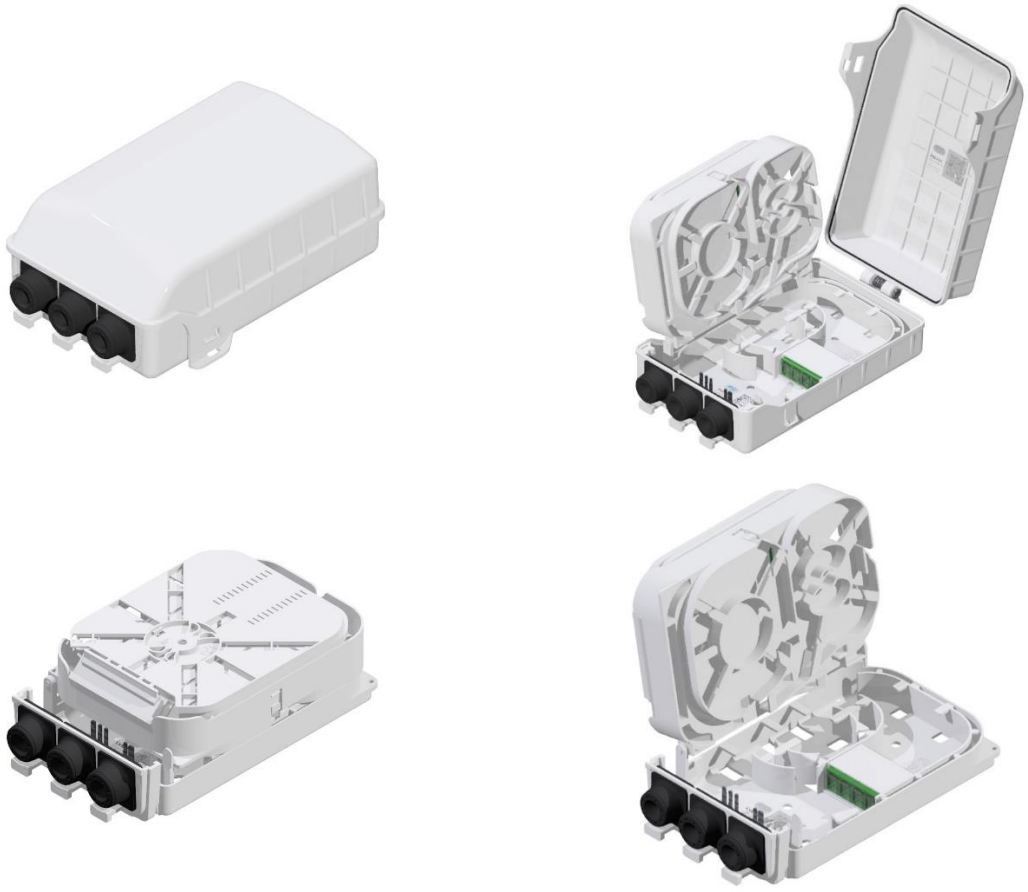
| | |
|---|---|
| ENTRANCE No. | **4 CIRCULARS** |
| SPLICE TRAYS No. | **4 WITH HOUSING FOR 12 SPLICES EACH** |
| DIMENSIONI BOX | **270x200x108 mm** |
| EXTERNAL PLASTIC MATERIALS | **PC** |
| INTERNAL PLASTIC MATERIALS | **ABS AUTO-EXTINGUISH RATE UL 94 V0** |
| PROTECTION RATING EN 60529 (DUST, LIQUIDS) | **IP 56** |
| PROTECTION RATING EN 50102 (IMPACTS) | **IK 10** |

## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-L01** | PTE UNIF. SMALL 24 U.I. |
| **17.250.500-L05** | OPTICAL CORE PTE SMALL UNIF. 24 U.I |

# UNIFIED PTE 12 UNITS

The **PTE 12 UNITS** shows the same characteristics of the previous boxes reduced and optimized in a small box that can also be used in this case (as for the PTE 24 U.I.) as a terminal PTE only.



The rack features:

- 8 SC-SC type sleeves for connecting the fibers of the vertical multifiber cable/single user cables.
- 4 SC-SC type sleeves for connection to the **OLO (Other Licensed Operators)** for the assignment of the fibers

## MAIN FEATURES

| | |
|---|---|
| ENTRANCE No. | **3 CIRCULARS** |
| SPLICE TRAYS No. | **2 WITH HOUSING FOR 12 SPLICES EACH** |
| DIMENSIONI BOX | **202x123x74 mm** |
| EXTERNAL PLASTIC MATERIALS | **PC** |
| INTERNAL PLASTIC MATERIALS | **ABS DEGREE OF SELF-EXTINGUISHING UL 94 V0** |
| PROTECTION RATING EN 60529 (DUST, LIQUIDS) | **IP 56** |
| PROTECTION RATING EN 50102 (IMPACTS) | **IK 10** |

## PRODUCT CODES

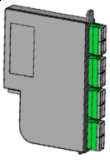
| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-L06** | PTE UNIF. 12 UNITS |
| **17.250.500-L04** | OPTICAL CORE PTE UNIF. 12 UNITS |

## SPLITTERS FOR TELECOM ITALIA NETWORK ARCHITECTURE

CPE offers the complete range of splitters comply with TELECOM ITALIA Technical Specification.

They are splitters of the balanced type, which is they divide the optical power, coming from the input port, equally among the N output ports.

Below are the four types of splitters currently used in the FTTH TIM network.

| A | B | C | D |
|---|---|---|---|
|  |  |  |  |

Types A and B are so-called "standalone" as the fibers entering and leaving the branching unit are not contained and organized inside a case as occurs for models C and D.

## SPLITTER STANDALONE

### PRIMARY SPLITTER “A”

As far as type "A" is concerned, it is a splitter:

- **primary:** first level of splitting (1:2, 1:4, 1:8)
- **250 um coating:** inputs and outputs made with fibers having a 250 µm coating.
- **for CNO:** to use inside the cabinet CNO box inside the special junction modules (TIM network)

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-L39** | PRIMARY SPLITTER 1x8 FOR ENCLOSURE |

### SECONDARY SPLITTER “B”

The type "B" splitter has the following particularities:

- **secondary:** second level of division (1:2, 1:4, 1:8)
- **coating:** inputs and outputs made with fiber having a coating at 900 µm.
- **for ROE:** to use inside underground, internal, or external ROE boxes (TIM network)

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-H92** | SECONDARY SPLITTER 1:8 FOR ROE 16 UNITS |

## INTEGRATED SPLITTER

### PRECABLED SPLITTER “C”

Category "C" splitters have the following characteristics:

- **primary and secondary:** double level of concentrated splitting
- **pre-cabled:** the fibers with a 250 µm coating are protected inside a plastic case and are already connectorized.
- **for CRO**: to be installed inside the cabinets to manage the double split level in a single environment.

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-F76** | MOD. SPLITTER INTEG. PRE-CABL. 1:16 |

## SPLITTER FOR ROE “D”

Category "D" splitters have the following characteristics:

- **secondary:** second level of 1:8 splitting in the diffused splitter architecture.
- **pre-cabled:** the fibers with a 250 µm coating are protected inside a plastic case and are already connectorized (nr. 4 SC/APC duplex connectors)
- **for ROE:** to use inside the unified box ROE 16 UNITS or ROE 32 UNITS to manage the double split level in a single room.

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-H94** | SPLITTER PREC. 1:8 PER ROE UNIF. |

## ROE 16 UNITS FOR MANHOLES

The **ROE 16 UNITS FOR MANHOLES** is a box designed for installation in the manhole capable of accommodating up to no. 2 of **1x8 splitters** with SC/APC connectorized input and output fibers.

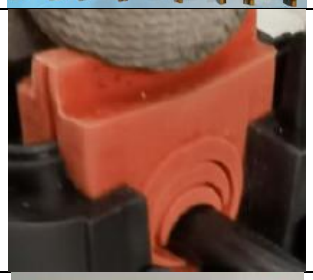
Specific features:

- a horizontal rack with 4 SC sleeves for the connection of the input fibers of the network cable (splitter input, OLO connection, point-to-point connections for business users)
- a vertical rack with nr. 16 SC sleeves for connecting the fibers of the vertical cable (splitter outputs, OLO fiber transfer, point-to-point connections for business users)

| | |
|---|---|
| MAXIMUM POTENTIALITY | **2 MODULE N TO HOUSE THE SPLITTER 1X8**<br>**1 MODULE SE TYPE FOR PARKING** |
| DIMENSIONS | **240X190X70 mm** |
| No. EXITS | **8 (IN LINE, 4 ON EACH SIDE)** |
| RATING PROTECTION EN 60529 (DUST, LIQUIDS) | **IP 68** |
| RATING PROTECTION EN 50102 (IMPACTS) | **IK 10** |

**NOTE: this product is intended only for the Italian market**

## FIRST SUPPLY KIT

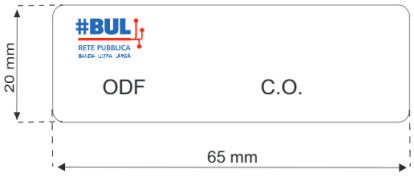
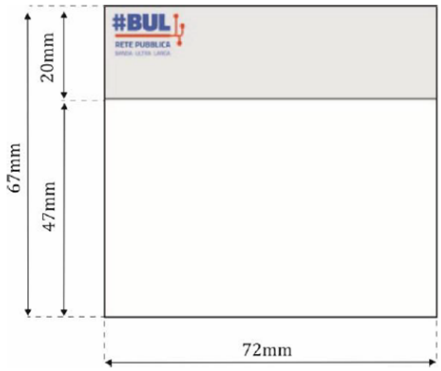
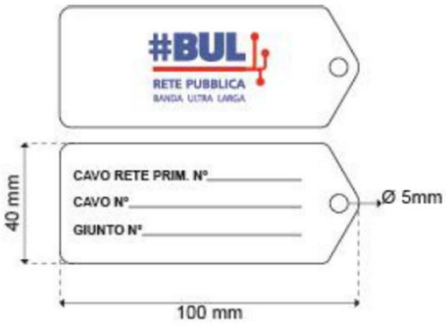
| | |
|---|---|
| • NO. 2 EXTENDING FRAME TO FIX THE CABLES |  |
| • FEEDER GROMMETS |  |
| • 9 HOLE DROP GROMMETS |  |
| • BRASS CLAMPS TO FIX THE STRENGTH MESSENGER MICROCABLES |  |

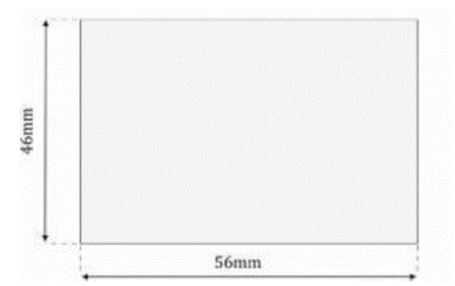
## PRODUCT CODE

| CPE CODE | DESCRIPTION |
|---|---|
| **17.250.500-H93** | ROE 16 UNITS FOR MANHOLES |

# IDENTIFICATIVE LABELS

The identification labels are necessary for the identification of network elements both during the population of the operator's *network inventory* and for maintenance activities. Depending on the type, the labels have a protective coating that makes them suitable for outdoor installation and a surface that can be written on with a permanent marker.

| DESCRIPTION | PICTURE | CPE CODE |
|---|---|---|
| LABELS FOR ODF |  | **17.250.000-Q19** |
| LABELS FOR OPTICAL CASSETTE |  | **17.250.000-Q20** |
| LABELS FOR CABLES |  | **17.250.000-Q21** |
| LABELS FOR ENCLOSURE |  | **17.250.000-Q22** |

| | | |
|---|---|---|
| LABELS FOR CABINET |  | **17.250.000-Q23** |
| LABEL FOR BOXES |  | **17.250.000-Q24** |
| LABELS FOR BOXES (PROTECTION) |  | **17.250.000-Q25** |
| LABELS FOR SPLITTERS |  | **17.250.000-Q26** |

**NOTE: labels can be customized with operator's logo**

# ANTIRODENT SOLUTIONS

Cpe Italia anti-rodent solutions allow the protection of the optical infrastructure from damage caused by rodent attacks.

These solutions also prevent accidental damage caused by installers and maintenance workers by guaranteeing the mechanical protection of the infrastructure and its proper organization within the buildings as well as protection from the entry of sand, soil, and dirt.

The range of these products consists of:

- **enclosures**
- **protection elements**
- **special accessories**

## ENCLOSURES

### IN LINE HERMETIC ENCLOSURE

**CPE CODE: TBA**

The in-line enclosure allows anti-rodent and mechanical protection as well as hermetic closure of the bundle of miniducts housed inside it and of the related connectors.

A metal clamp placed at both ends ensures resistance to the bundle of inlet and outlet miniducts being pulled out.

The closing and re-opening operations of the enclosure are carried out manually thanks to the coupling system of the two constituent half-shells by acting on the appropriate levers and installing the two screwable end caps on the inlets.

A wide range of seals is available for varied sizes and types of miniduct bundles.

| | |
|---|---|
| MATERIAL | **PP + GLASSFIBER** |
| INPUT/ OUTPUT SEALINGS | **TPU** |
| EXTERNAL SEALINGS | **TPU** |
| COLOR | **BLACK RAL 9005** |
| DIMENSIONS | **503 x 138 x 72 MM** |
| PROTECTION RATING EN 60529 (DUST, LIQUIDS) | **IP 68** |
| PROTECTION PROTEZIONE EN 50102 (IMPACTS) | **IK 09** |

## DERIVATION HERMETIC ENCLOSURE

**CPE CODE: TBA**

The derivation enclosure has the same functionality as the in-line one and allows a 45° branch to allow outreach operations towards the users.

| | |
|---|---|
| MATERIAL | **PP + GLASSFIBER** |
| INPUT/ OUTPUT SEALINGS | **TPU** |
| EXTERNAL SEALINGS | **TPU** |
| COLOR | **BLACK RAL 9005** |
| DIMENSIONS | **503 x 214 x 72 MM** |
| PROTECTION RATING EN 60529 (DUST, LIQUIDS) | **IP 68** |
| PROTECTION PROTEZIONE EN 50102 (IMPACTS) | **IK 09** |

**NOTE: marks and colors can be customized on request**

## ENCLOSURE FOR MANHOLES

CPE CODE: TBA

Compact enclosure to ensure the integrity of the minducts and connectors contained inside.

Manual assembly/disassembly of the two half-shells by means of closing levers arranged on the perimeter.

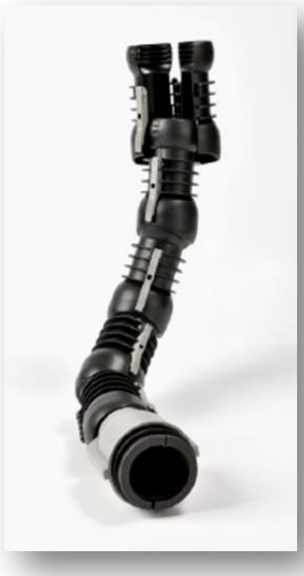
## MD CUP

**CPE CODE: TBA**

Cap used to protect miniducts from the entry of water and dirt.

Different rubber seals are available for the various bundle type.

**CPE CODE: TBA**



Innovative modular protection element for miniduct with the possibility of adjusting the radius-length within the available space of the well.

Adapters (male/female) available for any installation need.

Perfect compatibility with ENCLOSURE FOR MANHOLES and MD CUP.

| | |
|---|---|
| **MATERIAL** | **PP + GLASFIBERS** |
| **COLOR** | **BLACK RAL 9005** |
| **DIMENSIONS** | **141 x 70 x 70 MM** |

## FENDER FIXING SYSTEM

**CPE CODE: TBA**

Product specifically developed to facilitate the installation of miniducts in "fender" configuration in large or small trenches (up to 6 cm wide).

Thanks to this accessory, the miniducts are organized in an orderly and stable manner without incurring unwanted movements during installation.

| | |
|---|---|
| MATERIAL | **PP** |
| COLOR | **BLACK RAL 9005** |
| DIMENSIONS | **124 x 55 x 20 MM** |

MINIDUCT ORGANIZER

**CPE CODE: TBA**

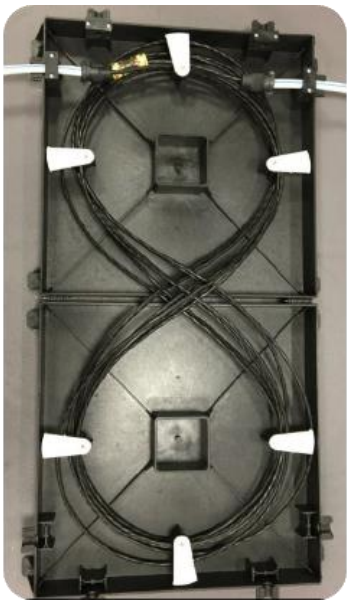
Compact modular system for organizing miniducts and fenders inside manholes along the internal perimeter. The modularity of the system allows you to organize layers of miniducts one above the other.

Assembly and disassembly are completely manual using sliding plastic locking keys**.**

| | |
|---|---|
| MATERIAL | **PA + GLASFIBERS** |
| COLOR | **BLACK RAL 9005** |
| DIMENSIONS (BASE + 1° MODULE) | **155 x 70 x 25 MM** |
| MAX No. OF INSTALLABLE ELEMENTS | **5** |

STOCK PROTECTION BOX

**CPE CODE: TBA**



Box with anti-rodent and mechanical protection to create stocks of microcable (**up to 50 meters**) in the shape of an "8". Can also be installed on the wall and available in a transparent version to allow immediate inspection of the microcable.

The product is supplied with adapters, gaskets for 12 and 14 mm miniducts sizes and anchors for wall installation.

A compact version is also available (only 7 cm thick) for small-sized manholes.

| | |
|---|---|
| MATERIAL | **PBT + GLASSFIBERS** |
| COLOR | **BLACK RAL 9005** |
| MAXIMU STORAGE CAPACITY | **50 METRI** |
| DIMENSIONS | **460 x 460 x 115 MM**<br>**430 x 460 x 69,5 MM (reduced version)** |
| PROTECTION RATING EN 60529 (DUST, LIQUIDS) | **IP 56** |

# HDPE MINIDUCTS

Miniducts are tubular structures in HDPE (High Density Polyethylene) used for the development of operators' underground networks. They are used to lay the microcables inside them using blowing technology which involves the introduction of high-pressure (up to **16 bar**) dehumidified air capable of creating a thrust bearing that allows insertion for the sections interested. For this reason, the miniducts have internal ribs in silicone material capable of minimizing friction with the surface of the microcables and making laying in general more effective and efficient.

The CPE offer miniducts can be classified into three macro-families as follows:

- classic miniducts in single configuration
- miniducts in aggregate configuration
- special miniducts

## CLASSIC MINIDUCTS IN SINGLE CONFIGURATION

These miniducts have the following recurring dimensions with details of the specific application.

| OD [mm] | ID [mm] | APPLICATION |
|---|---|---|
| 12 | 10 | sub pipe |
| 14 | 10 | direct buried |
| 20 | 16 | direct buried |

The miniducts are usually produced in a transparent color to allow visual identification of the microcables once it has been laid. The identification of the miniducts is made based on longitudinal stripes with a RAL color dedicated to the various operators (red for Telecom Italia, blue for Open Fiber, etc.).

A marking containing the operator, the component structure, the production batch, and the progressive metric is impressed on the external surface at intervals of 1 meter.

Example of marking:

**CPE ITALIA - OPERATOR NAME – HDPE MINIDUCT 10/12 MM – MM/YYYY – 0000 M**

## CPE CODE AND AVAILABLE MODELS

| CPE CODE | DESCRIPTION | FEATURES |
|---|---|---|
| **64.010.901-013** | MINIDUCT 10/12 MM OPEN FIBER | no. 4 blue RAL 5002 stripes on transparent miniduct |
| **64.010.909-022** | MINIDUCT 10/12 MM OPEN FIBER\|NEXT | |
| **64.010.901-014** | MINIDUCT 16/20 MM OPEN FIBER | |
| **64.010.909-023** | MINIDUCT 16/20 MM OPEN FIBER\|NEXT | |
| **TBA** | MINIDUCT 10/12 MM TELECOM ITALIA | no. 4 red stripes on transparent miniduct |
| **TBA** | MINIDUCT 10/14 MM TELECOM ITALIA | |
| **64.919.999-037** | MINIDUCT 12/14 MM TELECOM ITALIA | |

**NOTE: colors and marking are customizable upon client's request**

## MINIDUCTS IN AGGREGATE CONFIGURATION

### FENDER

Among the miniducts in aggregated configuration, the so-called ***fenders*** must be included, and which are made up of several single miniducts arranged in parallel and joined together by an external connecting sheath having good elasticity. In this way, this structure lends itself both to being collected in a circular configuration to minimize the encumbrance in the "sub-pipe" phase and to being left intact in a planar configuration.

The type containing 14/10 mm miniduct is suitable for installation directly inside excavations (trench or mini trench).

The marking on the miniducts is replicated on the outer sheath of the fender structure.

## CPE CODE AND AVAILABLE MODELS

| CPE CODE | DESCRIPTION | FEATURES |
|---|---|---|
| **64.010.901-017** | FENDER 7x10/14 MM INFRATEL | external sheath ORANGE RAL 2009 whit transparent miniduct with no. 4 longitudinal stripes distinct colors |
| **64.010.009-024** | FENDER 7 x10/14 MM OPEN FIBER\|NEXT | external sheath BLU RAL 5002 whit transparent miniduct with no. 4 longitudinal stripes in BLU RAL 5002color |
| **TBA** | FENDER 4x10/12 MM TELECOM ITALIA | external sheath ORANGE RAL 2009 whit transparent miniduct with no. 3 longitudinal stripes RED colored |
| **TBA** | FENDER 5 x 10/12 MM TELECOM ITALIA | |
| **TBA** | FENDER 4x10/14 MM TELECOM ITALIA | |
| **TBA** | FENDER 5 x 10/14 MM TELECOM ITALIA | |

## NO DIG BUNDLE

By Bundle "*No Dig*" is intended a circular aggregate configuration with a loose high-density polyethylene (HDPE) outer sheath that allows for the possible extraction of individual miniducts. By virtue of the reinforcement guaranteed by the wall thickness of at least 3 mm, this structure guarantees the possibility of installation directly in the trench or with closed-air excavation technologies (no dig).

| CPE CODE | DESCRIPTION | FEATURES |
|---|---|---|
| **TBA** | BUNDLE 50/43 x 7 10/12 MM | OD= 50 mm ID=43 mm. External sheath ORANGE RAL 2009 with no. 7 whit transparent miniduct inside with no. 4 longitudinal stripes distinct colors |

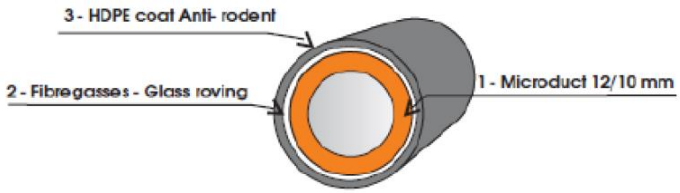
Among the special miniducts there is the **ANTIRODENT** type specially designed to ensure the durability of the infrastructure.

## MINIDUCT VH9E
**CPE CODE: 64.919.999-012**

The VH9 miniduct is a 10/12 mm size miniduct equipped with a special protection consisting of a structural mesh in glass yarns to which a heat-sealed corrugated steel tape is applied with the dual function of vapor barrier and mechanical protection. The structure is completed by an external HDPE sheath.


| CPE CODE | DESCRIPTION | FEATURES |
|---|---|---|
| **64.919.999-012** | MINIDUCT VH9E | OD=16 mm. External sheath in BLACK RAL 9005 nominal thickness 1,6 mm |

## MINIDUCT 12/10 MM WITH GLASS ROVING

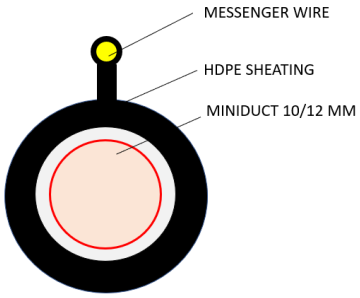



This 10/12 mm miniduct has an external protection consisting of a fiberglass mesh to which a high mechanical resistance HDPE sheath is co-extruded.

| CPE CODE | DESCRIPTION | FEATURES |
|---|---|---|
| **TBA** | MINIDUCT 12/10 MM WITH GLASS ROVING | OD=16 mm. External sheath in BLACK RAL 9005 nominal thickness 0,95 mm |

## AERIAL FIGURE 8 MINIDUCT

The *figure 8* aerial miniducts allow for the creation of a self-supporting dielectric infrastructure ready for the laying of optical microcables with the blowing technique. They consist of a HDPE tubular rigidly connected to a fiberglass load-bearing element by means of which the connection to the TLC poles takes place through special hooking and suspension devices. In case of multiple configurations, it is possible with a single solution to double and triple the potential of the infrastructure by installing several microcables in parallel.



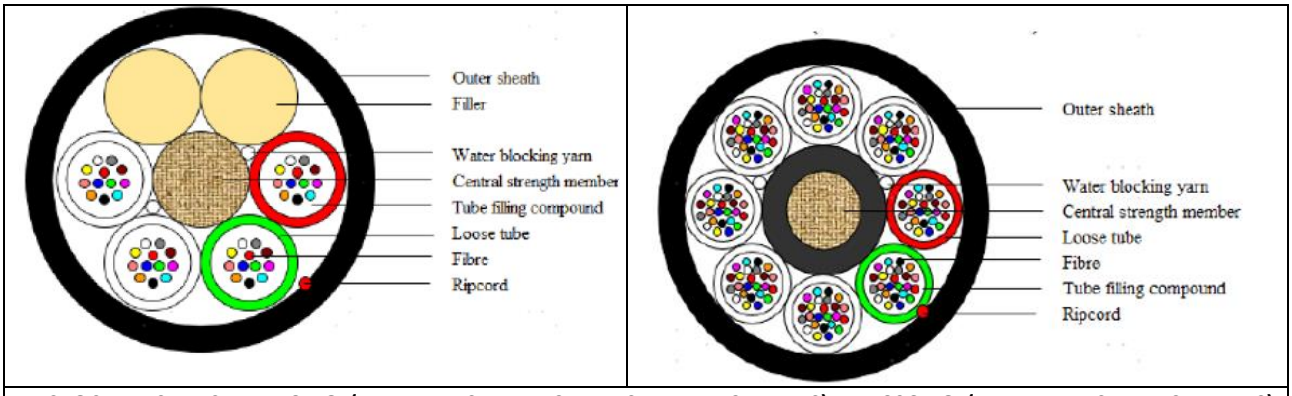

| CPE CODE | DESCRIPTION | FEATURES |
|---|---|---|
| **TBA** | AERIAL MINIDUCT FIGURE 8 1X12/10 MM | external sheath in black RAL 9005 |
| **TBA** | AERIAL MINIDUCT FIGURE 8 2X12/10 MM | |
| **TBA** | AERIAL MINIDUCT FIGURE 8 3X12/10 MM | |

# F.O. MICROCABLES AND AERIAL CABLES

The microcables and optical aerial cables offered by CPE comply with the Open Fiber Technical Specifications which require that the conformity of the products be assessed by a third-party certifying body.

## BLOWING MICROCABLES

Traditional microcables for "blowing" laying are dedicated to buried blown laying in OD/ID 10/12 miniducts (potential from 12 to 288 optical fibers) and in OD/ID 16/20 mm miniducts (for 396 potential). They are also compatible for direct underground installation (trench/mini-trench) blown inside mini-pipes OD/ID 10/14 mm.




**MICROCABLE STRUCTURE 48 F.O. (No. 4 TUBES WITH 12 FIBERS AND No. 2 FILLERS) AND 396 F.O. (No. 11 TUBES WITH 24 FIBERS)**

Specific features:

- central dielectric support element in fiberglass around which the tubes containing the fibers and any fillers that complete the circular geometry are gathered.
- “loose” tubes in thermoplastic material containing up to 36 fibers per tube. The optical fibers inside are immersed in a suitable protective synthetic buffer, water-repellent, non-toxic, transparent, odorless, and easily removable.
- SM single-mode fibers having the optical, mechanical, and geometrical characteristics indicated in the latest updates of the **ITU-T Recommendation G.657.A1 or A2**
- tubes gathered around the central element by means of S-Z type stranding to form the optical nucleus by means of synthetic yarns.
- hygro-expandable tapes inside the core such as to guarantee the properties of resistance to the longitudinal propagation of humidity.
- outer sheath in black high-density polyethylene resistant to U.V.
- marking stamped on the outer sheath (every meter) showing information relating to the potential, the internal structure, the type of fiber, the applicable ST, the lot, and the sequential metric (example below)

Example of marking:

**OPTICAL CABLE -TOL8D-192-8-24-SM G.657.A1 T/E-ST – IQQ – TS AA- LOT 0000 - CPE ITALIA – 0000 M**

(192 F.O. cable with “LmD” loose tube structure, G.657.A1 fiber inside, inspected by third body “IQQ” , applicable technical spec “AA” and polyethylene sheath)

## GEOMETRICAL AND CONSTRUCTIVE FEATURES

| FIBERS No. | TUBES No. | FIBERS/ TUBE No. | FILLERS No. | EXTERNAL DIAMETER [mm] | NOMINAL WEIGTH [Kg/km] | MINIMUM SHEATH THICKNESS [mm] |
|---|---|---|---|---|---|---|
| 12 | 1 | 12 | 5 | 6.5 | 40 | 0,4 |
| 24 | 2 | 12 | 4 | 6.5 | 40 | 0,4 |
| 48 | 4 | 12 | 2 | 6.5 | 40 | 0,4 |
| 96 | 4 | 24 | 2 | 8.0 | 45 | 0,4 |
| 144 | 6 | 24 | 0 | 8.0 | 65 | 0,4 |
| 192 | 8 | 24 | 0 | 8.0 | 65 | 0,4 |
| 288 | 8 | 36 | 0 | 11.0 | 70 | 0,4 |
| 396 | 11 | 36 | 0 | 12.0 | 110 | 0,4 |

## OPTICAL PARAMETERS

| PARAMETERS | VALUE |
|---|---|
| Attenuation @ 1310 nm | ≤ 0.36 dB/ Km |
| Attenuation @ 1383 nm | ≤ 0.36 dB/ Km |
| Attenuation @ 1550 nm | ≤ 0.23 dB/ Km |

## PRODUCT CODES

| DESCRIPTION | CPE CODE |
|---|---|
| Microcable "blowing" 12 FO | **05.236.000-042** |
| Microcable "blowing" 24 FO | **05.236.000-044** |
| Microcable "blowing" 48 FO | **05.236.000-046** |
| Microcable "blowing" 96 FO | **05.236.000-047** |
| Microcable "blowing" 144 FO | **05.236.000-048** |
| Microcable "blowing" 192 FO | **05.236.000-049** |
| Microcable "blowing" 288 FO | **05.236.000-050** |
| Microcable "blowing" 396 FO | **05.236.000-051** |

**NOTE: all microcables are supplied with a gray outer sheath and black marking. This color makes the microcables suitable for installation on facades.**
**Assorted colors are available on request.**

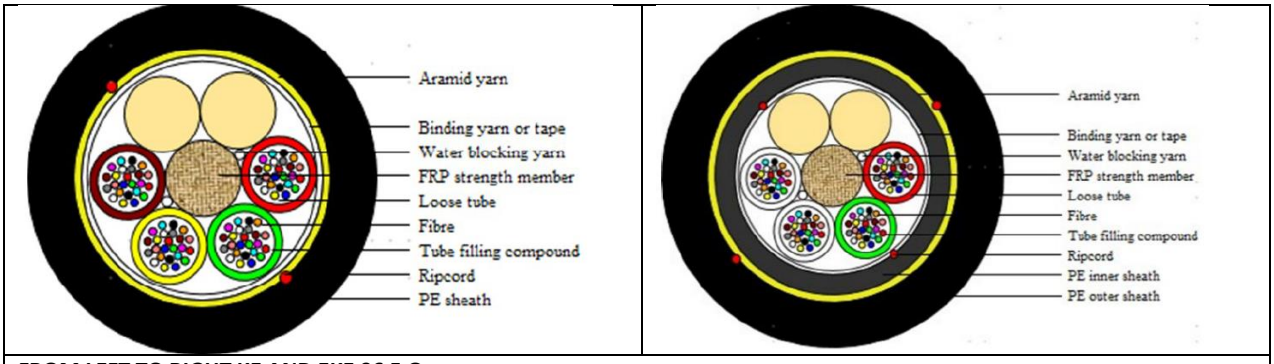
**ADSS** (All Dielectric Self Supporting) aerial cables are fully dielectric SELF-SUPPORTING optical cables capable of making optical connections typically on poles spans.

They are equipped with high tensile strength which allows them to be installed by means of special tensioners and dedicated hook and suspension devices which guarantee the effectiveness of the connection to the piling.

The cables have an optical core made up of tubes of thermoplastic material, each containing up to 36 optical fibers loosely (loose tubes), stranded in a crown around a central fiberglass element.

They split up into two main categories based on external protection:

- **KE o LIGTH:** with double protection by aramid yarns (K) and polyethylene (E)
- **EKE:** with triple protection by polyethylene (E), aramid yarns (K) and again polyethylene (E)




**FROM LEFT TO RIGHT KE AND EKE 96 F.O.**

The **KE** type is used on short spans up to **80 meters** (urban areas) and guarantees resistance to a maximum applicable traction force (M.A.T.) of **600 daN** while the **EKE** type is used on longer spans in extra-urban areas guaranteeing a resistance at a maximum applicable traction force of **1200 daN.**

Specific features:

- central dielectric support element in fiberglass around which the tubes containing the fibers and any fillers that complete the circular geometry are gathered.
- “loose” tubes in thermoplastic material containing up to 36 fibers per tube. The optical fibers inside are immersed in suitable protective synthetic buffer, water-repellent, non-toxic, transparent, odor-free, and easily transportable.
- SM single-mode fiber having the optical, mechanical, and geometric characteristics indicated in the latest updates of the ITU-T G.657.A1 or A2 Recommendation
- tubes gathered around the central element by means of S-Z type stranding to form the optical nucleus. by means of synthetic yarns
- hygro-expandable tapes inside the core such as to guarantee the properties of resistance to the longitudinal propagation of humidity.
- internal sheath in black high-density polyethylene (only for EKE)
- double weave of aramid yarns in alternate directions with a total count **≥ 75,000 dTex (KE)** and ≥ **280,000 dTex (EKE)**

- external sheath in black high-density polyethylene resistant to U.V.
- marking stamped on the outer sheath (every meter) showing information relating to the potential, the internal structure, the type of fiber, the applicable ST, the lot, and the sequential metric.

Example of marking:

**OPTICAL CABLE -TOL8D-192-8-24-SM G.657.A1 /EKE– IQQ – TS AA- LOT 0000 - CPE ITALIA – 0000 M**

(192 F.O. aerial cable with “LmD” loose tube structure, G.657.A1 fiber inside, inspected by third body “IQQ”, applicable technical spec “AA” triple protective sheath EKE type)

## GEOMETRIC AND CONSTRUCTION CHARACTERISTICS

### KE AERIAL CABLE

| FIBERS No. | TUBES No. | FIBERS/ TUBE No. | FILLERS No. | MAXIMUM EXTERNAL DIAMETER [mm] | NOMINAL WEIGTH [Kg/km] | MINIMUM EXTERNAL SHEATH [mm] |
|---|---|---|---|---|---|---|
| 12 LIGHT | 1 | 12 | 5 | 10.8 | 90 | 1,2 |
| 24 LIGHT | 2 | 12 | 4 | 10.8 | 90 | 1,2 |
| 48 LIGHT | 4 | 12 | 2 | 10.8 | 90 | 1,2 |
| 96 LIGHT | 4 | 24 | 2 | 14.0 | 130 | 1,2 |
| 144 LIGHT | 6 | 24 | 0 | 14.0 | 130 | 1,2 |
| 192 LIGHT | 8 | 24 | 0 | 14.0 | 160 | 1,2 |
| 288 LIGHT | 8 | 36 | 0 | 14.5 | 175 | 1,2 |
| 396 LIGHT | 11 | 36 | 0 | 16.0 | 220 | 1,2 |

### EKE AERIAL CABLE

| FIBERS No. | TUBES No. | FIBERS/ TUBE No. | FILLERS No. | MAXIMUM EXTERNAL DIAMETER [mm] | NOMINAL WEIGTH [Kg/km] | MINIMUM EXTERNAL SHEATH [mm] |
|---|---|---|---|---|---|---|
| 12 | 1 | 12 | 5 | 13.7 | 180 | 1,2 |
| 24 | 2 | 12 | 4 | 13.7 | 180 | 1,2 |
| 48 | 4 | 12 | 2 | 13.7 | 180 | 1,2 |
| 96 | 4 | 24 | 2 | 13.7 | 180 | 1,2 |
| 144 | 6 | 24 | 0 | 13.7 | 180 | 1,2 |
| 192 | 8 | 24 | 0 | 14.7 | 220 | 1,2 |
| 288 | 11 | 36 | 0 | 14.7 | 220 | 1,2 |
| 396 | 12 | 36 | 0 | 17.7 | 300 | 1,2 |

## OPTICAL PARAMETERS

| PARAMETERS | VALUE |
|---|---|
| Attenuation @ 1310 nm | ≤ 0.36 dB/ Km |
| Attenuation @ 1383 nm | ≤ 0.36 dB/ Km |
| Attenuation @ 1550 nm | ≤ 0.23 dB/ Km |

## PRODUCT CODES

| DESCRIPTION | CPE CODE |
|---|---|
| Aerial microcable ADSS light 24 FO | **05.236.000-052** |
| Aerial microcable ADSS light 48 FO | **05.236.000-053** |
| Aerial microcable ADSS light 96 FO | **05.236.000-054** |
| Aerial microcable ADSS light 144 FO | **05.236.000-055** |
| Aerial microcable ADSS light 192 FO | **05.236.000-056** |
| Aerial microcable ADSS light 288 FO | **05.236.000-057** |
| Aerial microcable ADSS light 396 FO | **05.236.000-058** |
| Aerial microcable ADSS 24 FO | **05.236.000-059** |
| Aerial microcable ADSS 48 FO | **05.236.000-060** |
| Aerial microcable ADSS 96 FO | **05.236.000-061** |
| Aerial microcable ADSS 144 FO | **05.236.000-062** |
| Aerial microcable ADSS 192 FO | **05.236.000-063** |
| Aerial microcable ADSS 288 FO | **05.236.000-064** |
| Aerial microcable ADSS 396 FO | **05.236.000-065** |

**NOTE: all CPE microcables are provided with external sheath grey color and black marking. Colors and marking are customizable upon client's request**

# MINIDUCTS CONNECTORS

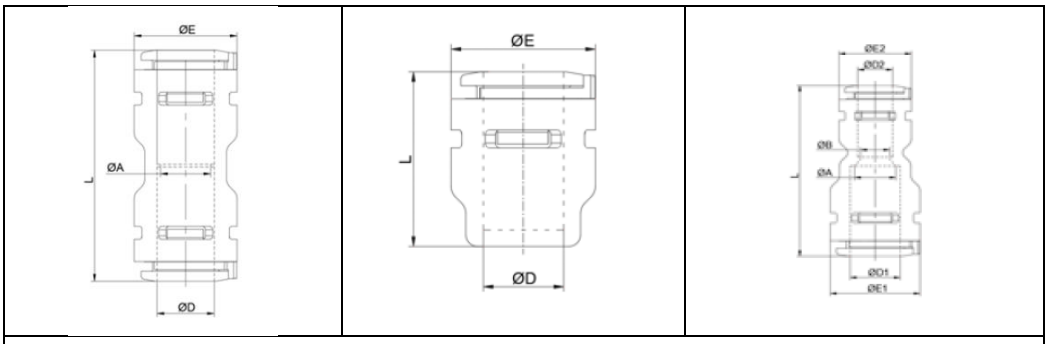
The connectors allow the connection of the HDPE miniducts to guarantee the physical and pneumatic continuity of the optical line inside manufactured articles such as manholes and TLC chambers.

The connectors offered by CPE comply with the **CEI EN 50411-2-8** standard which guarantees the reliability of the products in terms of mechanical performance (tightness, pressure, resistance to release, insertion force) and environmental performance (waterproofing, resistance to variations temperature, contaminated solvents and fluids, stress cracking from solvents, salt spray).

| **MAIN CHARACTERISTICS** | |
|---|---|
| PRESSURE RESISTANCE | **10 bar (12/10) - 16 bar (14/10)** |
| TENSILE STRENGTH | **500 N (12/10) - 700 N (14/10)** |

The connectors split into three large macro-families:

- **straight connectors**: for coupling between the same external diameter of contiguous miniducts
- **end line connectors**: used as "plugs" to guarantee the pneumatic seal and the protection of the system from external agents.
- **transition connectors**: for coupling between different external diameters of contiguous miniducts.




**MAIN DIMENSIONS FOR CONNECTORS**

| MODEL | D (mm) | A (mm) | E (mm) | L (mm) |
|---|---|---|---|---|
| 12/10 | 12+0.5 | 11±0.1 | 21±0.2 | 46±0.5 |
| 14/10 | 14+0.5 | 13±0.1 | 24.9±0.2 | 47.5±0.5 |

| MODEL | A (mm) | B (mm) | D1 (mm) | D2 (mm) | E1 (mm) | E2 (mm) | L (mm) |
|---|---|---|---|---|---|---|---|
| 14/12 | 12+0.5 | 10±0.1 | 14+0.5 | 12+0.5 | 24.9±0.2 | 21±0.2 | 48.3±0.5 |

These connectors are made of techno-polymer and stainless steel parts.

The transparent body facilitates checking the correct passage of the microcables inside it

All connectors are supplied with safety clips that prevent accidental disconnection.

## PRODUCT CODES

| CPE CODE | MODEL | FAMILY | PCS (un.) |
|---|---|---|---|
| **17.250.500-Q09** | 12 mm | END LINE CONNECTOR | 100 |
| **17.250.500-Q10** | 14 mm | | 100 |
| **17.250.500-Q11** | 12/10 mm | STRAIGHT CONNECTOR | 100 |
| **17.250.500-Q12** | 14/10 mm | | 100 |
| **17.250.500-Q13** | 14/12 mm | TRANSITION CONNECTOR | 100 |

# ENCLOSURES ACCESSORIES

These products are suitable for use inside any passive part (closures, boxes, optical drawers) with FIST-type locking systems.

## SPLICE TRAYS KITS - STK

Splice Trays Kits (STK) allow the protection and parking of several types of fibers (coated primary, coated secondary) and to securely house the splices.

They consist of a series of modules which are mounted on a support board, which allows the modules to hinge and gives access to all fibers and splices. The base is then hooked manually by lateral clips to the frames of any optical FIST closures.

Available kits:

- **Single Circuit (SC)**
- **Single Element (SE)**
- **Single Element Reduced (SER)**

The 4mm thick SC-type module can manage up to 4 fibers (250 µm) and 2 fibers (900 µm).

The SE version and the reduced version type SER with thickness of 8 mm and 4 mm respectively can manage up to 12 fibers with primary coating (250 µm) or 4 fibers with secondary coating (900 µm).

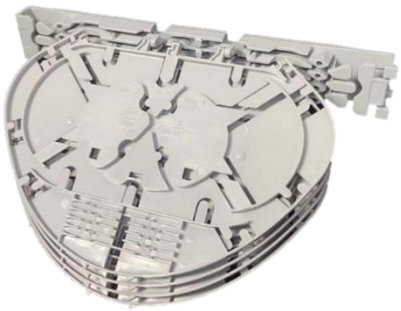
## TECHNICAL DATA

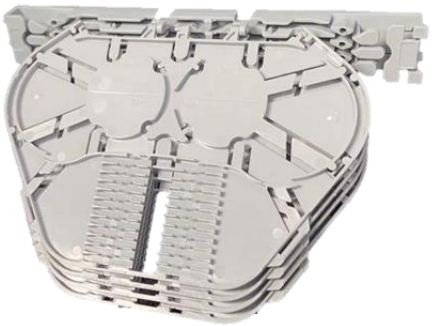
| | |
|---|---|
| APPLICATIONS | **OPTICAL CLOSURES, FTTH BOXES** |
| COLOR | **GREY** |
| MATERIAL | **PC SELF-EXTINGUISHING UL94 V0** |
| SPLICING TYPE | **FUSION SPLICES** |
| MINIMUM BENDING RADIUS | **30 mm** |

## GENERAL DIMENSIONS

| | |
|---|---|
| TRAY HEIGHT SE-SC-SER | **8 mm - 4 mm – 4 mm** |
| TRAY DEPTH SE-SC-SER | **103,5 mm - 103,5 mm - 104 mm** |
| TRAY LENGHT SE-SC-SER | **152 mm -152 mm - 152 mm** |
| FIBER LENGTH STORAGE (EACH SIDE OF SPLICE) MAX. | **1500 mm (900 µm) - 1500 mm for 250/900 µm mixed - 2050 mm 250 µm** |
| FIBER LENGTH STORAGE (EACH SIDE OF SPLICE) MIN. | **650 mm** |
| SPLICE PROTECTOR DIMENSIONS (MAX.) | **45 mm** |

## PRODUCT CODES

| CPE CODE | DESCRIPTION | PICTURE | NOTES |
|---|---|---|---|
| **17.150.500-G51** | **STK 4SC** |  | • nr. 4 SC splice trays+ support base<br>• 16 splices (250µm)<br>• 8 splices (900µm) |
| **17.150.500-G52** | **STK 8SC** |  | • nr. 8 SC splice trays SC+ support base<br>• 32 splices (250µm)<br>• 16 splices (900µm) |

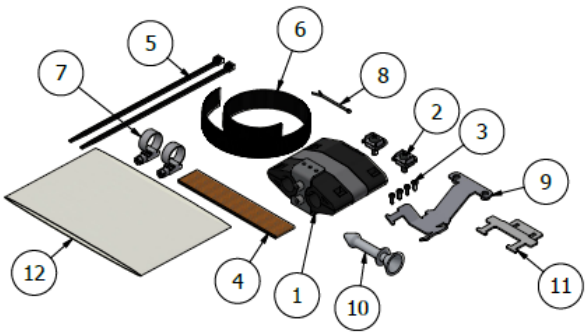
| | | | |
|---|---|---|---|
| **17.150.500-G53** | **STK 2SE** |  | • nr. 2 SE splice modules + support base<br>• 24 splices (250µm)<br>• 8 splices (900µm) |
| **17.150.500-G54** | **STK 4SE** |  | • nr.4 SE splice modules + support base<br>• 48 splices (250µm)<br>• 16 splices (900µm) |
| **17.150.500-G55** | **STK 4SER** |  | • nr.4 SER splice trays + support base<br>• 48 splices (250µm)<br>• 16 spices (900µm) |

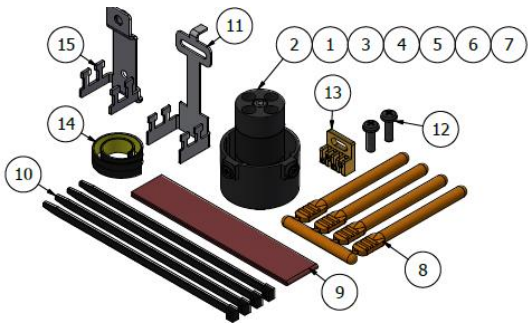
## COLD SEALING KITS - FIST GCO2 COMPATIBLE

The FST cold entry kits are compatible with the ports of all FIST-GCO2 closures.

The sealing action is guaranteed through the silicone rubber capable of expanding by tightening the internal screw using a simple Allen key.

The 4 cables round kit can cover the entire range of cables with an external diameter **from 4 to 8 mm**.




## KIT CONTENT

| **OVAL COLD SEALING KIT** | **ROUND COLD SEALING KIT** |
|---|---|
| • foam tape.<br>• metal/plastic tie wraps<br>• velcro strip<br>• dummy rod for unused port<br>• fixation bracket for FIST-Bx type closures<br>• fixation bracket for FIST-Fx type closures<br>• metal clamps with screws<br>• cotter pins<br>• bag for looped tubes storage | • foam tape.<br>• plastic tie wraps<br>• dummy rods for unused ports<br>• fixation bracket for FIST-Bx type closures<br>• fixation bracket for FIST-Fx type closures<br>• strength member fix. plate |

## TECHNICAL DATA

| | |
|---|---|
| GASKET | **SILICON RUBBER** |
| OVAL PORT CABLE RANGE | **7-16 mm** |
| ROUND PORT CABLE RANGE | **4-8 mm** |

## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.750.500-G45** | FST-RPCS 4X4-8mm |
| **17.750.500-G46** | FST-OPCS 2X7-16mm |
| **17.750.500-G46** | OPCS-4X14-20 mm |

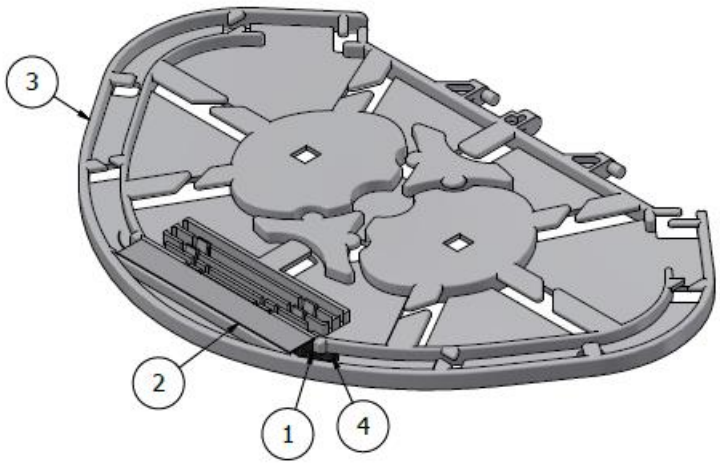
## SPLITTER TRAY 1:16

**CPE CODE: 17.150.500-G87**

The “1:16 splitter tray” splice module allows the installation of a 1:16 standalone splitter with protection made by a metal module (2) inside a 4 mm thick SC (Single Circuit) junction module (3).

On the sides of the splitter there are guides (4) for blocking the INPUT and OUTPUT fibers.

This product is suitable for use inside any FIST passive part (boxes, closures, optical drawers) with in FTTH GPON networks.




## TECHNICAL DATA

| | |
|---|---|
| TYPE OF FIBER | **G.657-A1** |
| WAVELENGTH | **1250 nm - 1650 nm** |
| INSERTION LOSS (MAX) | **13.7 dB** |

| | |
|---|---|
| UNIFORMITY | **1.1 dB** |
| PDL | **0.2 dB** |
| INPUT AND OUTPUT FIBER LENGTH | **1,5 M** |
| FIBER COLOR | **INPUT: NATURAL – OUTPUT: COLOR CODE TIA 598** |

# OPTICAL RACKS AND SHELVES

## FIBER MANAGEMENT SHELVES

The **Fiber Management Shelves (FMS)** are optical shelves used as a platform for mounting optical trays within a rack environment.

FMS are used in ETSI and 19-inch racks. Shelves include 19-inch/ETSI adaptation brackets. Trays are staggered for easier fiber routing and connector access.

Available versions:

- **patch only.**
- **splice-patch with standard adapters (SC/UPC, SC/APC)**
- **splice-patch with small form factor adapters (LC/UPC, LC/APC)**

Please refer to the following section for details of the available optical trays.

## DIMENSIONS

| **SHELF TYPE** | **I** | **M** |
|---|---|---|
| LENGHT (W/O MOUNTING BRACKETS) | **481 / 444 mm** | **531/ 494 mm** |
| HEIGHT | **125 mm**<br>**3x19" HU** | **125 mm**<br>**5 metric HU** |
| DEPTH | **280 mm** | **280 mm** |
| **HU= height unit** | | |

## KIT CONTENT

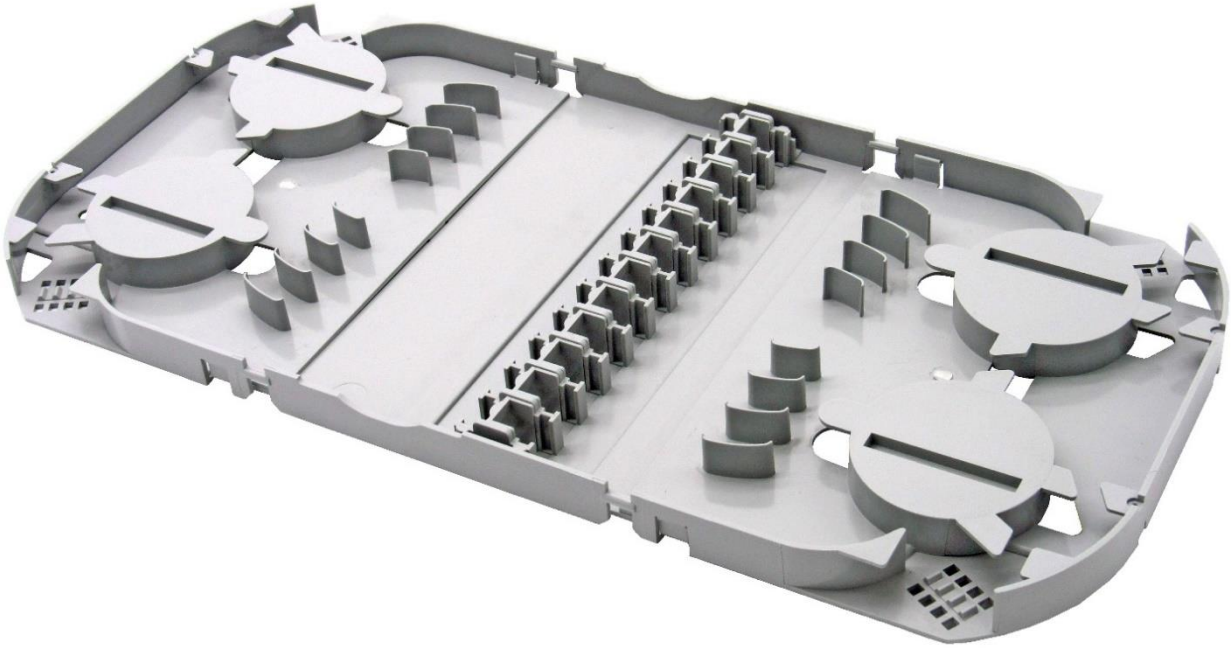
- Metal frame with removable drawer
- Mounting brackets
- The drawer includes:
  - tray fixing bracket.
  - velcro to fix the trays.
- One or two trumpets to guide the patchcords at shelf exits.
- Openable and removable front metal door
- Fiber identification panel
- Mounting screws and nuts
- QR code with installation instructions

## PRODUCT CODES

| CPE CODE | DESCRIPTION |
|---|---|
| **17.150.500-G60** | **FMS I TYPE**<br>Height: 3x19” HU |
| **17.150.500-G61** | **FMS M TYPE**<br>Height: 5 metric HU |

## OPTICAL TRAYS - FOST

**Fiber Optic Shelf Trays (FOST)** are optical trays that supply mechanical protection and parking capability for pigtails, fibers, splices, connectors, and other optical passive components within an FMS shelves environment. They can be supplied in both patch/patch and patch/splice configurations and with SC/APC-SC/UPC-LC/APC-LC/UPC connectors.



| LEFT SIDE | RIGHT SIDE |
|---|---|

| FOST PATCH-PATCH 12 ADAPTER SC/UPC | FOST PATCH-SPLICE 24 ADAPTER LC/UPC |
|---|---|

## PRODUCT CODES

| LAYOUT<br>LEFT – RIGHT SIDE | DESCRIPTION | NOTES | CPE CODE |
|---|---|---|---|
| PATCH-PATCH | FOSC<br>PATCH-PATCH<br>(empty) | - | 17.150.500-G62 |

| | | | |
|---|---|---|---|
| | **FOSC**<br><br>**PATCH-PATCH FOR 12 SC/APC ADAPTER** | • SC adapter<br>• nr. 12 adapters<br>• ferule APC | **17.150.500-G63** |
| | **FOSC PATCH- PATCH FOR 12 SC/UPC ADAPTER** | • SC adapter<br>• Nr. 12 adapters<br>• ferule UPC | **17.150.500-G64** |
| | **FOSC PATCH- PATCH FOR 24 LC/APC ADAPTER** | • LC adapter<br>• nr. 24 adapters<br>• ferule APC | **17.150.500-G65** |
| | **FOSC PATCH- PATCH FOR 24 LC/UPC ADAPTER** | • LC adapter<br>• nr. 24 adapters<br>• ferule UPC | **17.150.500-G66** |
| **PATCH-SPLICE** | **FOSC PATCH-SPLICE FOR 12 SC ADAPTER**<br><br>**(empty)** | - | **17.150.500-G67** |
| | **FOSC PATCH-SPLICE FOR 24 LC ADAPTER**<br><br>**(empty)** | - | **17.150.500-G68** |
| | **FOSC PATCH-SPLICE FOR 12 SC/APC ADAPTER** | • SC adapter<br>• nr. 12 adapters<br>• ferule APC | **17.150.500-G69** |
| | **FOSC PATCH-SPLICE FOR 12 SC/UPC ADAPTER** | • SC adapter<br>• nr. 12 adapters<br>• ferule UPC | **17.150.500-G70** |
| | **FOSC PATCH-SPLICE FOR 24 LC/APC ADAPTER** | • SC adapter<br>• nr. 12 adapters<br>• ferule APC | **17.150.500-G71** |
| | **FOSC PATCH-SPLICE FOR 24 LC/UPC ADAPTER** | • LC adapter<br>• nr. 24 adapters<br>• ferule UPC | **17.150.500-G72** |

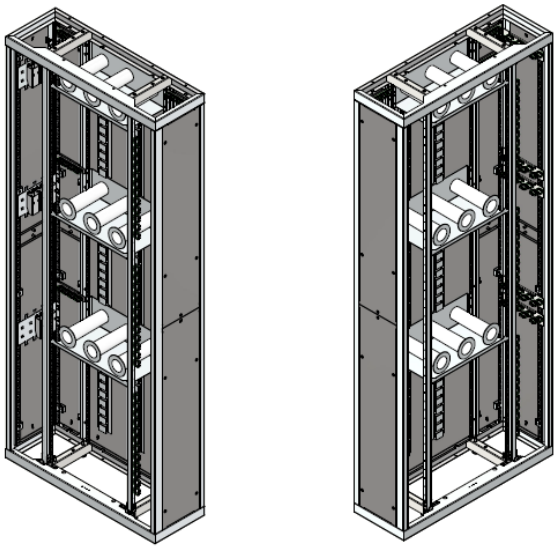
## ODF RACKS

The ODF frame (Optical Distribution Frame) is the frame where patch cords coming from the OTDR monitoring system are connected at the input.

Finally, from the ODF, the fibers are routed to the 144 or 192 f.o. microcables of each Cable Area (section of the access network served by the same microcable outgoing from the POP).

## ODF 900
**CPE CODE: 17.050.500-L60**

The ODF 900 chassis is used in Open Fiber network headquarters sites. It consists of a monobloc supporting structure and was designed and developed to comply with the Open Fiber Technical Specification ST 1909 "ODF FRAMES AND OPTICAL DRAWERS_CD-V 1.0".



## TECHNICAL DATA

| | |
|---|---|
| DIMENSIONS | **900 x 300 x 2200 mm** |
| COLOR | **GREY RAL 7035** |
| FRONT MOUNTING PROFILES | **19” / 47RU - REMOVABLE** |
| REAR MOUNTING PROFILES | **19” / 47 RU - FIXED** |
| SIDE PANELS | **REMOVABLE** |
| REAR CENTRAL PANEL | **REMOVABLE** |

| | |
|---|---|
| CENTRAL REAR PANEL | **EQUIPPED WITH TUBES MANAGEMENT FIXATION POINTS** |

NOTE: the rack is configured to comply with the open fiber technical specs. any requests for deviation from the official configuration must be evaluated by the CPE technical office to make the product compatible with the customer's requests

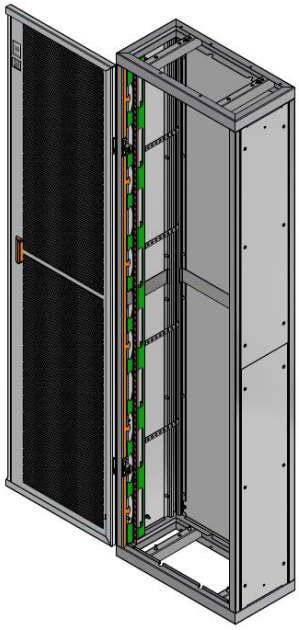
## KIT CONTENT

- 3 storage panels of 3RU each
- 8 cable termination units – CBO
- 3 CBO brackets
- 5 – 4 ring brackets
- 5 – 8 ring brackets
- wall, row structure and floor fixing kits.
- grounding kit

NOTE: door kit code 17k.134.100-146 is optional

## ODF 600
**CPE CODE: 17.050.500-M14**

The ODF 600 frame is dedicated to **OLOs (Other Licensed Operators)** and consists of a monolithic structure to host TLC equipment.



## TECHNICAL DATA

| | |
|---|---|
| DIMENSIONS | **600 x 300 x 2200 mm** |
| COLOR | **GREY RAL 7035** |
| FRONT MOUNTING PROFILES | **21” / 41RU - REMOVABLE** |
| SIDE PANELS | **REMOVABLE** |
| REAR PANELS | **REMOVABLE** |
| DOOR | **REMOVABLE** |
| DOOR LOCK | **MAGNETIC LOCK** |
| BASE AND ROOF | **OPEN** |
| SLOTTED CHANNEL | **ON LEFT AND RIGHT SIDES** |

## KIT CONTENT

Each ODF is supplied with a bracket kit CPE CODE 17K.134.100-147 including:

- nr. 4 “L” brackets with nuts and bolts
- nr. 4 *fisher*
- grounding kit
- QR serial code

## WALL BOX DD 12 FO

**CPE CODE: 17.050.500-M38**

The DD (Double Doors) 12 f.o. wall box it is specifically designed and developed to manage the termination of optical cables in access networks and optical distribution on the floor.


## TECNHICAL CARACTERISTICS

| | |
|---|---|
| DIMENSIONS | **254 x 270 x 65 mm** |
| WEIGTH | **2,2 kg** |
| MATERIAL | **PAINTED STEEL** |
| COLOR | **RAL 7035** |
| CABLE ENTRY | **PG16 – range DE=5÷12 mm** |
| LOCKING NETWOEK ACCESS | **TIM TYPE** |
| LOCKING USERS SIDE | **TRIANGULAR SHAPE 8** |
| HINGES DIMENSIONS | **30 x 30 mm** |
| HINGES MATERIAL | **METAL or PLASTIC** |
| PROTECTION RATING AGAINST DUST AND WATER ENTRANCE | **IP 43 (IEC 60529)** |

## FIRST SUPPLYING KIT

| COMPONENT | PICTURES | DETAILS |
|---|---|---|
| No. 4 PLUGS 6x30 mm |  | |
| No.4 BLACK CABLE TIES 3x150 mm |  | |
| No. 2 ADAPTER DUPLEX LC/PC |  | -tappi già posizionati sulle porte inutilizzate |
| No. 4 PIGTAIL G657.A1 |  | -coda e testa numerati con anelli<br>-disponibili pigtail con fibre colorate |
| No. 1 CABLE ENTRANCE PG16 |  | -posizionato all'interno del box in attesa del montaggio in fase di installazione |
| ROOF **(OPTIONAL)** |  | -profilato metallico con funzione di protezione dagli eventi atmosferici |

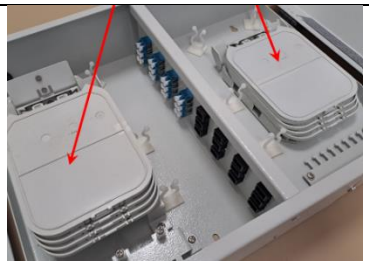
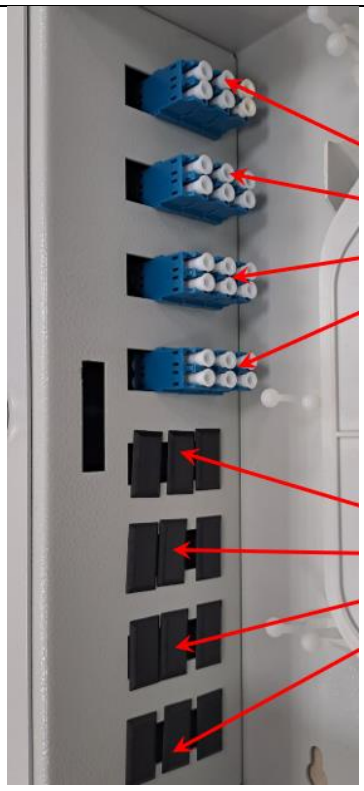
## WALL BOX DD 48 FO

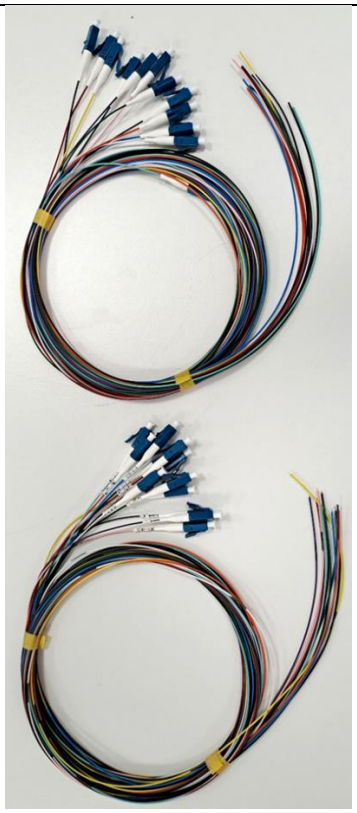
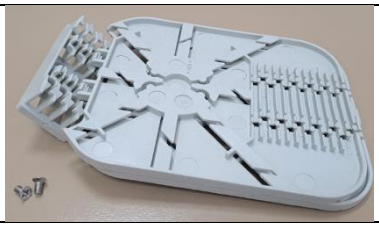
**CPE CODE: 17.050.500-P05**

## TECNHICAL CARACTERISTICS

| | |
|---|---|
| DIMENSIONS | **370 x 270 x 80,5 mm** |
| WEIGTH | **2,2 kg** |
| MATERIAL | **PAINTED STEEL** |
| COLOR | **RAL 7035** |
| CABLE ENTRY | **OVAL+CIRCULAR** |
| LOCKING NETWOEK ACCESS | **TIM TYPE** |
| LOCKING USERS SIDE | **TRIANGULAR SHAPE 8** |
| HINGES DIMENSIONS | **30 x 30 mm** |
| HINGES MATERIAL | **METAL or PLASTIC** |
| PROTECTION RATING AGAINST DUST AND WATER ENTRANCE | **IP 43 (IEC 60529)** |

## FIRST SUPPLYING KIT

| COMPONENT | PICTURES | DETAILS |
|---|---|---|
| No. 4 PLUGS 6x30 mm |  | |
| No.8 BLACK CABLE TIES 3x150 mm |  | |
| NO. 4+4 SC SPLICE TRAYS 12 F.O. WITH COVER |  | |
| NO. 12 (3+3+3+3) ADAPTER DUPLEX LC/PC (2 for cassettes) |  | -caps already placed on unused ports |

| | | |
|---|---|---|
| No. 12 PIGTAIL G657.A1 colored easy strip L=2m (with fiber of the same color as the pigtails)<br><br>No. 12 PIGTAIL G657.A1 colored with black tracer easy strip L=2m (with fiber of the same color as the pigtails) |  | |
| No.1 CIRCULAR + No. 1 OVAL ENTRANCE |  | |
| No. 2 SPLICE TRAYS AND RELATED SUPPORT WITH NO. 2 SCREWS M3x6 |  | -kit code 17K.334.100-163 (for extracting cable from circular door) |

## MOC 24

**CPE CODE: 17.050.500-M64**

**MOC (Compact Optical Module)** allows the termination of cables up to 24 optical fibers and can be installed on ETSI N3 and/or 19-inch modular structures, both at exchange and at user sites.

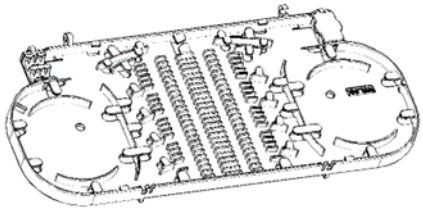
The MOC allows to house, in suitable modules, the junction and the relative spare of single fibers with the respective SC-PC and/or SC-APC pigtails.

The product complies with the Technical Specification ST 769 Telecom Italia "Compact Optical Module (MOC) termination on ETSI N3 and 19" racks."

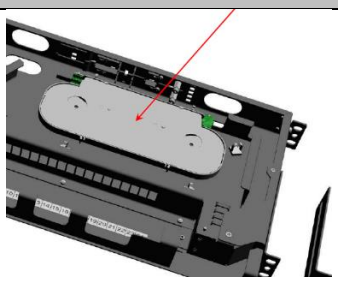
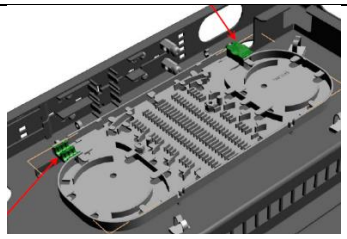
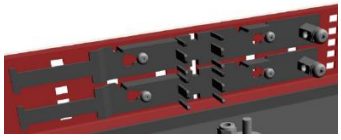
## TECHNICAL DATA

| | |
|---|---|
| DIMENSIONS | **1 STANDARD 19” UNIT** |
| COLOR | **GREY RAL 7035** |
| No. OF TERMINATIONS | **24 SC SIMPLEX** |
| No. OF SPLICES | **24 f.o. IN A SINGLE SPLICE TRAY** |
| CABLE TERMINATION | **2 CABLES – LEFT OR RIGHT ENTRANCE** |
| RACK MOUNTING | **19” O ETSI – FRONT/REAR** |

**NOTE: the shelf can mount 24 lc duplex adapters and join up to 48 fibers by utilize the second splice trays module**



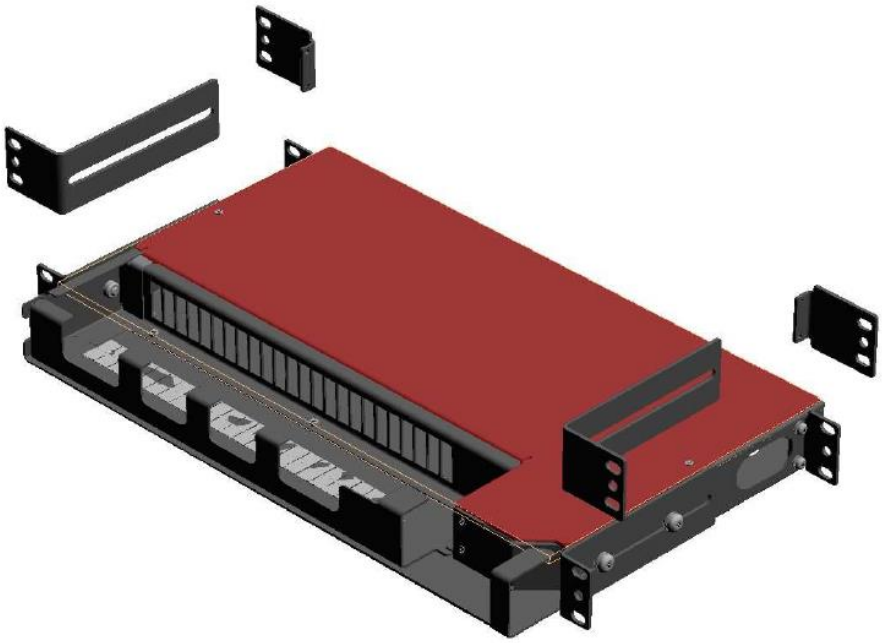
FIRST SUPPLYING KIT

| DESCRIPTION | PICTURE |
|---|---|
| No. 2 SPLICE MODULES WITH COVER |  |
| No. 1 TUBE HOLDER (left)<br>No.1 PIGTAILS HOLDER (right) |  |
| No. 2 ANCHORING FRAME FOR CABLES |  |
| 4.5 METERS OF PROTECTIVE TRANSPORT TUBE (DE=5 mm, DI=3 mm) |  |

| | |
|---|---|
| No. 2 HEAT-SHRINK TUBES(17/3 length A 60 mm) |  |
| No. 4 PAIRS OF NUMBERED RINGS (4.5 mm DI): 1+1, 2+2, 3+3 e 4+4 |  |
| No. 2 PROTECTIVE SPIRALS 4/3 mm, length 200 mm |  |
| No. 4 PLASTIC CABLE TIES (L=140 mm)<br>No. 4 PLASTIC CABLE TIES (L=100 mm) |  |
| REAR BRACKETS 19”/ ETSI |  |

## MOC 48

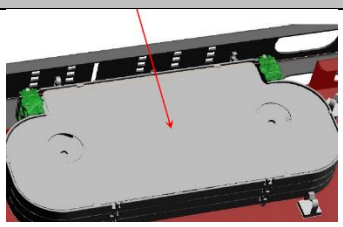
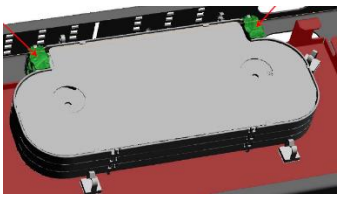
**CPE CODE: TBD**



## TECHNICAL DATA

| | |
|---|---|
| DIMENSIONS | **1 STANDARD UNIT 19”** |
| COLOR | **GREY RAL 7035** |
| No. OF TERMINATIONS | **48 SC SIMPLEX** |
| No. OF SPLICES | **48 IN No. 3 DEDICATED MODULES** |
| INTERNAL MANAGEMENT | **2 CABLES WIN ENTRY ON LEFT OR BACK SIDE** |
| FIXING TO RACK | **FRONT OR REAR 19” O ETSI** |

## FIRST SUPPLYING KIT

| DESCRIPTION | PICTURE |
|---|---|
| No. 3 SPLICE MODULES WITH COVER |  |
| No. 1 TUBE HOLDER (left)<br>No.1 PIGTAILS HOLDER (right) |  |
| No. 1 ANCHORING CABLE FRAME (ON REQUEST ) |  |
| 4.5 TRANSPORT PROTECTIVE TUBE (DE=5 mm, DI=3 mm) |  |
| No. 1 HEAT-SRHINK TUBE (16/4 L= 60 mm) |  |
| No. 6 PAIRS OF NUMBERED RINGS (4.5 mm DI): 1+1, 2+2, 3+3, 4+4, 5+5, 6+6 |  |
| No. 2 PROTECTIVE SPIRALS 4/3 mm length 200 mm |  |
| No. 4 PLASTIC CABLE TIES (L=140 mm)<br>No. 4 PLASTIC CABLE TIES (L=100 mm) |  |
| REAR BRACKETS 19”/ ETSI |  |
| No. 72 SMOUV |  |

## FRONT EASY DRAWER

The Front Easy Drawer **S&P (Sliding and Patching)** is a subframe with a 19 inch -1 unit structure equipped with a **sliding module with end hold (without extractable guides).** It features 12 f.o. junction modules. able to accommodate a splitter.

The drawer is supplied without adapters and without pigtails (available on request).

## TECNHICAL PERFORMANCES

| | |
|---|---|
| DIMENSIONS | **1 UNITA' STANDARD 19"** |
| COLOR | **NERO RAL 9005** |
| No. TERMINATIONS | **24 FO WITH 24 SC SIMPLEX**<br>**48 FO WITH24 SC DUPLEX** |
| No. SPLICES | **24 IN No. 2 DEDICATED MODULES**<br>**48 IN No. 4 DEDICATED MODULES** |
| ENTER OF CABLES | **BACK SIDE** |
| FISING TO RACK COLUMN | **BRACKETS 19"** |

## CPE CODE

| **DESCRIZIONE** | **CPE CODE** |
|---|---|
| FRONT EASY DRAWER S&P 24 FO | **17.050.500-Q16** |
| FRONT EASY DRAWER S&P 48 FO | **17.050.500-Q17** |

## OPTICAL DRAWERS

G/T (Splice/Termination) Optical Drawers are used to terminate and swap fibers coming from the primary network.

The routing paths are organized in such a way as to guarantee:

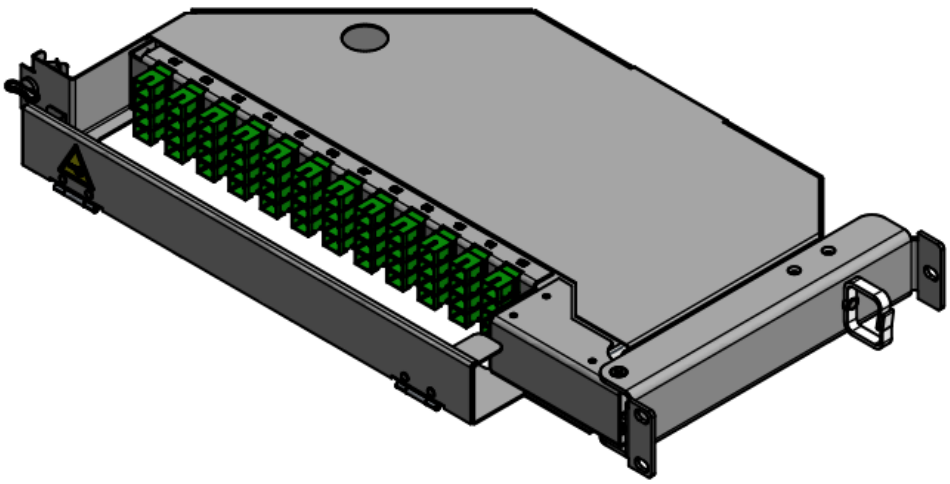
- minimum bending radius of the fibers (30 mm)
- the protected and guided conveyance of the fibers.

The termination areas are accessible by a pivoting opening system on the right side.

Inside the drawer there are up to 4 splice trays with 12 splices each (except for the basic versions) to splice the fibers of the "192/144 cable" to the pigtails.

The drawer is covered by a removable protective panel of the same material as the drawer.

## G/T 48 F.O. DRAWER
**CPE CODE: 17.050.500-806**



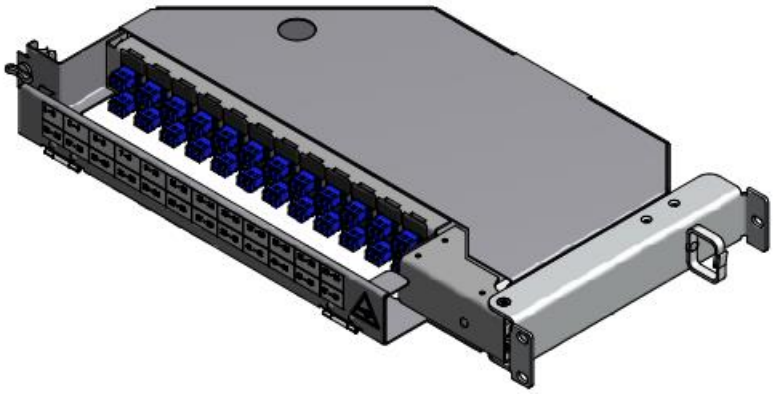
## TECHNICAL DATA

| | |
|---|---|
| DIMENSIONS | **1 HU 19” ONLY FRONT MOUNTING** |
| COLOR | **GREY RAL 7035** |
| No. OF SPLICE TRAYS | **4 SPLICE TRAYS ST-24 M** |
| No. OF TERMINATIONS | **48 SC/APC SIMPLEX** |
| COMPATIBILITY | **ODF INFRATEL ITALIA CLUSTER C&D** |

**NOTE: the drawer is available in the basic version CPE code 17.050.500-a33 without splice trays and pitgtails**

## G/T 48 F.O. LC/UPC DRAWER

**CPE CODE: 17.050.500-948**

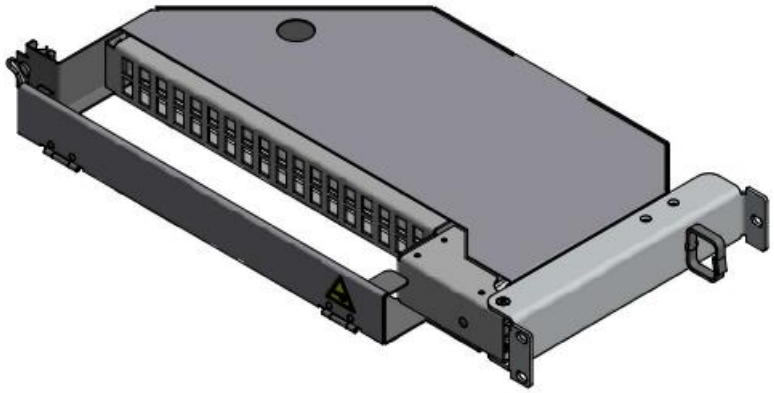


## TECHNICAL DATA

| | |
|---|---|
| DIMENSIONS | **1 HU 19” ONLY FRONT MOUNTING** |
| COLOR | **GREY RAL 7035** |
| NO. OF SPLICE TRAYS | **4 SPLICE TRAYS ST-24 M** |
| NO. OF TERMINATIONS | **48 LC/UPC SIMPLEX** |

## G/T 72 F.O. BASIC DRAWER

**CPE CODE: 17.050.500-897**

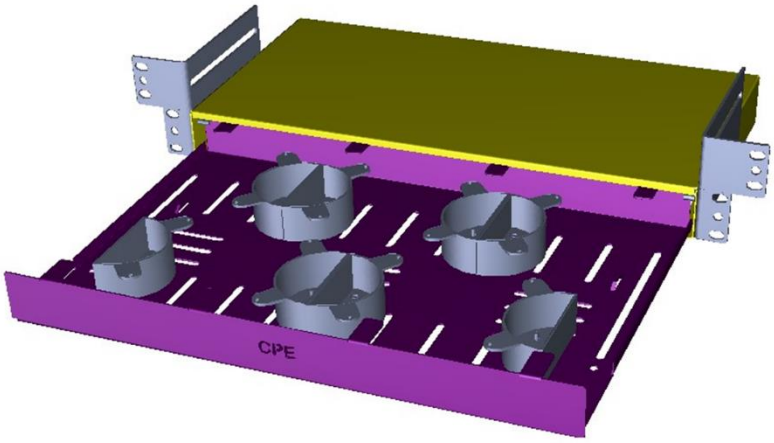


## TECHNICAL DATA

| | |
|---|---|
| DIMENSIONS | **1 HU 19" ONLY FRONT MOUNTING** |
| COLOR | **GREY RAL 7035** |
| NR. OF TERMINATIONS | **36 LC (NO ADAPTERS INCL.)** |
| CABLE ENTRY | **2 CABLES – LEFT OR REAR ENTRANCE** |

## FIBER STORAGE 1 HU

**CPE CODE: 17.050.500-R17**

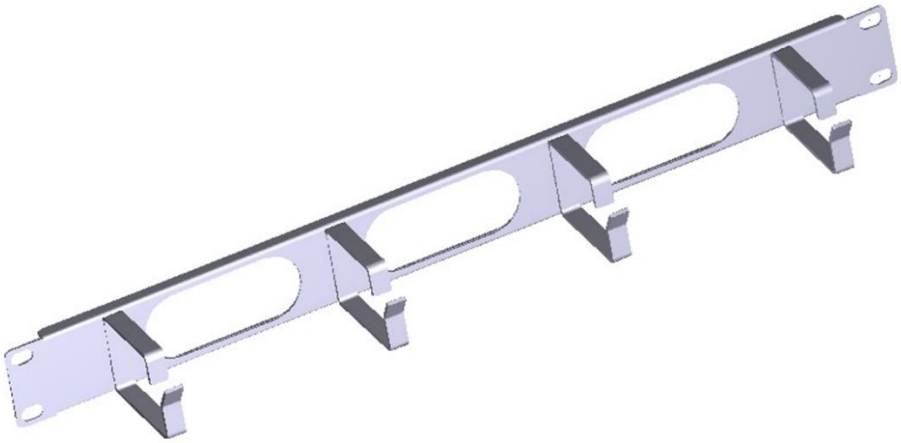



Optical drawer used for the dissipation of the braces through the plastic dispersers arranged on the sliding panel. It is equipped with brackets to be installed on 21" and 19" cabinets.

| | |
|---|---|
| SUBRACK MATERIAL | **METALLIC SHEET** |
| CHASSIS COLOR | **WHITE RAL 9010** |
| OVERALL DIMENSIONS | **1U - 482 x 300 x 43,7 mm** |
| MOUNTING BRACKETS | **ETSI N3/ 19" & ETSI N3/ 21"** |

## HORIZONTAL CABLE MANAGEMENT - 1U / 19”

**CPE CODE: 18.239.913-307**

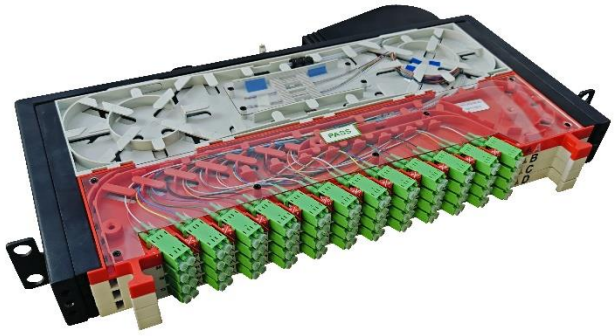


Front mounted cable management panel. Ideal for optical drawers in server/DATA CENTER cabinets.

| | |
|---|---|
| SUBRACK MATERIAL | **METALLIC SHEET** |
| CHASSIS COLOR | **WHITE RAL 9010** |
| OVERALL DIMENSIONS (L x H) | **1U - 19”** |

## PATCH SPLICE PANEL HD 96 F.O

**CPE CODE: 95.400.000-543**



The **HD (High Density) 96 f.o.** patch-splice panel it is a metal sub-rack with a junction and termination function. It is equipped with four patch-splice trays, made of thermoplastic material, each of which houses 12 duplex LC/APC adapters, with independent sliding guides that allow the individual module to be extracted during operations.

It can be used on FTTH optical networks inside a 19" indoor cabinet.

The first supply kit includes no. 12 LC/APC duplex adapters per module (already installed), corner brackets and screws for panel installation, output patch management system (protective plastic case, routing accessories, protective tubes), plastic ties and clamp for cable fixing.

The product can be supplied empty or already equipped with nr. 24 900µm pigtails per module with G.657A1 type fiber.

| | |
|---|---|
| SUBRACK MATERIAL | **METALLIC SHEET** |
| SPLICE TRAYS MATERIAL | **PC/ABS** |
| CHASSIS COLOR | **GREY RAL 7035** |
| ADAPTER | **LC duplex or SC, CERAMIC SLEEVE** |
| OVERALL DIMENSIONS | **1U - 520 x 210 x 44,4 mm** |
| STOCKING TEMPERATURE | **-10°C +50°C** |
| INSTALLATION TEMPERATURE | **-10°C +50°C** |
| OPERATIVE TEMPERATURE | **-25°C +70°C** |

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| **17.150.500-H08** | DERIVATION BOX 6 U.I. FOR FLOATING OR FACADE INSTALLATION | **99** |
| **17.150.500-H09** | DERIVATION BOX 12 U.I. FOR FLOATING OR FACADE INSTALLATION | **99** |
| **17.150.500-H09** | DERIVATION BOX 12 U.I. FOR FLOATING OR FACADE INSTALLATION | **99** |
| **17.150.500-H10** | DERIVATION BOX 4 U.I. FOR FLOATING OR FACADE INSTALLATION | **99** |
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| **17.750.500-A00** | ROUND COLD SEALING KIT RPCS-4X10mm | **40** |
| **17.750.500-A00** | ROUND COLD SEALING KIT RPCS-4X10mm | **111** |
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