

# Optical Systems

Active and passive components



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# ACTIVE OPTICAL COMPONENTS

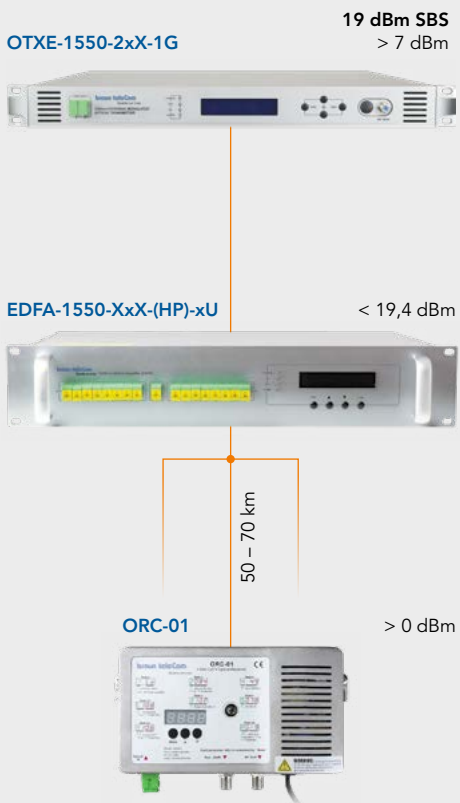
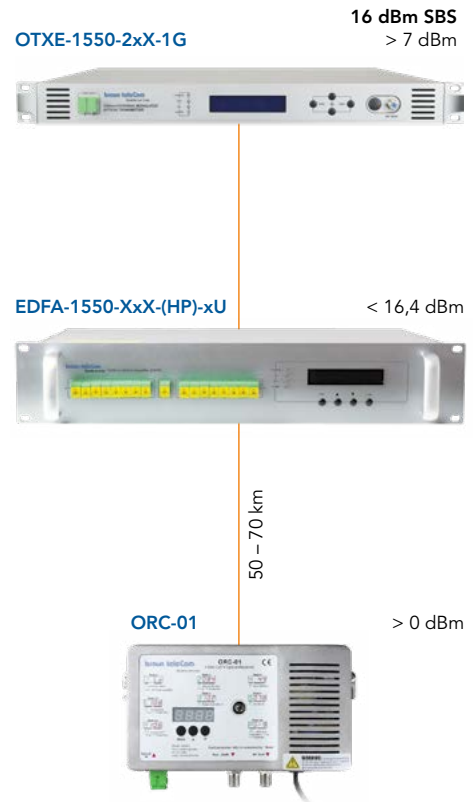
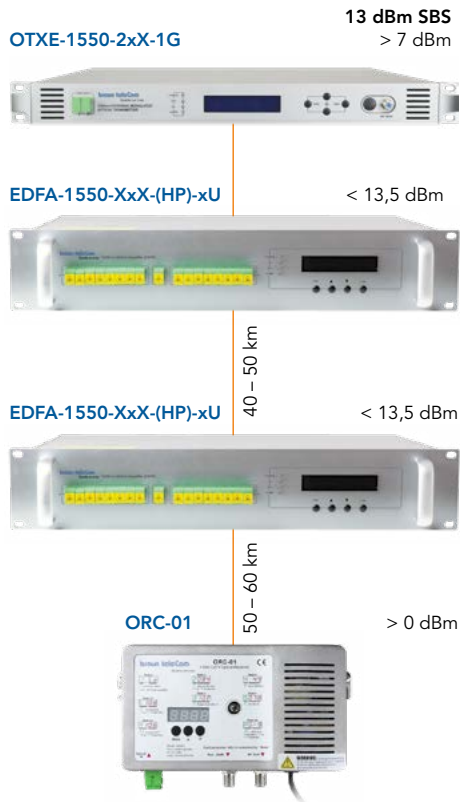
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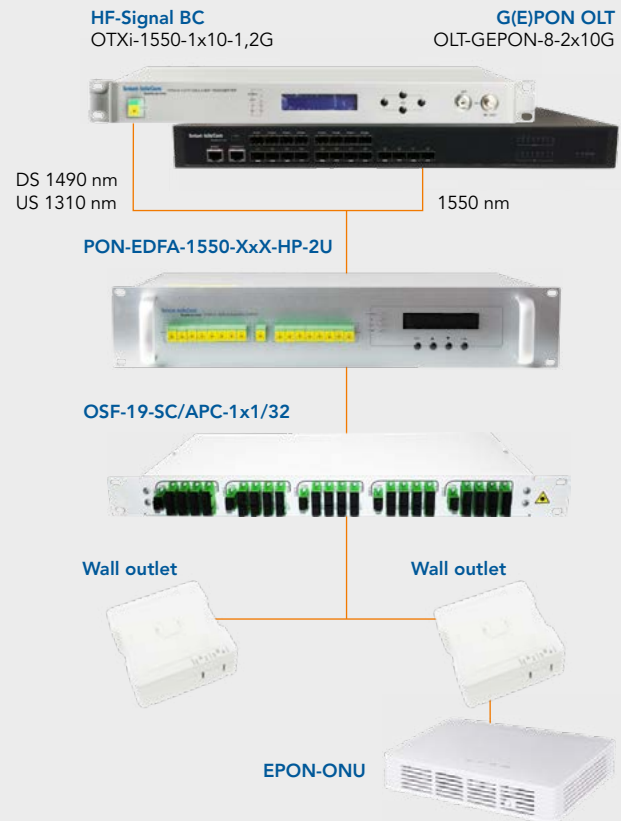
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# Various possible combinations

## of our active optical components



### Network example with EPON OLT and HF Broadcast



# Optical transmitters

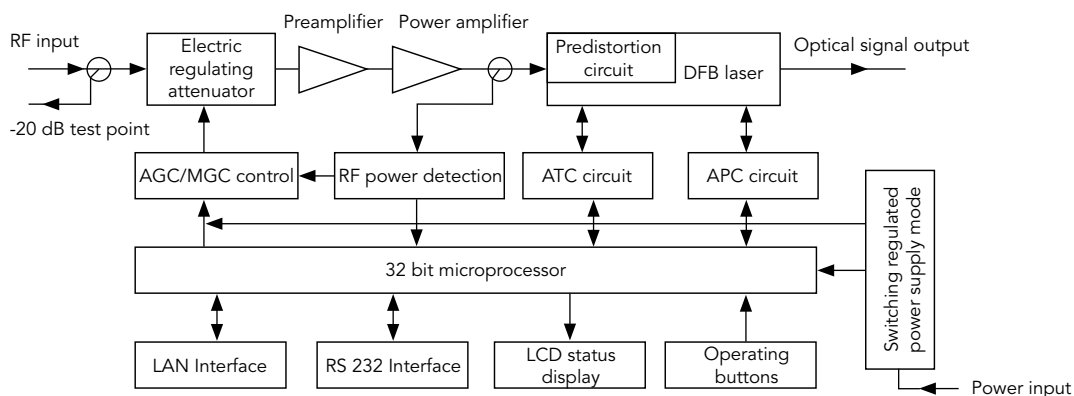
## 1550 nm directly modulated optical transmitter (45 – 1.218 MHz)

10420211  
OTXi-1550-1xX-1,2G



- Cost effective 1550 nm optical transmitter for use in HFC networks with short fiber lengths and modest requirements
- Conversion of RF signals in amplitude-modulated optical signals for the forward path in CATV HFC networks
- Equipped with either ORTEL or AOI DFB lasers for a very good linearity and high optical output power
- Independently developed digital automatic processing technology in the RF drive part, automatic processing of the drive level power according to the actual RF input signal level and the channel loading to ensure the optimal value of system parameters
- Advanced multi-frequency RF pre-distortion technology, combined with GaAs amplifier stages, ensures an effective improvement of the system parameters
- Advanced 32 bit processor, built-in blue screen 160 x 32 dot matrix LCD monitor
- System parameter setting by front panel keypad, serial interface (RS 232) or user-friendly web interface
- SNMP network management functionality via RJ 45 interface
- 2 power supplies, each with 50 % load sharing, in case one power supply fails the second takes over 100 %
- Dimensions: 19"/1RU (483 x 370 x 44 mm (W x D x H))
- Weight: approx. 3,7 kg
- Connector types: SC/APC (optical) and F-females (RF and test point) – E2000/APC alternative available
- Ready for DOCSIS® 3.1

| Parameter                                      | Frequency [MHz] | OTXi-1550-1xX-1,2G                                           |
|------------------------------------------------|-----------------|--------------------------------------------------------------|
| Operating wavelength [nm]                      |                 | 1550 ± 20                                                    |
| Optical output power [mW/dBm]                  |                 | 10/10                                                        |
| Optical return loss [dB]                       |                 | ≥ 50                                                         |
| RF frequency range [MHz]                       |                 | 45 – 1.218                                                   |
| RF input level range [dBμV]                    |                 | 72 ... 88                                                    |
| Frequency response [dB]                        |                 | ± 0,75                                                       |
| AGC control range [dB]                         |                 | ± 5                                                          |
| MGC control range [dB]                         |                 | 0 – 10                                                       |
| Return loss [dB]                               | 45 – 550        | ≥ 16                                                         |
|                                                | 550 – 1.218     | ≥ 14                                                         |
| System parameters                              |                 | 42 channels CENELEC, 4 % OMI, 20 km fiber length, Rx = 0 dBm |
| Composite Second Order (CSO) [dB]              |                 | ≥ 60                                                         |
| Composite Triple-Beat (CTB) [dB]               |                 | ≥ 63                                                         |
| Carry-to-Noise (C/N) [dBc]                     |                 | ≥ 48                                                         |
| Optical connectors                             |                 | SC/APC                                                       |
| Supply voltage [VAC]                           |                 | 2 x 110 – 250/50 Hz (50 – 50 load sharing)                   |
| Power consumption [W]                          |                 | < 30                                                         |
| Operating temperature range [°C]               |                 | 0 ... +45                                                    |
| Storage temperature range [°C]                 |                 | -20 ... +65                                                  |
| Max. relative humidity (operation and storage) |                 | max. 95 %, no condensation                                   |
| Order No.                                      |                 | 10420211                                                     |



# 1550 nm externally modulated optical transmitter (47 – 1.006 MHz)

10420328  
OTXE-1550-2x8-1G



- Narrowband and very low noise DFB laser for a very good linearity and excellent system parameters
- Designed for the operation with optical amplifiers (normal-power EDFAs and high-power EDFAs)
- Suitable for the realization of optical transmission links of over 100 km
- Setting of an automatic gain control (AGC) or a manual gain control (MGC)
- Perfect SBS suppression circuit, adjustable SBS threshold
- Optical modulator with 2 optical outputs
- 2 fans with intelligent fan control for a very long lifespan and reduction of power consumption
- Advanced 32 bit processor, LCD display
- System parameter setting by front panel keypad, user-friendly web interface or serial interface (RS 232)
- SNMP network management functionality via RJ 45 interface
- 2 redundant and hot-pluggable power supplies each with 50 % load sharing, in case one power supply fails the second takes over 100 %
- Dimensions: 19"/1RU (483 x 455 x 44 mm (W x D x H))
- Weight: approx. 5,5 kg
- Connector types: SC/APC (optical) and F-females (RF and test point) – E2000/APC alternative available

| Parameter                                                      | OTXE-1550-2x8-1G                      | OTXE-1550-2x10-1G                     |
|----------------------------------------------------------------|---------------------------------------|---------------------------------------|
| Operating wavelength [nm]                                      | 1545 ... 1560                         | 1545 ... 1560                         |
| Wavelength adjustment range [GHz]                              | ± 50                                  | ± 50                                  |
| Output power per port [dBm]                                    | 8                                     | 10                                    |
| Amount of output ports                                         | 2                                     | 2                                     |
| Equivalent noise intensity (RIN) [dBc/Hz]                      | < -160                                | < -160                                |
| Side Mode Suppression Ratio (SMSR) [dB]                        | > 30                                  | > 30                                  |
| SBS threshold value [dBm]                                      | +13 ... +19 (continuously adjustable) | +13 ... +19 (continuously adjustable) |
| Laser linewidth [MHz]                                          | 0,3                                   | 0,3                                   |
| RF frequency range [MHz]                                       | 47 – 1.006                            | 47 – 1.006                            |
| RF input level range [dBμV]                                    | 78 ... 96 (AGC mode)                  | 78 ... 96 (AGC mode)                  |
| Frequency response [dB]                                        | ± 0,75                                | ± 0,75                                |
| <b>System parameters</b>                                       |                                       |                                       |
| Composite Second Order (CSO)/Composite Triple Beat (CTB) [dBc] | ≥ 64/≥ 65                             | ≥ 64/≥ 65                             |
| Carry-to-Noise (C/N) [dBc]                                     | ≥ 55,5                                | ≥ 55,5                                |
| Return loss [dB]                                               | ≥ 16                                  | ≥ 16                                  |
| AGC control range [dB]                                         | ± 3                                   | ± 3                                   |
| MGC control range [dB]                                         | 0 – 15                                | 0 – 15                                |
| Operating temperature range [°C]                               | -5 ... +45                            | -5 ... +45                            |
| Storage temperature range [°C]                                 | -30 ... +70                           | -30 ... +70                           |
| Max. relative humidity (operation and storage)                 | max. 95 %, no condensation            | max. 95 %, no condensation            |
| Supply voltage                                                 |                                       |                                       |
| Optical connectors                                             | SC/APC                                | SC/APC                                |
| Power consumption [W]                                          | < 60                                  | < 60                                  |
| Order No.                                                      | 10420328                              | 10420330                              |

A practical example as well as a block diagram of the 1550 nm externally modulated optical transmitters can be found on the following page.

10420330  
OTXE-1550-2x10-1G

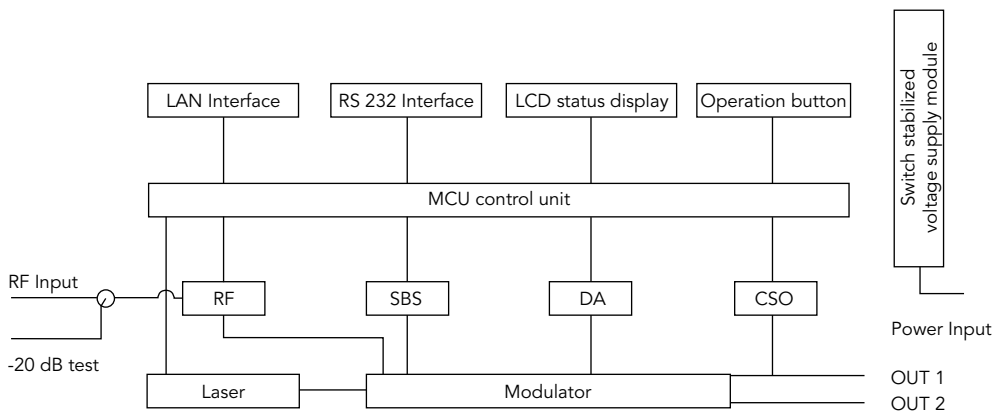


### Practical example of CSO, CTB, and C/N as a function of SBS

Testing conditions: RF Mode = AGC, RF input level = 80 dBμV, Rx input power = 0 dBm, EDFA with 5 dB noise figure

| Test name | SBS      | 1st stage EDFA | 1st fiber cable length | 2nd stage EDFA | 2nd fiber cable length | optical receiver input power |
|-----------|----------|----------------|------------------------|----------------|------------------------|------------------------------|
| Tx/Rx     | 13,5 dBm | none           | none                   | none           | none                   | 0 dBm                        |
| Link 1    | 13,5 dBm | none           | 35 km                  | none           | none                   | 0 dBm                        |
| Link 2    | 16 dBm   | 16 dBm         | 65 km                  | none           | none                   | 0 dBm                        |
| Link 3    | 13 dBm   | 13 dBm         | 50 km                  | 13 km          | 50 km                  | 0 dBm                        |

| Test model                 | C42        | D59     | D84     | D30     |
|----------------------------|------------|---------|---------|---------|
| Channel plan               | CENELEC 42 | PAL D59 | PAL D84 | PAL D   |
| Channel number TV/FM/QAM64 | 42/0/0     | 59/0/0  | 84/0/0  | 30/0/48 |
| Bandwidth noise [dBc]      | 5          | 5       | 5       | 5       |
| C/N Tx/Rx [dBc]            | 55,5       | 54      | 52,5    | 54,5    |
| C/N Link 1 [dBc]           | 55         | 53,5    | 52      | 54      |
| C/N Link 2 [dBc]           | 53         | 52,5    | 50,5    | 52,5    |
| C/N Link 3 [dBc]           | 50,5       | 50,5    | 49      | 51      |
| CSO Tx/Rx and Link 1 [dBc] | 64         | 65      | 65      | 70      |
| CSO Link 2 [dBc]           | 63         | 65      | 65      | 70      |
| CSO Link 3 [dBc]           | 62         | 64      | 63      | 65      |
| CTB [dBc]                  | 65         | 65      | 65      | 68      |



# OTX-1310-1xX-1G directly modulated transceivers (45 – 1.006 MHz)

10420409  
OTX-1310-1x8-1,2G



- Cost effective 1310 nm optical transmitter for use in HFC networks with short fiber lengths and modest requirements
- Conversion of RF signals in amplitude-modulated optical signals for the forward path in CATV HFC networks
- Equipped with high-performance coaxial DFB laser for a very good linearity and high optical output power
- Advanced multi-frequency RF pre-distortion technology, combined with GaAs amplifier stages, ensures an effective improvement of the system parameters
- Advanced 32 bit processor, built-in blue screen 160 x 32 dot matrix LCD monitor
- System parameter setting by front panel keypad, serial interface (RS 232) or user-friendly web interface
- SNMP network management functionality via RJ 45 interface
- 2 power supplies, each with 50 % load sharing, in case one power supply fails the second takes over 100 %
- Dimensions: 19"/1RU (483 x 370 x 44 mm (W x D x H))
- Weight: approx. 3,7 kg
- Connector types: SC/APC (optical) and F-females (RF and test point) – E2000/APC alternative available
- Ready for DOCSIS 3.1

| Parameter                                                          | OTX-1310-1x8-1,2G                                            | OTX-1310-1x10-1,2G         | OTX-1310-1x12-1,2G         | OTX-1310-1x14-1,2G         |
|--------------------------------------------------------------------|--------------------------------------------------------------|----------------------------|----------------------------|----------------------------|
| Operating wavelength [nm]                                          | 1310 ± 20                                                    | 1310 ± 20                  | 1310 ± 20                  | 1310 ± 20                  |
| Optical output power [mW]                                          | 6                                                            | 10                         | 16                         | 26                         |
| Optical output power [dBm]                                         | 8                                                            | 10                         | 12                         | 14                         |
| Optical link loss [dB]                                             | 9                                                            | 11                         | 13                         | 15                         |
| Optical return loss [dB]                                           | ≥ 50                                                         | ≥ 50                       | ≥ 50                       | ≥ 50                       |
| RF frequency range [MHz]                                           | 45 – 1.218                                                   | 45 – 1.218                 | 45 – 1.218                 | 45 – 1.218                 |
| RF input level range [dBμV]                                        | 75 ... 85                                                    | 75 ... 85                  | 75 ... 85                  | 75 ... 85                  |
| Frequency response [dB]                                            | ± 0,75                                                       | ± 0,75                     | ± 0,75                     | ± 0,75                     |
| AGC control range [dB]                                             | ± 5                                                          | ± 5                        | ± 5                        | ± 5                        |
| MGC control range [dB]                                             | 0 – 10                                                       | 0 – 10                     | 0 – 10                     | 0 – 10                     |
| Return loss [dB]                                                   | ≥ 16 (45 – 550 MHz)<br>≥ 14 (550 – 1.218 MHz)                |                            |                            |                            |
| System parameters                                                  | 42 channels CENELEC, 4 % OMI, 20 km fiber length, Rx = 0 dBm |                            |                            |                            |
| Composite Second Order (CSO)/<br>Composite Triple Beat (CTB) [dBc] | 62/67                                                        | 62/67                      | 62/67                      | 62/67                      |
| Carry-to-Noise (C/N) [dBc]                                         | 52                                                           | 52                         | 52                         | 52                         |
| Optical connectors                                                 | SC/APC                                                       | SC/APC                     | SC/APC                     | SC/APC                     |
| Supply voltage                                                     | 2 x 110 – 250/50 Hz (each 50 % load sharing)                 |                            |                            |                            |
| Power consumption [W]                                              | < 30                                                         | < 30                       | < 30                       | < 30                       |
| Operating temperature range [°C]                                   | 0 ... +45                                                    | 0 ... +45                  | 0 ... +45                  | 0 ... +45                  |
| Storage temperature range [°C]                                     | -20 ... +65                                                  | -20 ... +65                | -20 ... +65                | -20 ... +65                |
| Max. relative humidity<br>(operation and storage)                  | max. 95 %, no condensation                                   | max. 95 %, no condensation | max. 95 %, no condensation | max. 95 %, no condensation |
| Order No.                                                          | 10420409                                                     | 10420411                   | 10420413                   | 10420415                   |

Further OTX models are available on request!

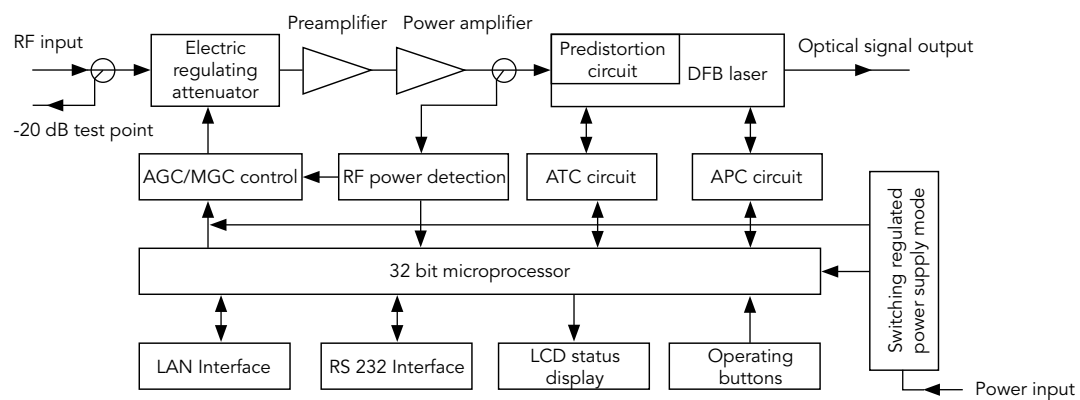
The optical link carrier to noise ratio degradation as well as a block diagram of the 1310 nm optical transmitters can be found on the following page.

10420413  
OTX-1310-1x12-1G



### Optical link carrier to noise ratio degradation

| Optical power | Optical link loss [dB] |   |   |      |      |      |      |      |      |      |      |      |      |      |      |  |  |  |
|---------------|------------------------|---|---|------|------|------|------|------|------|------|------|------|------|------|------|--|--|--|
|               | 4                      | 5 | 6 | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   |  |  |  |
| 6 mW          |                        |   |   | 53,0 | 52,0 | 51,0 | 50,1 | 49,1 | 48,1 |      |      |      |      |      |      |  |  |  |
| 10 mW         |                        |   |   |      |      | 52,9 | 51,9 | 51,0 | 50,1 | 49,1 | 48,2 |      |      |      |      |  |  |  |
| 16 mW         |                        |   |   |      |      |      |      |      | 52,0 | 51,0 | 50,1 | 49,1 | 48,1 |      |      |  |  |  |
| 26 mW         |                        |   |   |      |      |      |      |      |      |      | 51,5 | 50,2 | 49,2 | 48,5 | 47,6 |  |  |  |



# Optical amplifiers

## EDFA-1550-XxX-HP-1U high power optical amplifiers

10420718

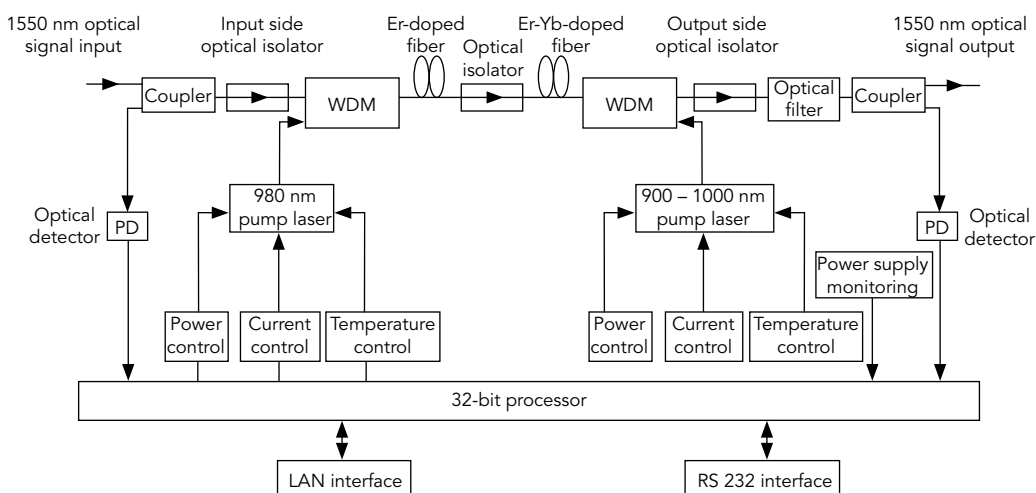
EDFA-1550-4x18-HP



- Adopts erbium ytterbium co-doped double-clad fiber technology
- 4 – 16 output ports
- Extremely high optical output power per port
- Adjustable loss at the output -3 – 0 dB
- Low noise figure
- Network management interface, in line with standard SNMP network management
- Intelligent temperature control system for lowering the power consumption
- RS 232 and RJ 45 control interface
- System parameter setting by front panel keypad, serial interface (RS 232) or user-friendly web interface
- 2 power supplies with each 50 % load sharing, 160 ... 250 VAC or 48 VDC, not hot-pluggable
- Connector types: SC/APC (optical) – E2000/APC alternative available

| Parameter                                      | EDFA-1550-4x18-HP          | EDFA-1550-4x21-HP | EDFA-1550-8x18-HP | EDFA-1550-8x21-HP | EDFA-1550-16x18-HP | EDFA-1550-16x20-HP |
|------------------------------------------------|----------------------------|-------------------|-------------------|-------------------|--------------------|--------------------|
| Operating wavelength [nm]                      | 1545 – 1565                |                   |                   |                   |                    |                    |
| Optical input power range [dBm]                | -3 ... +10                 |                   |                   |                   |                    |                    |
| Max internal output power [dBm]                | 25                         | 28                | 29                | 32                | 33                 | 35                 |
| Amount output ports                            | 4                          | 4                 | 8                 | 8                 | 16                 | 16                 |
| Output power per port [dBm]                    | 18                         | 21                | 18                | 21                | 18                 | 20                 |
| Output power stability [dBm]                   | ± 0,5                      |                   |                   |                   |                    |                    |
| Return loss optical output [dB]                | ≥ 45                       |                   |                   |                   |                    |                    |
| Return loss optical input [dB]                 | ≥ 45                       |                   |                   |                   |                    |                    |
| Noise figure [dBμV]                            | ≤ 5                        |                   |                   |                   |                    |                    |
| Optical connectors                             | SC/APC                     |                   |                   |                   |                    |                    |
| Power consumption [W]                          | 30                         |                   |                   |                   |                    |                    |
| Operating temperature range [°C]               | -10 ... +45                |                   |                   |                   |                    |                    |
| Storage temperature range [°C]                 | -30 ... +70                |                   |                   |                   |                    |                    |
| Max. relative humidity (operation and storage) | max. 95 %, no condensation |                   |                   |                   |                    |                    |
| Dimensions (L x W x H) [mm]                    | 483 x 475 x 44             |                   |                   |                   |                    |                    |
| Weight [kg]                                    | 3,7                        |                   |                   |                   |                    |                    |
| Rack unit                                      | 19"/1 RU                   |                   |                   |                   |                    |                    |
| Order No.                                      | 10420718                   | 10420721          | 10420738          | 10420741          | 10420818           | 10420754           |

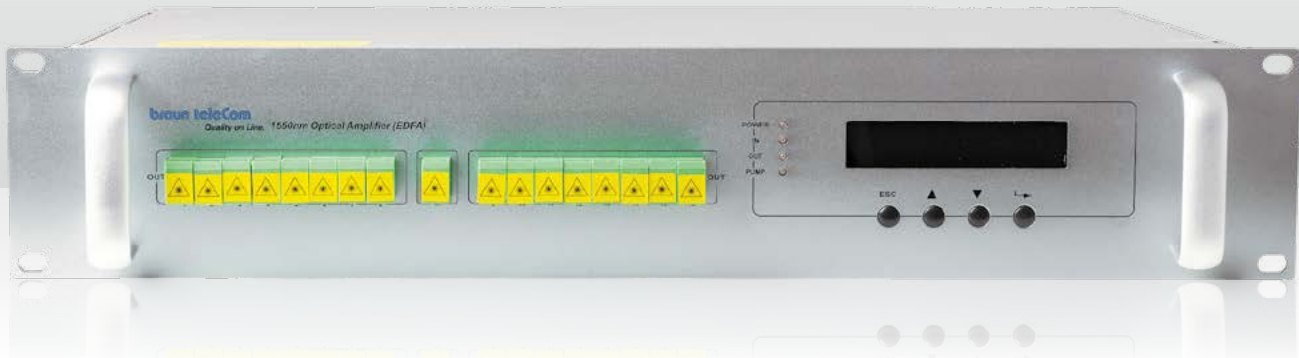
Further EDFA models are available on request!



# EDFA-1550-XxX-HP-2U high power optical amplifiers

10420821

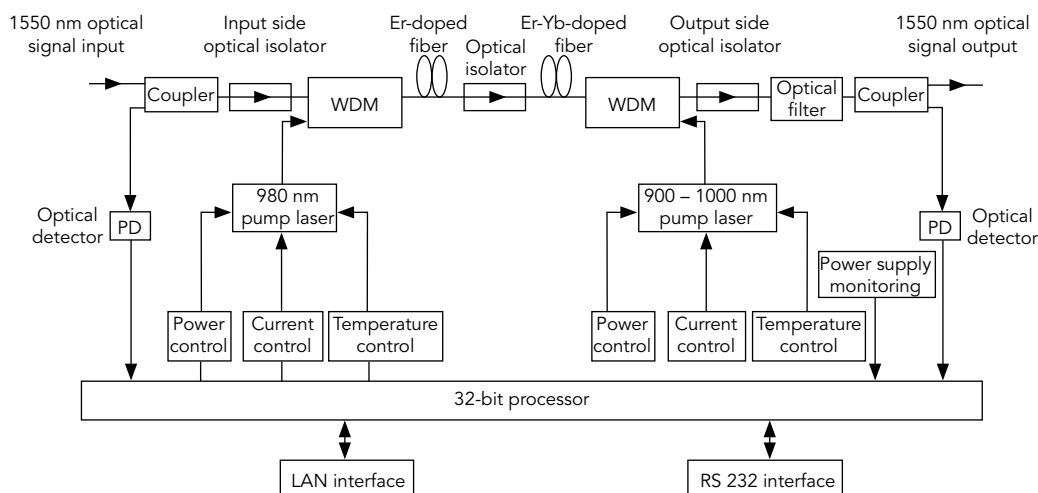
EDFA-1550-16x21-HP-2U



- Adopts erbium ytterbium co-doped double-clad fiber technology
- 4 – 32 output ports
- Extreme high optical output power per port
- Adjustable loss at the output 0 – 3 dB
- Low noise figure
- Network management interface, in line with standard SNMP network management
- Intelligent temperature control system for lowering the power consumption
- System parameter setting by front panel keypad, serial interface (RS 232) or user-friendly web interface
- RS 232 and RJ 45 control interface
- 2 power supplies with each 50 % load sharing, 160 ... 250 VAC or 48 VDC, hot-pluggable
- Connector types: SC/APC (optical) – E2000/APC alternative available

| Parameter                                          | EDFA-1550-16x21-HP-2U      | EDFA-1550-32x18-HP-2U | EDFA-1550-64x18-HP-2U |
|----------------------------------------------------|----------------------------|-----------------------|-----------------------|
| Operating wavelength [nm]                          | 1545 – 1565                |                       |                       |
| Optical input power range [dBm]                    | -3 ... +10                 |                       |                       |
| Max internal output power [dBm]                    | 36                         | 33                    | 37                    |
| Amount output ports                                | 16                         | 32                    | 64                    |
| Output power per port [dBm]                        | 21                         | 18                    | 18                    |
| Output power stability [dBm]                       | ± 0,5                      |                       |                       |
| Return loss optical output [dB]                    | ≥ 45                       |                       |                       |
| Return loss optical input [dB]                     | ≥ 45                       |                       |                       |
| Noise figure [dBμV]                                | ≤ 5                        |                       |                       |
| Optical connectors                                 | SC/APC                     |                       |                       |
| Power consumption [W]                              | 30                         |                       |                       |
| Operating temperature range [°C]                   | -10 ... +45                |                       |                       |
| Storage temperature range [°C]                     | -30 ... +70                |                       |                       |
| Max. relative humidity (operation and storage) [%] | max. 95 %, no condensation |                       |                       |
| Dimensions (L x W x H) [mm]                        | 434 x 456 x 87             |                       |                       |
| Weight [kg]                                        | 6,8                        |                       |                       |
| Rack unit                                          | 19" 1/2 RU                 |                       |                       |
| Order No.                                          | 10420821                   | 10420828              | 10420837              |

Further EDFA models are available on request!



# EDFA-1550-XxX optical amplifiers

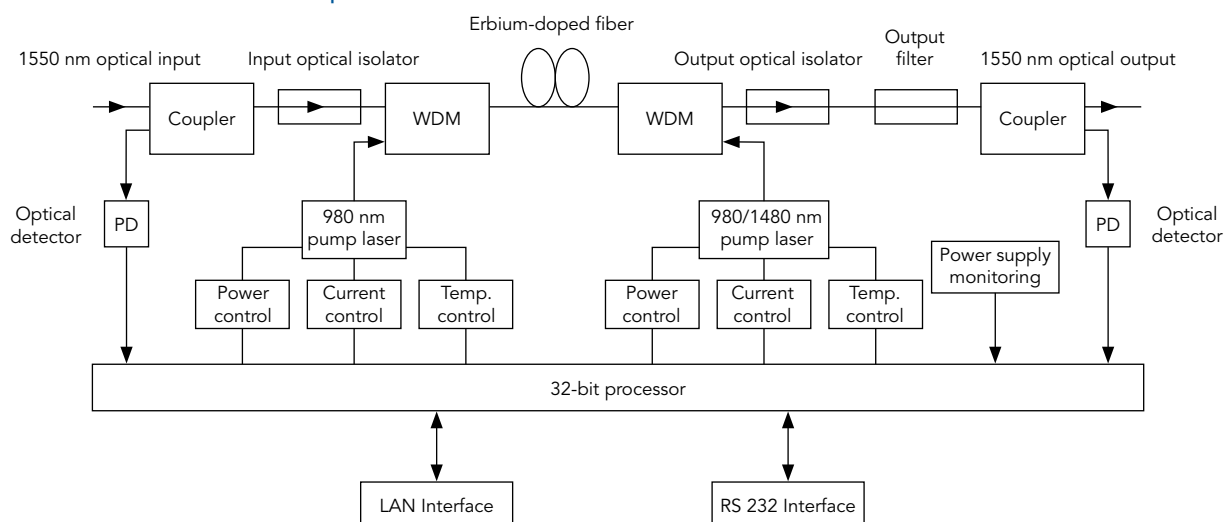
10420648  
EDFA-1550-2x18



- High-performance erbium doped fiber and low noise pump laser
- 1 – 4 output ports
- Extremely high optical output power per port
- Adjustable loss at the output -3 – 0 dB
- Low noise figure
- Network management interface, in line with standard SNMP network management
- Intelligent temperature control system for lowering the power consumption
- System parameter setting by front panel keypad, serial interface (RS 232) or user-friendly web interface
- RS 232 and RJ 45 control interface
- 2 power supplies with each 50 % load sharing, 160 ... 250 VAC or 48 VDC, hot-pluggable
- Connector types: SC/APC (optical) – E2000/APC alternative available

| Parameter                                      | EDFA-1550-1x18             | EDFA-1550-1x20 | EDFA-1550-1x21 | EDFA-1550-2x18 | EDFA-1550-2x21 | EDFA-1550-4x17 |
|------------------------------------------------|----------------------------|----------------|----------------|----------------|----------------|----------------|
| Operating wavelength [nm]                      | 1545 – 1565                |                |                |                |                |                |
| Optical input power range [dBm]                | -3 ... +10                 |                |                |                |                |                |
| Max internal output power [dBm]                | 18                         | 20             | 21             | 22             | 25             | 24             |
| Amount output ports                            | 1                          | 1              | 1              | 2              | 2              | 4              |
| Output power per port [dBm]                    | 18                         | 20             | 21             | 18             | 21             | 17             |
| Output power stability [dBm]                   | ± 0,5                      |                |                |                |                |                |
| Return loss optical output [dB]                | ≥ 45                       |                |                |                |                |                |
| Return loss optical input [dB]                 | ≥ 45                       |                |                |                |                |                |
| Noise figure [dBμV]                            | ≤ 5                        |                |                |                |                |                |
| Optical connectors                             | SC/APC                     |                |                |                |                |                |
| Power consumption [W]                          | 30                         |                |                |                |                |                |
| Operating temperature range [°C]               | -5 ... +55                 |                |                |                |                |                |
| Storage temperature range [°C]                 | -30 ... +70                |                |                |                |                |                |
| Max. relative humidity (operation and storage) | max. 95 %, no condensation |                |                |                |                |                |
| Dimensions (L x W x H) [mm]                    | 483 x 420 x 44             |                |                |                |                |                |
| Weight [kg]                                    | 3,7                        |                |                |                |                |                |
| Rack unit                                      | 19"/1 RU                   |                |                |                |                |                |
| Order No.                                      | 10420608                   | 10420610       | 10420611       | 10420648       | 10420651       | 10420717       |

Further EDFA models are available on request!



# PON-EDFA-1550-XxX-HP-2U high power optical amplifiers

10420822

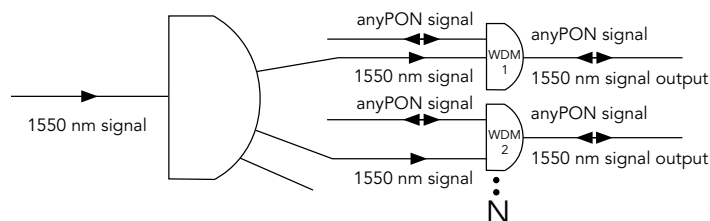
PON-EDFA-1550-16x21-HP-2U



- Adopts erbium ytterbium co-doped double-clad fiber technology
- Extremely high optical output power per port
- Adjustable loss at the output 0 – 3 dB
- Low noise figure
- **With integrated anyPON WDM, 1270/1310/1490/1577 nm per output**
- Network management interface, in line with standard SNMP network management
- Intelligent temperature control system for lowering the power consumption
- System parameter setting by front panel keypad, serial interface (RS 232) or user-friendly web interface
- RS 232 and RJ 45 control interface
- 2 power supplies with each 50 % load sharing, 160 ... 250 VAC or 48 VDC, hot-pluggable
- Connector types: CATV and COM SC/APC – xPON: SC/PC or CATV and COM:LC/APC; xPON: LC/PC

| Parameter                                      | PON-EDFA-1550-8x18-HP-2U                           | PON-EDFA-1550-8x21-HP-2U | PON-EDFA-1550-16x18-HP-2U | PON-EDFA-1550-16x21-HP-2U | PON-EDFA-1550-32x18-HP-2U | PON-EDFA-1550-32x21-HP-2U | PON-EDFA-1550-64x18-HP-2U-LC |
|------------------------------------------------|----------------------------------------------------|--------------------------|---------------------------|---------------------------|---------------------------|---------------------------|------------------------------|
| CATV wavelength [nm]                           | 1545 – 1565                                        |                          |                           |                           |                           |                           |                              |
| xPON wavelength [nm]                           | 1260 – 1360, 1460 – 1500, 1575 – 1581, 1610 – 1650 |                          |                           |                           |                           |                           |                              |
| WDM through loss [dB]                          | < 1,0                                              |                          |                           |                           |                           |                           |                              |
| Optical input power range [dBm]                | -3 ... +10                                         |                          |                           |                           |                           |                           |                              |
| Amount output ports                            | 8                                                  | 8                        | 16                        | 16                        | 32                        | 32                        | 64                           |
| Output power per port [dBm]                    | 18                                                 | 21                       | 18                        | 21                        | 18                        | 21                        | 18                           |
| Output power stability [dBm]                   | ± 0,5                                              |                          |                           |                           |                           |                           |                              |
| Return loss optical output [dB]                | ≥ 45                                               |                          |                           |                           |                           |                           |                              |
| Return loss optical input [dB]                 | ≥ 45                                               |                          |                           |                           |                           |                           |                              |
| Noise figure [dBμV]                            | ≤ 5                                                |                          |                           |                           |                           |                           |                              |
| Optical connectors                             | SC/APC; xPON IN – SC/PC                            | SC/APC; xPON IN – SC/PC  | SC/APC; xPON IN – SC/PC   | SC/APC; xPON IN – SC/PC   | SC/APC; xPON IN – SC/PC   | SC/APC; xPON IN – SC/PC   | LC/APC; xPON IN – LC/PC      |
| Power consumption [W]                          | 30                                                 |                          |                           |                           |                           |                           |                              |
| Operating temperature range [°C]               | -10 ... +45                                        |                          |                           |                           |                           |                           |                              |
| Storage temperature range [°C]                 | -30 ... +70                                        |                          |                           |                           |                           |                           |                              |
| Max. relative humidity (operation and storage) | max. 95 %, no condensation                         |                          |                           |                           |                           |                           |                              |
| Dimensions (L x W x H) [mm]                    | 434 x 456 x 87                                     |                          |                           |                           |                           |                           |                              |
| Weight [kg]                                    | 6,8                                                |                          |                           |                           |                           |                           |                              |
| Rack unit                                      | 19"/2 RU                                           |                          |                           |                           |                           |                           |                              |
| Order No.                                      | 10420861                                           | 10420864                 | 10420815                  | 10420822                  | 10420829                  | 10420824                  | 10420833                     |

Further PON EDFA models are available on request!



# H-EDFA-1550-XxX optical amplifiers for outdoor cabinets

10420920  
H-EDFA-1550-8x20-X



- Due to enhanced operation temperature range (-30°C ... +65°C) optimized for installation in outdoor cabinets
- Innovative cooling concept guarantees reliable temperature control in harsh environments
- Space saving design due to 45° angled optical connectors at the front side, also ensuring a low bend radius of the applied patchcords
- Compact design with only 24 cm of installation depth for usage within street cabinets
- Adopts erbium ytterbium co-doped double-clad fiber technology
- Extremely high optical output power per port
- Output power is adjustable from -3 to 0 dB
- Low noise figure
- Network management interface, in line with standard SNMPv2/v3 network management
- Intelligent temperature control system for lowering the power consumption and extending the product's lifespan
- System parameter setting via front panel keypad, serial interface (RS 232) or user-friendly web interface (HTTPS)
- RS 232 and RJ 45 control interface
- 2 hot-swappable power supplies with each 50 % load sharing, 160 ... 250 VAC or 48 VDC
- Optional redundancy switch at the input of the EDFA
- Filter replaceable from the front

| Parameter                        | H-EDFA-1550-8x20-X | H-EDFA-1550-16x20-X | H-EDFA-1550-32x18-XLC |
|----------------------------------|--------------------|---------------------|-----------------------|
| CATV wavelength [nm]             | 1540 – 1563        |                     |                       |
| Optical input power range [dBm]  | -10 ... +10        |                     |                       |
| Internal output power [dBm]      | 31                 | 35                  | 36                    |
| Amount of output ports           | 8                  | 16                  | 32                    |
| Output power per port [dBm]      | 20                 | 20                  | 18                    |
| Optical output power [dBm]       | ≥ 17               |                     |                       |
| Amount of input ports            | 1                  |                     |                       |
| Insertion loss [dB]              | ≤ 1,0              |                     |                       |
| Output power stability [dBm]     | ≤ ± 0,3            |                     |                       |
| Return loss optical output [dB]  | ≥ 50               |                     |                       |
| Return loss optical input [dB]   | ≥ 50               |                     |                       |
| RF test point [dB typ.]          | ≥ 78               |                     |                       |
| Noise figure [dBpV]              | ≤ 5,5              |                     |                       |
| Optical connectors               | SC/APC             | SC/APC              | LC/APC                |
| Power supplies                   | 2 x 230 VAC        |                     |                       |
| Power consumption [W]            | 50                 |                     |                       |
| Operating temperature range [°C] | -30 ... +65        |                     |                       |
| Storage temperature range [°C]   | -40 ... +80        |                     |                       |
| Max. relative humidity [%]       | 95                 |                     |                       |
| Dimensions (L x W x H) [mm]      | 240 x 482 x 87     |                     |                       |
| Weight [kg]                      | 6                  |                     |                       |
| Rack Unit                        | 19"/2 RU           |                     |                       |
| Order-No.                        | 10420940           | 10420941            | 10420942              |

Further Hardened EDFA models are available on request!

# H-PON-EDFA-1550-XxX optical PON amplifiers for outdoor cabinets

10420877

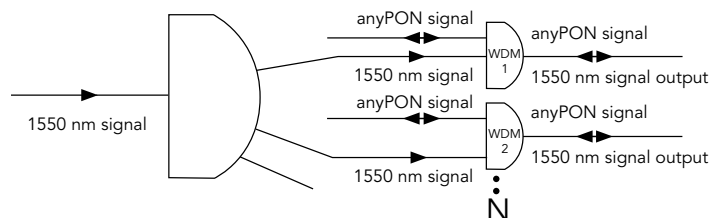
H-PON-EDFA-DC-1550-32x18-XLC



- Due to enhanced operation temperature range (-30°C ... +65°C) optimized for installation in outdoor cabinets
- Innovative cooling concept guarantees reliable temperature control in harsh environments
- Space saving design due to 45° angled optical connectors at the front side, also ensuring a low bend radius of the applied patchcords
- Compact design with only 24 cm of installation depth for usage within street cabinets
- **With integrated anyPON WDM, 1270/1310/1490/1577 nm per output**
- Adopts erbium ytterbium co-doped double-clad fiber technology
- Extremely high optical output power per port
- Output power is adjustable from -3 to 0 dB
- Low noise figure
- Network management interface, in line with standard SNMPv2/v3 network management
- Intelligent temperature control system for lowering the power consumption and extending the product's lifespan
- System parameter setting via front panel keypad, serial interface (RS 232) or user-friendly web interface (HTTPS)
- RS 232 and RJ 45 control interface
- 2 hot-swappable power supplies with each 50 % load sharing, 160 ... 230 VAC or 48 VDC
- Optional redundancy switch at the input of the EDFA
- Filter replaceable from the front

| Parameter                        | H-PON-EDFA-1550-8x18-X                             | H-PON-EDFA-1550-8x20-X  | H-PON-EDFA-1550-16x18-X | H-PON-EDFA-1550-16x20-X | H-PON-EDFA-1550-32x18-XLC | H-PON-EDFA-DC-1550-32x18-XLC |
|----------------------------------|----------------------------------------------------|-------------------------|-------------------------|-------------------------|---------------------------|------------------------------|
| CATV wavelength [nm]             | 1540 – 1563                                        |                         |                         |                         |                           |                              |
| xPON wavelength [nm]             | 1260 – 1360, 1460 – 1500, 1575 – 1581, 1610 – 1650 |                         |                         |                         |                           |                              |
| WDM through loss [dB]            | < 1,0                                              |                         |                         |                         |                           |                              |
| Optical input power range [dBm]  | -10 ... +10                                        |                         |                         |                         |                           |                              |
| Internal output power [dBm]      | 29                                                 | 31                      | 33                      | 35                      | 36                        | 36                           |
| Amount of output ports           | 8                                                  | 8                       | 16                      | 16                      | 32                        | 32                           |
| Output power per port [dBm]      | 18                                                 | 20                      | 18                      | 20                      | 18                        | 18                           |
| Optical output power [dBm]       | ≥ 17                                               |                         |                         |                         |                           |                              |
| Amount of input ports            | 1                                                  |                         |                         |                         |                           |                              |
| Insertion loss [dB]              | ≤ 1,0                                              |                         |                         |                         |                           |                              |
| Output power stability [dBm]     | ≤ ± 0,3                                            |                         |                         |                         |                           |                              |
| Return loss optical output [dB]  | ≥ 50                                               |                         |                         |                         |                           |                              |
| Return loss optical input [dB]   | ≥ 50                                               |                         |                         |                         |                           |                              |
| RF test point [dB typ.]          | ≥ 78                                               |                         |                         |                         |                           |                              |
| Noise figure [dBμV]              | ≤ 5,5                                              |                         |                         |                         |                           |                              |
| Optical connectors               | SC/APC; xPON IN – SC/PC                            | SC/APC; xPON IN – SC/PC | SC/APC; xPON IN – SC/PC | SC/APC; xPON IN – SC/PC | LC/APC; xPON IN – LC/PC   | LC/APC; xPON IN – LC/PC      |
| Power supplies                   | 230 VAC                                            | 230 VAC                 | 230 VAC                 | 230 VAC                 | 230 VAC                   | 48 VDC                       |
| Power consumption [W]            | 50                                                 |                         |                         |                         |                           |                              |
| Operating temperature range [°C] | -30 ... +65                                        |                         |                         |                         |                           |                              |
| Storage temperature range [°C]   | -40 ... +80                                        |                         |                         |                         |                           |                              |
| Max. relative humidity [%]       | 95                                                 |                         |                         |                         |                           |                              |
| Dimensions (L x W x H) [mm]      | 240 x 482 x 87                                     |                         |                         |                         |                           |                              |
| Weight [kg]                      | 6                                                  |                         |                         |                         |                           |                              |
| Rack Unit                        | 19"/2 RU                                           |                         |                         |                         |                           |                              |
| Order-No.                        | 10420943                                           | 10420944                | 10420945                | 10420946                | 10420935                  | 10420936                     |

Further Hardened PON EDFA models are available on request!



# RFoG optical return path receiver

## ORX-4C-200 RFoG

10420092  
ORX-4C-200 RFoG



- Designed for converting optical upstream signals into RF signals in head-ends and hubs, especially for usage in RFoG network topologies
- Supports Docsis 3.0 upstream channel bonding in PON architectures
- 4 separate optical return path receivers in one compact device
- Connection of up to 256 optical RFoG micro nodes (e.g. 4 clusters with each 64 RFoG micro nodes)
- Microprocessor-controlled adjustment of system parameters using frontal keypads or via a web interface (RJ 45 or RS 232)
- **The device is switchable from "RFoG" mode to "normal" mode (continuous light at the entrance)**
- Monitoring of the optical input power via web interface in "normal" mode
- Extremely high input sensitivity
- Very high RF output level for each receiver, depending on the relevant optical input level
- Fine tuning of the RF output level for each receiver by using internal attenuators
- Optical status indication with LEDs and built-in LCD monitor
- Separate test points for measuring the RF output levels (front side)
- Extremely wide operating temperature range, thereby suitable in almost all environmental conditions
- 2 power supplies with each 50 % load sharing, in case of a failure of one power supply 100 % load transfer to the 2nd power supply
- Connector types: SC/APC (optical) and F-females (RF and test points) – E2000/APC alternative available

| Parameter                               | ORX-4C-200 RFoG                                                             |
|-----------------------------------------|-----------------------------------------------------------------------------|
| Operating wavelength [nm]               | 1200 ... 1620                                                               |
| Optical input power range [dBm]         | -27 ... -13                                                                 |
| Equivalent noise current input [pA/√Hz] | 1                                                                           |
| Optical return loss [dB]                | > 50                                                                        |
| Test point per RF output [dB]           | -20 ± 0,5                                                                   |
| Return loss output [dB]                 | > 16                                                                        |
| Return loss optical input [dB]          | ≥ 45                                                                        |
| RF frequency range [MHz]                | 5 – 200                                                                     |
| RF output level per receiver [dBμV]     | 90 ... 120 (e.g.: 98 dBμV at 10 % OMI, -27 dBm , ATT. = 0 dB)               |
| Frequency response [dB]                 | ± 0,75                                                                      |
| Attenuator range per receiver [dB]      | -30 ... 0 (in 1 dB steps via front site, in 0,5 dB steps via web interface) |
| Power consumption [W]                   | ≤ 12                                                                        |
| Operating temperature range [°C]        | -40 ... +65                                                                 |
| Dimensions (L x W x H) [mm]             | 480 x 325 x 44                                                              |
| Weight [kg]                             | 2,0                                                                         |
| Order No.                               | 10420092                                                                    |

# Optical switch

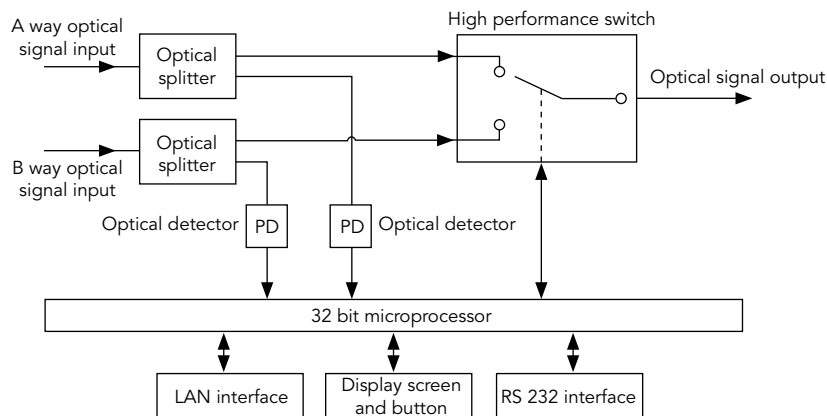
1 x 2 optical switch for redundant optical fiber transmissions

10420103  
OSW-2



- Extremely short switching time
- Transmission of very high optical powers
- Advanced 32 bit processor for punctual and accurate monitoring of input power, reliable control of switch status and setup of automatic or manual switch mode
- Switches automatically when optical signal has a fault
- System parameters setting by front panel keypad or serial interface (RS 232)
- SNMP network management functionality via RJ 45 interface
- 2 power supplies with each 50 % load sharing, in case one power supply fails the second takes over 100 %
- Built-in blue screen 160 x 32 dot matrix LCD monitor
- SC/APC connectors at the front side
- Dimensions: 19"/1 RU (483 x 285 x 44 mm (W x D x H))
- Weight: approx. 2,0 kg

| Parameter                        | OSW-2                                        |
|----------------------------------|----------------------------------------------|
| Operating wavelength [nm]        | 1200 ... 1620                                |
| Max. optical input power [dBm]   | 27                                           |
| Through loss [dB]                | ≤ 1,3 (tested at 1310, 1490, 1550 nm)        |
| Return loss output [dB]          | > 55                                         |
| Optical return loss [dB]         | > 55                                         |
| Optical input power ranges [dBm] | -15 ... +24                                  |
| Max. switching life (MTBF)       | ≥ 10.000.000                                 |
| Optical connectors               | SC/APC                                       |
| Supply voltage [VAC]             | 2 x 160 – 250/50 Hz (each 50 % load sharing) |
| Power consumption [W]            | ≤ 2                                          |
| Operating temperature range [°C] | -5 ... +55                                   |
| Storage temperature range [°C]   | 30 ... +70                                   |
| Order No.                        | 10420103                                     |



# Optical receivers

Optical broadband receivers 45 – 1.006 MHz  
with high power output for CATV applications

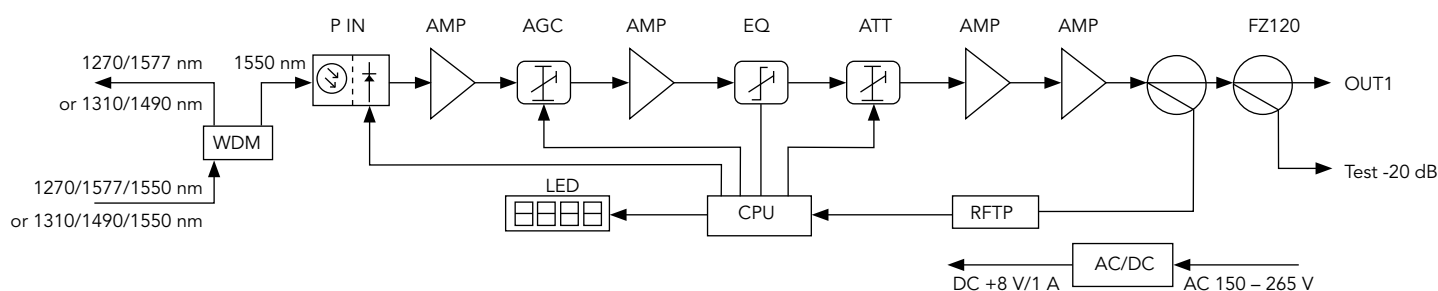


- Optical status indication by LEDs
- Integrated test point for the RF output
- Very high and constant RF output level within the whole optical input power range by an integrated automatic gain control (AGC)
- Connector types: SC (optical) and F-females
- Dimensions: approx. 190 x 110 x 52 mm (W x H x D)
- Weight: approx. 0,4 kg

| Parameter                                           | ORC-01      | ORC-01-1550                            | ORC-01-XPON         |
|-----------------------------------------------------|-------------|----------------------------------------|---------------------|
| Max. optical input power [dBm]                      |             | -9 – +2                                |                     |
| Responsivity [A/W]                                  |             | 0,85                                   |                     |
| Optical return loss [dB]                            |             | 45                                     |                     |
| Optical connectors input                            |             | SC/APC                                 |                     |
| Operation bandwidth [MHz]                           |             | 45 – 1.006                             |                     |
| Output level (depending on opt. input power) [dBμV] |             | 108 (-9 – +2 dBm)<br>110 (-8 – +2 dBm) |                     |
| Electrical control EQ range [dB]                    |             | 0 – 20 (0,5 dB steps)                  |                     |
| Electrical control ATT range [dB]                   |             | 0 – 20 (0,5 dB steps)                  |                     |
| Flatness [dB]                                       |             | ±0,75                                  |                     |
| Output return loss [dB]                             |             | 16                                     |                     |
| RF test point at output [dB typ.]                   |             | -20                                    |                     |
| Composite Second Order (CSO) [dB]                   |             | 60*                                    |                     |
| Composite Triple Beat (CTB) [dB]                    |             | 60*                                    |                     |
| Carry-to-Noise (C/N) [dB]                           |             | 51*                                    |                     |
| Supply voltage [VAC]                                |             | 150 ... 265                            |                     |
| Operating temperature range [°C]                    |             | -40 – +60                              |                     |
| Power consumption [W]                               |             | ≤ 8                                    |                     |
| Operating wavelength [nm]                           | 1100 – 1600 | 1545 – 1565                            | 1260 – 1650         |
| CATV wavelength [nm]                                | –           | –                                      | 1540 – 1560         |
| anyPON pass through wavelengths (SC/PC) [nm]        | –           | –                                      | 1270/1310/1490/1577 |
| Order No.                                           | 10420060    | 10420062                               | 10420066            |

\* At  $P_{in} = -1$  dBm,  $P_{out} = 106$  dBμV, EQ = 8 dB, 42 CH CENELEC, OMI = 3,5 %

## Block diagram (example for ORC-01-XPON):



# Gateways / ONTs

## 1 Gbps DKT Gateways



**84179740**  
FTTH-1F-CATV,  
image with matching FTU

### 1 Gbps Gateways

The 1 Gbps gateway series is a unique and innovative product line that distinguishes itself by its small form factor and unique click-on interface. The small form factor, combined with ease of installation due to its click-on interface, makes the gateways an extremely flexible solution, with optimized handling and efficiency.

| Parameter                                      | FTTH-1F-CATV    | JUMA-1F-WAN-OAM                                                          | FTTH-1F-4P-S | FTTH-2F-4P-S-C  | FTTH-GPON-1F-1 | FTTH-GPON-1F-1/C | FTTH-GPON-1F-4P | FTTH-GPON-1F-4P/C |
|------------------------------------------------|-----------------|--------------------------------------------------------------------------|--------------|-----------------|----------------|------------------|-----------------|-------------------|
| 1 Gbps WAN                                     | (1)             | Yes                                                                      | Yes          | Yes             | –              | –                | –               | –                 |
| GPON WAN                                       | –               | –                                                                        | –            | –               | Yes            | Yes              | Yes             | Yes               |
| 1 Gbps LAN                                     | –               | 1                                                                        | 4            | 4               | 1              | 1                | 4               | 4                 |
| CATV                                           | Yes             | –                                                                        | –            | Yes             | Optional       | Optional         | Optional        | Optional          |
| CATV RF output [dBμV]                          | 84              | 84                                                                       | 84           | 84              | 84             | 84               | 84              | 84                |
| Switch engine <sup>(2)</sup>                   | –               | Yes                                                                      | Yes          | Yes             | Yes            | Yes              | Yes             | Yes               |
| CATV RF filter option                          | –               | –                                                                        | –            | –               | Optional       | Optional         | Optional        | Optional          |
| SFP WAN                                        | –               | Fixed                                                                    | Fixed        | Fixed           | Fixed          | Fixed            | Fixed           | Fixed             |
| Fiber connector                                | SC/APC          | SC/UPC                                                                   | SC/UPC       | SC/UPC & SC/APC | SC/APC         | SC/APC           | SC/APC          | SC/APC            |
| WDM filter                                     | –               | –                                                                        | Optional     | Optional        | –              | –                | –               | –                 |
| WBF blocker                                    | –               | –                                                                        | –            | –               | –              | Ja               | –               | Ja                |
| GPON quality                                   | –               | –                                                                        | –            | –               | Class B+       | Class C+         | Class B+        | Class C+          |
| Compatible with click-on FTU                   | Yes             | Yes                                                                      | Yes          | Yes             | Yes            | Yes              | Yes             | Yes               |
| TR-069                                         | –               | Yes                                                                      | Yes          | Yes             | –              | –                | –               | –                 |
| Dimensions with/without cover (H x D x W) [mm] | 23/15 x 88 x 88 |                                                                          |              |                 |                |                  |                 |                   |
| Operating temperature range [°C]               | 0 ... 40        |                                                                          |              |                 |                |                  |                 |                   |
| Ethernet                                       | –               | IEEE 802.1Q VLANs (4k VLANs) incl. Q-in-Q                                |              |                 |                |                  |                 |                   |
|                                                | –               | IEEE 802.1Q tag insertion and stripping                                  |              |                 |                |                  |                 |                   |
|                                                | –               | IGMP v1/2/3 snooping                                                     |              |                 |                |                  |                 |                   |
| QoS                                            | –               | IEEE 802.1p prioritization and reclassification                          |              |                 |                |                  |                 |                   |
| Management                                     | –               | OAM optional supporting IEEE 802.3ah, Dying Gasp, Discovery and Loopback |              |                 |                |                  |                 |                   |
|                                                | –               | TR-069, including support for TR-181                                     |              |                 |                |                  |                 |                   |
| Item number DKT                                | 79740           | 79734                                                                    | 79741        | 79742           | 79753          | 79754            | 79755           | 79756             |
| Order No.                                      | 84179740        | 84020734                                                                 | 84179741     | 84020742        | 84179753       | 84179754         | 84179755        | 84179756          |

<sup>(1)</sup> Data port loop through, adapter SC/APC

<sup>(2)</sup> Support for VLANs, Q-in-Q, QoS, IGMP, Jumbo Frames and traffic shaping and manipulation

Are you looking for the perfect companion for the DKT Gateways?

**You will find matching Fiber Termination Units (FTUs) in our range of passive optical components!**

# 10 Gbps DKT Gateways



**84179752**  
FTTH-10G-2F-3P-CATV,  
image with matching FTU

## 10 Gbps Gateways

The 10 Gbps Gateway series is based upon a sophisticated wirespeed Layer 2 switching-based "System-on-Chip" (SoC) solution. This solution implies that fiber termination and service activation occur as part of the operator's "demarcation point" at the end customer in a FTTH 10 Gbps environment.

| Parameter                        | FTTH-10G-1F-3P                                                                                             |                          | XGS-PON        |                | XGS-PON with CATV        |                          | 10G EPON with DPoE    |                       |
|----------------------------------|------------------------------------------------------------------------------------------------------------|--------------------------|----------------|----------------|--------------------------|--------------------------|-----------------------|-----------------------|
|                                  | FTTH-10G-1F-3P                                                                                             | FTTH-10G-2F-3P-CATV      | FTTH-XGS-1F-3P | FTTH-XGS-1F-2P | FTTH-XGS-1F-3P-CATV      | FTTH-XGS-1F-2P-CATV      | FTTH-10G-EPON-1F-3P   | FTTH-10G-EPON-1F-2P   |
| 10G EPON WAN                     | –                                                                                                          | –                        | –              | –              | –                        | –                        | Yes                   | Yes                   |
| 10 Gbps WAN                      | Yes                                                                                                        | Yes                      | –              | –              | –                        | –                        | –                     | –                     |
| XGS-PON WAN                      | –                                                                                                          | –                        | Yes            | Yes            | Yes                      | Yes                      | –                     | –                     |
| 1 Gbps LAN                       | 2                                                                                                          | 2                        | 2              | 1              | 2                        | 1                        | 2                     | 1                     |
| 10 Gbps LAN                      | 1                                                                                                          | 1                        | 1              | 1              | 1                        | 1                        | 1                     | 1                     |
| 10 Gbps LAN specifications       | 1x RJ-45, support for 10G BASE-T (also 1G/2,5G/5G), 2 LEDs: Yellow (Speed, 10 Gbps), Green (Link/Activity) |                          |                |                |                          |                          |                       |                       |
| CATV                             | –                                                                                                          | 85 dBμV at -5 dBm, input | –              | –              | 85 dBμV at -5 dBm, input | 85 dBμV at -5 dBm, input | –                     | –                     |
| Switch engine <sup>(1)</sup>     | Yes                                                                                                        | Yes                      | Yes            | Yes            | Yes                      | Yes                      | Yes                   | Yes                   |
| WDM filter                       | –                                                                                                          | Optional                 | –              | –              | Yes                      | Yes                      | –                     | –                     |
| Fiber connector                  | SC/UPC                                                                                                     | SC/UPC & SC/APC          | SC/APC         | SC/APC         | SC/APC                   | SC/APC                   | SC/APC (SC/UPC a. A.) | SC/APC (SC/UPC a. A.) |
| SFP WAN                          | Yes                                                                                                        | Yes                      | Yes            | –              | Yes                      | –                        | Yes                   | –                     |
| BOSA WAN                         | –                                                                                                          | –                        | –              | Yes            | –                        | Yes                      | –                     | Yes                   |
| Compatible with click-on FTU     | Yes                                                                                                        | Yes                      | Yes            | Yes            | Yes                      | Yes                      | Yes                   | Yes                   |
| TR-069                           | Yes                                                                                                        | Yes                      | –              | –              | –                        | –                        | –                     | –                     |
| Dimensions (W x H x D) [mm]      | 88 x 151 x 40                                                                                              |                          |                |                |                          |                          |                       |                       |
| Operating temperature range [°C] | 0 ... 40                                                                                                   |                          |                |                |                          |                          |                       |                       |
| Layer 2 Ethernet                 | IEEE 802.1Q VLANs incl. Q-in-Q, IEEE 802.1Q tag insertion and stripping, IGMP v2/3 snooping                |                          |                |                |                          |                          |                       |                       |
| Monitoring                       | OAM optional supporting IEEE 802.3ah, Dying Gasp, Discovery and Loopback                                   |                          |                |                |                          |                          |                       |                       |
| Item number DKT                  | 79751                                                                                                      | 79752                    | 79757          | 79857          | 79759                    | 79859                    | 79761                 | 79861                 |
| Order No.                        | 84179751                                                                                                   | 84179752                 | 84179757       | 84179857       | 84179759                 | 84179859                 | 84179761              | 84179861              |

<sup>(1)</sup> Support for VLANs, Q-in-Q, QoS, IGMP, Jumbo Frames and traffic shaping and manipulation

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# Splice splitter patch outdoor cabinets

WAVEPACE® Fiber cabinets for point to multipoint networks

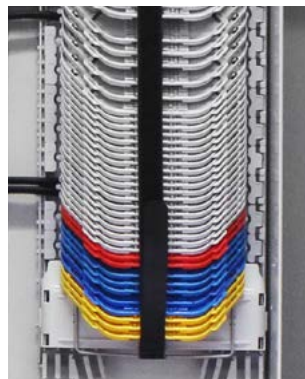
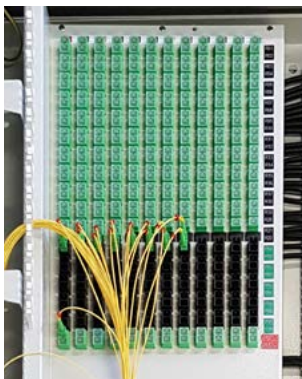


**75700100**  
Fiber-Cabinet-P2MP-256-SC/APC-Crimp

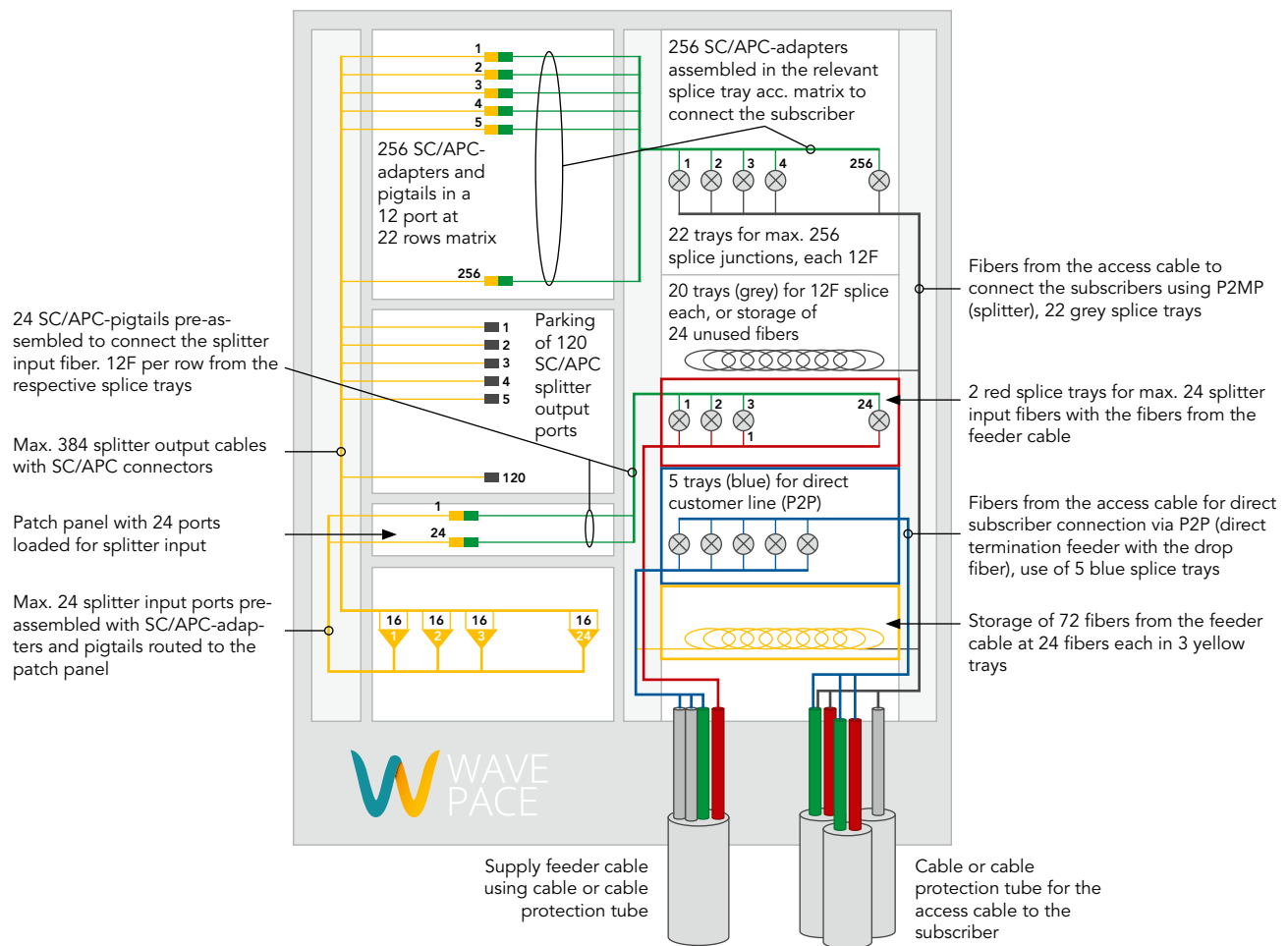


- Passive ready-to-connect outside plant cabinet for distribution of fiber optic connections via splitters to the subscriber at network level 3
- Robust, application-optimized cabinet made of powder-coated stainless steel
- Smallest cabinet dimensions, only 20 cm depth
- All housing elements can be individually replaced, without any impact to operation
- Mounting frame with hinged patch panel and splice block for easy access to the rear for service and maintenance purpose
- Pre-assembled with 256 SC/APC adapter and pigtails with G.657.A1 fibers in a 12 port horizontal at 22 vertical rows matrix
- Splitter mounting for 24 plug and play splitter modules, 1 splitter module SC/APC 1:16 pre-assembled in the basic configuration
- Parking area for up to 120 SC splitter output cables
- Functional slack storage bag
- Splice module with 90° foldable splice trays, each at max. capacity of 12 fibers for crimp or heat shrink splice protection
- Colored splice trays for different applications (e.g. splitter input connection by feeder cable connection at red tray)
- Integrated protection tube management for pigtail routing from patch to splicing area
- Transparent dust protection caps for identification by means of fiber optic red light source
- Cable feed for cable and protection tubes up to a diameter of 23 mm
- Logical port labeling and color coding, e.g. according to DIN color codes
- Loop function
- RFID tag identification in door handle possible on request

| Parameter                   | Fiber-Cabinet-P2MP-256-SC/APC-Crimp                                          | Fiber-Cabinet-P2MP-256-SC/APC-HS          | Fiber-Cabinet-P2MP-256-SC/APC-HS-DIN                                             | Fiber-Cabinet-P2MP-256-LC/APC-Crimp-DIN                                                     |
|-----------------------------|------------------------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Application                 | Splice/Splicer/Patch                                                         | Splice/Splicer/Patch                      | Splice/Splicer/Patch                                                             | Splice/Splicer/Patch                                                                        |
| Interface                   | 256 x SC/APC adapters & pigtails                                             |                                           | 256 x SC/APC adapters & pigtails, pre-assembled acc. to DIN IEC 60304 color code | 128 x LC/APC duplex adapters & 256 pigtails, pre-assembled acc. to DIN IEC 60304 color code |
| Splice capacity             | 52 splice trays for each 12 x crimp                                          | 52 splice trays for each 12 x heat shrink |                                                                                  | 52 splice trays for each 12 x crimp                                                         |
| Dimensions (H x W x D) [mm] | 1.100 x 700 x 200                                                            |                                           |                                                                                  |                                                                                             |
| Weight [kg]                 | 70                                                                           |                                           |                                                                                  |                                                                                             |
| Protection class            | IP55/IK10                                                                    |                                           |                                                                                  |                                                                                             |
| Material                    | Stainless steel, powder-coated                                               |                                           |                                                                                  |                                                                                             |
| Color                       | Light grey, RAL 7035                                                         |                                           |                                                                                  |                                                                                             |
| Mounting options            | Plinth and duct system                                                       |                                           |                                                                                  |                                                                                             |
| Cable feed                  | Bottom                                                                       |                                           |                                                                                  |                                                                                             |
| Number of in- and outlets   | Feeder: 6 x up to Ø 23 mm and loop with Ø 23 mm / Access: up to 60 x Ø 13 mm |                                           |                                                                                  |                                                                                             |
| Door aperture angle         | 110°/removable                                                               |                                           |                                                                                  |                                                                                             |
| Pivot angle mounting frame  | 45°                                                                          |                                           |                                                                                  |                                                                                             |
| Angle of hinged splice tray | 90°                                                                          |                                           |                                                                                  |                                                                                             |
| Lock system                 | Pivoting lever with lock, RFID tag identification optional                   |                                           |                                                                                  |                                                                                             |
| Order No.                   | 75700100                                                                     | 75700105                                  | 75700103                                                                         | 75700102                                                                                    |



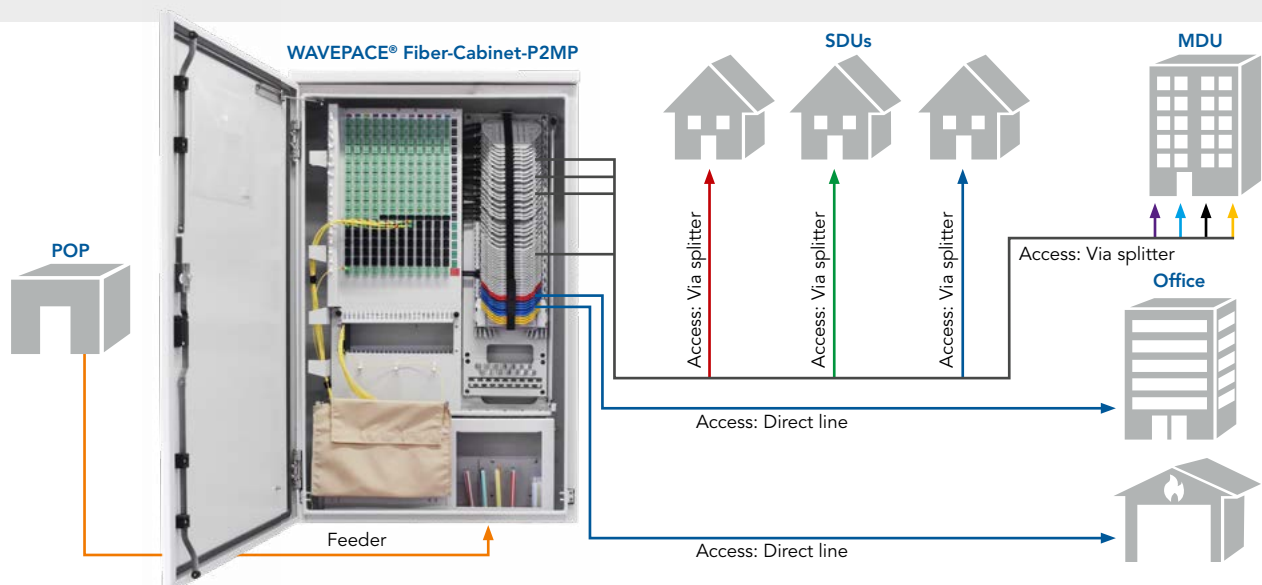
# Setup of the WAVEPACE® Fiber-Cabinet-P2MP with application overview of the individual components



## Application example

An appropriate feeder cable is blown in from the PoP to the WAVEPACE® Fiber-Cabinet-P2MP. At the cabinet, the feeder cable gets spliced to splitter input and not used fiber are being stored. Through splicing, the subscribers get connected to the splitter output fiber. The service activation will be carried out by patching the splitter output connector from

the parking area to the corresponding subscriber port. Customers, who need a dedicated line (e.g. for security reasons), will be directly connected with the fibers from the PoP in the blue splice trays, and the service will be provided accordingly.



## Accessories for the splice splitter patch outdoor cabinet

77700902  
Concrete-Base-Fiber-Cabinet



Replacement base plate  
available on request



### Lightweight concrete base for WAVEPACE® Fiber Cabinet

- Modular lightweight concrete base for quick assembly with removable inspection panel on the front for use with the WAVEPACE® Fiber Cabinet
- The low weight of the individual components facilitates simple assembly
- Smallest housing dimensions, only 20 cm installation depth
- Height from ground level approx. 300 mm
- Designed for a housing with mounting dimensions 635 x 103 mm
- Very space-saving delivery of the dismantled base on one-way pallet

| Parameter                              | Concrete-Plinth-Fiber-Cabinet                             |
|----------------------------------------|-----------------------------------------------------------|
| Application                            | Ground plinth for Fiber Cabinet                           |
| Total dimensions (H x W x D) [mm]      | 1.000 x 700 x 200                                         |
| Dimensions base plate (H x W x D) [mm] | 55 x 880 x 350                                            |
| Weight [kg]                            | 190                                                       |
| Material                               | Lightweight concrete, concrete quality min. LC 25/28 D1,8 |
| Order No.                              | 77700902                                                  |

### Further accessories

| Item                        | Description                                                                                                                                                               | Order No.  |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Splitter-Module 1:8-SC/APC  | PLC-Splitter box, type SC/APC 1:8 for Fiber-Cabinet-P2MP                                                                                                                  | on request |
| Splitter-Module 1:16-SC/APC | PLC-Splitter box, type SC/APC 1:16 for Fiber-Cabinet-P2MP                                                                                                                 | 75700110   |
| Splitter-Module 1:16-LC/APC | PLC-Splitter box, type LC/APC 1:16 for Fiber-Cabinet-P2MP                                                                                                                 | 75700112   |
| Splitter-Module 1:32-SC/APC | PLC-Splitter box, type SC/APC 1:32 for Fiber-Cabinet-P2MP, the cabinet housing must be adapted for this splitter module                                                   | 75700114   |
| Splitter-Module 1:32-LC/APC | PLC-Splitter box, type LC/APC 1:32 for Fiber-Cabinet-P2MP, the cabinet housing must be adapted for this splitter module                                                   | 75700116   |
| Fiber-Cabinet-Base          | Metal base with removable inspection panel                                                                                                                                | 77700905   |
| Base plate                  | Replacement base plate with foam seal, Access: 6 x Ø 23 mm (+ Loop), outlet: 60 x Ø 13 mm, one base plate is included in the delivery of the WAVEPACE® Fiber-Cabinet-P2MP | on request |



WAVEPACE® Fiber-Cabinet-P2MP  
with mounted lightweight concrete plinth

# ODF systems

## WAVEPACE® ODF system



**77700900**  
ODF-System-900,  
open



**77701200**  
ODF-System-1200,  
closed



- Stable distribution cabinet as a complete unit for termination and distribution of fiber optic technology
- Completely accessible from the front
- Designed for all installation types
- Optimized 19" front and rear mounting rails for installing the WAVEPACE® panel system solutions for free access
- Designed for challenging environmental conditions and needs-oriented growth
- Alignment by use of the freely accessible, adjustable base
- Easy to use, logical cable routing and support
- Guiding element for protective tubes at the inside of the rear wall on each RU
- Cable entry from top and bottom for cables and cable protection tubes
- Connection to external patch cord management systems
- UL listed for UL 2416 for Audio/Video, Information and Communication Technology Equipment Cabinet, Enclosure and Rack Systems
- Compliant with EN 61587-1:2012, Mechanical structures for electronic equipment

| Parameter                   | ODF-System-900                                                      | ODF-System-1200       |
|-----------------------------|---------------------------------------------------------------------|-----------------------|
| Application                 | Splice/splitter/patch                                               | Splice/splitter/patch |
| Dimensions (H x W x D) [mm] | 2.200 x 900 x 300                                                   | 2.200 x 1.200 x 300   |
| Weight [kg]                 | 90                                                                  | 110                   |
| Number of doors             | 2                                                                   | 2                     |
| Material                    | Rack: steel, powder-coated; mounting rail: stainless steel          |                       |
| Color                       | Light grey, RAL 7035                                                |                       |
| Mounting options            | Wall/floor/back to back/row                                         |                       |
| Cable feed                  | Top/bottom                                                          |                       |
| Door aperture angle         | 180°                                                                |                       |
| Environmental conditions    | Acc. to IEC 60068-2-1 and 2-2,<br>Cold test: -25 to +70°C, dry heat |                       |
| Lock system                 | Magnetic lock                                                       |                       |
| Order No.                   | 77700900                                                            | 77701200              |

### Robust distribution cabinet with innovative mounting solution

The distribution cabinets of the WAVEPACE® ODF-System family are equipped with an access-optimized installation solution for system panels with a free insight and access to the cable routing. Therefore, these ODF systems are the ideal solution for a quick and secure set-up of CO, HE and PoP sites.<sup>\*)</sup> Besides this unique mounting option, the distribution cabinets of course also offer a classic 19" mounting. The split doors protect the wiring of your network, offering optimal access to all working areas with their 180° opening angle for safe and quick handling. The 47 rack units are marked consistently on both mounting profiles with the RU area and the position, thus supporting the panel installation. The height-unit-related patch cable

routing in the right cable routing area ensures a clean and targeted patch cable routing. The management systems ensure long-term and proper cable routing and storage of patch cord slack to increase operational safety.

<sup>\*)</sup> CO: Central Office; HE: Headend;  
PoP: Point of Presence

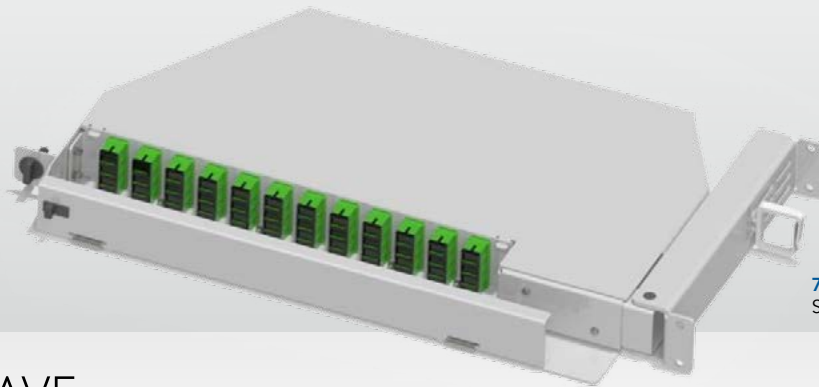
### Accessories

| Item                | Description                                                                                                                                               | Order No. |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Fiber-Cable-Divider | Cable clamp and divider module for feeder cables Ø 7 – 12 mm using PG-gland up to 192 fibers, division to 8 x protection tube 5/3,5 mm (each 1,75 m long) | 10444008  |



# 19" splice panels

WAVEPACE® termination and distribution panel for the ODF system



**77750004**  
SP-48-System-Panel-SC/APC



- Torsion-resistant and stable panel construction
- 19" wide panel with unique pivot function
- Pre-assembled with 48 SC/APC or LC/APC ports and pigtails according DIN color code, stored in splice trays, ready for connection
- Patch field with foldable front cover for cable protection and documentation
- Integrated management for fibers and wires
- 4 hinged splice trays at max. capacity of 12 fibers with a 90° hinge angle for good insight and handling
- Cable entry for cables and protective tubes
- Adapter alignment with space in between for secure individual access
- Minimal cable movement and bending radius protection

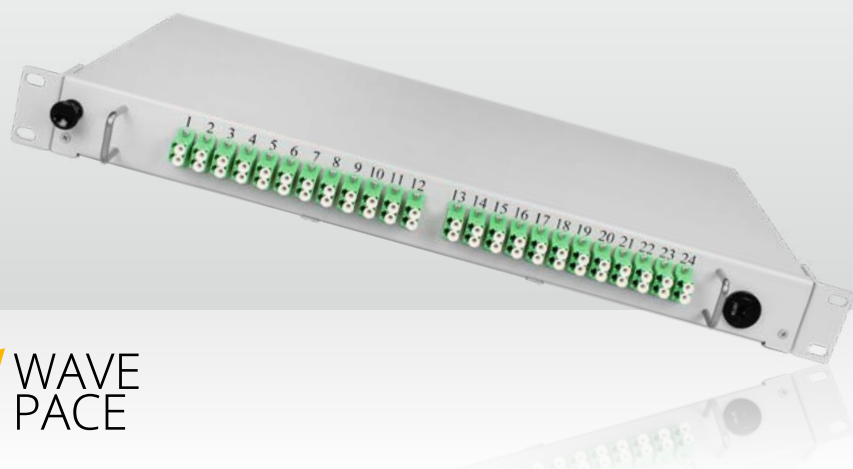
| Parameter                   | SP-48-System-Panel-SC/APC-Crimp                                     | SP-48-System-Panel-SC/APC-Heat-Shrink | SP-48-System-Panel-LC/APC-Crimp           | SP-48-System-Panel-LC/APC-Heat-Shrink | P-48-System-Panel-SC/APC     | P-48-System-Panel-LC/APC    |
|-----------------------------|---------------------------------------------------------------------|---------------------------------------|-------------------------------------------|---------------------------------------|------------------------------|-----------------------------|
| Application                 | Splice/Patch                                                        | Splice/Patch                          | Splice/Patch                              | Splice/Patch                          | Patch                        | Patch                       |
| Interface                   | 48 x SC/APC-simplex adapters & 48 pigtails                          |                                       | 24 x LC/APC-duplex adapters & 48 pigtails |                                       | 48 x SC/APC-simplex adapters | 24 x LC/APC-duplex adapters |
| Splice capacity             | 4 splice trays for 12 x crimp or heat shrink                        |                                       |                                           |                                       | –                            |                             |
| Dimensions (L x W x D) [mm] | 485 x 260 x 44,45 (1 RU)                                            |                                       |                                           |                                       |                              |                             |
| Material                    | Steel, powder-coated                                                |                                       |                                           |                                       |                              |                             |
| Color                       | Light grey, RAL 7035                                                |                                       |                                           |                                       |                              |                             |
| Mounting options            | System installation, incl. cage nut and screw kit                   |                                       |                                           |                                       |                              |                             |
| Cable feed                  | Sideways, using U-shaped mounting bracket with protective tube feed |                                       |                                           |                                       |                              |                             |
| Pivot angle                 | 90°                                                                 |                                       |                                           |                                       |                              |                             |
| Angle of hinged splice tray | 90°                                                                 |                                       |                                           |                                       |                              |                             |
| Performance parameter       | IL: 0,25 dB max., RL: 60 dB min.                                    |                                       |                                           |                                       | –                            |                             |
| Fiber type                  | Single Mode G.657.A1 color coded acc. to DIN (IEC 60304)            |                                       |                                           |                                       | –                            |                             |
| Special features            | Splitter holder in splice tray                                      |                                       |                                           |                                       | –                            |                             |
| Order No.                   | 77750004                                                            | 77750002                              | 77750014                                  | 77750012                              | 77750007                     | 77750017                    |

| Parameter                   | SP-72-System-<br>Panel-LC/APC-<br>Crimp                             | SP-72-System-<br>Panel-LC/APC-<br>Heat-Shrink | SP-96-System-<br>Panel-LC/APC-<br>Crimp         | SP-96-System-<br>Panel-LC/APC-<br>Heat-Shrink | P-72-System-<br>Panel-LC/APC  | P-96-System-<br>Panel-LC/APC  |
|-----------------------------|---------------------------------------------------------------------|-----------------------------------------------|-------------------------------------------------|-----------------------------------------------|-------------------------------|-------------------------------|
| Application                 | Splice/Patch                                                        | Splice/Patch                                  | Splice/Patch                                    | Splice/Patch                                  | Patch                         | Patch                         |
| Interface                   | 18 x LC/APC-quad<br>adapters & 72 pigtails                          |                                               | 24 x LC/APC-quad<br>adapters & 96 pigtails      |                                               | 18 x LC/APC-<br>quad adapters | 24 x LC/APC-<br>quad adapters |
| Splice capacity             | 6 splice trays<br>for 12 x crimp or heat shrink                     |                                               | 8 splice trays<br>for 12 x crimp or heat shrink |                                               | –                             |                               |
| Dimensions (L x W x D) [mm] | 485 x 260 x 44,45 (1 RU)                                            |                                               |                                                 |                                               |                               |                               |
| Material                    | Steel, powder-coated                                                |                                               |                                                 |                                               |                               |                               |
| Color                       | Light grey, RAL 7035                                                |                                               |                                                 |                                               |                               |                               |
| Mounting options            | System installation, incl. cage nut and screw kit                   |                                               |                                                 |                                               |                               |                               |
| Cable feed                  | Sideways, using U-shaped mounting bracket with protective tube feed |                                               |                                                 |                                               |                               |                               |
| Pivot angle                 | 90°                                                                 |                                               |                                                 |                                               |                               |                               |
| Angle of hinged splice tray | 90°                                                                 |                                               |                                                 |                                               |                               |                               |
| Performance parameter       | IL: 0,25 dB max., RL: 60 dB min.                                    |                                               |                                                 |                                               | –                             |                               |
| Fiber type                  | Single Mode G.657.A1 color coded acc. to DIN (IEC 60304)            |                                               |                                                 |                                               | –                             |                               |
| Special features            | Splitter holder in splice tray                                      |                                               |                                                 |                                               | –                             |                               |
| Order No.                   | 77750024                                                            | 77750022                                      | 77750034                                        | 77750032                                      | 77750027                      | 77750037                      |

## Accessories

| Item                   | Description                            | Order No.  |
|------------------------|----------------------------------------|------------|
| Fiber management panel | 19" panel, 3 RU equipped with 3 spools | on request |

# WAVEPACE® pull-out panel for up to 48 port LC/APC

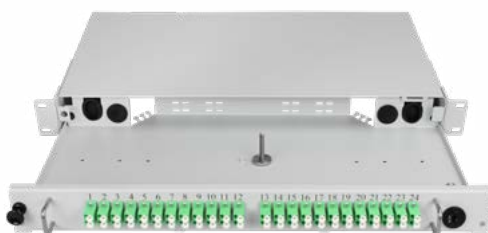


**10443957**  
SP-48-Pull-Panel-LC/APC



- 1 RU pull-out panel for splicing and patching with 19" mounting option
- Robust metal construction with pull-out tray
- Mounting bracket adjustable in depth
- Pre-installed with 24 LC/APC duplex adapters
- Option to include up to 4 splice trays
- Includes separate horizontal cable routing bracket for appropriate installation on the front without disturbing the systems underneath
- Rear cable entry, offset by 30 mm in depth for PG gland and angled feed with hammer head support using cable ties
- Additional support options on the back to secure cables/wires using cable ties
- Installation material and accessories are included in the scope of delivery
- Customer-specific configurations are possible on request

| Parameter                   | SP-48-Pull-Panel-LC/APC                                                                                                                                                    | SP-48-Pull-Panel-LC/APC-24-Crimp                                                                                                                             | SP-48-Pull-Panel-LC/APC-48-Crimp                                                                                                                             |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application                 | Splice/patch                                                                                                                                                               |                                                                                                                                                              |                                                                                                                                                              |
| Interface                   | 24 LC/APC duplex adapters pre-installed, bolt for 4 splice cassettes                                                                                                       | Ready-to-splice pre-installed with 24 LC/APC duplex adapters and 24 pigtails according DIN color code, stored in 2 splice trays with crimp splice protection | Ready-to-splice pre-installed with 24 LC/APC duplex adapters and 48 pigtails according DIN color code, stored in 4 splice trays with crimp splice protection |
| Capacity                    | 48 port LC/APC, 48 splices                                                                                                                                                 |                                                                                                                                                              |                                                                                                                                                              |
| Material                    | Metal, powder-coated                                                                                                                                                       |                                                                                                                                                              |                                                                                                                                                              |
| Cable feed                  | Rear cable entry (left/right offset) for PG 16 and PG 13,5 (each included once in scope of supply), PG gland and angled cable feed with hammer head support for cable ties |                                                                                                                                                              |                                                                                                                                                              |
| Connector quality           | –                                                                                                                                                                          | Grade B                                                                                                                                                      |                                                                                                                                                              |
| Fiber type                  | –                                                                                                                                                                          | G.657.A1                                                                                                                                                     |                                                                                                                                                              |
| Dimensions (L x W x H) [mm] | 465 x 240 x 44,45 (1 RU),<br>separate horizontal cable routing bracket: D = 50 mm                                                                                          |                                                                                                                                                              |                                                                                                                                                              |
| Special features            | Key-lock system at right hand side, separate horizontal cable routing bracket                                                                                              |                                                                                                                                                              |                                                                                                                                                              |
| Color                       | Light grey, RAL 7035                                                                                                                                                       |                                                                                                                                                              |                                                                                                                                                              |
| Order No.                   | 10443957                                                                                                                                                                   | 10443964                                                                                                                                                     | 10443965                                                                                                                                                     |



## Further splice panels, pre-assembled with splice trays and pigtails

| Parameter                      | OSP-19-12-SC/APC           | OSP-19-24-SC/APC | OSP-19-48-SC/APC | OSP-19-48-SC/APC-2U | OSP-19-72-SC/APC-2U | OSP-19-12-LC/APC | OSP-19-24-LC/APC | OSP-19-48-LC/APC-2U | OSP-19-72-LC/APC-2U |
|--------------------------------|----------------------------|------------------|------------------|---------------------|---------------------|------------------|------------------|---------------------|---------------------|
| <b>Application</b>             | Use in standard 19" racks  |                  |                  |                     |                     |                  |                  |                     |                     |
| <b>Amount splice cassettes</b> | 1                          | 2                | 4                | 4                   | 6                   | 1                | 2                | 4                   | 6                   |
| <b>Amount adapters</b>         | 12                         | 24               | 24               | 48                  | 72                  | 6                | 12               | 24                  | 36                  |
| <b>Connector type</b>          | SC/APC Simplex             | SC/APC Simplex   | SC/APC Duplex    | SC/APC Simplex      | SC/APC Simplex      | LC/APC Duplex    | LC/APC Duplex    | LC/APC Duplex       | LC/APC Duplex       |
| <b>Amount pigtails</b>         | 12                         | 24               | 48               | 48                  | 72                  | 12               | 24               | 48                  | 72                  |
| <b>Dimensions</b>              | 1 HE                       | 1 HE             | 1 HE             | 2 HE                | 2 HE                | 1 HE             | 1 HE             | 2 HE                | 2 HE                |
| <b>Material</b>                | 1,6 mm RAL 7035 light grey |                  |                  |                     |                     |                  |                  |                     |                     |
| <b>Order No.</b>               | <b>10443950</b>            | <b>10443951</b>  | <b>10443949</b>  | <b>10443952</b>     | <b>10443953</b>     | <b>10443910</b>  | <b>10443911</b>  | <b>10443921</b>     | <b>10443920</b>     |

Further splicepanel models are available on request (e.g. FC and E2000)!

# 19" housings for PLC splitters and multiplexers

with or without pre-installed modules

Sample configuration with a PLC mini splitter and LC/PC connectors



## 19" housings, pre-installed with PLC mini splitters

| Parameter                            | OSF-19-SC/<br>APC-16x1/2                         | OSF-19-SC/<br>APC-8x1/4 | OSF-19-SC/<br>APC-5x1/8 | OSF-19-SC/<br>APC-1x1/16 | OSF-19-SC/<br>APC-1x1/32 | OSF-19-SC/<br>APC-1x1/64 | OSF-19-LC/<br>APC-1x1/32 | OSF-19-LC/<br>APC-1x1/64 |
|--------------------------------------|--------------------------------------------------|-------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Pre-installed with PLC Mini splitter | 16 x 2-way                                       | 8 x 4-way               | 5 x 8-way               | 1 x 16-way               | 1 x 32-way               | 1 x 64-way               | 1 x 32-way               | 1 x 64-way               |
| Connector type                       | SC/APC                                           | SC/APC                  | SC/APC                  | SC/APC                   | SC/APC                   | SC/APC                   | LC/APC                   | LC/APC                   |
| Operating wavelength [nm]            | 1260 ... 1650                                    |                         |                         |                          |                          |                          |                          |                          |
| Through loss* [dB max.]              | 4,2                                              | 7,6                     | 10,9                    | 14,0                     | 17,5                     | 21,0                     | 17,5                     | 21,0                     |
| Uniformity S/P [dB max.]             | 0,6                                              | 0,6                     | 1,0                     | 1,1                      | 1,5                      | 1,8                      | 1,5                      | 1,8                      |
| PDL S/P [dB max.]                    | 0,2                                              | 0,2                     | 0,2                     | 0,3                      | 0,3                      | 0,4                      | 0,3                      | 0,4                      |
| Directivity [dB min.]                | 55                                               | 55                      | 55                      | 55                       | 55                       | 55                       | 55                       | 55                       |
| Return loss [dB min.]                | 50                                               | 50                      | 50                      | 50                       | 50                       | 50                       | 50                       | 50                       |
| Maximum optical power [mW]           | 500                                              | 500                     | 500                     | 500                      | 500                      | 500                      | 500                      | 500                      |
| Operating temperature range [°C]     | -40 ... +85                                      |                         |                         |                          |                          |                          |                          |                          |
| Storage temperature range [°C]       | -40 ... +85                                      |                         |                         |                          |                          |                          |                          |                          |
| Length of the pigtails [m]           | 1,5 (± 0,1)                                      |                         |                         |                          |                          |                          |                          |                          |
| Fiber                                | Corning SMF-28e XB acc. G657A, 900 µm loose tube |                         |                         |                          |                          |                          |                          |                          |
| Dimensions (L x W x H) [mm]          | 483 x 200 x 44                                   |                         |                         |                          |                          |                          |                          |                          |
| Order No.                            | 10443530                                         | 10443532                | 10443534                | 10443536                 | 10443538                 | 10443540                 | 10443542                 | 10443544                 |

## 19" housings for PLC mini splitters, empty

| Parameter                   | OSF-19-18-empty              | OSF-19-34 empty              | OSF-19-16-1x2-empty                | OSF-19-8-1x4-empty                | OSF-19-5-1x8-empty                |
|-----------------------------|------------------------------|------------------------------|------------------------------------|-----------------------------------|-----------------------------------|
| PLC splitter                | empty                        |                              |                                    |                                   |                                   |
| Port count                  | max. 2 inputs and 16 outputs | max. 2 inputs and 32 outputs | max. 16 x 1-to-2 SC port structure | max. 8 x 1-to-4 SC port structure | max. 5 x 1-to-8 SC port structure |
| Dimensions (L x W x H) [mm] | 483 x 200 x 44               |                              |                                    |                                   |                                   |
| Order No.                   | 10443608                     | 10443610                     | 10443614                           | 10443616                          | 10443618                          |

## Accessories

| Item              | Description                                                                                                | Order No. |
|-------------------|------------------------------------------------------------------------------------------------------------|-----------|
| SP-KA-WE-2x12     | Splice tray, white, for 24 crimp splices, 4 splice trays fit into the 1 RU splice box on top of each other | 10443443  |
| SP-DL-WE          | Cover, white, for splice tray SP-KA-WE-2x12                                                                | 10443444  |
| Bunny-Clip        | Cable bracket, curved, adhesive, e. g. for guiding the pigtails inside the splice box                      | 10443450  |
| Cable-tie-100-2,5 | Cable ties/cable straps 100 x 2,5 mm, to be used for up to 25 mm diameter, packaging unit 100 pcs          | 10443451  |

## 19" housings for reception of the CWDM multiplexers and demultiplexers

| Parameter | OSF-19-CWDM-8xGPON-SC                                                                           | OSF-19-CWDM-16xGPON-SC                           | OSF-19-CWDM-24xGPON-LC                                                                          | OSF-19-CWDM-32xGPON-LC                           | OSF-19-CWDM-8xGPON-RFoG-SC                                                                                                      | OSF-19-CWDM-MUX-1x9-SC/APC                                                                          | OSF-19-CWDM-DE-MUX-1x9-SC/APC                                                                                                |
|-----------|-------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Equipment | 8 pcs CWDM multiplexer for GPON with RF Overlay                                                 | 16 pcs CWDM multiplexer for GPON with RF Overlay | 24 pcs CWDM multiplexer for GPON with RF Overlay                                                | 32 pcs CWDM multiplexer for GPON with RF Overlay | 8 pcs with CWDM multiplexer for GPON and RFoG (OLT)                                                                             | CWDM multiplexer for 9 channels                                                                     | CWDM demultiplexer for 9 channels                                                                                            |
| Ports     | 1 port SC/PC for 1310 ± 40 nm & 1490 ± 10 nm, 1 port SC/APC for 1550 ± 10 nm, 1 COM port SC/APC |                                                  | 1 port LC/PC for 1310 ± 40 nm & 1490 ± 10 nm, 1 port LC/APC for 1550 ± 10 nm, 1 COM port LC/APC |                                                  | 1 port SC/PC for 1310 ± 40 nm & 1490 ± 10 nm, 1 port SC/APC for 1550 ± 10 nm, 1 Pprt SC/APC for 1610 ± 10 nm, 1 COM port SC/APC | 1 port for each of the 8 ITU channels 11 – 18 (1471/1491/1511/.../1611 ± 6,5 nm), 1 COM port SC/APC | 1 port for 1310 ± 40 nm, 1 port for each of the 8 ITU channels 11 – 18 (1471/1491/1511/.../1611 ± 6,5 nm), 1 COM port SC/APC |
| Order No. | 10450070                                                                                        | 10450072                                         | 10450074                                                                                        | 10450076                                         | 10450078                                                                                                                        | 10450080                                                                                            | 10450082                                                                                                                     |

# PLC mini splitter modules

SFF-type with SC/APC or LC/APC-connectors



**10439070**  
2 x 32 PLC Mini splitter

**10439010**  
1 x 8 PLC Mini splitter

- Based on planar lightwave technology
- Designed as 1 x N splitter with 1 input as well as 2 x N splitter with 2 redundant inputs
- Low through loss, very low PDL
- Excellent port-to-port uniformity

- Very high return loss
- Wide wavelength range
- Highly reliable and stable
- Available in 2 grades: Standard (S) and Premium (P)
- Both grades are qualified with Telcordia standard

## 1 x N PLC Mini splitter (1 input)

| Parameter                        | 1 x 2                                                         | 1 x 4         | 1 x 8         | 1 x 16        | 1 x 32        | 1 x 64        |
|----------------------------------|---------------------------------------------------------------|---------------|---------------|---------------|---------------|---------------|
| Operating wavelength [nm]        | 1260 ... 1650                                                 | 1260 ... 1650 | 1260 ... 1650 | 1260 ... 1650 | 1260 ... 1650 | 1260 ... 1650 |
| Through loss* S/P [dB max.]      | 4,5/4,2                                                       | 7,9/7,6       | 11,3/10,9     | 14,5/14,0     | 18,0/17,5     | 21,5/21,0     |
| Uniformity loss S/P [dB max.]    | 0,6/0,6                                                       | 0,8/0,6       | 1,0/1,0       | 1,3/1,1       | 1,5/1,5       | 1,8/1,8       |
| PDL S/P [dB max.]                | 0,2/0,2                                                       | 0,2/0,2       | 0,3/0,2       | 0,3/0,3       | 0,3/0,3       | 0,4/0,4       |
| Directivity [dB min.]            | 55                                                            | 55            | 55            | 55            | 55            | 55            |
| Return loss [dB min.]            | 50                                                            | 50            | 50            | 50            | 50            | 50            |
| Maximum optical power [mW]       | 500                                                           | 500           | 500           | 500           | 500           | 500           |
| Operating temperature range [°C] | -40 ... +85                                                   | -40 ... +85   | -40 ... +85   | -40 ... +85   | -40 ... +85   | -40 ... +85   |
| Storage temperature range [°C]   | -40 ... +85                                                   | -40 ... +85   | -40 ... +85   | -40 ... +85   | -40 ... +85   | -40 ... +85   |
| Pigtail length, fiber type [m]   | 1,5 (± 0,1), Corning SMF-28e XB acc. G657A, 900 µm loose tube |               |               |               |               |               |
| Dimensions (H x W x L) [mm]      | 4 x 7 x 60                                                    | 4 x 7 x 60    | 4 x 7 x 60    | 6 x 19 x 100  | 6 x 19 x 100  | 6 x 40 x 100  |
| Order No.                        |                                                               |               |               |               |               |               |
| PLSC-(1xN)-P Premium SC/APC      | 10439100                                                      | 10439105      | 10439110      | 10439115      | 10439120      | 10439125      |
| PLLC-(1xN)-P Premium LC/APC      | 10439300                                                      | 10439305      | 10439310      | 10439315      | 10439320      | 10439325      |

# CWDM multiplexers

for 8 ITU channels and 1 channel  $1310 \pm 40$  nm, with SC/APC pigtails



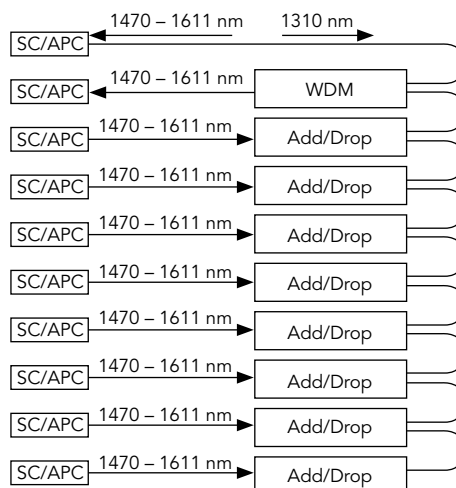
10450040

CWDM-B-MUX 1x9-SC/APC

- For combining the 8 ITU channels C11-C18 and retrieval of the channel 1310 nm
- 1 port for 1310, each 1 port for the 8 ITU channels C11 – C18 (1471/1491/1511/.../1611 nm), 1 COM-port
- Very low through loss, very low PDL
- Very high isolation, very high directivity
- Very high return loss
- Highly reliable and stable
- Qualified according Telcordia standard

| Parameter                               | CWDM-B-MUX 1x9-SC/APC                                |
|-----------------------------------------|------------------------------------------------------|
| Central wavelenghts [nm]                | 1310, 1471, 1491, 1511, 1531, 1551, 1571, 1591, 1611 |
| Operating wavelenghts [nm]              | $1310 \pm 40$ & 1460 – 1620                          |
| Channel space [nm]                      | 20                                                   |
| Channel bandwidth [nm]                  | $\lambda_c \pm 6,5$                                  |
| Through loss for 1460 – 1620 nm* [dB]   | $\leq 3,1$                                           |
| Through loss for 1310 nm* [dB]          | $\leq 0,7$                                           |
| Channel flatness [dB]                   | $\leq 0,4$                                           |
| Channel uniformity [dB]                 | $\leq 1,0$                                           |
| Isolation                               |                                                      |
| Demux-adjacent channels [dB]            | $\geq 30$                                            |
| Demux-non-adjacent channels [dB]        | $\geq 40$                                            |
| Mux or reflection channels [dB]         | $\geq 15$                                            |
| Polarization dependent loss (PDL) [dB]  | $\leq 0,15$                                          |
| Polarization mode dispersion (PDM) [ps] | $\leq 0,1$                                           |
| Directivity [dB]                        | $\geq 55$                                            |
| Return loss [dB]                        | $\geq 50$                                            |
| Maximum optical power [mW]              | $\leq 500$                                           |
| Operating temperature range [°C]        | 0 ... +70                                            |
| Storage temperature range [°C]          | -40 ... +85                                          |
| Pigtail length, fiber type [m]          | 1,5 ( $\pm 0,1$ ), Corning SMF-28e, 2 mm fiber       |
| Dimensions [mm]                         | 100 x 80 x 10                                        |
| Order No.                               | 10450040                                             |

\* Plus connector loss



# CWDM demultiplexer module for 8 ITU channels and 1 channel 1310 ± 40 nm, with SC/APC pigtails

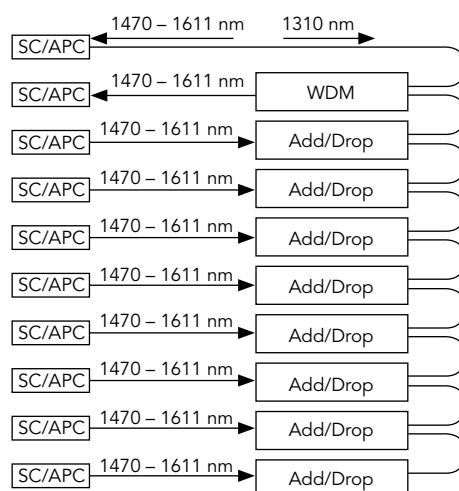


**10450045**  
CWDM-B-DEMUX 1x9-SC/APC

- For separation of the 8 ITU channels C11-C18 and insertion of the channel 1310 nm
- 1 port for 1310, each 1 port for the 8 ITU channels C11 – C18 (1471/1491/1511/.../1611 nm), 1 COM-port
- Very low through loss, very low PDL
- Very high isolation, very high directivity
- Very high return loss
- Highly reliable and stable
- Qualified according Telcordia standard

| Parameter                               | CWDM-B-DEMUX 1x9-SC/APC                              |
|-----------------------------------------|------------------------------------------------------|
| Central wavelenghts [nm]                | 1310, 1471, 1491, 1511, 1531, 1551, 1571, 1591, 1611 |
| Operating wavelenghts [nm]              | 1310 ± 40 & 1460 – 1620                              |
| Channel space [nm]                      | 20                                                   |
| Channel bandwidth [nm]                  | $\lambda_c \pm 6,5$                                  |
| Through loss for 1460 – 1620 nm* [dB]   | $\leq 3,5$                                           |
| Through loss for 1310 nm* [dB]          | $\leq 0,7$                                           |
| Channel flatness [dB]                   | $\leq 0,4$                                           |
| Channel uniformity [dB]                 | $\leq 1,0$                                           |
| Isolation                               |                                                      |
| Demux-adjacent channels [dB]            | $\geq 30$                                            |
| Demux-non-adjacent channels [dB]        | $\geq 40$                                            |
| Mux or reflection channels [dB]         | $\geq 15$                                            |
| Polarization dependent loss (PDL) [dB]  | $\leq 0,15$                                          |
| Polarization mode dispersion (PDM) [ps] | $\leq 0,1$                                           |
| Directivity [dB]                        | $\geq 55$                                            |
| Return loss [dB]                        | $\geq 50$                                            |
| Maximum optical power [mW]              | $\leq 500$                                           |
| Operating temperature range [°C]        | 0 ... +70                                            |
| Storage temperature range [°C]          | -40 ... +85                                          |
| Pigtail length, fiber type [m]          | 1,5 (±0,1), Corning SMF-28e, 2 mm fiber              |
| Dimensions [mm]                         | 100 x 80 x 10                                        |
| Order No.                               | <b>10450045</b>                                      |

\* Plus connector loss

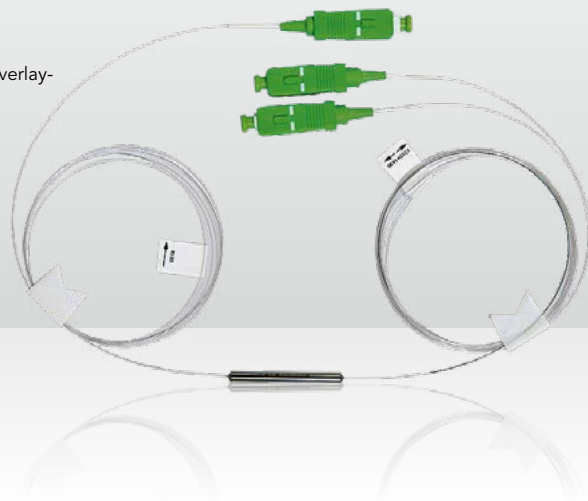


# CWDM multiplexer for GPON with RF Overlay



**10450030**  
CWDM-B-GPON w/ RF-Overlay-  
SC/APC, box style

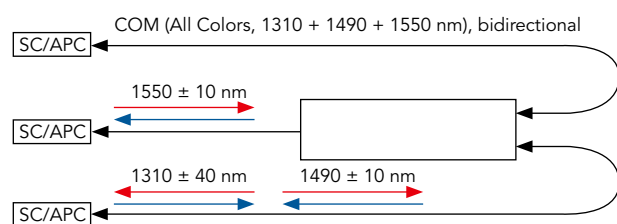
**10450035**  
CWDM-B-GPON w/ RF-Overlay-  
SC/APC, tube style



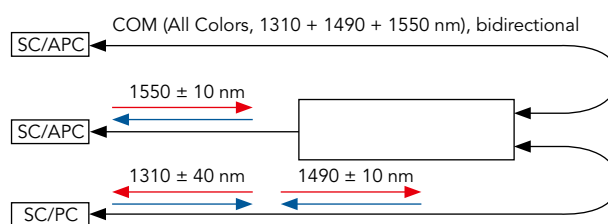
- For combining or separating the 3 wavelengths which are required for a GPON network architecture with RF Overlay (only forward transmission) respectively Active-Ethernet (P2P) with RF Overlay
- Usable as MUX (red signal direction) or DEMUX (blue signal direction) due to the bidirectional design
- 1 Port for 1310 & 1490 nm (GPON),  
1 port for 1550 nm (RFoG forward way),  
1 COM port
- Very low through loss, very low PDL
- Very high directivity, very high return loss
- Highly reliable and stable
- Qualified according Telcordia standard

| Parameter                                              | CWDM-B-GPON w/ RF-Overlay-<br>SC/APC, box style | CWDM-R-GPON w/ RF-Overlay-<br>SC/APC, tube style |
|--------------------------------------------------------|-------------------------------------------------|--------------------------------------------------|
| <b>Pigtails</b>                                        | alle Anschlüsse SC/APC                          | alle Anschlüsse SC/APC                           |
| <b>Transmitted operating wavelength bandwidth [nm]</b> | 1550 ± 10                                       | 1550 ± 10                                        |
| <b>Reflected operating wavelength bandwidth [nm]</b>   | 1310 ± 40 & 1490 ± 10                           | 1310 ± 40 & 1490 ± 10                            |
| <b>Transmitted through loss* [dB]</b>                  | ≤ 0,6                                           | ≤ 0,7                                            |
| <b>Channel flatness [dB]</b>                           | ≤ 0,4                                           | ≤ 0,4                                            |
| <b>Reflected through loss* [dB]</b>                    | ≤ 0,6                                           | ≤ 0,4                                            |
| <b>Isolation</b>                                       |                                                 |                                                  |
| Transmitted channel [dB]                               | ≥ 30                                            | ≥ 25                                             |
| Reflected channel [dB]                                 | ≥ 15                                            | ≥ 20                                             |
| <b>Polarization dependent loss (PDL) [dB]</b>          | ≤ 0,10                                          | ≤ 0,10                                           |
| <b>Directivity [dB]</b>                                | ≥ 55                                            | ≥ 55                                             |
| <b>Return loss [dB]</b>                                | ≥ 50                                            | ≥ 50                                             |
| <b>Maximum optical power [mW]</b>                      | ≤ 500                                           | ≤ 500                                            |
| <b>Operating temperature range [°C]</b>                | 0 ... +70                                       | -5 ... +70                                       |
| <b>Storage temperature range [°C]</b>                  | -40 ... +85                                     | -40 ... +85                                      |
| <b>Pigtail length, fiber type [m]</b>                  | 1,5 (±0,1), Corning SMF-28e,<br>2 mm fiber      | 1,5 (±0,1), Corning SMF-28e XB                   |
| <b>Dimensions [mm]</b>                                 | 100 x 80 x 10                                   | Diameter 3,8 x 36                                |
| <b>Order No.</b>                                       | <b>10450030</b>                                 | <b>10450035</b>                                  |

\* Plus connector loss



**10450030 & 10450035**



**10450035**

# CWDM multiplexer module for GPON and RFOG (OLT), with SC/APC pigtails



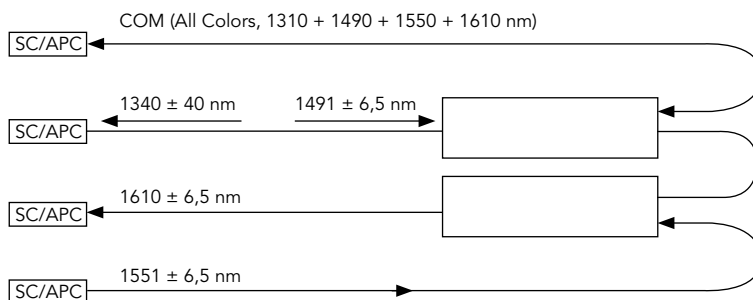
**10450020**

CWDM-B-GPON + RFOG-OLT-SC/APC,  
box style

- For combination or separation of the 4 wavelengths which are required for a combined GPON and RFOG architecture
- Usage in headends and Optical Line Terminals (OLT)
- 1 port for 1310 & 1490 nm (GPON Tx & Rx),  
1 port for 1550 nm (RFOG Tx),  
1 port for 1610 nm (RFOG Rx),  
1 COM port
- Very low through loss, very low PDL
- Very high isolation, very high directivity
- Very high return loss
- Highly reliable and stable
- Qualified according Telcordia standard

| Parameter                               | CWDM-B-GPON + RFOG-OLT-SC/APC, box style |
|-----------------------------------------|------------------------------------------|
| Central wavelenghts [nm]                | 1310, 1491, 1551, 1611                   |
| Operating wavelenghts [nm]              | 1310 ± 40 & 1460 – 1620                  |
| Channel space [nm]                      | 20                                       |
| Channel bandwidth [nm]                  | $\lambda_c \pm 6,5$                      |
| Transmission through loss* [dB]         | ≤ 1,2                                    |
| Channel flatness [dB]                   | ≤ 0,4                                    |
| Channel uniformity [dB]                 | ≤ 1,0                                    |
| Isolation                               |                                          |
| Demux-adjacent channels [dB]            | ≥ 30                                     |
| Demux-non-adjacent channels [dB]        | ≥ 40                                     |
| Mux or reflection channels [dB]         | ≥ 15                                     |
| Polarization dependent loss (PDL) [dB]  | ≤ 0,15                                   |
| Polarization mode dispersion (PMD) [ps] | ≤ 0,1                                    |
| Directivity [dB]                        | ≥ 55                                     |
| Return loss [dB]                        | ≥ 50                                     |
| Maximum optical power [mW]              | ≤ 500                                    |
| Operating temperature range [°C]        | 0 ... +70                                |
| Storage temperature range [°C]          | -40 ... +85                              |
| Pigtail length, fiber type [m]          | 1,5 (± 0,1), Corning SMF-28e, 2 mm fiber |
| Dimensions [mm]                         | 100 x 80 x 10                            |
| Order No.                               | 10450020                                 |

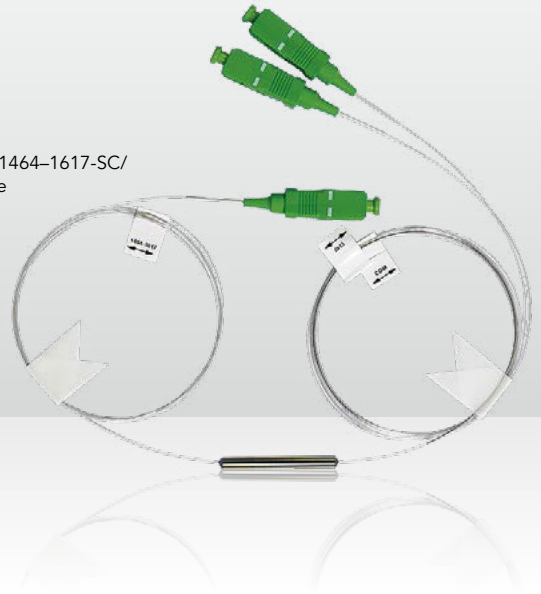
\* Plus connector loss



# WDM multiplexers with SC/APC pigtails



**10450010**  
WDM-B-1310/1464-1617-SC/  
APC, box style



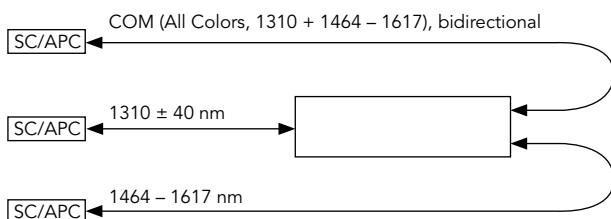
**10450015**  
WDM-R-1310/1464-1617-SC/  
APC, tube style

- To combine or separate wavelengths for forward and return path transmission
- Usage as MUX or DEMUX by bidirectional design
- 1 port for 1310 nm,  
1 port for 1464 – 1617 nm,  
1 COM port
- Very low through loss, very low PDL
- Very high directivity, very high return loss
- Highly reliable and stable
- Qualified according Telcordia standard

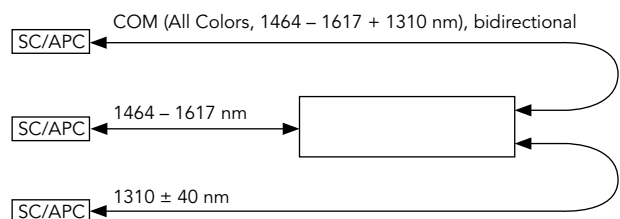
| Parameter                                       | WDM-B-1310/1464-1617-SC/APC,<br>box style | WDM-R-1310/1464-1617-SC/APC,<br>tube style                    |
|-------------------------------------------------|-------------------------------------------|---------------------------------------------------------------|
| Transmitted operating wavelength bandwidth [nm] | 1310 ± 40                                 | 1464 – 1617                                                   |
| Reflected operating wavelength bandwidth [nm]   | 1464 – 1617                               | 1310 ± 40                                                     |
| Channel flatness [dB]                           | ≤ 0,4                                     | ≤ 0,4                                                         |
| Transmitted through loss* [dB]                  | ≤ 0,6                                     | ≤ 0,7                                                         |
| Reflected through loss* [dB]                    | ≤ 0,6                                     | ≤ 0,4                                                         |
| Isolation                                       |                                           |                                                               |
| Transmitted channel [dB]                        | ≥ 30                                      | ≥ 25                                                          |
| Reflected channel [dB]                          | ≥ 15                                      | ≥ 20                                                          |
| Polarization dependent loss (PDL) [dB]          | ≤ 0,10                                    | ≤ 0,10                                                        |
| Directivity [dB]                                | ≥ 55                                      | ≥ 55                                                          |
| Return loss [dB]                                | ≥ 50                                      | ≥ 50                                                          |
| Maximum optical power [mW]                      | ≤ 500                                     | ≤ 500                                                         |
| Operating temperature range [°C]                | 0 ... +70                                 | -5 ... +70                                                    |
| Storage temperature range [°C]                  | -40 ... +85                               | -40 ... +85                                                   |
| Pigtail length, fiber type [m]                  | 1,5 (± 0,1), Corning SMF-28e, 2 mm fiber  | 1,5 (± 0,1), Corning SMF-28e XB acc. G657A, 900 µm loose tube |
| Dimensions [mm]                                 | 100 x 80 x 10                             | Durchmesser 3,8 x 36                                          |
| Order No.                                       | <b>10450010</b>                           | <b>10450015</b>                                               |

\* Plus connector loss

## Configuration box style



## Configuration tube style



# Fiber-optic cable

## Blown cable



**66000041**  
A-D(ZN)2Y, 1x4



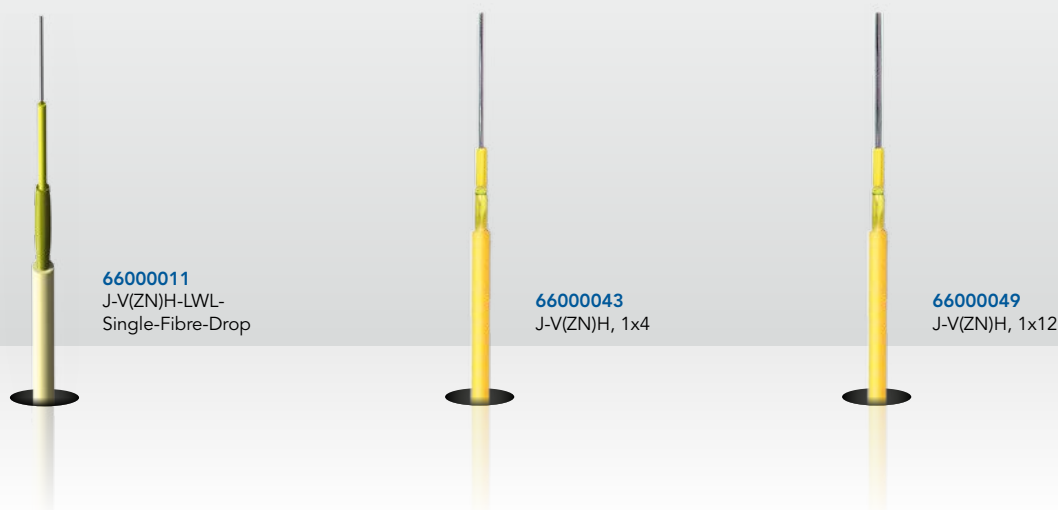
**66000047**  
A-D(ZN)2Y, 1x12

Blown cables are non-metallic cables with optical fibers, that are mainly installed in confined spaces within the access network. Due to the two-layer cores and the friction-optimized PE sheath, MiniXtend cables are particularly well suited for blowing into mini- or microducts. The fibers within the ducts are colored for better distinctness. MiniXtend are available with Corning SMF 28-e® (ITU-G 652D) or SMF-28® Ultra single-mode fibers with optimized bending.

- Reduced outer diameter
- Installation of customer connections in micro tube/speedpipe systems
- Compact design with reduced weight
- Low investment costs
- Non-metallic cable structure
- No grounding necessary
- Secure transmission properties and low loss
- SMF-28e+® or SMF-28® Ultra according to ITU-T G.652.D

| Parameter                                          | A-D(ZN)2Y, 1x4                                                                   | A-D(ZN)2Y, 1x12 | A-D(ZN)2Y-6F-(1X6)-<br>E9U-CT-1.7-SST | A-D(ZN)2Y-12F-(1X12)-<br>E9U-CT-1.7-SST | A-D(ZN)2Y-24F-<br>E9U200-CT1.7 |
|----------------------------------------------------|----------------------------------------------------------------------------------|-----------------|---------------------------------------|-----------------------------------------|--------------------------------|
| Application                                        | Micro tubes/speedpipes                                                           |                 |                                       |                                         |                                |
| Cable type                                         | Central core A-D(ZN)2Y                                                           |                 |                                       |                                         |                                |
| Product type                                       | Dielectric                                                                       |                 |                                       |                                         |                                |
| Longitudinal water tightness (0,1<br>bar/24 h) [m] | ≤ 1                                                                              |                 |                                       |                                         |                                |
| Crush resistance                                   | 1.000 N/10 cm                                                                    |                 |                                       |                                         |                                |
| Operating temperature range [°C]                   | -20 – 60                                                                         |                 |                                       |                                         |                                |
| Fiber category                                     | SMF-28®                                                                          |                 | SMF-28® Ultra                         |                                         |                                |
| Fulfilled standards and norms                      | TIA/EIA 492-CAAB IEC 60793-2-50 Typ<br>B1.3, ITU-T G.652.D, ISO/IEC 11801 Ed.2.2 |                 | ITU-T G.652.D, ITU-T G.657.A1         |                                         |                                |
| Fiber count                                        | 4                                                                                | 12              | 6                                     | 12                                      | 24                             |
| Outer diameter [mm]                                | 2,5                                                                              |                 |                                       |                                         |                                |
| Packaging unit [m]                                 | 2.000                                                                            |                 | 6.000                                 |                                         |                                |
| Tensile strength (short-term) [N]                  | 80                                                                               |                 |                                       |                                         |                                |
| Order No.                                          | 66000041                                                                         | 66000047        | 66014006                              | 66014012                                | 66014024                       |

# Fixed core installation cable



These fiber optic cables can be used indoors for riser cabling or as distribution cables. The fixed cores enable a simple and direct plug-in field mounting without the use of a distribution adapter. The cables can be routed in cable ducts and manholes inside buildings.

- Metal-free construction
- No potential equalization required
- Easy to install because there is no filling compound
- Fast, direct connector assembly without a dividing adapter

- Suitable for direct assembly of field-installable connectors on the fixed core
- Low cable diameter and bending radius
- Therefore easy installation in confined spaces
- Easily stippable with lengths of approx. 100 mm due to the TB3 fixed core construction
- Silicon-free sheath
- Cable sheath and outer sheath of the basic components (but 900 µm fixed core cables) are free of lacquer-wetting substances
- Flame-retardant LSZH™ / FRNC
- Fiber count: 1, 4 or 12 pcs.

| Parameter                                        | J-V(ZN)H-LWL-Single-Fibre-Drop                               | J-V(ZN)H, 1x4 | J-V(ZN)H, 1x12 |
|--------------------------------------------------|--------------------------------------------------------------|---------------|----------------|
| Application                                      | Indoor                                                       |               |                |
| Cable type                                       | Fixed core                                                   |               |                |
| Product type                                     | Dielectric                                                   |               |                |
| Longitudinal water tightness (0,1 bar/24 h) [m]  | ≤ 0,1                                                        |               |                |
| Fier class                                       | LSZH™/FRNC                                                   |               |                |
| Fiber category                                   | SMF-28® Ultra Faser 0,9 mm; ITU-T G.652.D and ITU-T G.657.A1 |               |                |
| Coding acc. to DIN VDE 0888-100-1 (EN 60794-1-1) | J-V(ZN)H                                                     |               |                |
| Former coding acc. to DIN VDE 0888-3             | J-VH                                                         |               |                |
| Fire behaviour                                   | Cca, s1a, d1, a1                                             |               |                |
| Outer diameter [mm]                              | 2,4                                                          | 4,2           |                |
| Fiber count                                      | 1                                                            | 4             | 12             |
| Packaging unit [m]                               | 2.000                                                        |               |                |
| Tensile strength at installation [N]             | 200                                                          | 600           |                |
| Order No.                                        | 66000011                                                     | 66000043      | 66000049       |

## The perfect addition: WAVEPACE® connectors for field termination

- SC/APC connector with short boot for field termination at 900 µm buffer and cable diameters up to 3 mm
- V-groove and matching gel
- Reusable in case of poor performance values
- Temperature range: -25°C – +70°C
- Packaging unit 60 pcs
- Incl. cleaving tool

| Item                               | Description                                                               | Order No. |
|------------------------------------|---------------------------------------------------------------------------|-----------|
| SC/APC-connector-field-termination | SC/APC connector, IL: typical ≤ 0,3 dB (max. ≤ 0,6 dB), RL: ≥ 55 dB media | 10444050  |
| LC/APC-connector-field-termination | LC/APC connector IL: typical ≤ 0,3 dB (max. ≤ 0,5 dB), RL: ≥ 55 dB media  | 10444051  |



**10444050**  
SC/APC-connector-field-termination

# MiniXtend® universal cable



**66000024**  
U-DQ(ZN)H-2x12-  
E9/125-SMF-28-Ultra



**66000050**  
U-DQ(ZN)H-4x12-  
E9/125-SMF-28-Ultra



**66000096**  
U-DQ(ZN)H-4x24-  
E9/125-SMF-28-Ultra



**66000144**  
U-DQ(ZN)H-6x24-  
E9/125-SMF-28-Ultra

- Indoor/outdoor universal cables, typically used when limited space is available
- With the dual layer tube design and low friction sheath MiniXtend cables are optimised for blowing and best used in mini or micro ducts
- The buffer tubes and fiber in each tube are colour-coded to Telcordia-Bellcore for quick and easy identification

- Designed with increased resistance against moisture or chemicals
- Additional flame retardant features enable indoor/outdoor deployments along ducts or pipelines
- Reduced outer cable diameter for high fibre density in microduct systems
- All-dielectric cable construction, no need for grounding or bonding
- All MiniXtend® cables are RoHS compliant

| Parameter                                             | Wavelength [nm] | U-DQ(ZN)H-2x12-<br>E9/125-SMF-28-Ultra                                      | U-DQ(ZN)H-4x12-<br>E9/125-SMF-28-Ultra | U-DQ(ZN)H-4x24-<br>E9/125-SMF-28-Ultra | U-DQ(ZN)H-6x24-<br>E9/125-SMF-28-Ultra  |
|-------------------------------------------------------|-----------------|-----------------------------------------------------------------------------|----------------------------------------|----------------------------------------|-----------------------------------------|
| Application                                           |                 | Blowing installation in miniduct systems                                    |                                        |                                        |                                         |
| Cable type                                            |                 | Loose Tube                                                                  |                                        |                                        |                                         |
| Product type                                          |                 | Dielectric                                                                  |                                        |                                        |                                         |
| Flame rating                                          |                 | LSZH™/FRNC                                                                  |                                        |                                        |                                         |
| Coding according to EN 60794-1-1 (DIN VDE 0888-100-1) |                 | U-DQ(ZN)H                                                                   |                                        |                                        |                                         |
| Reaction to fire                                      |                 | Eca                                                                         |                                        |                                        |                                         |
| Fiber Category                                        |                 | SMF-28® Ultra 200 Optical Fiber                                             |                                        |                                        |                                         |
| Installation temperature range [°C]                   |                 | -5 – 50                                                                     |                                        |                                        |                                         |
| Operation/storage temperature range [°C]              |                 | -40 – 70                                                                    |                                        |                                        |                                         |
| Central element                                       |                 | Dielectric with swellable element                                           |                                        |                                        |                                         |
| Fiber count                                           |                 | 24                                                                          | 48                                     | 96                                     | 144                                     |
| Fibers per tube                                       |                 | 12                                                                          | 12                                     | 24                                     | 24                                      |
| Number of tube positions                              |                 | 6                                                                           | 6                                      | 6                                      | 6                                       |
| Number of active tubes                                |                 | 2                                                                           | 4                                      | 4                                      | 6                                       |
| Buffer tube colour                                    |                 | Blue, orange                                                                | Blue, orange, green, brown             | Blue, orange, green, brown             | Blue, orange, green, brown, gray, white |
| Buffer tube diameter [mm]                             |                 | 1,7                                                                         | 1,7                                    | 1,7                                    | 1,7                                     |
| Number of filling elements                            |                 | 4                                                                           | 2                                      | 2                                      | –                                       |
| Number of ripcords                                    |                 | 2                                                                           | 2                                      | 2                                      | 2                                       |
| Outer sheath material                                 |                 | Flame-retardant, non-corrosive/low-smoke, zero-halogen (FRNC/LSZH) material |                                        |                                        |                                         |
| Outer sheath colour                                   |                 | Black                                                                       | Black                                  | Black                                  | Black                                   |
| Outer sheath nominal thickness [mm]                   |                 | 1,2                                                                         | 1,2                                    | 1,2                                    | 1,2                                     |
| Nominal outer diameter [mm]                           |                 | 7,8                                                                         | 7,8                                    | 7,8                                    | 7,8                                     |
| Weight [kg/km]                                        |                 | 51,74                                                                       | 57,3                                   | 60,36                                  | 67,48                                   |
| Min. bend radius installation/operation [mm]          |                 | 78/117                                                                      | 78/117                                 | 78/117                                 | 78/117                                  |
| Max. tensile strength, short-term [N]                 |                 | 1.000                                                                       | 1.000                                  | 1.000                                  | 1.000                                   |
| Crush resistance (reversible) [N/10 cm]               |                 | 1.000                                                                       | 1.000                                  | 1.000                                  | 1.000                                   |
| Fire Load [MJ/m]                                      |                 | 1.475                                                                       | 1.413                                  | 1.413                                  | 1.357                                   |
| Fiber name                                            |                 | SMF-28® Ultra 242 Optical Fiber                                             |                                        | SMF-28® Ultra 200 Optical Fiber        |                                         |
| Mode field diameter [µm]                              | 1310            | 9,2                                                                         | 9,2                                    | 9,2                                    | 9,2                                     |
| Fiber code                                            |                 | Z                                                                           | Z                                      | Z                                      | Z                                       |
| Coating/cladding diameter [µm]                        |                 | 242/125                                                                     | 242/125                                | 200/125                                | 200/125                                 |
| Maximum/typical attenuation [dB/km]                   | 1310            | 0,34/0,32                                                                   | 0,34/0,32                              | 0,34/0,32                              | 0,34/0,32                               |
|                                                       | 1383            | 0,34/0,32                                                                   | 0,34/0,32                              | 0,34/0,32                              | 0,34/0,32                               |
|                                                       | 1550            | 0,20/0,18                                                                   | 0,20/0,18                              | 0,20/0,18                              | 0,20/0,18                               |
| Serial 1 gigabit ethernet [m]                         |                 | 5.000/-                                                                     | 5.000/-                                | 5.000/-                                | 5.000/-                                 |
| Serial 10 gigabit ethernet [m]                        |                 | 10.000/40.000                                                               | 10.000/40.000                          | 10.000/40.000                          | 10.000/40.000                           |
| Cable cutoff wavelength [nm]                          |                 | 1260                                                                        | 1260                                   | 1260                                   | 1260                                    |
| Dispersion [ps/(nm*km)]                               | 1285 – 1300     | ≤ 3,5                                                                       | ≤ 3,5                                  | ≤ 3,5                                  | ≤ 3,5                                   |
|                                                       | 1550            | ≤ 18                                                                        | ≤ 18                                   | ≤ 18                                   | ≤ 18                                    |
| PMD Link Design Value [ps/√km]                        |                 | ≤ 0,04                                                                      | ≤ 0,04                                 | ≤ 0,04                                 | ≤ 0,04                                  |
| PMD maximum individual fiber [ps/√km]                 |                 | ≤ 0,1                                                                       | ≤ 0,1                                  | ≤ 0,1                                  | ≤ 0,1                                   |
| Fiber compliance                                      |                 | ITU-T G.652.D and ITU-T G.657.A1                                            |                                        |                                        |                                         |
| Order No.                                             |                 | 66000024                                                                    | 66000050                               | 66000096                               | 66000144                                |

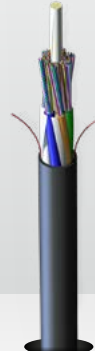
# MiniXtend® blown cable



**66012096**  
A-DQ(ZN)2Y-8x12-  
E9G.657.A1-LT1.4-FAB



**66012144**  
A-DQ(ZN)2Y-12x12-  
E9G.657.A1-LT1.4-FAB



**66014144**  
A-DQ(ZN)2Y-144F-  
E9U200-W/FAB



**66014192**  
A-DQ(ZN)2Y-192F-  
E9U200-W/FAB

- Cable for installation in micro tubes
- Very good installation properties due to optimized cable stiffness and low-friction sheath
- Good mechanical properties
- A metal-free cable without grounding or potential problems
- The innovative FastAccess® technology simplifies cable stripping without the use of ripcords and special tools

- The Corning E9U200/125 SMF 28® ULTRA single-mode fiber used is an ITU-T G652.D fiber with Corning's "low-loss" and bending-optimization technology. This full-spectrum fiber exceeds the bending requirement of ITU-T G657.A1 and is fully compatible with standard single mode fibers, such as Corning SMF28e+®
- Fiber and core colors according to VDE
- Cable construction according to Corning standard

| Parameter                                    | Wavelength<br>[nm] | A-DQ(ZN)2Y<br>-6x12-E9U200-<br>LT1.1-FAB | A-DQ(ZN)2Y-<br>8x12-E9G.657.<br>A1-LT1.4-FAB | A-DQ(ZN)2Y-<br>12x12-E9G.657.<br>A1-LT1.4-FAB | A-DQ(ZN)2Y-<br>144F-E9U200-<br>W/FAB | A-DQ(ZN)2Y-<br>192F-E9U200-<br>W/FAB | A-DQ(ZN)2Y-<br>288F-E9U200-<br>W/FAB |
|----------------------------------------------|--------------------|------------------------------------------|----------------------------------------------|-----------------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Application                                  |                    | Micro tubes                              |                                              |                                               |                                      |                                      |                                      |
| Cable type                                   |                    | Minibündelmikrokabel                     |                                              |                                               |                                      |                                      |                                      |
| Product type                                 |                    | Dielectric                               |                                              |                                               |                                      |                                      |                                      |
| Fiber category                               |                    | SMF-28® Ultra 200 optical fibers         |                                              |                                               |                                      |                                      |                                      |
| Installation temperature range [°C]          |                    | -5 – +40                                 |                                              |                                               |                                      |                                      |                                      |
| Operation/storage temperature range [°C]     |                    | -40 – +70 / -30 – +70                    |                                              |                                               |                                      |                                      |                                      |
| Central element                              |                    | Dielectric with swellable element        |                                              |                                               |                                      |                                      |                                      |
| Fiber count                                  |                    | 72                                       | 96                                           | 144                                           | 144                                  | 192                                  | 288                                  |
| Fibers per tube                              |                    | 12                                       | 12                                           | 12                                            | 24                                   | 24                                   | 24                                   |
| Number of tube positions                     |                    | 6                                        | 8                                            | 12                                            | 6                                    | 8                                    | 12                                   |
| Number of filling elements                   |                    | 0                                        | 0                                            | 0                                             | 0                                    | 0                                    | 0                                    |
| Outer sheath material                        |                    | High-density polyethylene (HDPE)         |                                              |                                               |                                      |                                      |                                      |
| Outer sheath colour                          |                    | black                                    |                                              |                                               |                                      |                                      |                                      |
| Nominal outer diameter [mm]                  |                    | 4,4 ± 0,3                                | 6,3 ± 0,3                                    | 8,1 ± 0,3                                     | 6,3 ± 0,3                            | 7,5 ± 0,3                            | 9,7 ± 0,3                            |
| Weight [kg/km]                               |                    | 23                                       | 35                                           | 56                                            | 37                                   | 55                                   | 87                                   |
| Min. bend radius installation/operation [mm] |                    | 88 / 66                                  | 15xD / 10xD                                  |                                               |                                      |                                      |                                      |
| Max. tensile strength, short-term [N]        |                    | 350                                      | 1.000                                        |                                               |                                      |                                      |                                      |
| Crush resistance (reversible) [N/10 cm]      |                    | 1.000                                    |                                              |                                               |                                      |                                      |                                      |
| Fiber name                                   |                    | E9/125 SMF 28® ULTRA                     |                                              |                                               |                                      |                                      |                                      |
| Mode field diameter [µm]                     | 1310               | 9,2                                      | 9,2 ± 0,4                                    |                                               |                                      |                                      |                                      |
| Cladding diameter [µm]                       |                    | 125                                      | 125,0 ± 0,7                                  |                                               |                                      |                                      |                                      |
| Coating diameter [µm]                        |                    | 200                                      | 200 ± 5                                      |                                               |                                      |                                      |                                      |
| Attenuation [dB/km]                          | 1310               | ≤ 0,34                                   |                                              |                                               |                                      |                                      |                                      |
|                                              | 1383               | ≤ 0,34                                   |                                              |                                               |                                      |                                      |                                      |
|                                              | 1550               | ≤ 0,20                                   |                                              |                                               |                                      |                                      |                                      |
| Cable cutoff wavelength [nm]                 |                    | ≤ 1260                                   |                                              |                                               |                                      |                                      |                                      |
| Dispersion [ps/(nm*km)]                      | 1285 – 1300        | ≤ 3,5                                    |                                              |                                               |                                      |                                      |                                      |
|                                              | 1550               | ≤ 18                                     |                                              |                                               |                                      |                                      |                                      |
| PMD Link Design Value [ps/√km]               |                    | ≤ 0,04                                   | ≤ 0,06                                       |                                               |                                      |                                      |                                      |
| PMD maximum individual fiber [ps/√km]        |                    | ≤ 0,1                                    | ≤ 0,2                                        |                                               |                                      |                                      |                                      |
| Fiber compliance                             |                    | ITU-T G.652.D and ITU-T G.657.A1         |                                              |                                               |                                      |                                      |                                      |
| Order No.                                    |                    | 66000072                                 | 66012096                                     | 66012144                                      | 66014144                             | 66014192                             | 66014288                             |

# MiniFlex cable



**66000202**  
Miniflex-2F-2,2



**66000302**  
Miniflex-2F-3,0

The MiniFlex Euroclass cable is a tough and lightweight optical fiber loose tube cable, available with up to 12 optical fibers. At just 2,2 or 3,0 mm outer diameter MiniFlex is a rugged, ultra-flexible drop cable solution for pushing and pulling inside raceways or for fixing directly to building surfaces. By virtue of the MiniFlex grooving technology this ruggedize lightweight fiber cable is ultra flexible whilst resisting the urge to kink like regular fiber cables. No specialist installation tools are required to push/pull MiniFlex through FTTx microducts. When combined with low-friction microducts, the cable can be pushed by hand in long routes.

- UV stabilized
- Ultra tough
- Very lightweight
- Small diameter (3 mm for up to 12 fibers)
- High crush resistance
- Best-is-class push/pull and blowability
- Ultra-flexible, small bend radius for compact slack fiber storage
- Small and unobtrusive enough for surface mount applications
- Tough enough for clipping, tacking and gluing

| Parameter                                        | MiniFlex-1F-2,2    | MiniFlex-2F-2,2 | MiniFlex-4F-2,2 | MiniFlex-1F-3,0 | MiniFlex-2F-3,0 | MiniFlex-4F-3,0 | MiniFlex-6F-3,0 | MiniFlex-8F-3,0 | MiniFlex-12F-3,0 |
|--------------------------------------------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|
| Application                                      | Indoor and outdoor |                 |                 |                 |                 |                 |                 |                 |                  |
| Fiber category                                   | ITU-T G.657 A1     |                 |                 |                 |                 |                 |                 |                 |                  |
| Product type                                     | Dielectric         |                 |                 |                 |                 |                 |                 |                 |                  |
| Fiber coating [µm]                               | 250                |                 |                 |                 |                 |                 |                 |                 |                  |
| EN CPR Rating                                    | Eca                | Eca             | Eca             | Cca             | Cca             | Cca             | Cca             | Cca             | Cca              |
| Outer diameter [mm]                              | 2,2                | 2,2             | 2,2             | 3,0             | 3,0             | 3,0             | 3,0             | 3,0             | 3,0              |
| Fiber count                                      | 1                  | 2               | 4               | 1               | 2               | 4               | 6               | 8               | 12               |
| Max. attenuation [dB/km]                         | ≤ 0,40             |                 |                 |                 |                 |                 |                 |                 |                  |
|                                                  | 1550 nm            |                 |                 |                 |                 |                 |                 |                 |                  |
| Min. bending radius, attenuation at 1550 nm [dB] | ≤ 0,35             |                 |                 |                 |                 |                 |                 |                 |                  |
|                                                  | 10 curves, 15 mm   |                 |                 |                 |                 |                 |                 |                 |                  |
|                                                  | 0,20               |                 |                 |                 |                 |                 |                 |                 |                  |
|                                                  | 1 curve, 10 mm     |                 |                 |                 |                 |                 |                 |                 |                  |
|                                                  | 0,50               |                 |                 |                 |                 |                 |                 |                 |                  |
| Tensile strength [N]                             | 100                |                 |                 |                 |                 |                 |                 |                 |                  |
| Operating temperature range [°C]                 | -40 – +70          |                 |                 |                 |                 |                 |                 |                 |                  |
| Packaging unit [m]                               | 2.000              |                 |                 |                 |                 |                 |                 |                 |                  |
| Order No.                                        | 66000201           | 66000202        | 66000204        | 66000301        | 66000302        | 66000304        | 66000306        | 66000308        | 66000312         |

## Fiber-optic indoor cable



**66000038**  
COR1821-4-Fiber-  
4xG657A2



**66000045**  
FR-Micro-Cable-  
4F-Cca

- These fiber optic cables (COR1821 from ACOME and FR-Micro-Cable-4F from CORNING) have been specially developed for in-house subscriber connection in FTTH networks
- The cables are suitable for cabling in the building and can be e.g. blown or pulled into micro tubes, cable ducts, intermediate floors and hollow walls
- Halogen-free, flame-retardant jacket (LSOH)
- UV resistant
- Lightweight cables with small outer diameter
- Suitable for blowing into distances up to 150 m

| Parameter                          | COR1821-4-Fiber-4xG657A2                           | FR-Micro-Cable-4F-Cca                                                |
|------------------------------------|----------------------------------------------------|----------------------------------------------------------------------|
| Application                        | Indoor                                             |                                                                      |
| Fiber count                        | 4                                                  | 4                                                                    |
| Fiber type                         | Singlemode G.657.A2                                | Singlemode ClearCurve® LBL                                           |
| Product type                       | Dielectric                                         |                                                                      |
| Outer diameter [mm]                | 2,65                                               | 2,4                                                                  |
| Outer jacket thickness [mm]        | 0,5                                                | 0,58                                                                 |
| Outer jacket color                 | Ivory                                              | White                                                                |
| Outer jacket material              | Halogen free, flame retardant (LSOH), UV resistant |                                                                      |
| Tensile strength [N]               | 250                                                | 150                                                                  |
| Crush resistance [N/cm]            | 200                                                | 50                                                                   |
| Minimal bending radius [mm]        | 10                                                 | 40                                                                   |
| Weight [kg/km]                     | 6,50                                               | 7                                                                    |
| Reaction to fire                   | Dca-s2,d2,a2                                       | Cca, s1, d1, a1                                                      |
| Flame propagation test             | IEC 60332-1                                        | IEC 60332-1-2 (single cable) and<br>IEC 60332-3-24 (bunch of cables) |
| Operational temperature range [°C] | -5 – +70                                           | -10 – +60                                                            |
| Max. distance for blowing in [m]   | 150                                                | 150                                                                  |
| Order No.                          | <b>66000038</b>                                    | <b>66000045</b>                                                      |

## Smooth Fiber Units



66000060

ACE-TKF-SFU-6xSM-G.657A1

- TKF's Smooth Fiber Units (SFU) consist of a bundle of fibers encapsulated by a dry acrylic layer
- Protected by a smooth, lightly ribbed polyethylene outer jacket
- For use in the access network
- Suitable for blowing into micro tubes of 3,5 mm or 4,0 mm inner diameter
- Halogen free acc. to EN 60754-1/2

| Parameter                                  | ACE-TKF-SFU-4xSM-G.657A1               | ACE-TKF-SFU-6xSM-G.657A1 | ACE-TKF-SFU-12xSM-G.657A1 |
|--------------------------------------------|----------------------------------------|--------------------------|---------------------------|
| Application                                | Indoor & outdoor                       |                          |                           |
| Fiber count                                | 4                                      | 6                        | 12                        |
| Fiber type                                 | Singlemode 9/125, fiber ITU-T G.657.A1 |                          |                           |
| Core type                                  | Central loose tube                     |                          |                           |
| Product type                               | Dielectric                             |                          |                           |
| Outer diameter [mm]                        | 1,4                                    | 1,4                      | 1,7                       |
| Outer jacket thickness [mm]                | 0,15                                   |                          |                           |
| Outer jacket color                         | Yellow                                 |                          |                           |
| Outer jacket material                      | Polyethylene (PE)                      |                          |                           |
| Tensile strength [N]                       | 20                                     |                          |                           |
| Crush resistance [N/cm]                    | 100                                    |                          |                           |
| Minimal bending radius [mm]                | 40                                     |                          |                           |
| Weight [kg/km]                             | 2                                      |                          |                           |
| Reaction to fire                           | Fca                                    |                          |                           |
| Operating temperature range Ta1 – Tb1 [°C] | -30 – +70                              |                          |                           |
| Operating temperature range Ta2 – Tb2 [°C] | -40 – +70                              |                          |                           |
| Order No.                                  | 66000039                               | 66000060                 | 66000062                  |

### Matching accessories: Fiber Beads

- For Smooth Fiber Units (SFUs) with 2 or 4 fibers
- Applied to the fiber optic cable, these end caps improve blow-in performance and protect the cable
- The fiber bead compensates for unevenness, such as connector transitions, during the blowing process and the cable does not get stuck
- Mounting with crimp tool
- Packing unit 25 pcs
- Material: Brass



Order No. 43022718

# Speedpipes, micro tubes and accessories

Special solutions for indoor or outdoor applications



| Parameter                                                       | LSOH-MDD-1824/X5017A | LSOH-MDD-1824/H0260A | LSOH-MDD-1824/H0261A |
|-----------------------------------------------------------------|----------------------|----------------------|----------------------|
| Application                                                     | Indoor               |                      |                      |
| Incl. needle/string for easy insertion of the fiber optic cable | Yes                  | No                   | Yes                  |
| Standard packaging [m]                                          | 500                  |                      |                      |
| Inner diameter [mm]                                             | 3,5                  | 4                    | 4                    |
| Outer diameter [mm]                                             | 5                    | 7                    | 7                    |
| Weight [kg/km]                                                  | 17,0                 | 40,0                 | 41,0                 |
| Operating temperature range [°C]                                | -15 – +70            | -40 – +70            | -40 – +70            |
| Flame retardant according to                                    | EN 50290-2-27        |                      |                      |
| Color                                                           | Ivory                |                      |                      |
| Minimum bending radius [mm]                                     | 20                   | 15                   | 15                   |
| UV resistant                                                    | Yes                  |                      |                      |
| Producer / brand                                                | ACOME                |                      |                      |
| Order No.                                                       | 42575355             | 42575360             | 42575361             |

| Parameter                               | sp-i-7x1,5                                                  | sp-i-10x2,0 | sp-i-14x2,0 | Speedpipe-ground-7x1,5                                                          | Speedpipe-ground-10x2,0 | Speedpipe-ground-14x2,0 |
|-----------------------------------------|-------------------------------------------------------------|-------------|-------------|---------------------------------------------------------------------------------|-------------------------|-------------------------|
| Application                             | Indoor                                                      |             |             | Outdoor, for direct burial                                                      |                         |                         |
| Standard packaging on drum [m]          | 1.250                                                       | 2.500       | 1.500       | 1.250                                                                           | 2.500                   | 1.500                   |
| Inner diameter [mm]                     | 4                                                           | 6           | 10          | 4                                                                               | 6                       | 10                      |
| Outer diameter [mm]                     | 7                                                           | 10          | 14          | 7                                                                               | 10                      | 14                      |
| Material                                | Polyethylene PE – flame retardant, halogen free & low smoke |             |             | Polyethylene PE-HD – regenerate- and recycle-free                               |                         |                         |
| Weight [kg/km]                          | 30                                                          | 53          | 76          | 30                                                                              | 50                      | 74                      |
| Operating temperature, outdoor [°C]     | not specified                                               |             |             | -40 – +70                                                                       |                         |                         |
| Special features                        | Halogen free acc. to DIN EN 60684-2 < 0,02 %                |             |             | 3 years UV resistant according to DIN EN ISO 4892-1 (Southern European climate) |                         |                         |
| Reaction to fire acc. to DIN EN 13501-1 | D s3 d2                                                     |             |             | E                                                                               |                         |                         |
| Color                                   | White                                                       |             |             | Orange                                                                          | Pink                    | Orange                  |
| Minimum bending radius [mm]             | 70                                                          | 100         | 140         | 70 (guided 65)                                                                  | 100 (guided 65)         | 140 (guided 100)        |
| Producer / brand                        | Gabocom                                                     |             |             |                                                                                 |                         |                         |
| Order No.                               | 42601686                                                    | 42603525    | 42600014    | 42602223                                                                        | 42601340                | 42600214                |

# Indoor speedpipe accessories



## Indoor connectors

- For tension-proof and pressure-tight connection of indoor speedpipes with identical diameters
- Metal-free and transparent base body
- Suitable for injection pressures up to 15 bar
- Flame retardant according to DIN EN 61386-22
- Not suitable for direct burial

| Parameter                    | VF-5                                                    | FDF-5    | DSM-7-indoor | DSM-10-indoor | DSM-14-indoor |
|------------------------------|---------------------------------------------------------|----------|--------------|---------------|---------------|
| For outer tube diameter [mm] | 5                                                       | 5        | 7            | 10            | 14            |
| Packing quantity [pcs]       | 10                                                      | 10       | 50           | 50            | 25            |
| Gas stop                     | No                                                      | Yes      | No           | No            | No            |
| Special features             | For e.g. Hydra cable;<br>Stainless steel clamping teeth |          | –            |               |               |
| Producer / brand             | Emtelle                                                 |          | Gabocom      |               |               |
| Order No.                    | 43022707                                                | 43022708 | 42601220     | 42601221      | 42600102      |

## Indoor end caps

- For permanent, tension-proof and pressure-tight sealing of unoccupied indoor speedpipes
- Metal-free and transparent base body
- Suitable for injection pressures up to 15 bar
- Flame retardant according to DIN EN 61386-22
- Not suitable for direct burial

| Parameter                    | ESKF-5                                                  | EGKF-5   | ES-7-indoor | ES-10-indoor | ES-14-indoor |
|------------------------------|---------------------------------------------------------|----------|-------------|--------------|--------------|
| For outer tube diameter [mm] | 5                                                       | 5        | 7           | 10           | 14           |
| Packing quantity [pcs]       | 250                                                     | 10       | 50          | 50           | 50           |
| Gas stop                     | No                                                      | Yes      | No          | No           | No           |
| Special features             | For e.g. Hydra cable;<br>Stainless steel clamping teeth |          | –           |              |              |
| Producer / brand             | Emtelle                                                 |          | Gabocom     |              |              |
| Order No.                    | 43022705                                                | 43022706 | 42601694    | 42601695     | 42600101     |

## Indoor sealing element „EZA-t-14/6,5-8,0“

- Divisible and reusable sealing element for sealing unoccupied and occupied indoor speedpipes
- Tight against gas and water up to 10 bar
- Suitable for speedpipes with outer diameter 14 mm
- Sealing range cable outer diameter 6,5 – 8,0 mm
- Packing unit 40 pcs.

Order No. 42600103

## Indoor divisible connectors/closures for blowing-in

- Halogen-free, flame retardant, tensile strong and divisible
- For gas- and water-tight connection of occupied speedpipes up to 0,5 bar
- Installation without special tools
- Fire behavior of hard components classified according to DIN EN 13501-1
- Designed for operating temperatures from 0 – 50°C (storage and installation)

| Item          | Tube diameter [mm] | Packing quantity [pcs] | Order No. |
|---------------|--------------------|------------------------|-----------|
| EBM-7-indoor  | 7                  | 12                     | 42601748  |
| EBM-10-indoor | 10                 | 12                     | 42601749  |
| EBM-14-indoor | 14                 | 12                     | 42600104  |

# Outdoor speedpipe accessories



**42465515**  
Miniduct-seal-10/2,9,  
divisible construction



**42465515**  
Miniduct-seal-10/2,9,  
installed

## Outdoor connectors

- Connector for pressure-tight connection of speedpipes with the same or different outer diameter
- Quick and easy assembly, easy disassembly with release ring
- Particularly resistant to external influences and contamination with direct burial

| Parameter                   | VF-4     | VF-7     | RVF-4-7  | DSM-7    | DSM-10   | DSM-14   | DSM-16   | RSM-16/14 | RSM-14/12 | RSM-10/7 | RSM-7/5  |
|-----------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|-----------|----------|----------|
| Outer diameter, tube 1 [mm] | 4        | 7        | 7        | 7        | 10       | 14       | 16       | 16        | 14        | 10       | 7        |
| Outer diameter, tube 2 [mm] | 4        | 7        | 4        | 7        | 10       | 14       | 16       | 14        | 12        | 7        | 5        |
| Packing quantity [pcs]      | 10       | 10       | 10       | 50       | 50       | 25       | 25       | 25        | 25        | 25       | 25       |
| Operating pressure [bar]    | 16       |          |          | 15       |          |          |          |           |           |          |          |
| Producer / brand            | Emtelle  |          |          | Gabocom  |          |          |          |           |           |          |          |
| Order No.                   | 43022650 | 43022712 | 43022651 | 42602397 | 42602398 | 42600302 | 42602276 | 42602281  | 42602280  | 42602278 | 42601456 |

## Outdoor end caps

- Gas- and watertight sealing of speedpipes up to 0,5 bar
- High tensile strength with easy assembly
- Removal possible with retaining ring
- Suitable for buried installation

| Item  | Tube diameter [mm] | Packing quantity [pcs] | Order No. |
|-------|--------------------|------------------------|-----------|
| ES-7  | 7                  | 50                     | 42602400  |
| ES-10 | 10                 | 50                     | 42602401  |
| ES-14 | 14                 | 25                     | 42600301  |

## Outdoor fiber feed through

- Fittings to create a water- and gas-tight connection and seal between the speedpipe and the cable
- Subsequent release is possible by pressing the collet chuck
- With gas stop – sealing against gas (permanently): 0,3 bar

| Item          | Tube diameter [mm] | Cable diameter [mm] | Qty. [pcs] | Order No. |
|---------------|--------------------|---------------------|------------|-----------|
| FD7-7/1,0-1,6 | 7                  | 1,0 – 1,6           | 10         | 43022713  |
| FD7-7/1,8-2,4 | 7                  | 1,8 – 2,4           | 10         | 43022714  |
| FD7-7/2,5-3,0 | 7                  | 2,5 – 3,0           | 10         | 43022715  |

## Outdoor sealing elements

- Split design, therefore possibility of subsequent installation
- Slim design for use in distribution cabinets, closed or wall boxes
- Gas and water tight up to 0,5 bar

| Item                  | Tube diameter [mm] | Cable diameter [mm] | Qty. [pcs] | Order No. |
|-----------------------|--------------------|---------------------|------------|-----------|
| Miniduct-seal-7/0,9   | 7                  | 0,8 – 1,1           | 100        | 42463557  |
| Miniduct-seal-7/1,25  | 7                  | 1,2 – 1,5           | 100        | 42465572  |
| Miniduct-seal-7/1,6   | 7                  | 1,8 – 1,8           | 100        | 42465573  |
| Miniduct-seal-7/2,1   | 7                  | 1,9 – 2,2           | 100        | 42465575  |
| Miniduct-seal-7/2,5   | 7                  | 2,3 – 3,0           | 100        | 42465574  |
| Miniduct-seal-10/0,9  | 10                 | 0,8 – 1,1           | 100        | 42465510  |
| Miniduct-seal-10/1,25 | 10                 | 1,2 – 1,5           | 100        | 42465511  |
| Miniduct-seal-10/1,6  | 10                 | 1,6 – 1,9           | 100        | 42465512  |
| Miniduct-seal-10/2,1  | 10                 | 2,0 – 2,3           | 100        | 42465513  |
| Miniduct-seal-10/2,5  | 10                 | 2,4 – 2,7           | 100        | 42465514  |
| Miniduct-seal-10/2,9  | 10                 | 2,8 – 3,1           | 100        | 42465515  |
| Miniduct-seal-10/3,3  | 10                 | 3,2 – 3,6           | 100        | 42465516  |
| Miniduct-seal-10/3,8  | 10                 | 3,7 – 4,0           | 100        | 42465517  |
| EZA-t-14/6,5-8,0      | 14                 | 6,5 – 8,0           | 40         | 42600303  |

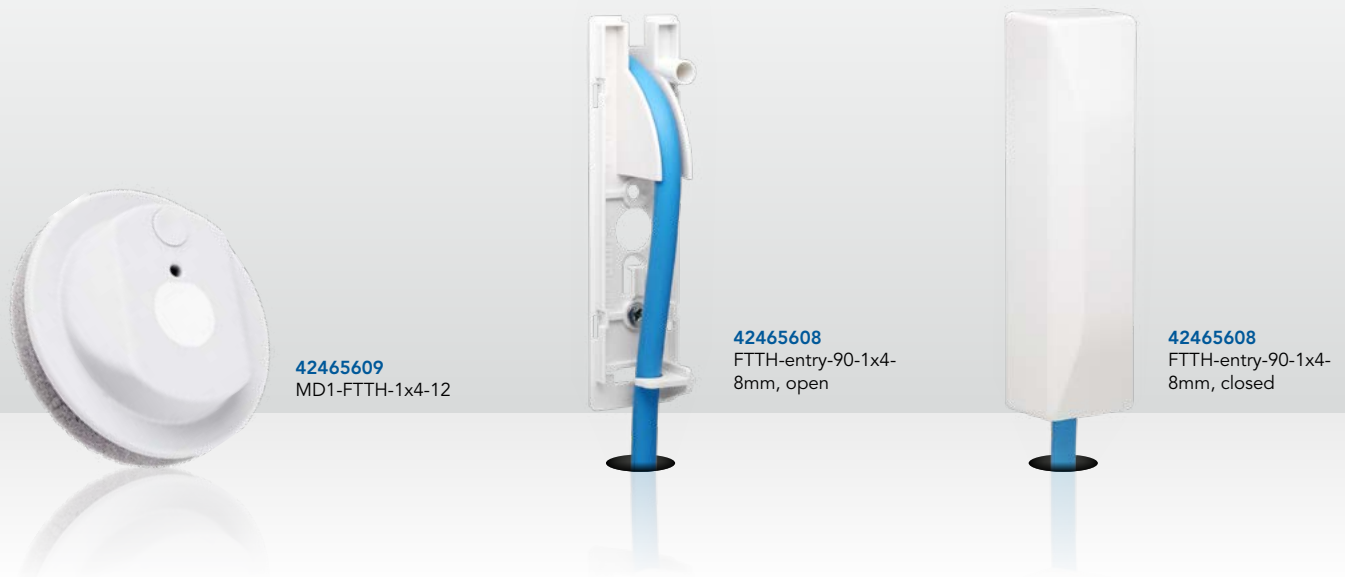
## Outdoor divisible connectors/closures for blowing-in

- For permanent connection of occupied speedpipes up to 0,5 bar, gas- and water-tight for 30 minutes up to 10 bar
- Installation without special tools

| Item   | Tube diameter [mm] | Packing quantity [pcs] | Order No. |
|--------|--------------------|------------------------|-----------|
| EBM-7  | 7                  | 12                     | 42610753  |
| EBM-10 | 10                 | 12                     | 42610786  |
| EBM-14 | 14                 | 12                     | 42600304  |

# House infeeds

## Home entries for FTTH connections



### FTTH single wall feedthrough

- Gas and watertight house entry for speedpipes and cables up to 2 bar
- Quick and easy installation without special tools
- No complex core drilling necessary
- Also suitable for angled feedthroughs
- For all common types of masonry with waterproofing according to DIN 18533 - Water penetration class W1-E and W2-E

| Parameter                                             | MD1-FttH-1x4-12 | MD1-FttH-1x14-20 |
|-------------------------------------------------------|-----------------|------------------|
| Diameter speedpipe/cable [mm]                         | 4 – 12          | 14 – 20          |
| Diameter drilling [mm]                                | 16 – 20         | 32 – 40          |
| Dimensions closure cap / inner diabeler / height [mm] | 106 / 72 / 24   |                  |
| Start of expansion [seconds]                          | 20              |                  |
| End of expansion [minutes]                            | 2               |                  |
| Curing time [minutes]                                 | 5               |                  |
| Pressure load capacity [N/cm²]                        | > 60            |                  |
| Density [kg/m³]                                       | > 50            |                  |
| Gas tight [bar]                                       | ≥ 2             |                  |
| Pull-out resistance tube/cable [N]                    | > 400           |                  |
| Order No.                                             | 42465609        | 42465610         |

### 90° FTTH infeeds

- Above-ground house entry as a visual cover for the tube entry into the building
- Integrated bending radius for safe deflection of speedpipes and cables
- Genügend Raum, um bspw. Gasblocker unterzubringen
- Sealing compound type MD+ included in the scope of delivery
- Material PC/ASA, flame retardant
- UV and weather resistant, suitable for outdoor use

| Parameter                                            | FTTH-entry-90-1x4-8mm                               | FTTH-entry-90-1x10-12/2x7mm                        |
|------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------|
| Diameter speedpipe/cable [mm]                        | 4 – 8                                               | 10 – 12                                            |
| Diameter drilling [mm]                               | 10 – 25                                             | 22 – 32                                            |
| Dimensions L x W x H [mm]                            | 120 x 45 x 28                                       | 160 x 40 x 40                                      |
| Density of the sealing compound [g/cm³]              | 1,2                                                 |                                                    |
| Pull-out resistance tube/cable, sealing compound [N] | ≥ 1.000                                             |                                                    |
| Hardening of the sealant [mm/24 hours]               | 3                                                   |                                                    |
| Scope of delivery                                    | 25 infeeds & 1 cartridge<br>sealing compound 310 ml | 6 infeeds & 1 cartridge<br>sealing compound 310 ml |
| Order No.                                            | 42465608                                            | 42465611                                           |

### Matching accessory: 90° speedpipe branching aids

- For guided branching of speedpipes at an angle of 90°
- Can be optionally equipped with a marking ball to facilitate later location of the branch
- Material: Acrylnitrile-Butadien-Styrole ABS

| Item | Form   | Bending radius [mm] | Dimensions L x W x H [mm] | Packing quantity [pcs] | Order No. |
|------|--------|---------------------|---------------------------|------------------------|-----------|
| LBS  | L form | 175                 | 282 x 282 x 30            | 12                     | 42602330  |
| TBS  | T form | 175                 | 495 x 300 x 30            | 12                     | 42602423  |

# Patch cords

WAVEPACE® simplex patch cords with SM G.657.A2 fiber



**10448403**  
OPC-2,0-3-LC/APC-LC/APC



| Parameter                                                  | OPC-2,0-x-SC/APC-SC/APC               | OPC-2,0-x-LC/APC-SC/APC             | OPC-2,0-x-LC/APC-LC/APC | OPC-2,8-x-SC/APC-SC/APC | OPC-2,8-x-LC/APC-SC/APC             | OPC-2,8-x-LC/APC-LC/APC |
|------------------------------------------------------------|---------------------------------------|-------------------------------------|-------------------------|-------------------------|-------------------------------------|-------------------------|
| Patch cord type                                            | Simplex LSZH fiber optic patch cord   |                                     |                         |                         |                                     |                         |
| Cable color                                                | white                                 |                                     |                         | yellow                  |                                     |                         |
| Cable diameter [mm]                                        | 2,0                                   |                                     |                         | 2,8                     |                                     |                         |
| Max. tensile strength, short-term [N]                      | 150                                   |                                     |                         | 240                     |                                     |                         |
| Min. bending radius, static [mm]                           | 7,5                                   |                                     |                         |                         |                                     |                         |
| Max. crush resistance per 100 mm, short-term [N]           | 1.000                                 |                                     |                         |                         |                                     |                         |
| Flame retardancy rating                                    | CPR Dca                               |                                     |                         |                         |                                     |                         |
| Insertion loss [dB]                                        | ≤ 0,25                                |                                     |                         |                         |                                     |                         |
| Return loss [dB]                                           | > 65 (plunged)                        |                                     |                         |                         |                                     |                         |
| Fiber type                                                 | SM G.657.A2                           |                                     |                         |                         |                                     |                         |
| Operation, installation and storage temperature range [°C] | -20 – 70                              |                                     |                         |                         |                                     |                         |
| Compliances                                                | RoHS 3 (2015/863), REACH and UL94 V-0 |                                     |                         |                         |                                     |                         |
| Connectors                                                 | 2 x SC/APC, 8°, Grade B               | 1 x LC/APC, 1 x SC/APC, 8°, Grade B | 2 x LC/APC, 8°, Grade B | 2 x SC/APC, 8°, Grade B | 1 x LC/APC, 1 x SC/APC, 8°, Grade B | 2 x LC/APC, 8°, Grade B |
| Order No. 1,0 m                                            | 10448001                              | 10448201                            | 10448401                | 10448101                | 10448301                            | 10448501                |
| Order No. 2,0 m                                            | 10448002                              | 10448202                            | 10448402                | 10448102                | 10448302                            | 10448502                |
| Order No. 3,0 m                                            | 10448003                              | 10448203                            | 10448403                | 10448103                | 10448303                            | 10448503                |
| Order No. 5,0 m                                            | 10448005                              | 10448205                            | 10448405                | 10448105                | 10448305                            | 10448505                |
| Order No. 10,0 m                                           | 10448010                              | 10448210                            | 10448410                | 10448110                | 10448310                            | 10448510                |

Different connector types, combinations and/or cable colors available on request.

## High-quality fiber optic patch cords ensure your network operation

The WAVEPACE® fiber optic patch cables are the link between the active technology and the distribution network. These cables are used in many places in the network, such as:

- In the Central Office
- At the Point of Presence (PoP) at highest packing densities
- In outdoor distribution cabinets, like multifunctional or point to multipoint cabinets
- To connect the end customer as part of an FTTH rollout
- In data center environments

The patch cords must therefore always meet the highest requirements, both today and in the future.

The operationally reliable installation during initial connection as well as subsequent service and switching work must be possible safely and trouble-free by all installers, regardless of their level of experience.

The WAVEPACE® high-end patch cords with diameters of 2,0 or 2,8 mm use the most advanced fibers in accordance with the G.657.A2 standard and are assembled with high-quality Grade B connectors. Before delivery, the patch cords are 100% cleaned, tested and individually packaged in the factory.

# WAVEPACE® armored patchcords with SM G.657.A2 fiber



**10445150**  
OJS-5,0-SC/APC-SC/APC



| Parameter                   | OJS-xx-SC/APC-SC/APC                                           | OJS-xx-LC/APC-SC/APC                | OJS-xx-LC/APC-LC/APC    |
|-----------------------------|----------------------------------------------------------------|-------------------------------------|-------------------------|
| Patch cord type             | Simplex LSZH steel armored customer premises fiber patch cable |                                     |                         |
| Cable color                 | White                                                          |                                     |                         |
| Cable diameter [mm]         | 3,0                                                            |                                     |                         |
| Minimum bending radius [mm] | 30                                                             |                                     |                         |
| Insertion loss [dB]         | ≤ 0,25                                                         |                                     |                         |
| Return loss [dB]            | > 65                                                           |                                     |                         |
| Fiber type                  | SM G657.A2                                                     |                                     |                         |
| Connectors                  | 2 x SC/APC, 8°, Grade B                                        | 1 x LC/APC, 1 x SC/APC, 8°, Grade B | 2 x LC/APC, 8°, Grade B |
| Order No. 1,0 m             | 10445110                                                       | 10445220                            | 10445260                |
| Order No. 1,5 m             | 10445115                                                       | 10445225                            | 10445265                |
| Order No. 3,0 m             | 10445130                                                       | 10445230                            | 10445270                |
| Order No. 5,0 m             | 10445150                                                       | 10445250                            | 10445275                |

Different connector types, combinations and/or cable colors available on request.

## Undercutting the bending radius is a thing of the past!

Today, many service calls within FTTH networks find its source in the customer in-home network. Experience teaches us, that, apart from unpowered CPEs, in most occasions the fiber patch cord connecting the passive FTU with the fiber CPE is causing the service call.

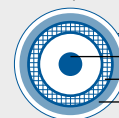
Everything goes well with the installation, until the time the customer decides to "re-wind" the patch cords with overlength. Most of the time, the customer does not take the patch cord's minimal bending radius into account, and in some cases undercutting the bending radius even causes the fiber to break.

To overcome unnecessary and costly service calls and truck rolls, braun teleCom has designed an **LSZH steel armored patch cord** so robust that bending radius issues or broken fiber cords are things of the past.

During development we learned, that stiff white-colored patch cords, looking like standard RF flyleads, are treated with more care by the customer than the standard yellow ones. For the customer it is more easier to determine that this patch cable is part of the internet and TV services network.

These high-end subscriber patch cables are equipped with high-quality grade B connectors by default, and are 100 % cleaned and tested before leaving our production facility. On request, the patch cords can be delivered with individual labeling, defined by the operator (MOQ 500 pcs).

**No more unnecessary and costly truck rolls due to broken fibers!**



Outer sheath (white)  
Tight buffer  
Aramid yarn  
Steel armored



Undercutting of the patch cord's bending radius by the customer leads to **unnecessary service calls and broken fibers**.



With our new **high-quality armored patch cords**, costly truck rolls are a thing of the past!

# Pigtails

Singlemode pigtails with LC/APC or SC-APC connector



**10448903**  
OP-LC/APC-bl, 10 Stk.

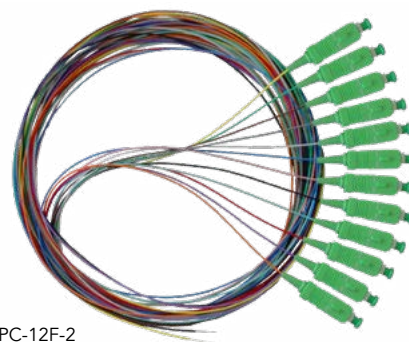


| Parameter                                   | OP-LC/APC-xx                                                                                                                                                                                                                                                                                |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application                                 | Single-fiber singlemode pigtail with LC/APC connector and DIN color code for use in connection and termination components, indoor and outdoor                                                                                                                                               |
| Fiber type                                  | G.657.A1                                                                                                                                                                                                                                                                                    |
| Fiber construction                          | Ø 9 / 125 / 250 µm; fiber dyed through                                                                                                                                                                                                                                                      |
| Core construction                           | LSZH loose tube fiber Ø 900 µm; (Maxi Strip)                                                                                                                                                                                                                                                |
| Color code                                  | DIN (IEC 60304), available in 12 colors                                                                                                                                                                                                                                                     |
| Length [m]                                  | 2,0 m                                                                                                                                                                                                                                                                                       |
| Ferrule material                            | Cylindrical ceramic ferrule (zirconia dioxide ferrule / ZrO2)                                                                                                                                                                                                                               |
| Connector pin spring                        | Corrosion resistant springs with spring ends put on and smoothed                                                                                                                                                                                                                            |
| Connector quality                           | Classification according to DIN EN IEC 61753-1:2019-10<br>Grade B / Class B with IL: typ. ≤ 0,12 dB, max. ≤ 0,25 dB<br>(Measurement of the attenuation of randomly mated connectors according to IEC 61300-3-34)                                                                            |
| Attenuation class                           | Classification according to DIN EN IEC 61753-1: 2019-10:<br>Stage 1 with RL: typ. > 65 dB (required standard: ≥ 60 dB plugged), min ≥ 60 dB (required standard: ≥ 55 dB unplugged)<br>(Measurement of the attenuation of randomly mated connectors and adapters according to IEC 61300-3-6) |
| Return loss class                           | Limiting dimensions of the connector surface according to DIN EN 61755-1<br>Optical interfaces of fiber optic connectors – part 1: Optical interfaces of non-dispersion shifted single mode fibers –<br>General and guideline (IEC 61755-1:2005)                                            |
| Optical interfaces                          | Fulfillment of requirements according to DIN EN IEC 61753-1 with test method and test severity according to IEC 61300                                                                                                                                                                       |
| Mechanical properties                       | 1.000 mating cycles (required standard: 200 cycles)                                                                                                                                                                                                                                         |
| Mechanical lifespan                         | Compatible with LC/APC adapters IEC 61753;<br>Can be used with approved crimp, heat shrink, mini HS and mechanical splice protection elements                                                                                                                                               |
| Compatibility                               | Min. 5 N acc. to IEC 61300-2-4                                                                                                                                                                                                                                                              |
| Tensile strength                            | -40 – +70                                                                                                                                                                                                                                                                                   |
| Temperature range, storage & transport [°C] | -25 – +70                                                                                                                                                                                                                                                                                   |
| Temperature range, operation [°C]           | 10                                                                                                                                                                                                                                                                                          |
| Packing quantity [pieces]                   | Red: 10448901      Green: 10448902      Blue: 10448903      Yellow: 10448904<br>White: 10448905      Gray: 10448906      Brown: 10448907      Violet: 10448908<br>Turquoise: 10448909      Black: 10448910      Orange: 10448911      Pink: 10448912                                        |
| Order No.                                   |                                                                                                                                                                                                                                                                                             |

We are happy to also provide the pigtails listed above with SC/APC connectors!

## 12 pc pigtail sets

| Item                     | Description                                                                                                       | Order No. |
|--------------------------|-------------------------------------------------------------------------------------------------------------------|-----------|
| Pigtail-set-LC/APC-12F-2 | Pigtail set LC/APC, 12 colors acc. to DIN color code, SM at G.657.A1 fiber, length 2 m, 900 µm, connector grade B | 10445938  |
| Pigtail-set-SC/APC-12F-2 | Pigtail set SC/APC, 12 colors acc. to DIN color code, SM at G.657.A1 fiber, length 2 m, 900 µm, connector grade B | 10445936  |
| OPT-2-LC/APC-E9U-TB3     | Pigtail set LC/APC, 12 colors acc. to DIN color code, SSF-28 Ultra TB3 fiber, length 2 m, 900 µm, LSZH            | 10445952  |
| OPT-2-SC/APC-E9U-TB3     | Pigtail set SC/APC, 12 colors acc. to DIN color code, SSF-28 Ultra TB3 fiber, length 2 m, 900 µm, LSZH            | 10445962  |



**10445936**  
Pigtail-set-SC/APC-12F-2

# Adapters and attenuators

Optical adapters and attenuators, SC/APC and LC/APC



**10444000**  
OAD-SSA-P



**10444500**  
OAD-LCA-P



**10442110**  
OATC-10-All-Band-Window-SC/APC

## Optical adapters

- Very low through loss
- High-precision alignment and stability
- Qualified according Telcordia standard
- Versions available with and without flange or laser shutter

| Parameter                                 | SC/APC-Simplex-Adapter | SC/APC-Simplex-Adapter-Shutter | OAD-SSA-P-(SC/APC-plastic) | SC/APC-Duplex Adapter | LC/APC-Duplex Adapter | LC/APC-Duplex-Adapter-Flange | LC/APC-Duplex-Adapter-Shutter | OAD-LCA-P-(LC/APC-plastic) | LC/APC-Quad-Adapter | OAD-E2000-P |
|-------------------------------------------|------------------------|--------------------------------|----------------------------|-----------------------|-----------------------|------------------------------|-------------------------------|----------------------------|---------------------|-------------|
| Type                                      | SC/APC Simplex         |                                |                            | SC/APC Duplex         | LC/APC Duplex         |                              |                               |                            | LC/APC Quad         | E2000       |
| Hook color code                           | Green                  |                                |                            |                       |                       |                              |                               |                            |                     |             |
| Through loss [dB max.]                    | 0,2                    |                                |                            |                       |                       |                              |                               |                            |                     |             |
| Sleeve material                           | ZrO2 (Zirkonia)        |                                |                            |                       |                       |                              |                               |                            |                     |             |
| Body material                             | Plastic                |                                |                            |                       |                       |                              |                               |                            |                     |             |
| 3 mm flange                               | No                     | No                             | Yes                        | No                    | No                    | Yes                          | No                            | Yes                        | No                  | Yes         |
| Laser shutter                             | No                     | Yes                            | No                         | No                    | No                    | No                           | Yes                           | No                         | No                  | No          |
| Temperature range, operation [°C]         | -25 – +70              |                                |                            |                       |                       |                              |                               |                            |                     |             |
| Temperature range, transport/storage [°C] | -40 – +70              | -40 – +70                      | -40 – +85                  | -40 – +70             | -40 – +70             | -40 – +70                    | -40 – +70                     | -40 – +85                  | -40 – +70           | -40 – +85   |
| Order No.                                 | 10444006               | 10444011                       | 10444000                   | 10444017              | 10444007              | 10444014                     | 10444012                      | 10444500                   | 10444009            | 10444604    |

## Blind cap SC simplex black

SC blind cap for capping the cavities at a 19" front panel

Order No. 10443441

## LC/APC loop back connector

LC/APC duplex loop back connector module with A-B port labeling at the housing; housing color black, dimensions: (L x W x H) 50,9 x 14,4 x 12,0 mm

Order No. 10444055

## Optical attenuators (male-female-type)

- Precise attenuation values
- Excellent uniformity
- Very high return loss
- Highly reliable and stable
- All-band window

| Parameter                        | OATC-10-All-Band-Window-SC/APC | OATC-20-All-Band-Window-SC/APC | OATC-10-All-Band-Window-E2000/APC | OATC-20-All-Band-Window-E2000/APC | OATC-10-All-Band-Window-LC/APC | OATC-20-All-Band-Window-LC/APC |
|----------------------------------|--------------------------------|--------------------------------|-----------------------------------|-----------------------------------|--------------------------------|--------------------------------|
| Central wavelength [nm]          | 1260 ... 1650                  | 1260 ... 1650                  | 1260 ... 1650                     | 1260 ... 1650                     | 1260 ... 1650                  | 1260 ... 1650                  |
| Attenuation tolerance [%]        | ± 10                           | ± 10                           | ± 10                              | ± 10                              | ± 10                           | ± 10                           |
| Operating temperature range [°C] | - 40 ... +75                   | - 40 ... +75                   | - 40 ... +75                      | - 40 ... +75                      | - 40 ... +75                   | - 40 ... +75                   |
| Attenuation values [dB]          | 10                             | 20                             | 10                                | 20                                | 10                             | 20                             |
| Connector                        | SC/APC                         | SC/APC                         | E2000/APC                         | E2000                             | LC/APC                         | LC/APC                         |
| Order No.                        | 10442110                       | 10442120                       | 10442210                          | 10442220                          | 10442310                       | 10442320                       |

If you wish to order adapters with other attenuation values (1 ... 20 dB):

**Please replace the last two digits of the Order No. as well as the specification within the item name with an attenuation value of your choice!**

# Termination boxes for buildings

## WAVEPACE® MDU splice patch wallbox



**10418990**  
WAVEPACE® MDU-Wallbox-SP-24

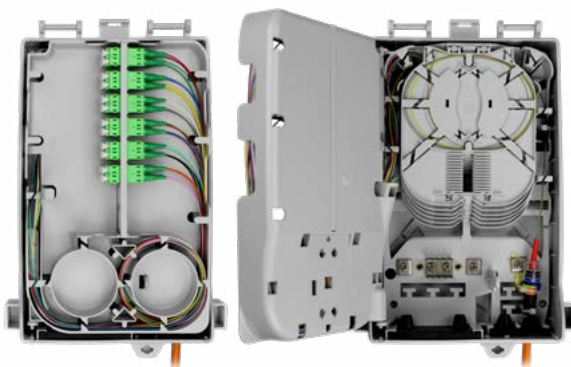


- Wallbox suitable for open access for the network level 3 indoor-termination as well as the connection of single dwelling units
- Robust and compact design
- 3-part modular design, consisting of housing, fiber module and cover; all components can be installed independently of each other
- Fiber module with pivoting patch panel, pull-out adapter holder, splice tray system, fiber management and cable feeds/outlets
- Designed for 48 LC/APC or 24 SC/APC ports and pigtails by means of exchangeable adapter holders
- 6 hinged splice trays with each 12 fibers and a maximum capacity of 72 fibers using optional crimp or heat shrink splice protection elements
- Integrated management for fibers and wires
- Cable feed for cables and cable protection tubes up to Ø 16 mm
- 10 mm entries for optional loop-function of the feeder cable
- 24 outlets with 5 mm diameter for cables or protection tubes for indoor installation
- Storage of up to 4 m slack at the bottom of the fiber module for wires/cables with 2,8 mm diameter
- Cover lock using latch and additional sealing option
- Prepared for a modern identification and access control system based on NFC standard RFID tag acc. to ISO-IEC 14443A on request

| Parameter                                        | applies to all Wallbox models on the right |
|--------------------------------------------------|--------------------------------------------|
| Application                                      | Splice/patch                               |
| Dimensions (L x W x D) [mm]                      | 250 x 170 x 90                             |
| Protection class                                 | IP55/IK08                                  |
| Flammability                                     | UL94-V0                                    |
| Material                                         | Polycarbonate                              |
| Color                                            | Grey, RAL 7035                             |
| Mounting options                                 | Wall/pole                                  |
| Feed and outlet options                          | 2 x Ø 16 mm, 2 x Ø 10 mm, 24 x Ø 5 mm      |
| Cable feed                                       | Bottom                                     |
| Use of cable and protection tube for blown fiber | Yes                                        |
| Aperture angle removable cover                   | 180°                                       |
| Pivot angle patch panel                          | 120°                                       |
| Angle of the hinged splice tray                  | 70°                                        |

| Item                           | Interface                          | Splice capacity                     | Special features               | Order No. |
|--------------------------------|------------------------------------|-------------------------------------|--------------------------------|-----------|
| MDU-Wallbox-SP-empty-Crimp     | Patch frame for LC and SC adapters | 6 splice trays for 12 x crimp       | Depending on splice tray       | 10418990  |
| MDU-Wallbox-SP-empty-HS        | Patch frame for LC and SC adapters | 6 splice trays for 12 x heat shrink | Depending on splice tray       | 10418995  |
| MDU-Wallbox-SP-24-SC/APC-Crimp | 24 x SC/APC ports & pigtails       | 6 splice trays for 12 x crimp       | Splitter access at splice tray | 10419022  |
| MDU-Wallbox-SP-8-LC/APC-Crimp  | 8 x LC/APC ports & pigtails        |                                     |                                | 10419040  |
| MDU-Wallbox-SP-12-LC/APC-Crimp | 12 x LC/APC ports & pigtails       |                                     |                                | 10419036  |
| MDU-Wallbox-SP-16-LC/APC-Crimp | 16 x LC/APC ports & pigtails       |                                     |                                | 10419046  |
| MDU-Wallbox-SP-24-LC/APC-Crimp | 24 x LC/APC ports & pigtails       |                                     |                                | 10419026  |
| MDU-Wallbox-SP-24-SC/APC-HS    | 24 x SC/APC ports & pigtails       | 6 splice trays for 12 x heat shrink | -                              | 10419024  |
| MDU-Wallbox-SP-24-LC/APC-HS    | 24 x LC/APC ports & pigtails       |                                     |                                | 10419028  |

We are happy to also provide the WAVEPACE® MDU wall boxes with different connector versions pre-installed PLC splitters!



### Accessories

| Item                   | Description                                                                                              | Order No. |
|------------------------|----------------------------------------------------------------------------------------------------------|-----------|
| Adapter-LC/APC-Duplex  | Duplex adapter LC/APC with ceramic sleeve, without flange                                                | 10444007  |
| Adapter-LC/APC-Quad    | Quad adapter LC/APC with ceramic sleeve, without flange                                                  | 10444009  |
| Adapter-SC/APC         | Simplex adapter SC/APC with ceramic sleeve, without flange                                               | 10444006  |
| Pigtail-set-LC/APC-12  | Pigtail set with 12 fibers LC/APC, SM at G.657.A1 fiber, length 2 m, DIN (IEC60304) color coding, 900 µm | 10445938  |
| Pigtail-set-SC/APC-12  | Pigtail set with 12 fibers SC/APC, SM at G.657.A1 fiber, length 2 m, DIN (IEC60304) color coding, 900 µm | 10445936  |
| Splice-tray-kit-HS-12F | Kit, containing 6 splice trays with holder for heat-shrink splice protection for 12 fibers each          | 10443958  |

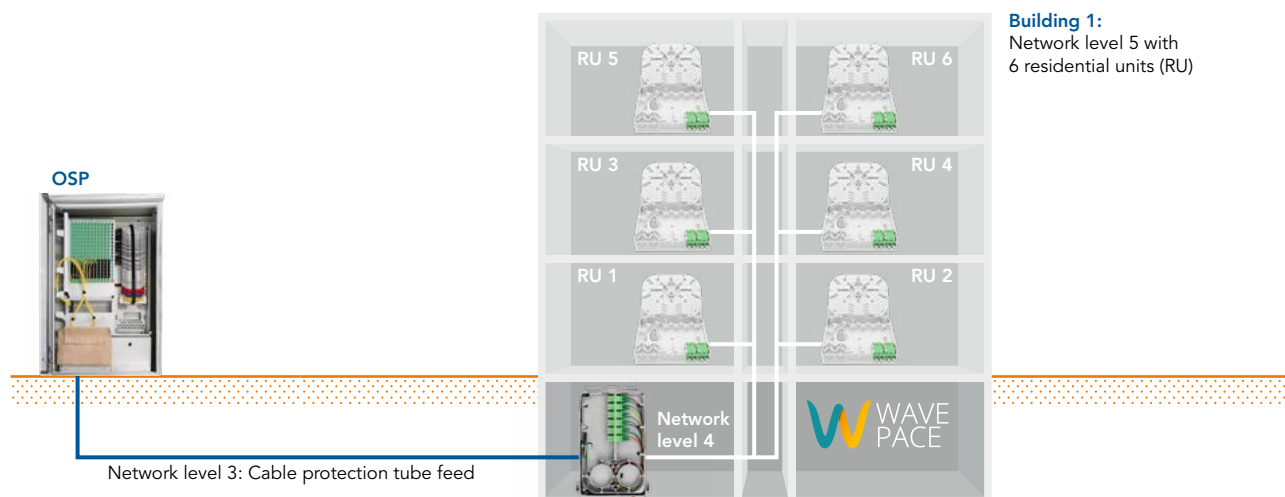
# Application examples of the WAVEPACE® MDU wallbox

## Connection of a building, supply of 6 residential units with 4 fibers each

From the OSP cabinet (e. g. the WAVEPACE® Fiber-Cabinet-P2MP), the corresponding fibers will, for example, be routed into the utility room of the building (network level 4). At that location, the WAVEPACE® MDU-Wallbox-SP-24 is already pre-assembled: 4 fibers for each residential unit are spliced from the WAVEPACE® FTTH-WO-4F (a customer premise fiber junction box for 4 fibers) onto the pigtails of the distribution area in an individual splice tray per residential unit.

In the MDU-Wallbox, the fibers from the incoming cable of the OSP-cabinet are now being spliced onto the pigtails of the feeder cable in accordance to the network planning. For example, this can be each one fiber for IP service and one fiber for CATV.

The 2 unused, remaining ports of the subscriber in the residential unit are available for other services or a second network operator. Testing and switching can be easy done via the connector interface.



## Connection of 2 buildings using Loop function, supply of 6 residential units with 4 fibers

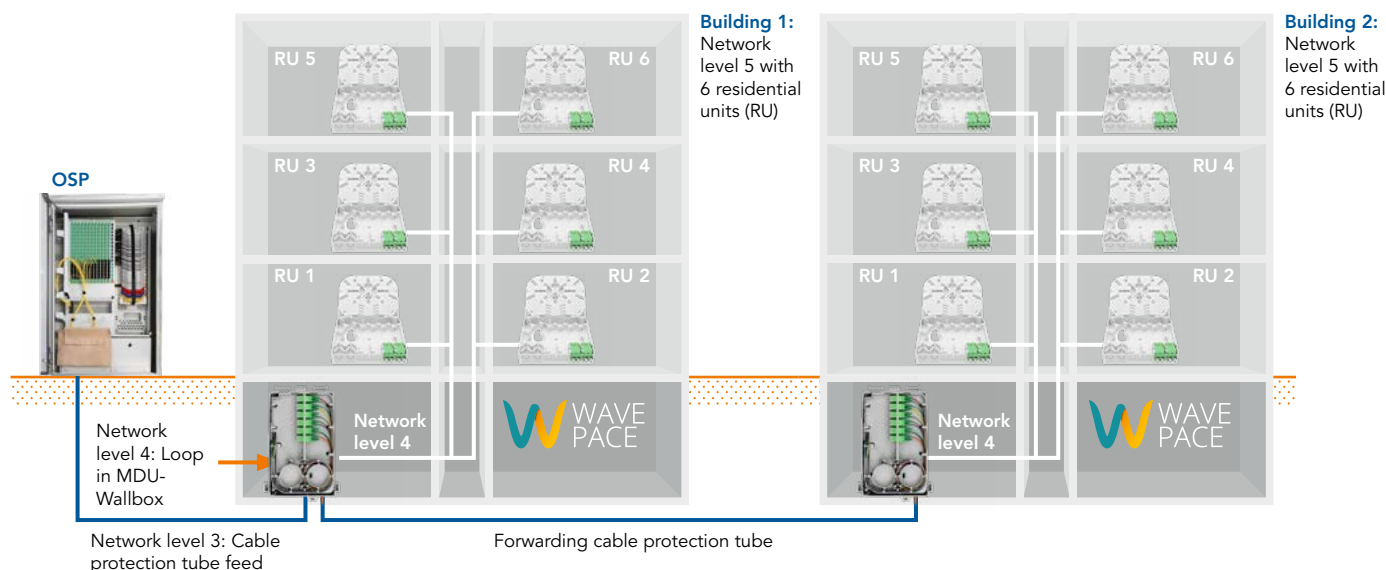
From the OSP cabinet (e. g. the WAVEPACE® Fiber-Cabinet-P2MP), the corresponding fibers will, for example, be blown into the first building, and are from there being forwarded into the cable protection tube to the next building. During this process, the required loop length will be stored. By a window-cut the cable shall be stripped at the required length and the appropriate buffer tube with the fibers get separated.

For further installation, the fiber module will be taken out of the MDU-Wallbox and the prepared cable will be inserted via the cable feed to perform the loop into the module. The pursuing wires can be stored at the storage area at the bottom of the module. The incoming and forwarded cable

protection tube gets terminated at the module, using the installed gas-water seals. Subsequently, the module is re-installed into the wallbox housing.

In the next step, the fibers can be spliced onto the pigtails of the feeder cable according to the network planning. The fibers from the individual residential units can be routed to the wallbox and spliced onto the pigtails of the subscriber part.

In the second building, the continued cable is to be connected to the respective WAVEPACE® MDU-Wallbox-SP accordingly.



# WAVEPACE® MDU splice patch wallbox XL



MDU-XL-Wallbox  
closed



- FTTH wall box for indoor and outdoor application
- To be used for network level 3 indoor-termination and in-house distribution
- Robust and compact design
- 2-part modular design, consisting of housing with foldable cover and removeable fiber module including cable feed and clamp
- Accommodates up to 18 LC quad or SC duplex adapters; a patch frame for 48 SC simplex adapters is available optionally
- Very high splicing capacity with 144 fibers in 2 splice blocks, each with 6 splice trays
- Crimp splice trays with integrated splice holder; heat shrink version available upon request
- Fiber module with cable management at the hinged patch area and underneath for fiber routing, for splicing and loop function
- Handling separation through parallel construction for e.g. network level 3 and 4 termination through practical fiber and cable routing
- Locking system

| Parameter                   | MDU-XL-Wallbox-SP-72-Crimp-empty                     | MDU-XL-Wallbox-SP-72-HS-empty | MDU-XL-Wallbox-SP-72-LC/APC-72-Crimp               | MDU-XL-Wallbox-SP-72-SC/APC-48-Crimp               | MDU-XL-Wallbox-SP-72-SC/APC-48-HS |
|-----------------------------|------------------------------------------------------|-------------------------------|----------------------------------------------------|----------------------------------------------------|-----------------------------------|
| Splice protection holder    | Crimp                                                | Heat shrink                   | Crimp                                              | Crimp                                              | Heat shrink                       |
| Design                      | Empty                                                |                               | Pre-installed with 72 LC/APC ports and 72 pigtails | Pre-installed with 48 SC/APC ports and 48 pigtails |                                   |
| Capacity                    | 72 ports LC (36 SC*) / 144 splices                   |                               | 18 quad adapters LC/APC & 144 splices              | 48 simplex adapters SC/APC & 144 splices           |                                   |
| Feed and outlet options     | 2 x (24 x 7 mm) & 2 x 14 mm, with loop functionality |                               |                                                    |                                                    |                                   |
| Cable feed                  | Bottom with innovative cable/tube interception       |                               |                                                    |                                                    |                                   |
| Connector quality           | –                                                    |                               | Grade B                                            |                                                    |                                   |
| Fiber type                  | –                                                    |                               | G.657.A1                                           |                                                    |                                   |
| Dimensions (H x W x D) [mm] | 360 x 260 x 133                                      |                               |                                                    |                                                    |                                   |
| Protection class            | IP 56 / IK 10                                        |                               |                                                    |                                                    |                                   |
| Color                       | Gray                                                 |                               |                                                    |                                                    |                                   |
| Order No.                   | 10419080                                             | 10419081                      | 10419087                                           | on request                                         | 10419088                          |

\* Available with a patch frame for 48 SC simplex adapters on request



MDU-XL-Wallbox  
Patch area, pre-installed  
exemplarily



MDU-XL-Wallbox  
Splice area

# WAVEPACE® 2-door wallbox



**10419048**  
Wallbox-System-2-door-SP-12-  
Q-LC/APC-48F

- Compact metal wallbox, powder-coated
- 2 doors with separate locks
- Capacity for 48 LC/APC ports, or as HD version 64 ports with quad adapters and 48 ports SC with simplex adapters
- 6 foldable splice trays for crimp splice protection, to splice up to 72 fibers
- 2 cable feeds and clamps on the left side, each 40 x 73 mm
- Large opening angles for good access
- Hinged door with splice cassettes (e.g. pre-installed to be ready for splicing) can be easily opened to 90° and 180°, allowing installation directly under the ceiling

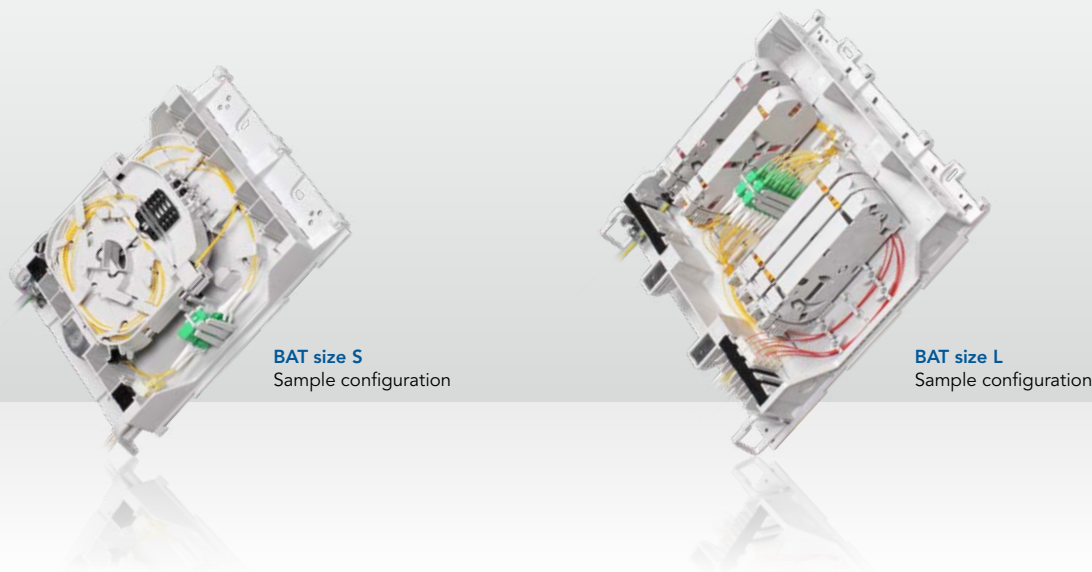
- Separately accessible patch area with cable feed from below and above by inserting the patch cables
- Completely pre-assembled versions available for quick on-site use
- Boxes can be mounted directly on top of each other for cascading, directly or on a joint support rail
- Open Access suitability
- Indoor application, IP 40

| Parameter                   | Wallbox-System-2-door-SP-12-Q-LC/APC-48F                                                                                                                                  | Wallbox-System-2-door-SP-12-SC/APC-48F-HS                 | Wallbox-System-2-door-SP-16-Q-LC/APC-64F                                                                                                                                                                       | Wallbox-System-2-door-SP-12-empty                                                                         | Wallbox-System-2-door-SP-12-empty-HS |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------|
| Application                 | Network level 3 termination (Fiber Access Point) and in-house distribution                                                                                                |                                                           |                                                                                                                                                                                                                |                                                                                                           |                                      |
| Capacity                    | 12 LC/APC quad adapters,pre-installed with 48 pigtails                                                                                                                    | 48 SC/APC simplex adapters,pre-installed with 48 pigtails | 16 LC/APC quad adapters, pre-installed with 64 pigtails                                                                                                                                                        | Exchangeable mounting plates for e. g. 12 LC/APC quad adapters and 48 SC/APC simplex adapters, 72 splices |                                      |
| Splice protection holder    | Crimp                                                                                                                                                                     | Heat shrink                                               | Crimp                                                                                                                                                                                                          | Crimp                                                                                                     | Heat shrink                          |
| Special features            | Pre-installed, “ready-to-splice” with pigtails, each 8 fibers inserted into splice trays acc. to DIN color code. Assignment of the splice trays from bottom to top.       |                                                           | Pre-installed, “ready-to-splice” with pigtails, inserted into 6 splice trays acc. to DIN color code, each 12 fibers in trays 1 to 5 and 4 fibers in tray 6. Assignment of the splice trays from bottom to top. | -                                                                                                         |                                      |
| Feed and outlet options     | 2 cable feed blocks on the left side with each 4 x Ø 12 mm, 12 x Ø 7 mm incl. clamp, each 2 patch cable feeds Ø 30 mm on the right side to be inserted from top or bottom |                                                           |                                                                                                                                                                                                                |                                                                                                           |                                      |
| Dimensions (H x W x D) [mm] | 180 x 450 x 150                                                                                                                                                           |                                                           |                                                                                                                                                                                                                |                                                                                                           |                                      |
| Material                    | Metal, powder-coated                                                                                                                                                      |                                                           |                                                                                                                                                                                                                |                                                                                                           |                                      |
| Color                       | Light gray, RAL 7035                                                                                                                                                      |                                                           |                                                                                                                                                                                                                |                                                                                                           |                                      |
| Performance                 | IL: 0,25 dB max., RL: 60 dB min.                                                                                                                                          |                                                           |                                                                                                                                                                                                                | -                                                                                                         |                                      |
| Fiber type                  | Single Mode G.657.A1, color-coded acc. to DIN (IEC 60304)                                                                                                                 |                                                           |                                                                                                                                                                                                                | -                                                                                                         |                                      |
| Order No.                   | 10419048                                                                                                                                                                  | 10419045                                                  | 10419049                                                                                                                                                                                                       | 10419047                                                                                                  | 10419044                             |

**10419048**  
Wallbox-System-2-door-SP-12-  
Q-LC/APC-48F, opened



# Building Access Terminals for up to 64 residential units



Building access terminal (BAT) is a wall-mountable combination of a fiber termination point for outside plant access cable and a building distribution point in one unit. It ensures a clear separation between outside plant cable, optical devices and building distribution cables. BAT provides a great level of flexibility allowing splitter, splicing, as well as patching applications, and is available in various sizes to address different capacity requirements. Slim, shallow design and rounded housing edges give BAT an unobtrusive appearance.

The housing accepts cables and microducts up to 12 mm outer diameter entering from bottom or top. Foam sealings provide IP55 rating for various cable types, and quick add-ons.

The design of the BAT enables easy access during installation. Multiple units can be placed side-by-side to increase capacity without the need for an additional duct. This also allows separating access for different operators.

The internal components of BAT can be pulled out or rotated for safe and easy access.

The BAT is made of flame-retardant material, making it ideal for MDU applications.

- Available in four sizes (S, M, L and XL)
- UL94, V01 and UV stable material
- Splice, patch and splitter option
- Bottom- or top-entry for microducts or cable up to 12mm
- EMKA lock
- Free of hazardous substances according to RoHS 2011/65/EU

## Empty housings and pre-installed boxes

| Parameter                    | BAT-S-HOUSING-EMP/NEUT/G/E                                                                 | BAT-MGE-ST001  | BAT-LGE-ST001  | BAT-XGE-ST001  |
|------------------------------|--------------------------------------------------------------------------------------------|----------------|----------------|----------------|
| Size                         | S                                                                                          | M              | L              | XL             |
| Capacity [residential units] | ≤ 3                                                                                        | ≤ 12           | ≤ 16           | ≤ 64           |
| Dimensions H x W x D [mm]    | 200 x 250 x 50                                                                             | 240 x 300 x 80 | 335 x 350 x 88 | 450 x 390 x 88 |
| EMKA lock included           | Yes                                                                                        | Yes            | Yes            | Yes            |
| Accessories included         | 2 splice trays, 2 heat shrink splice protection holders, 2 crimp splice protection holders | Empty          | Empty          | Empty          |
| Housing color                | RAL7047 Telegray                                                                           |                |                |                |
| Order No.                    | 80724014                                                                                   | 80736350       | 80045728       | 80739579       |

On the following page you will find an extensive selection of modules and accessories for the Building Access Terminals.

**We will be happy to assist you in putting together suitable modules!**

# Accessories for the Building Access Terminals

## Strain relief

| Item       | Type          | Application                                                       | Suitable for size |   |   |    | Order No. |
|------------|---------------|-------------------------------------------------------------------|-------------------|---|---|----|-----------|
|            |               |                                                                   | S                 | M | L | XL |           |
| BAT-CDS-01 | Strain relief | For cables & tubes up to an outer diameter of 12 mm               | •                 |   |   |    | 80726610  |
| BAT-CDM-01 | Strain relief | For cables & tubes up to an outer diameter of 12 mm               |                   | • |   |    | 80740082  |
| BAT-CAM-01 | Strain relief | For cables with a dielectric central member or branching adapters |                   | • |   |    | 80789471  |
| BAT-CDL-01 | Strain relief | For cables & tubes up to an outer diameter of 12 mm               |                   |   | • |    | 80795395  |
| BAT-CDX-01 | Strain relief | For cables & tubes up to an outer diameter of 12 mm               |                   |   |   | •  | 80733593  |

## Sealings and sealing modules

| Item       | Type           | Application                                                                  | Suitable for size |   |   |    | Order No. |
|------------|----------------|------------------------------------------------------------------------------|-------------------|---|---|----|-----------|
|            |                |                                                                              | S                 | M | L | XL |           |
| BAT-CFS-01 | Sealing        | Ports 1 – 6 for cables & tubes of up to 1 x 12 mm or 2 x 8 mm outer diameter | •                 |   |   |    | 80740831  |
| BAT-CFM-01 | Sealing        | Ports 1 – 8 for cables & tubes of up to 1 x 12 mm or 4 x 8 mm outer diameter |                   | • |   |    | 80740958  |
| BAT-CFX-01 | Sealing        | Ports 1 & 6 for cables & tubes of up to 2 x 12 mm outer diameter             |                   |   |   | •  | 80740959  |
| BAT-CFZ-01 | Sealing module | For up to 4 x 4 cables with an outer diameter of up to 8 mm                  |                   |   | • | •  | 80740960  |
| BAT-CFY-01 | Sealing module | For up to 2 x 2 cables with an outer diameter of up to 8 mm                  |                   |   | • | •  | 80740971  |
| BAT-CFT-01 | Sealing module | For up to 2 x 2 cables with an outer diameter of up to 12 mm                 |                   |   | • | •  | 80795730  |

## Splice trays and patch modules

| Item         | Type         | Accessories                                                                     | Suitable for size |   |   |    | Order No. |
|--------------|--------------|---------------------------------------------------------------------------------|-------------------|---|---|----|-----------|
|              |              |                                                                                 | S                 | M | L | XL |           |
| BAT-PSN-22RT | Patch module | Pre-installed with 2 LC/APC duplex adapters, without pigtails                   | •                 |   |   |    | 80735097  |
| BAT-PSN-44RT | Patch module | Pre-installed with 2 SC/APC simplex adapters, without pigtails                  | •                 |   |   |    | 80726651  |
| BAT-PTN-22RT | Patch module | Pre-installed with 2 LC/APC duplex adapters, without pigtails                   |                   | • | • | •  | 80775477  |
| BAT-PLN-22RT | Patch module | Pre-installed with 4 LC/APC duplex adapters, without pigtails                   |                   | • | • | •  | 80740973  |
| BAT-PTN-44RT | Patch module | Pre-installed with 2 SC/APC simplex adapters, without pigtails                  |                   | • | • | •  | 80775478  |
| BAT-PLN-44RT | Patch module | Pre-installed with 4 SC/APC simplex adapters, without pigtails                  |                   | • | • | •  | 80743855  |
| BAT-PTY-22RT | Patch module | Pre-installed with 2 LC/APC duplex adapters and 4 pigtails                      |                   | • | • | •  | 80775479  |
| BAT-PLY-22RT | Patch module | Pre-installed with 4 LC/APC duplex adapters and 8 pigtails                      |                   | • | • | •  | 80762612  |
| BAT-PLY-44RT | Patch module | Pre-installed with 4 SC/APC simplex adapters and 4 pigtails                     |                   | • | • | •  | 80768262  |
| BAT-F-01     | Splice tray  | Includes 1 shrink splice protection holder and 1 crimp splice protection holder |                   | • | • | •  | 80716780  |

## Splitter modules

| Item            | Type                     | Splitter ratio | Input  | Output | Suitable for size |   |   |    | Order No. |
|-----------------|--------------------------|----------------|--------|--------|-------------------|---|---|----|-----------|
|                 |                          |                |        |        | S                 | M | L | XL |           |
| BAT-K4422-102-1 | Module with PLC splitter | 1:2            | SC/APC | LC/APC |                   | • | • | •  | 80776570  |
| BAT-K4422-104-1 | Module with PLC splitter | 1:4            | SC/APC | LC/APC |                   | • | • | •  | 80776598  |
| BAT-K4422-108-1 | Module with PLC splitter | 1:8            | SC/APC | LC/APC |                   | • | • | •  | 80776625  |
| BAT-K4422-116-1 | Module with PLC splitter | 1:16           | SC/APC | LC/APC |                   | • | • | •  | 80776638  |
| BAT-K0022-116-1 | Module with PLC splitter | 1:16           | Open   | LC/APC |                   | • | • | •  | 80775443  |
| BAT-K4422-132-1 | Module with PLC splitter | 1:32           | SC/APC | LC/APC |                   | • | • | •  | 80776645  |
| BAT-K4400-132-1 | Module with PLC splitter | 1:32           | SC/APC | Open   |                   | • | • | •  | 80776644  |

## Cable management

| Item       | Type                  | Application                                            | Suitable for size |   |   |    | Order No. |
|------------|-----------------------|--------------------------------------------------------|-------------------|---|---|----|-----------|
|            |                       |                                                        | S                 | M | L | XL |           |
| BAT-R-01   | Cable guiding element | Facilitation of cable routing in the housing           |                   | • | • | •  | 80776496  |
| BAT-CC8-01 | Cable support         | For cables with aramid yarns up to 8 mm outer diameter | •                 | • | • | •  | 80775279  |
| BAT-BTS-01 | Slack storage         | Module for horizontal or vertical installation         |                   | • | • | •  | 80777281  |

## Cable gland

| Item                | Properties                                                                | Suitable for size |   |   |    | Order No. |
|---------------------|---------------------------------------------------------------------------|-------------------|---|---|----|-----------|
|                     |                                                                           | S                 | M | L | XL |           |
| Cable-gland-M25     | Light gray RAL 7035, M25 1 x 1,5, without lock nut, packaging unit 50 pcs | •                 | • | • | •  | 43000025  |
| Nut-cable-gland-M25 | Lock nut for cable gland M25, packaging unit 100 pcs                      | •                 | • | • | •  | 43000026  |

# WAVEPACE® SDU splice patch wallbox



- FTTH wallbox for indoor and outdoor applications
  - Optimally used for single dwelling units as well as multi dwelling units with only few apartments
  - Mounting kit consisting of screws and mounting pins is included
  - Protected against dust and splash water according to IP54
  - Slim, light and durable housing made of UV stable polycarbonate
  - Dedicated space for a gas/water block fitting, to be used with Ø 7 mm micro tubes
  - Cable entries for micro tubes with a Ø of 7 mm or 12 mm

| Parameter                   | SDU-Wallbox-SP-S-empty  |
|-----------------------------|-------------------------|
| Splice holder type          | Crimp splice protection |
| Maximal capacity            | 4 adapters, 12 splices  |
| Dimensions (H x W x D) [mm] | 220 x 120 x 28          |
| Protection classes          | IP 54, IK-10            |
| Flame resistance            | UL94-V0                 |
| Weight [kg]                 | 0,25                    |
| Color                       | Grey, RAL 7035          |
| Order No.                   | 10418994                |



**SDU-Wallbox-SP-S-empty**  
Cover inside



**SDU-Wallbox-SP-S-empty**  
Rear side



**SDU-Wallbox-SP-S-empty**  
Exemplary full occupancy  
(not included in scope of supply)

Subject to technical changes!

# Termination boxes for apartments

## FWO-CS – Flush-mounted fiber optic outlet



**24200602**  
FWO-CS-LC/APC-2

- Flush-mounted FTTH wall outlet for 4 LC ports
- Installation for a cavity wall box (60 mm mounting dimension)
- Fiber guiding element with splice protection holder for 4 crimp splice protectors
- Guiding contour in the fiber management areas
- Aesthetic appearance and stable design of the 2-part front cover, central plate with hinged adapter panels (dust protection)
- Conically shaped cable clamp for cables up to 3,2 mm diameter with snap-in clamp
- Pre-assembled adapters with single-port laser shutter
- Designed for pigtails with short boot
- Available versions: pre-assembled with adapters and/or pigtails as well as with in-house cable on roll-off carton

| Parameter                     | FWO-CS-LC/APC-2                                                                                  | FWO-CS-LC/APC-2-2F                                                                          | FWO-CS-xx-LC/APC-4F                                                                                                        |
|-------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Application                   | Splice/patch                                                                                     |                                                                                             | Patch                                                                                                                      |
| Interfaces                    | 2 x LC/APC duplex adapters with laser shutter                                                    | 2 x LC/APC duplex adapters with laser shutter & 2 x pigtails with short boot                | 2 x LC/APC duplex adapters with laser shutter& 4 x LC/APC connectors attached to pre-installed cable (4 fibers)            |
| Dimensions (L x W x D) [mm]   | 80 x 80 x 39                                                                                     |                                                                                             |                                                                                                                            |
| Dimensions central plate [mm] | 50 x 50 (DIN 49075)                                                                              |                                                                                             |                                                                                                                            |
| Mounting                      | Cavity wall/switch box (60 mm mounting dimension)                                                |                                                                                             |                                                                                                                            |
| Outlet material               | Frame, central plate and fiber management element: plastic<br>Support plate: aluminum-zinc alloy |                                                                                             |                                                                                                                            |
| Color                         | Pure white, glossy surface                                                                       |                                                                                             |                                                                                                                            |
| Cable guiding                 | Cable feed from behind through the cavity wall box to the fiber guiding element                  |                                                                                             |                                                                                                                            |
| Adapter quality               | Adapter with zirconia sleeve and spring-loaded cover for laser protection (shutter)              |                                                                                             |                                                                                                                            |
| Connector quality             | –                                                                                                | Grade B, level 1 classification acc. to<br>DIN EN IEC 61753-1:2019-10 with zirconia ferrule |                                                                                                                            |
| Insertion loss IL [dB max.]   | –                                                                                                | 0,25                                                                                        |                                                                                                                            |
| Return loss RL [dB min.]      | –                                                                                                | 65                                                                                          |                                                                                                                            |
| Safety                        | The frame of the FWO-CS is secured with a concealed screw                                        |                                                                                             |                                                                                                                            |
| Special features              | –                                                                                                |                                                                                             | In-house cable<br>Ø 2,65 mm with G.657.A2 fiber,<br>fire protection class B2ca-s1a, d0, a1,<br>for cable lengths see below |
| Order No.                     | 24200602                                                                                         | 24200604                                                                                    | 15 m 24200615<br>20 m 24200620<br>30 m 24200630<br>50 m 24200650                                                           |

### Please note:

All adapters are also available with internal dust and laser shutters.

# Construction and application of the FWO-CS

## Construction of the individual elements

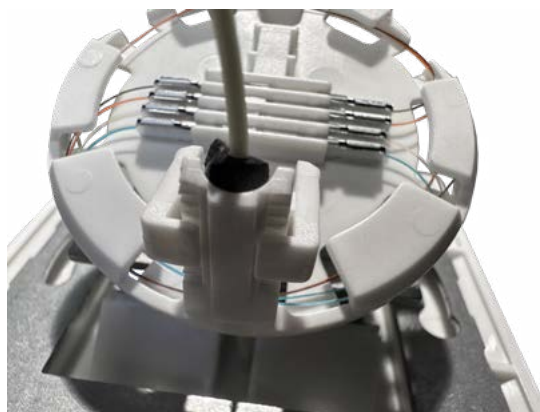
- 1 Frame
- 2 Screw cover and labeling field
- 3 Central plate
- 4 Dust covers
- 5 Support plate
- 6 Fiber management element, mounted
- 7 Cable clamps
- 8 LC/APC duplex adapter, mounted



## Application examples FWO-CS



**FWO-CS-LC/APC-2-2F**  
Pigtail routing



**FWO-CS**  
Wired with micro cable and  
4 crimp splice protectors



**FWO-CS-LC/APC-2**  
Adapter access opened

# WAVEPACE® FWO-X1

## Wall outlet for the FTTH subscriber connection



**10418800**  
FWO-X1-empty



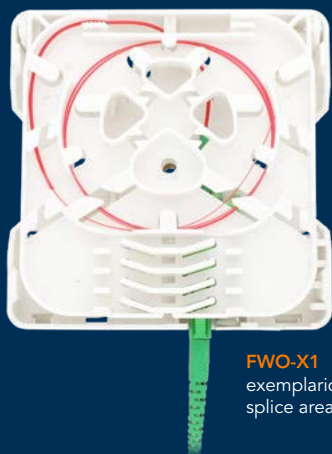
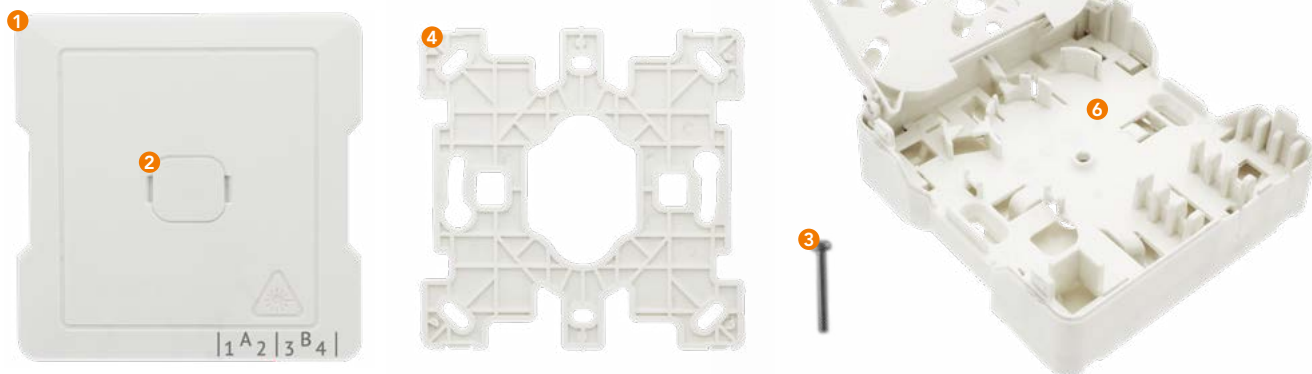
- Multifunctional junction box with 4 ports LC or 2 ports SC for fiber connection in network level 5
- Extremely compact dimensions 80 x 80 x 29 mm (W x H x D)
- Installation options for cavity wall box (60 mm mounting dimension), wall mounting, DIN rails and as click-on for DIY installation without access to the possibly pre-assembled fiber optics
- Versatile cable entries for all installation cases, from all sides as well as from behind
- 4 adapter positions possible (from freely accessible patch cord connection to fully secured)
- Single port access possible through individual housing cutouts
- Stable and pleasing housing made of white polycarbonate
- Large and free access area due to contour design for safe handling access
- Hinged splice tray with molded universal splice protector holder for crimp, heat shrink or Micro Smouv (Mini HS) splice protectors
- Integration option of reflector elements, also inline for remote service
- Stable bearing of the splice cassette to avoid pressure on the connectors during assembly
- Cable and wire entry opening also allows LC and SC connectors to be fed through
- Available versions: Empty housing, pre-terminated with adapters and/or pigtails and with in-house "pizza box" style cable on roll-off carton
- All pre-assembled adapters provide spring-loaded protection hood (shutter)

| Parameter                   | FWO-X1-<br>empty                                                                                                                                                          | FWO-X1-<br>SC/APC-2                                                                                   | FWO-X1-<br>LC/APC-1             | FWO-X1-<br>LC/APC-2             | FWO-X1-<br>SC/APC-2-2F                                                                       | FWO-X1-<br>LC/APC-1-2F                            | FWO-X1-<br>xx-SC/APC-4F                                                                                                                                                           | FWO-X1-<br>xx-LC/APC-4F                                                                            |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Application                 | –                                                                                                                                                                         | Splice/patch                                                                                          |                                 |                                 |                                                                                              |                                                   |                                                                                                                                                                                   | Patch                                                                                              |
| Interface                   | –                                                                                                                                                                         | 2 x SC/APC<br>simplex<br>adapters                                                                     | 1 x LC/APC<br>duplex<br>adapter | 2 x LC/APC<br>duplex<br>adapter | 2 x SC/APC<br>simplex<br>adapters &<br>2 x pigtails                                          | 1 x LC/APC<br>duplex<br>adapter &<br>2 x pigtails | 2 x SC/APC<br>simplex<br>adapters &<br>pre-assembled<br>cable (4 fibers)                                                                                                          | 2 x LC/APC<br>duplex<br>adapters &<br>pre-assembled<br>cable (4 fibers)                            |
| Dimensions (H x W x D) [mm] | 80 x 80 x 29                                                                                                                                                              |                                                                                                       |                                 |                                 |                                                                                              |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Mounting options            | On a cavity wall box (60 mm mounting dimension), wall mounting, DIN rails (horizontal & vertical)<br>and as click-on for DIY installation with pre-assembled fiber optics |                                                                                                       |                                 |                                 |                                                                                              |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Material wall outlet        | Plastic material ABS (LSOH, RoHS, REACH compliant, UI-94V0)                                                                                                               |                                                                                                       |                                 |                                 |                                                                                              |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Color                       | White                                                                                                                                                                     |                                                                                                       |                                 |                                 |                                                                                              |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Cable feed                  | From the bottom up to 5 mm, up to 4 mm from the top, left and right side and generally from the back                                                                      |                                                                                                       |                                 |                                 |                                                                                              |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Adapter quality             | –                                                                                                                                                                         | Adapter with ceramic sleeve and spring-loaded protection hood for dust and laser protection (shutter) |                                 |                                 |                                                                                              |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Connector quality           | –                                                                                                                                                                         |                                                                                                       |                                 |                                 | Grade B, Level 1 classification according<br>DIN EN IEC 61753-1:2019-10 with ceramic ferrule |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Insertion loss IL [dB max.] | –                                                                                                                                                                         |                                                                                                       |                                 |                                 | 0,25                                                                                         |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Return loss RL [dB min.]    | –                                                                                                                                                                         |                                                                                                       |                                 |                                 | 65                                                                                           |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Safety                      | Cover of the FWO-X1 can additionally be secured with a screw                                                                                                              |                                                                                                       |                                 |                                 |                                                                                              |                                                   |                                                                                                                                                                                   |                                                                                                    |
| Special features            | For self as-<br>sembly with<br>adapters and<br>pigtails                                                                                                                   | –                                                                                                     |                                 |                                 |                                                                                              |                                                   | In-house cable Ø 2,65 mm using<br>G.657.A2 fiber, fire protection<br>class Dca-s2, d2;<br>cable lenght options see below<br>Non-used 2<br>fibers are stored<br>in the splice tray | –                                                                                                  |
| Order No.                   | 10418800                                                                                                                                                                  | 10418822                                                                                              | 10418820                        | 10418825                        | 10418823                                                                                     | 10418821                                          | 15 m 10418811<br>20 m 10418802<br>30 m 10418813<br>50 m 10418815                                                                                                                  | 15 m 10418801<br>20 m 10418802<br>30 m 10418803<br>50 m 10418805<br>80 m 10418808<br>100m 10418809 |

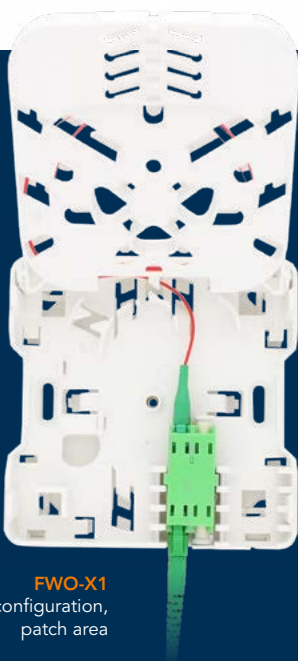
# Details of the WAVEPACE® FWO-X1

## Construction of the individual components

- 1 Self-locking cover
- 2 Screw cover, self locking
- 3 Locking screw
- 4 Click-on frame
- 5 Hinged splice tray, mounted
- 6 Basic housing



**FWO-X1**  
exemplaric configuration,  
splice area



**FWO-X1**  
exemplaric configuration,  
patch area



**Access restriction**  
Option to install the connector inside the  
outlet to avoid unauthorized access

## Further product versions



**Special configuration**  
in accordance with the  
specifications of the  
German subsidized  
fiber optic rollout



**Pre-assembled  
"Pizza box"**  
With in-house cable  
on roll-off carton,  
available in different  
cable lengths (please  
refer to the table)

# WAVEPACE® FWO-X1-APL-Kit

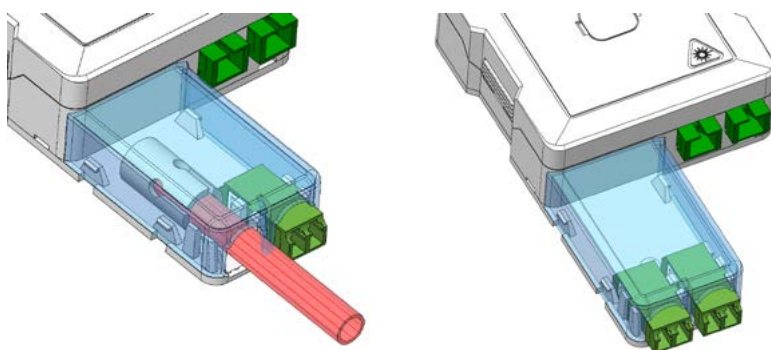
Accessory set to upgrade the FWO-X1 to an indoor demarcation point



**10444040**  
FWO-X1-APL-Kit

- Enables the use of the WAVEPACE® FWO-X1 FTTH wall outlet as a indoor demarcation point box for small dwelling units
- 2-part system accessory kit, consisting of support plate and cover for latching on
- Enables the installation of:
  - Up to 2 micro ducts of up to 10 mm with a gas/water blocking system (small design, e. g. ELITEX WGT)
  - Up to 2 adapters LC Duplex or SC Simplex
- Installation options for wall mounting and cavity wall box (60 mm mounting dimension)
- Installation of the FWO-X1 wall outlet by simply clicking the click-on plate onto the support plate or using a screw connection
- Resilient and attractive system made of white polycarbonate, matched to the FWO-X1 FTTH outlet

| Parameter                   | FWO-X1-APL-Kit                                                                                                     |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------|
| Application                 | Indoor termination box combined with the FWO-X1                                                                    |
| Interfaces                  | 2 x micro duct up to Ø 10 mm<br>and/or 2 x LC Duplex adapter / 2 x SC Simplex adapter                              |
| Dimensions (L x W x D) [mm] | 140 x 80 x 32,5<br>(Extends the dimensions of FWO-X1 from 80 x 80 x 29 in die relevant area by 60 x 40 mm (L x W)) |
| Mounting options            | Direct wall mounting, with screws up to 3 mm diameter or cavity wall box (60 mm mounting dimension)                |
| Material wall outlet        | Plastic ABS (LSOH, RoHS, REACH compliant, UL-94V0)                                                                 |
| Color                       | White                                                                                                              |
| Entries                     | Pre-punched                                                                                                        |
| Packing quantity            | Individually packed in bags and 10 pieces in a box                                                                 |
| Order No.                   | 10444040                                                                                                           |



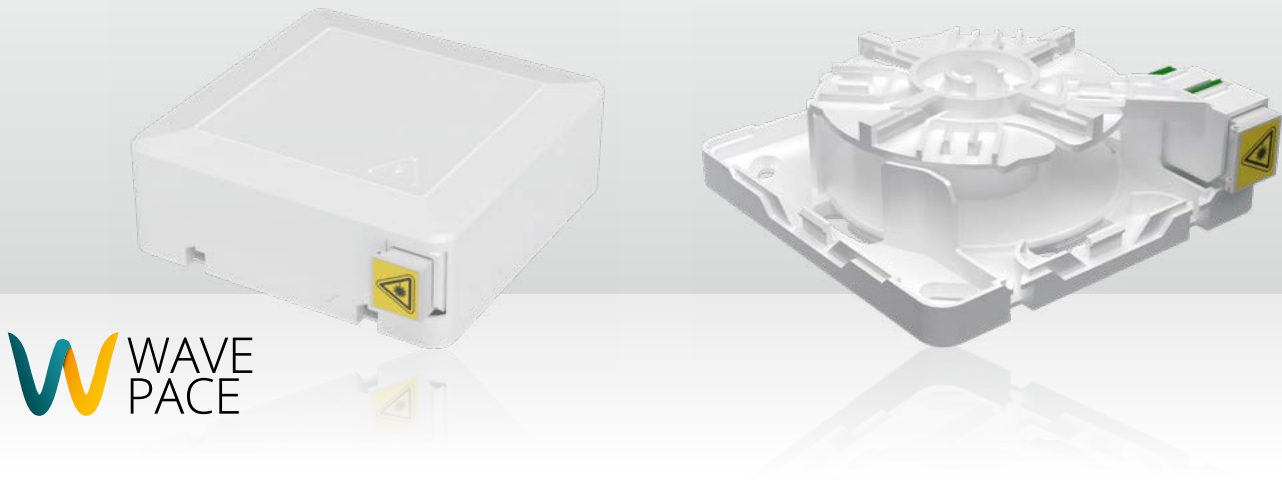
**Application examples of the FWO-X1-APL-Kit**

The FWO-X1-APL-Kit is compatible with all WAVEPACE® FWO-X1 FTTH subscriber outlets, e. g.:

| Parameter                      | FWO-X1-empty | FWO-X1-SC/APC-2            | FWO-X1-LC/APC-1           | FWO-X1-SC/APC-2-2F                       | FWO-X1-LC/APC-1-2F                      |
|--------------------------------|--------------|----------------------------|---------------------------|------------------------------------------|-----------------------------------------|
| Application                    | Universal    | Splice/patch               | Splice/patch              | Splice/patch                             | Splice/patch                            |
| Interfaces                     | –            | 2 x SC/APC-Simplex adapter | 1 x LC/APC-Duplex adapter | 2 x SC/APC-Simplex adapter & 2 x pigtail | 1 x LC/APC-Duplex adapter & 2 x pigtail |
| Compatible with FWO-X1-APL-Kit | Yes          | Yes                        | Yes                       | Yes                                      | Yes                                     |
| Order No.                      | 10418800     | 10418822                   | 10418820                  | 10418823                                 | 10418821                                |

# WAVEPACE® FWO-RS

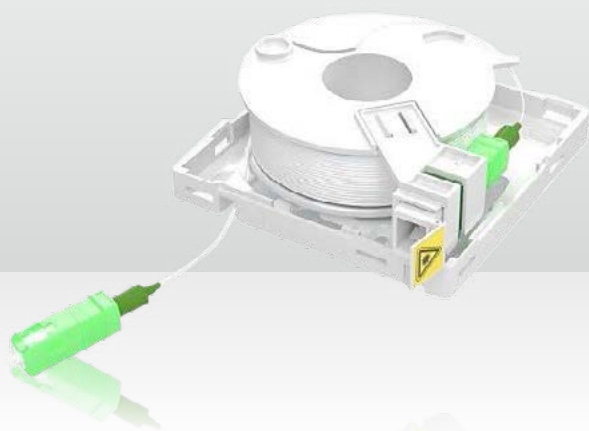
## Fiber wall outlet with reel system for subscriber connection



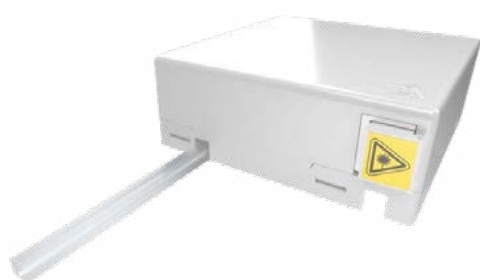
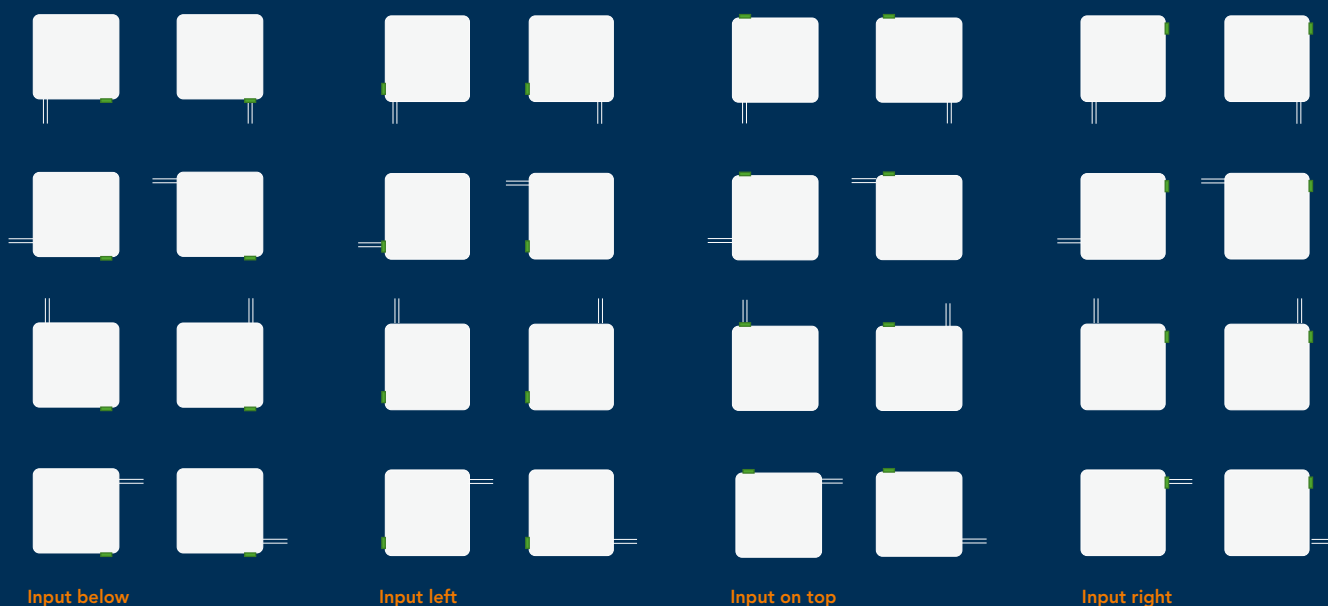
- FWO-RS (Fiber Wall Outlet Reel System) is a pre-installed subscriber outlet with LC/APC or SC/APC connectors at a 900 µm cable, available with various lengths
- Available lengths from 0 m to 15 m, and from 0 m to 30 m thanks to the innovative reel system
- Simplex connector at the feed area for pulling, and adapter (duplex LC/APC or simplex SC/APC) at the housing outlet
- Very compact dimensions of only 80 x 80 x 29 mm (W x H x D)
- DIY and tool-free installation with secure storage of any residual cable length
- Compatible with the WAVEPACE® Silway system
- Provision of fiber optic access at any desired location, as subscriber outlet or as a sub-distribution connection box

| Parameter                        | FWO-RS-LC/APC-x                                                                                       | FWO-RS-SC/APC-x                                            |
|----------------------------------|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| Application                      | Patch-able subscriber wall outlet / sub-distribution connection box                                   |                                                            |
| Interfaces                       | 1 x LC/APC simplex connector<br>1 x LC/APC duplex adapter                                             | 1 x SC/APC simplex connector<br>1 x SC/APC simplex adapter |
| Dimensions (W x H x D) [mm]      | 80 x 80 x 29                                                                                          |                                                            |
| Mounting options                 | Wall mounting / cavity wall box                                                                       |                                                            |
| Material wall outlet             | Plastic ABS                                                                                           |                                                            |
| Feed options                     | 2 x 5x5 mm feed and 2 x LC/APC ports                                                                  | 2 x 5x5 mm feed and 1 x SC/APC port                        |
| Material properties              | UL94-V0; UV resistant                                                                                 |                                                            |
| Protection class                 | IP 40 / IK09                                                                                          |                                                            |
| Connector quality                | Grade B, Level 1 classification according<br>DIN EN IEC 61753-1:2019-10 with ceramic ferrule          |                                                            |
| Adapter quality                  | Adapter with ceramic sleeve and spring-loaded protection hood for dust and laser protection (shutter) |                                                            |
| Insertion loss IL [dB max.]      | 0,25                                                                                                  |                                                            |
| Return loss RL [dB min.]         | 65                                                                                                    |                                                            |
| Fiber compatibility              | ITU-T G.657.A2 and G.657.B3                                                                           |                                                            |
| Operating temperature range [°C] | -25 – +65                                                                                             |                                                            |
| Color                            | White                                                                                                 |                                                            |
| Order No.                        |                                                                                                       |                                                            |
| 15 m                             | 10418861                                                                                              | 10418866                                                   |
| 30 m                             | 10418863                                                                                              | 10418868                                                   |

## Feed options of the FWO-RS



32 options for universal application  
thanks to the feed options

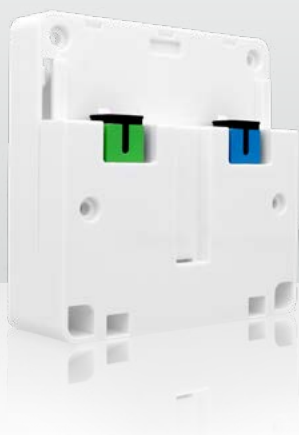


**Feed options**  
compatible with the WAVEFACE® Silway system



**Interior view**  
of the reel system

# Fiber Termination Units



**84179716**  
FTTH-0F-BASE-PC/APC-2,  
image without protective cover



**84179716**  
FTTH-0F-BASE-PC/APC-2,  
image with protective cover

## The most flexible FTUs in the industry

The DKT FTUs consist of a fiber tray/splice module, a click-on adapter module (with SC/APC, SC/PC or SC/UPC adapters included) and a protective cover mounted on top. When using a DKT Gateway, the protective cover is removed and the gateway is plugged onto the FTU.

In this way, the solution functions either as a passive FTTH outlet to which active third-party hardware can be connected without any problems, or as an active fiber optic termination in combination with a DKT Gateway, the so-called 2-box solution.

The simple click-on interface enables activation by the end customer and therefore significantly reduces the network operator's operating costs. The combination of FTU and e.g. 1 Gbps gateway is very space-saving with 88 x 88 x 65 mm and is therefore perceived as "just another outlet" by the customer.

| Parameter                             | FTTH-0F-SMALL-PC/APC       | FTTH-0F-BASE-TRAY                  | FTTH-0F-BASE-PC/APC                                              | FTTH-0F-BASE-PC/APC-2 | FTTH-2F-BASE-PC/APC-2 | FTTH-2F-BASE-CC-NOR |
|---------------------------------------|----------------------------|------------------------------------|------------------------------------------------------------------|-----------------------|-----------------------|---------------------|
| Splice tray included                  | No                         | Yes, large version                 | Yes, regular-sized version                                       |                       |                       |                     |
| Slack storage capacity in splice tray | –                          | approx. 30 cm of patch cord Ø 3 mm | approx. 150 cm of pigtails, not suitable for storing patch cords |                       |                       |                     |
| Dimensions (W x H x D) [mm]           | 88x88x–/15/23 <sup>1</sup> | 88x115x15/23/35 <sup>1</sup>       | 88x88x15/23/35 <sup>1</sup>                                      |                       |                       |                     |
| Housing color                         | white                      |                                    |                                                                  |                       |                       |                     |
| Adapter type                          | SC/APC & SC/PC             | SC/APC & SC/UPC                    | SC/APC & SC/PC                                                   |                       |                       | 2 x SC/APC          |
| Insertion loss [dB]                   | ≤ 0,20                     |                                    |                                                                  |                       |                       |                     |
| Interchangeability [dB]               | ≤ 0,20                     |                                    |                                                                  |                       |                       |                     |
| Repeatability [dB]                    | ≤ 0,20                     |                                    |                                                                  |                       |                       |                     |
| Mechanical durability                 | ≥ 1.000 cycles             |                                    |                                                                  |                       |                       |                     |
| Operating temperature range [°C]      | -40 – +80                  |                                    |                                                                  |                       |                       |                     |
| Sleeve material                       | Zirconia                   |                                    |                                                                  |                       |                       |                     |
| Pigtails                              | –                          |                                    |                                                                  |                       | SC/APC & SC/PC        | 2 x SC/APC          |
| Fiber type                            | –                          |                                    |                                                                  |                       | G.657.A1              |                     |
| Fiber length [mm]                     | –                          |                                    |                                                                  |                       | 750                   |                     |
| Fiber diameter [µm]                   | –                          |                                    |                                                                  |                       | 900                   |                     |
| Fiber color                           | –                          |                                    |                                                                  |                       | white                 |                     |
| Item number DKT                       | 79717                      | 79712                              | 79715                                                            | 79716                 | 79718                 | 79720               |
| Order No.                             | 84020717                   | 84179712                           | 84179715                                                         | 84179716              | 84020718              | 84020720            |

<sup>1</sup> Depth: splice tray / splice tray including adapter module / splice tray including adapter module and protective cover



**Splice tray, regular version**  
Image without adapter module and protection cover



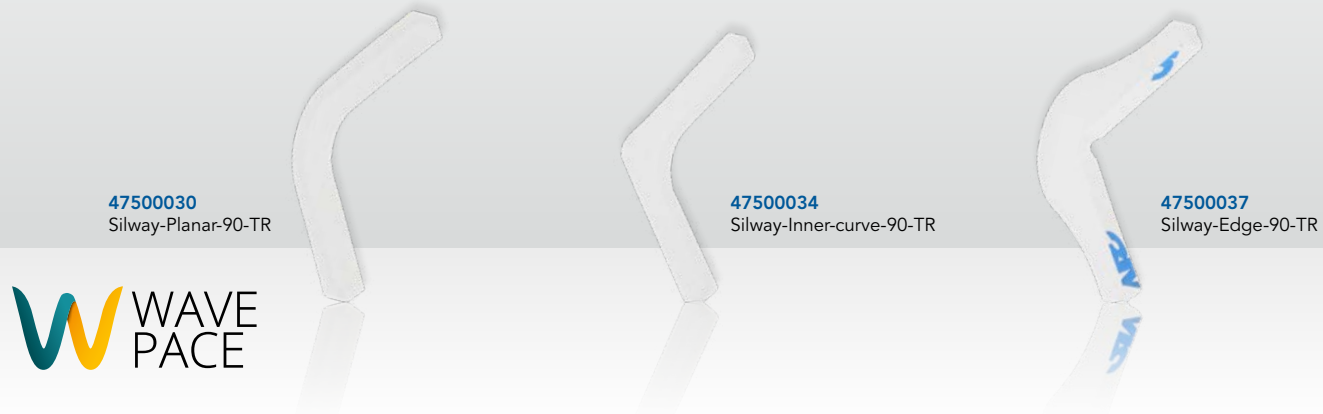
**Splice tray, large version**  
Image without adapter module and protection cover

Are you looking for the perfect companion for the DKT FTUs?

**You will find matching Gateways / ONTs in our range of active optical components!**

# Indoor distribution systems

## WAVEPACE® Silway: Flexible duct and guiding elements



- Distribution system for indoor application for up to 4 individual 900 µm buffer tubes, blown fiber cable with 4 – 6 fibers, or a cable with 2,5 mm diameter
- Space-saving duct size of 4 x 4 mm with inner diameter of 2,5 mm
- Allows storage of heat shrink splice protection elements
- Discrete routing inside the apartment or buildings
- Flexible self-adhesive duct and guiding elements available in translucent or white color for a discrete appearance
- Guiding elements for corners, edges and curves prevent undercutting the bending radius
- Strong double-sided tape at duct and guiding elements enables easy installation on every surface without any tools

### Available components:

- DIY kit (translucent or white) containing 50 m duct, 10 pcs of each 90° guiding element, 4 wall pass-through elements and a placing tool
- 50 m duct on drum (translucent or white)
- 90° guiding elements for edges, corners and curves (translucent or white, packaging quantity 100 pcs)
- Molded wall pass-through / dividing element for fibers and connectors with 5 feeding options, installation with screws or adhesive tape (white, packaging quantity 100 pcs)
- Transparent G.675.A2 fiber on 1.000 m drum with 900 µm buffer tube
- FWO-RS: Fiber Wall Outlet Reel System with storage of 30 m 900 µm cable, pre-installed with LC/APC or SC/APC connectors on both ends

| Parameter                           | Drum-Silway-50M-xx                                                                                       | Silway-Planar-90-xx                          | Silway-Inner-curve-90-xx          | Silway-Edge-90-xx                 |
|-------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------|-----------------------------------|
| Application                         | Cable duct, straight                                                                                     | Cable routing in a 90° curve on flat surface | Cable routing inside a 90° corner | Cable routing around a 90° corner |
| Color                               | xx = TR (translucent) or WH (white)                                                                      |                                              |                                   |                                   |
| Content                             | 50 m duct on drum                                                                                        | Box with 100 pcs                             |                                   |                                   |
| Dimensions (L x W x D) [mm]         | Ø 200 x 105                                                                                              | 32 x 32 x 4                                  | 32 x 32 x 4                       | 36 x 36 x 4                       |
| Outer dimensions, duct (L x W) [mm] | 4 x 4                                                                                                    |                                              |                                   |                                   |
| Inner diameter, duct [mm]           | 2,5                                                                                                      |                                              |                                   |                                   |
| Material                            | Flexible Silicon Rubber                                                                                  |                                              |                                   |                                   |
| Material property                   | White Color system: UL94-V0, LSZH<br>Translucent system: not tested, as only used inside the living area |                                              |                                   |                                   |
| Temperature resistance of adhesive  | Long term (e. g. days/weeks): 90°C,<br>Short term (e. g. minutes/hours): 150°C                           |                                              |                                   |                                   |
| Adhesive thickness [mm]             | 0,150 (without liner)                                                                                    |                                              |                                   |                                   |
| Capacity                            | 4 x 900 µm fiber or 1x cable/blown fiber with Ø 2,5 mm                                                   |                                              |                                   |                                   |
| Order No.                           |                                                                                                          |                                              |                                   |                                   |
| Translucent                         | 47500010                                                                                                 | 47500030                                     | 47500034                          | 47500037                          |
| White                               | 47500012                                                                                                 | 47500032                                     | 47500036                          | 47500038                          |



WAVEPACE® Silway cable duct  
with 4 fibers, each 900 µm



WAVEPACE® Silway Placing Tool  
for easy insertion of fibers into the duct



# WAVEPACE® Silway: Flexible duct and guiding elements



| Parameter         | Drum-0,9mm-FO-Cable-1000m-TR                   | Silway-WPT-WH           | Silway-FO-Placing-Tool                             | FWO-RS-LC/APC                                                                                          | FWO-RS-SC/APC       |
|-------------------|------------------------------------------------|-------------------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------|
| Application       | Discreet fiber cable, matching the Silway duct | Wall pass-through       | Support tool for inserting the fiber into the duct | Fiber Wall Outlet Reel System: Provide secure access to up to 30 m fiber cable on-site, easy to unwind |                     |
| Color             | Translucent                                    | White                   |                                                    |                                                                                                        |                     |
| Content           | 1.000 m fiber cable on drum                    | Box with 100 pcs        | 1 placing tool                                     | 1 wall-mounted outlet with 30 m fiber cable on reel                                                    |                     |
| Dimensions [mm]   | Ø 235 x 110                                    | 35 x 30 x 6 (L x W x D) | Ø 10 x 50                                          | 80 x 80 x 29 (L x W x D)                                                                               |                     |
| Material          | –                                              | ABS                     | ABS                                                | ABS                                                                                                    |                     |
| Material property | –                                              | UL94-V0, LSZH           | UV resistant                                       | UL94-V0                                                                                                |                     |
| Fiber property    | G.657.A2, Ø 900 µm                             | –                       | –                                                  | G.657.A2, Ø 900 µm                                                                                     |                     |
| Connectors        | –                                              | –                       | –                                                  | LC/APC at both ends                                                                                    | SC/APC at both ends |
| Order No.         | 47500020                                       | 47500039                | 47500050                                           | on request                                                                                             |                     |



## Our DIY Kits contain everything the end customer needs for an easy-as-pie WAVEPACE® Silway installation:

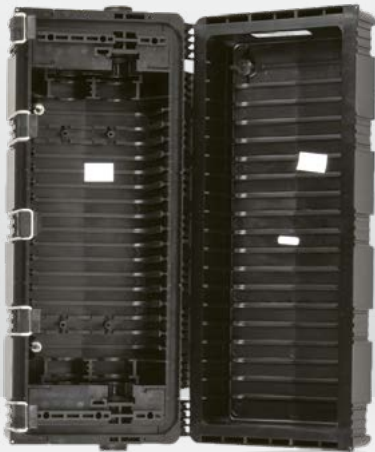
- 50 m duct
- 10 pcs of each 90° guiding element
- 4 wall pass-through elements
- 1 placing tool

Silway-Kit-50m-TR (translucent): 47500000  
Silway-Kit-50m-WH (white): 47500002



# Closures

## Inline and connecting closures



**80313269**  
UCAO-4-9, open



**42600305**  
FDM1, closed

### UCAO inline closure for up to 7 MFT splice trays

- Suitable for buried, duct and aerial lines
- For straight and branching application
- Fast and easy access to individual splice trays
- Closure sealing made of re-usable silicone
- Excellent cable strain relief and space for slack buffer tube storage
- To be installed with all common cable sheaths
- Compact design, therefore ideal for splicing cables with low to medium fiber counts
- The body of the closure consists of two half shells made of plastic that is resistant against common environmental influences
- To accommodate cables with up to a 21 mm diameter

| Parameter                                | UCAO-4-9                            |
|------------------------------------------|-------------------------------------|
| Closure shape                            | Inline                              |
| Crimp splice count per tray              | 24                                  |
| Distribution cable port count            | 2                                   |
| Distribution cable Ø range [mm]          | 6 – 21                              |
| Extra buffer storage system              | Installed                           |
| Grounding system                         | Metric                              |
| Heat shrink splice count per MFT tray    | 24                                  |
| Heat shrink splice protector support     | Yes                                 |
| Main cable circular port count           | 2                                   |
| Main cable diameter [mm]                 | 8                                   |
| Max. number of trays                     | 7 MFT                               |
| Maximum splice fiber capacity            | 168                                 |
| Maximum tray count                       | 7                                   |
| Number of distribution/drop cables ports | 4                                   |
| Sealing type                             | Compression fittings                |
| Size by fiber splice capacity            | 168                                 |
| SplicePak splice count per tray          | 12                                  |
| Supported cables                         | Flat drop cable Figure-8 drop cable |
| Dimensions (W x D x H) [mm]              | 410 x 160 x 120                     |
| Protection class                         | IP68                                |
| Order No.                                | 80313269                            |

### Accessories for the UCAO-4-9

| Item               | Description                                                                 | Order No. |
|--------------------|-----------------------------------------------------------------------------|-----------|
| MFT-splice-tray-10 | MFT splice tray for 24 crimp splice protections, black, package with 10 pcs | 80302169  |
| MFT-cover-10       | Cover for MFT splice tray, package with 10 pcs                              | 80313382  |

### Connecting closure FDM1

- Suitable for connecting fiber optic cables up to 24 fibers
- Designed for direct burial, limited outdoor use (UV)
- Test certificate of the State Testing Institute for Electrical Engineering and Electronics, TGM Vienna, tested according to: IP 68, ÖVE/ÖNORM, EN 60529, Test No.: VA EE 32767
- Scope of delivery:
  - 2-part closure base housing (consisting of upper and lower part) with M16 screw connection
  - 1 splice tray with 1 x 12 (resp. 2 x 12) heat shrink or crimp splice holders
  - 2 cable ties 140 mm
  - 2 assembly wrenches (per carton)
  - 1 assembly instruction

| Parameter                                                  | FDM1                                                                                             |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Dimensions (L x Ø) [mm]                                    | 307 x 69                                                                                         |
| Material                                                   | Polypropylene                                                                                    |
| Sealing                                                    | Thermoplastic elastomer, sconabled                                                               |
| Max. splice count                                          | 24                                                                                               |
| Screwing                                                   | 2 x M16<br>for cables of 4,5 – 10,0 mm<br>(M 20, 7,0 – 14 mm, M 25,<br>9,0 – 18 mm, upgradeable) |
| Temperature range (storage, installation & operation) [°C] | -30 – +65                                                                                        |
| Tensile strength (inputs) [N]                              | 55                                                                                               |
| Order No.                                                  | 42600305                                                                                         |



**42600305**  
FDM1, open

## Dome closures



**42400452**  
ACE-CL-FOC2-AA



**42405213**  
ACE-FOCT-AB-prefab-48x7mm,  
closure without tubes

### Pre-installed closures „FOCT“

- „Fiber Optic Closure for Tubes“ (FOCT) are pre-installed fiber optic closures for cable protection tube assemblies
- The defined number of micro tubes is divided over the round ports and protected by 3,5 m long flexible tubes
- The tube bundles are firmly connected and sealed to the closure body at the factory
- Protection of inserted tube ends with end caps against water penetration, outgoing tube assemblies are provided with shrink caps
- The pre-assembled gas and water tight closures are factory tested and delivered with a test and quality document
- Without having to do additional sealing work in the field, customer tubes can be connected immediately and only the feeder cable needs to be inserted with a mechanical oval seal

| Parameter                                                  | ACE-FOCT-AB-<br>prefab-48x7mm | ACE-FOCT-CC-<br>prefab-96x7mm | ACE-FOCT-AB-<br>prefab-24x10mm | ACE-FOCT-CC-<br>prefab-48x10mm |
|------------------------------------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|
| Dimensions (L x Ø) [mm]                                    | 525 x 285                     | 770 x 285                     | 525 x 285                      | 770 x 285                      |
| Number of pre-installed tubes                              | 48                            | 96                            | 24                             | 48                             |
| Diameter of the pre-installes tubes [mm]                   | 7                             |                               | 10                             |                                |
| Length of the pre-installes tubes [m]                      | 4                             |                               |                                |                                |
| Length of the protection tube [m]                          | 3,5                           |                               |                                |                                |
| Number of SE splice trays included                         | 36                            | 84                            | 36                             | 84                             |
| Splice capacity, crimp                                     | 432                           | 1.008                         | 432                            | 1.008                          |
| Color                                                      | Black                         |                               |                                |                                |
| Material                                                   | Plastic                       |                               |                                |                                |
| Number of round ports                                      | 6                             | 8                             | 6                              | 8                              |
| Number of oval ports                                       | 1                             | 2                             | 1                              | 2                              |
| Temperature range<br>(operation, transport & storage) [°C] | -15 – +45                     |                               |                                |                                |
| Protection class                                           | IP68                          |                               |                                |                                |
| Order No.                                                  | 42405213                      | 42405216                      | 42405233                       | 42405235                       |

### Fiber management closure „FOC2“

| Parameter                                               | ACE-CL-FOC2-AA |
|---------------------------------------------------------|----------------|
| Dimensions (L x Ø) [mm]                                 | 390 x 285      |
| Max. tube diameter [mm]                                 | 20             |
| Number of crimp splice trays included                   | 6              |
| Splice capacity per tray                                | 12             |
| Max. splice capacity (by upgrade)                       | 576            |
| Color                                                   | Black          |
| Material                                                | Plastic        |
| Number of round ports                                   | 6              |
| Round port diameter [mm]                                | 32             |
| Number of oval ports                                    | 1              |
| Temperature range (operation, transport & storage) [°C] | -15 – +45      |
| Protection class                                        | IP68           |
| Order No.                                               | 42400452       |

### Matching accessory: ACE closure bracket

- Closure bracket for FOCT and FOC2 closures
- Pivotal
- Material: Stainless steel
- Length: 1.760 mm

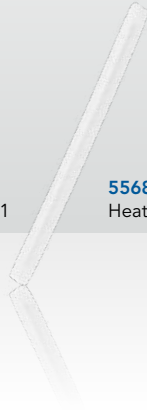
Order No. 42400451



# Installation accessories and splice protection



**55680109**  
Crimp splice protection KSS1



**55680118**  
Heat shrink splice protection



**43020006**  
Ball marker  
OMNIMARKER II

## Tangit expansion resin M3000

- 2 K expansion resin for fixing gas and water house entries, cable wall entries, and for sealing openings
- 150 ml cartridge – expands to 0,75 l

Order No. 42466150

## Trench warning tape

- Trench warning tape "Achtung Glasfaserkabel" (German language)
- 250 m spool

Order No. 42601798

## Marking spray DH1040

- Water soluble chalk based marking spray
- Ideally suited for markings which should only be visible for a short time
- Does not cause damage to the marked object
- For indoor and outdoor applications
- Color fluorescent yellow
- Contains 500 ml
- For up to 260 m marking

Order No. 42466500

## Marker peg with mount

- Tracking pen for pinpoint locating of lines and splitters
- Includes bracket for mounting the pen to the tube

Order No. 42602424

## Ball marker OMNIMARKER II, Orange

- Electronic marking for pinpoint location of buried components
- Locating of position and depth
- Transmits a signal with frequency 101,4 kHz
- Works with all electronic marker locators
- Diameter 100 mm, weight 150 g

Order No. 43020006

## Crimp splice protection KSS1

- TSON crimp splice protection for optical fibers
- Packaging unit: 150 pcs.

Order No. 55680109

## Heat shrink splice protection

- 45 x 2,4 mm, with support element
- Packaging unit: 100 pcs.

Order No. 55680118



**Crimp splice protection KSS1**  
Packaging unit with 150 pcs.



Do you have questions concerning our products or want to place an order?

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