WAVEPACE®

Passive FTTX Solutions

Version 1.1

WAVE PACE

WAVEPACE® addresses the challenges of the broadband industry with space-saving, pre-assembled and highly customizable products for all network levels.

An important requirement in the design of our products is the ease of installation. Due to the increasing shortage of skilled workers in the fiber optics industry, installers from other industries will also be confronted with the installation of fiber optic components in the future.

WAVEPACE® is a brand of Netceed. We are a global leader in distribution, logistics, technical engineering, and product design supporting the telecommunications and broadband industry. We supply and distribute a comprehensive range of passive and active equipment and tooling for network deployment, upgrades, and maintenance, supporting all technologies including FTTH, FTTx, HFC, Wi-Fi, 5G/mobile, and data center.

Netceed's comprehensive portfolio of 90,000+ products from nearly 1,500 industry-leading suppliers, along with their value-added supply chain solutions support carriers' seamless delivery of high-speed Internet, Video, Data, and Voice services to Residential, Business, and Mobile Users.Netceed employs over 2,000 people across 19 countries and counting, and its experienced team works hard every day shaping the future of communication networks across the globe.

Netceed

CONTENT

WAVE PACE


10 11 12
13 14 15 16 17 18 19 20 21 22 23 24

1.
ODF SYSTEM

System Panel

Termination and distribution panel for the ODF-System

- 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

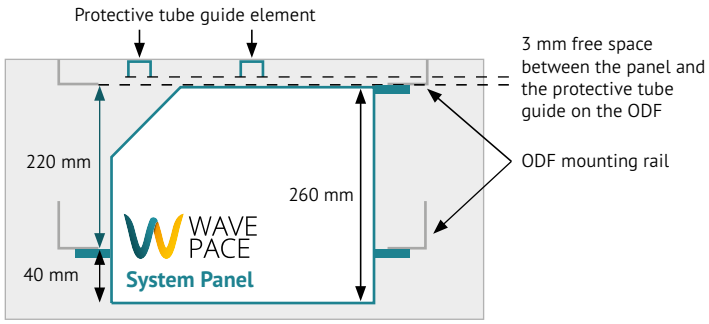
Accessories

Item	Description
Fiber management panel	19" panel, 3 RU equipped with 3 spools

	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				–	

	SP-72-System-Panel-LC/APC-Crimp	SP-72-System-Panel-LC/APC-Heat-Shrink	SP-96-System-Panel-LC/APC-Crimp	SP-96-System-Panel-LC/APC-Heat-Shrink	P-72-System-Panel-LC/APC	P-96-System-Panel-LC/APC
Application	Splice/Patch	Splice/Patch	Splice/Patch	Splice/Patch	Patch	Patch
Interface	18 x LC/APC-quad adapters & 72 pigtails		24 x LC/APC-quad adapters & 96 pigtails		18 LC/APC-quad adapters	24 LC/APC-quad adapters
Splice capacity	6 splice trays for 12 x crimp or heat shrink		8 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				–	

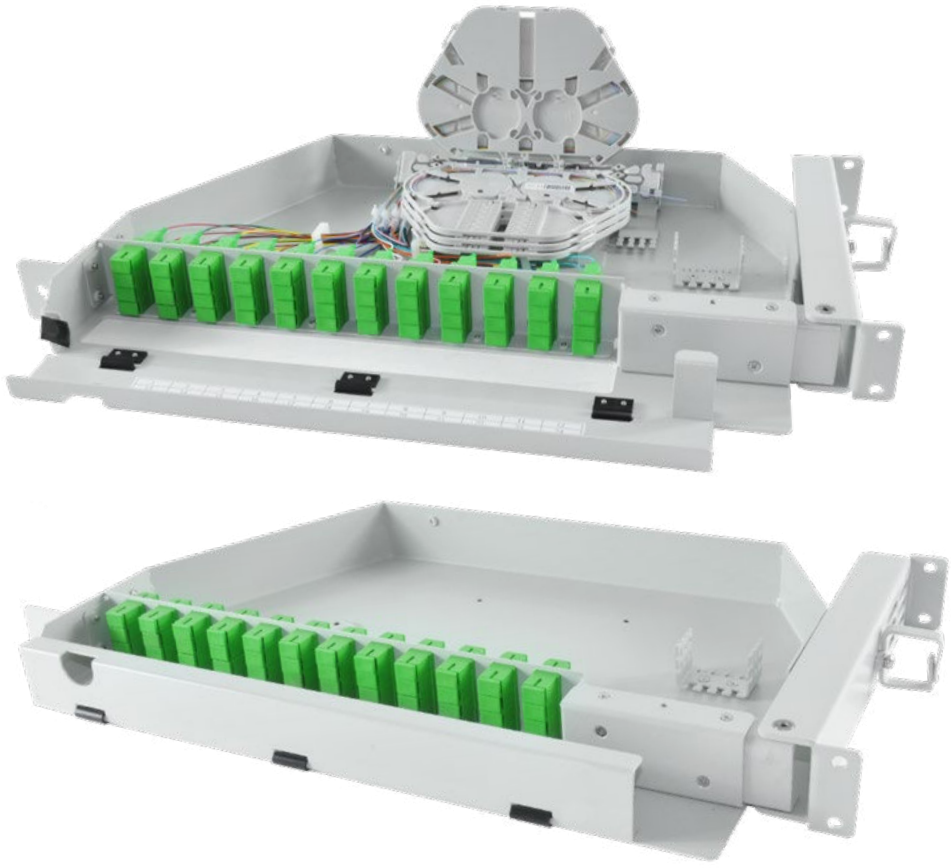
Unique pivot mounting option for free access to rear-side cable mounting



Unique pivot mounting option

The WAVEPACE® System-Panel family was specially developed for the termination and distribution of fiber optics in the ODF of a PoP, CO or HE site.* The unique mounting option in the form of the side U-mounting bracket is specially designed for use in the WAVEPACE® ODF-System. It offers free front access to rear-side cable routing in the ODF. The stabile pivot panel is thus fast and safely implemented into the network. The available panel variants splice/patch, patch, splice and splitter ensure the implementation of all applications of your network infrastructure and provide a high degree of planning flexibility.

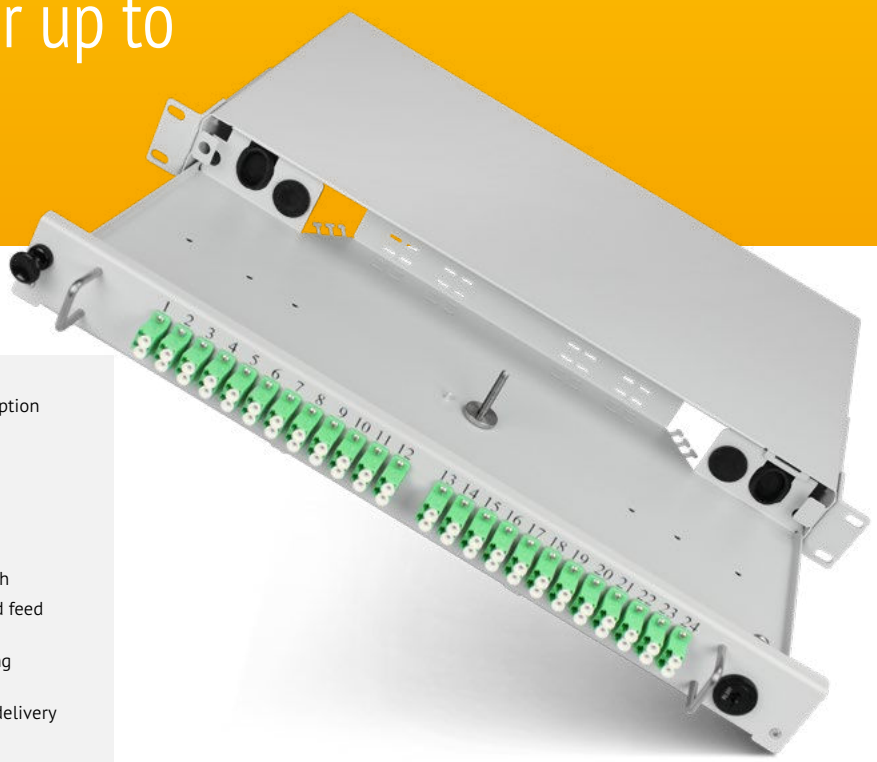
* CO: Central Office; HE: Headend; PoP: Point of Presence



WAVE PACE

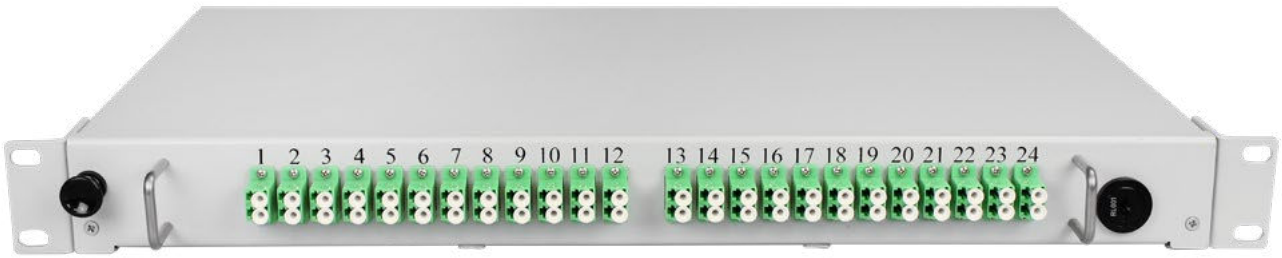
Pull-out Panel

Splice patch panel for up to 48 port 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

	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), 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		



ODF Rack
Optical Distribution Frame system solution

- 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 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

Accessories

Item	Description
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)

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.* 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.

* CO: Central Office; HE: Headend; PoP: Point of Presence

	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, Cold test: -25 to +70°C, dry heat	
Lock system	Magnetic lock	

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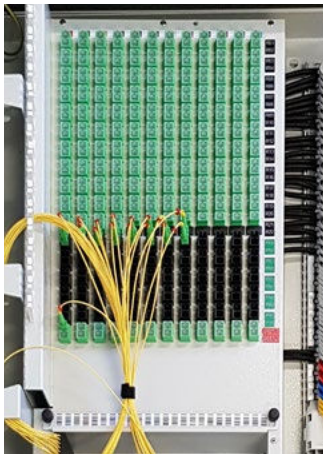
2.
CABINETS

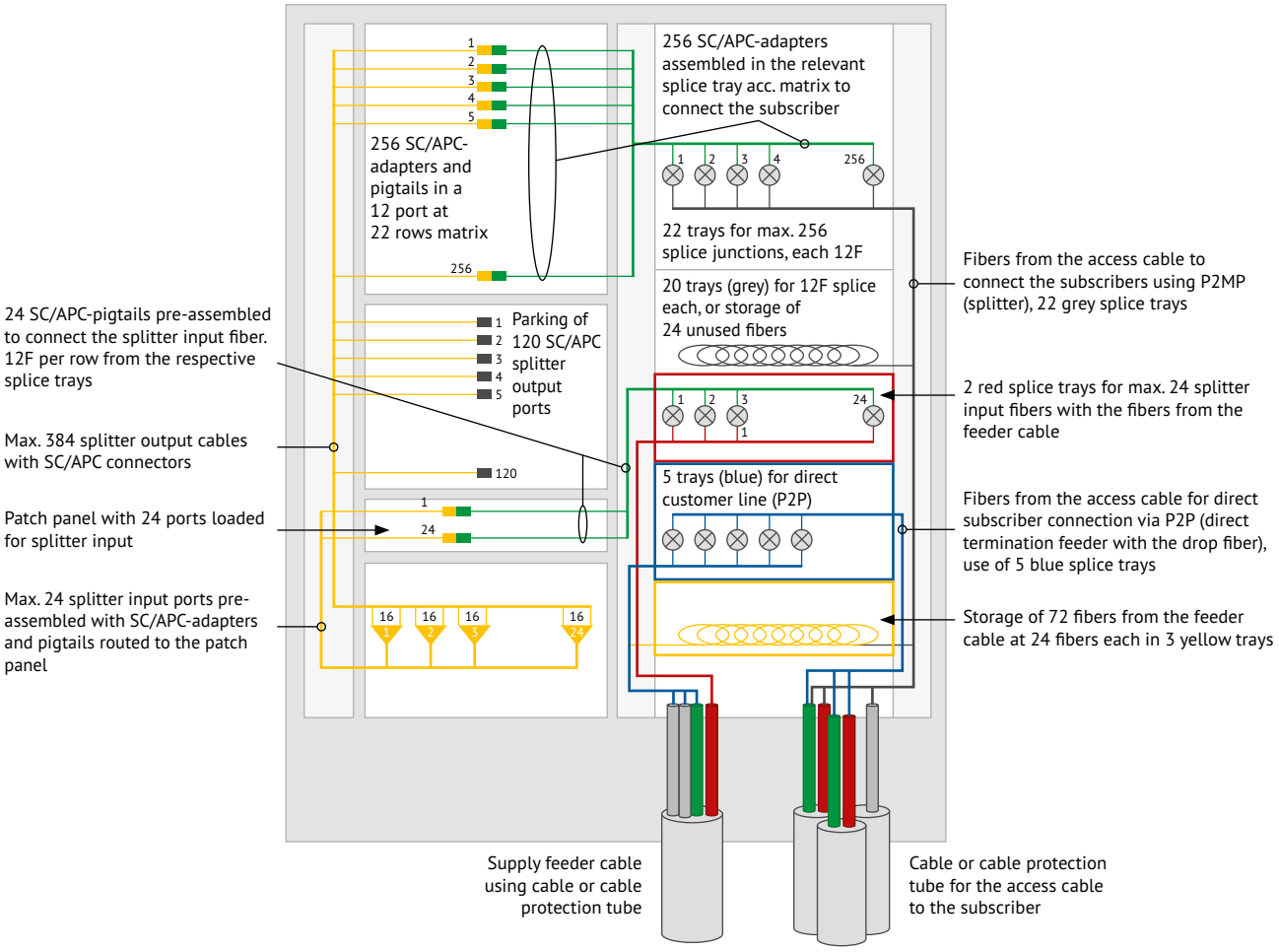
Splice splitter patch outdoor cabinet
for point to multipoint networks

- 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



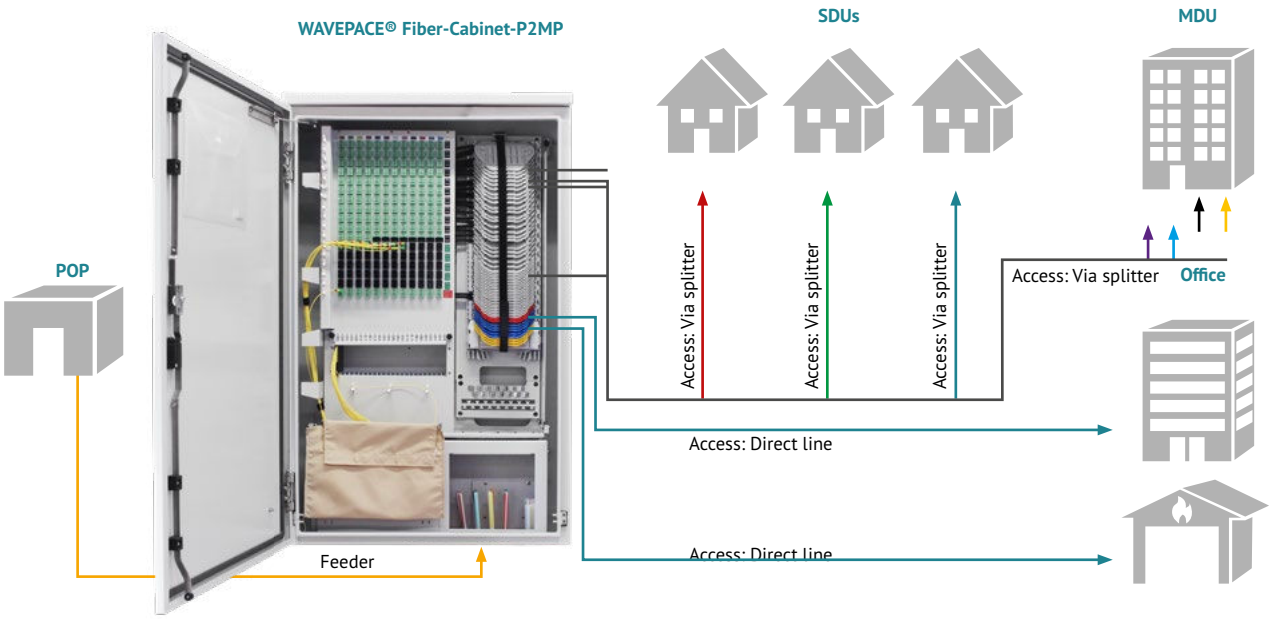
	Fiber-Cabinet-P2MP-256-SC/APC-Crimp	Fiber-Cabinet-P2MP-256-SC/APC-HS	Fiber-Cabinet-P2MP-256-SC/APC-HS-DIN	Fiber-Cabinet-P2MP-256-LC/APC-Crimp-DIN
Application	Splice/Splitter/Patch	Splice/Splitter/Patch	Splice/Splitter/Patch	Splice/Splitter/Patch
Interface	256 x SC/APC adapters & pigtails		256 x SC/APC adapters & pigtails, pre-assembled acc. to DIN IEC 60304 color code	128 x LC/APC 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			

Functional Layout (Schematic diagram)



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.



Splice splitter patch outdoor cabinet Accessories

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

Base plate for WAVEPACE® Fiber-Cabinet-P2MP

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

	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

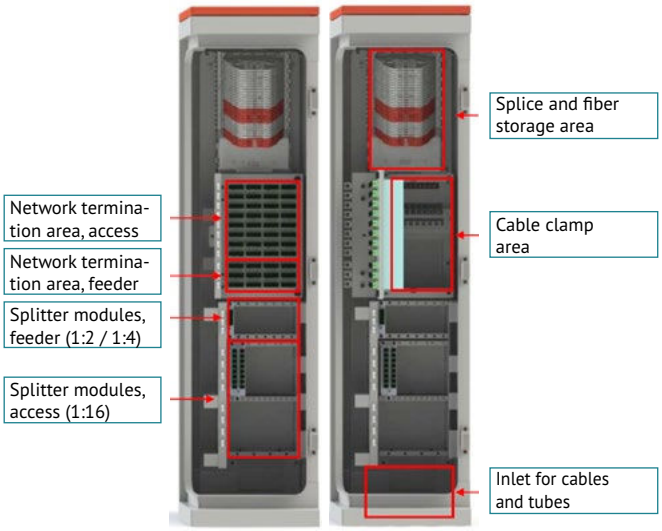
Further accessories

Item	Description
Splitter-Module-1:8-SC/APC	PLC-Splitter box, type SC/APC 1:8 for Fiber-Cabinet-P2MP
Splitter-Module-1:16-SC/APC	PLC-Splitter box, type SC/APC 1:16 for Fiber-Cabinet-P2MP
Splitter-Module-1:16-LC/APC	PLC-Splitter box, type LC/APC 1:16 for Fiber-Cabinet-P2MP
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.
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.
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.

Mini splice splitter patch outdoor cabinet
for point to multipoint networks

- Passive ready-to-connect outside plant cabinet for distribution of fiber optic connections via splitters to the subscriber at network level 3 or in buildings
- Robust, compact distribution cabinet for indoor and outdoor applications
- L shaped door for generous handling access
- Pre-assembled with 128 SC/APC access ports and 48 SC/APC feeder ports, stored with 2 x 4 fibers in splice trays for heat-shrink splice protection
- Lateral cable routing and slack management
- Splice trays for crimp splice protection are available in exchange
- Splice module with 90° foldable splice trays
- Colored splice trays for different applications (e. g. splitter input connection by feeder cable connection at red tray)
- Transparent dust protection caps for identification by means of fiber optic red light source
- All housing elements can be individually replaced, without any impact to operation
- The housing is designed so that all fibers have a minimum bending radius of 30 mm

Functional Layout (schematic diagram)



	Mini-Fiber-Cabinet-P2MP-128+48-SC/APC-HS
Application	Splice/Splitter/Patch
Interface	128 SC/APC access ports and 48 SC/APC feeder ports, stored with 2 x 4 fibers each splice tray with heat-shrink splice protection (pre-assembled)
Capacity	176 ports SC/APC, 32 splice trays, mounting for 8 splitter modules 1:16 and 8 splitter modules 1:2 or 1:4 splitter
Options for in- and outlets	12 x 6 – 16 mm diameter
Cable feed	Bottom
Adapter and fiber quality	Grade B / G.657.A1
Dimensions (H x W x D) [mm]	1.220 x 335 x 300
Weight [kg]	approx. 35
Door aperture angle	L shaped front door, hinged on the right side, removable, with 180° opening angle
Protection class	IP 55 / IK 10
Material	Metal, powder-coated (UV resistent), minimal layer thickness 60 µm
Color	Housing: RAL 7037 dust gray, housing roof: RAL 3020 traffic red

3.
WALL BOXES

MDU Splice patch wallbox
for 72 splices and 48 LC/24 SC port

- 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

Accessories

Item	Description
Adapter LC/APC Duplex	Duplex adapter LC/APC with ceramic sleeve, flangeless
Adapter LC/APC Quad	Quad adapter LC/APC with ceramic sleeve, flangeless
Adapter SC/APC	Simplex adapter SC/APC with ceramic sleeve, flangeless
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
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
Splice tray kit HS-12F	Kit, containing 6 splice trays with holder for heat-shrink splice protection for 12 fibers each

	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°

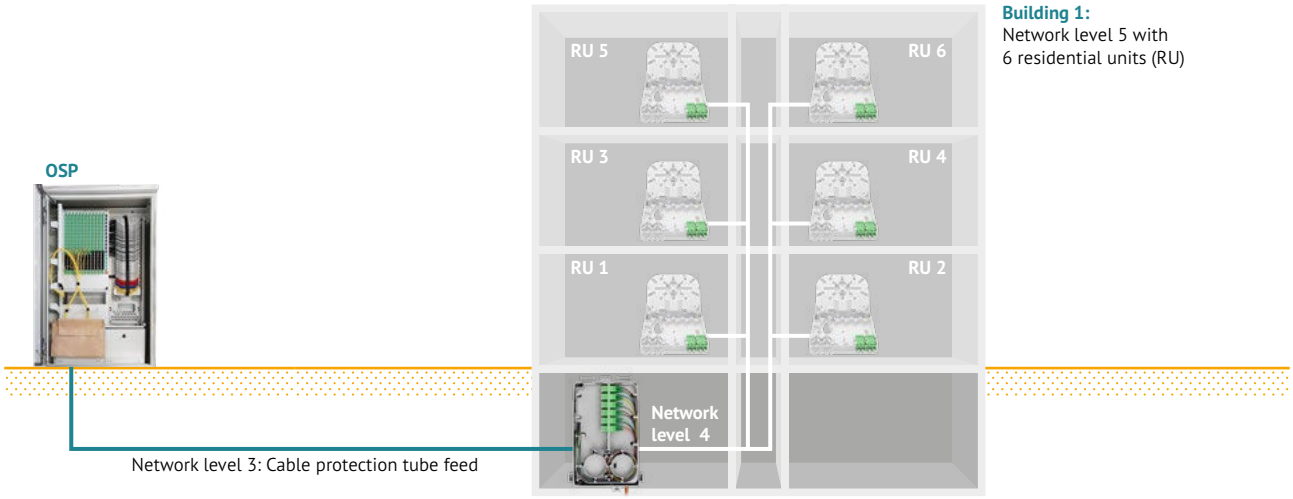
Item	Interface	Splice capacity	Special features
MDU-Wallbox-SP-empty-Crimp	Patch frame for LC and SC adapters	6 splice trays for 12 x crimp	Depending on splice tray
MDU-Wallbox-SP-empty-HS	Patch frame for LC and SC adapters	6 splice trays for 12 x heat shrink	Depending on splice tray
MDU-Wallbox-SP-24-SC/APC-Crimp	24 x SC/APC ports & pigtails	6 splice trays for 12 x crimp	Splitter access at splice tray
MDU-Wallbox-SP-8-LC/APC-Crimp	8 x LC/APC ports & pigtails		
MDU-Wallbox-SP-12-LC/APC-Crimp	12 x LC/APC ports & pigtails		
MDU-Wallbox-SP-16-LC/APC-Crimp	16 x LC/APC ports & pigtails		
MDU-Wallbox-SP-24-LC/APC-Crimp	24 x LC/APC ports & pigtails		
MDU-Wallbox-SP-24-SC/APC-HS	24 x SC/APC ports & pigtails	6 splice trays for 12 x heat shrink	–
MDU-Wallbox-SP-24-LC/APC-HS	24 x LC/APC ports & pigtails		

Application examples based on cable protection tubes and blown fiber technology

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.

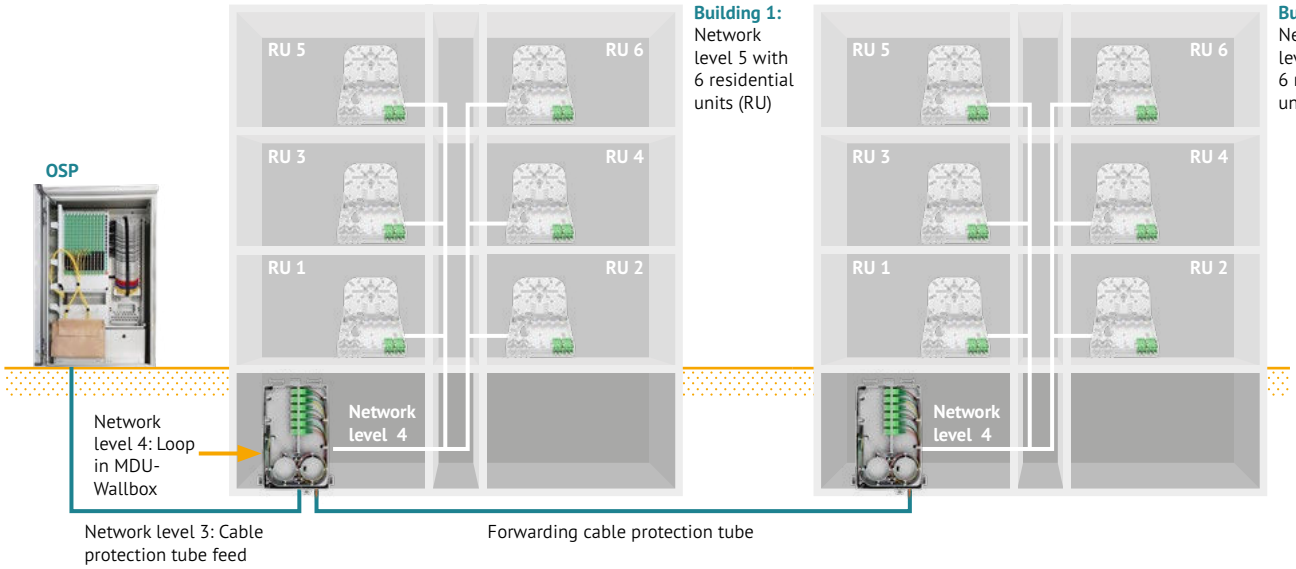
In the WAVEPACE® MDU-Wallbox, the fibers from the incoming cable of the OSP-cabinet are now being spliced onto the pigtails of the feeder cable in accordance to the network planning. For example, this can be each one fiber for IP service and one fiber for CATV. The 2 unused, remaining ports of the subscriber 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.



Building 1:
Network level 5 with 6 residential units (RU)

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 WAVEPACE® 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 plannnig. 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 MDU-Wallbox-SP accordingly.



Building 1:
Network level 5 with 6 residential units (RU)

Building 2:
Network level 5 with 6 residential units (RU)

MDU Splice patch wallbox XL
for 144 splices and 72 ports

- 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

Accessories

Item	Description
Adapter LC/APC Duplex	Duplex adapter LC/APC with ceramic sleeve, flangeless
Adapter LC/APC Quad	Quad adapter LC/APC with ceramic sleeve, flangeless
Adapter SC/APC	Simplex adapter SC/APC with ceramic sleeve, flangeless
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
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
Splice tray kit HS-12F	Kit, containing 6 splice trays with holder for heat-shrink splice protection for 12 fibers each

	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 & 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				

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

2-door Wallbox

Metal wallbox with two separate access areas

- 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

Accessories

Item	Description
Wallbox-System-2-door-Adpater-frame-LC	Adapter frame for 16 LC/APC quad adapters for the 2-door wallbox with port printing
Wallbox-System-2-door-Adpater-frame-SC	Adapter frame for 48 SC simplex adapters for the 2-door wallbox with port printing
Adapter-LC/APC-Quad	Quad adapter LC/APC with ceramic sleeve, without flange
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
Adapter-SC/APC	Simplex adapter SC/APC with ceramic sleeve, without flange
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

	Wallbox-System-2-door-SP-12-Q-LC/APC-48F	Wallbox-System-2-door-SP-12-Q-LC/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)			–	

SDU Splice patch wallbox
for up to12 splices and 4 ports

- 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 constisting of 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
- Holds up to 4 LC/APC duplex adapters or SC/APC adapters

	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

SDU-Wallbox-SP-S-empty
Cover inside

SDU-Wallbox-SP-S-empty
Rear side

SDU-Wallbox-SP
Exemplary full occupancy for supported expansion with LC/APC adapters and pigtails plus input with cable protection tube.

Further information at

wavepace.com


1 A 2 3 B 4

4.
WALL OUTLETS

FWO-X1

Universal wall outlet for FTTH applicatons

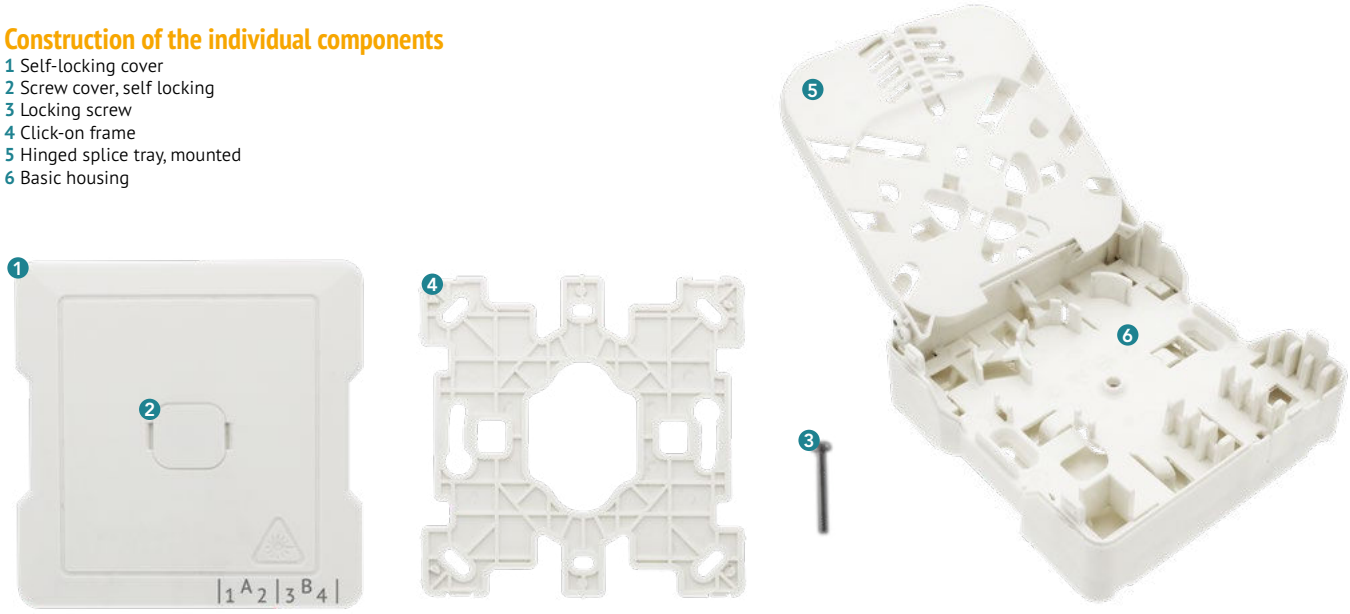
- Multifunctional junction box with 4 ports LC or 2 ports SC for fiber connection in network level 5
- Extremly compact dimensions 80 x 80 x 29 mm (W x H x D)
- Installation options for cavity wall box (60 mm mounting dimension), wall mounting, DIN rails and as click-on for DIY installation without access 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)

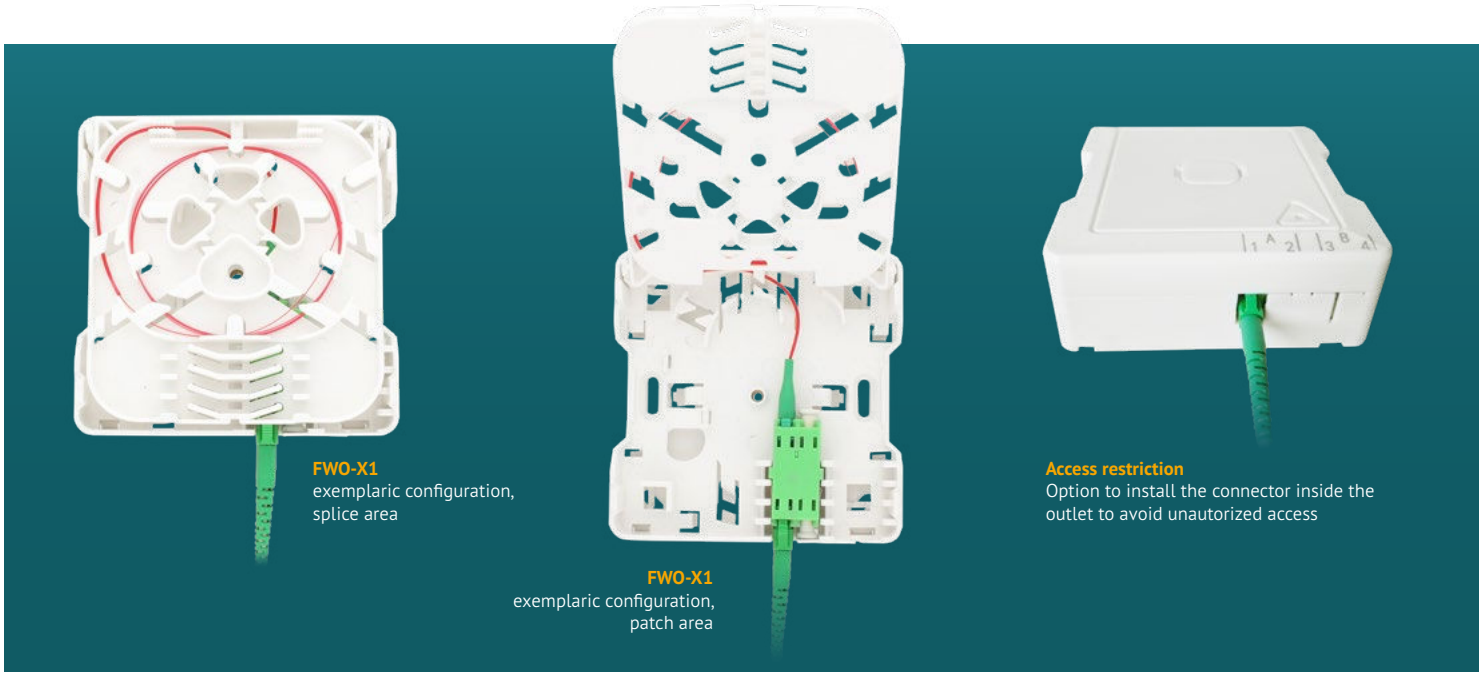
	FWO-X1-empty	FWO-X1-SC/APC-2	FWO-X1-LC/APC-1	FWO-X1-LC/APC-2	FWO-X1-SC/APC-2-2F	FWO-X1-LC/APC-1-2F	FWO-X1-xx-SC/APC-4F	FWO-X1-xx-LC/APC-4F
Application	–	Splice/patch						Patch
Interface	–	2 x SC/APC simplex adapters	1 x LC/APC duplex adapter	2 x LC/APC duplex adapter	2 x SC/APC simplex adapters & 2 x pigtails	1 x LC/APC duplex adapter & 2 x pigtails	2 x SC/APC simplex adapters & pre-assembled cable (4 fibers)	2 x LC/APC duplex adapters & pre-assembled 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) and as click-on for DIY installation with pre-assembled fiber optics							
Material wall outlet	Plastic material ABS (LSOH, RoSH, REACH compliant, Ul-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 an laser protection (shutter)						
Connector quality	–				Grade B, Level 1 classification according 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 assembly with adapters and pigtails	–					In-house cable Ø 2,65 mm using G.657.A2 fiber, fire protection class B2ca-s1a, d0, a1, **various cable lengths available** Non-used 2 fibers are stored in the splice tray	–

Details and product variants of the FTTH wall outlet 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



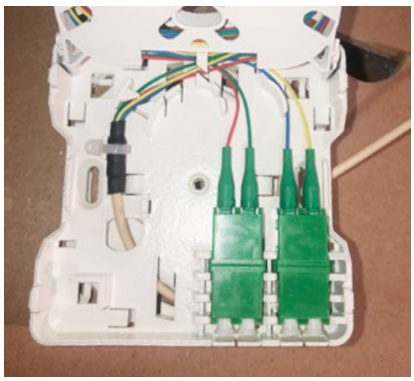


FWO-X1
exemplaric configuration, splice area

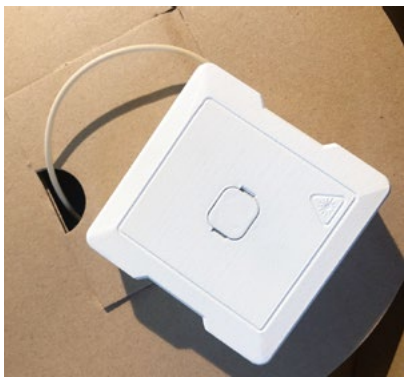
FWO-X1
exemplaric configuration, patch area

Access restriction
Option to install the connector inside the outlet to avoid unautorized access

Further product versions



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



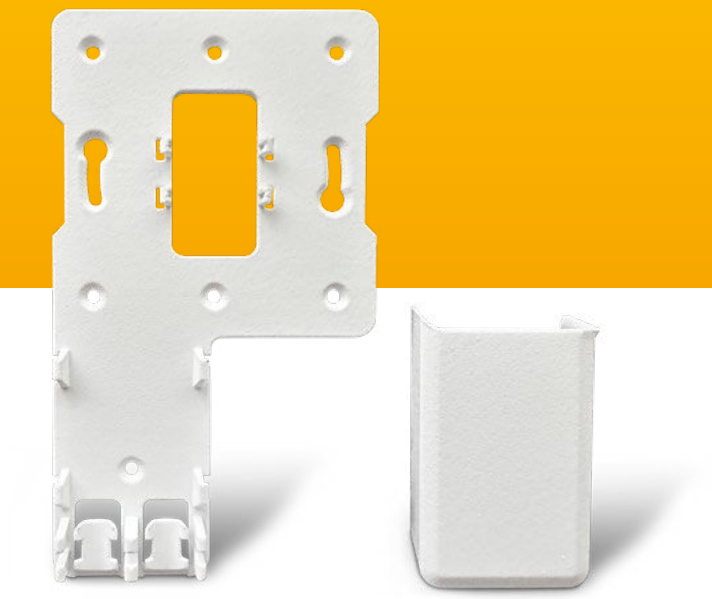
Pre-assembled "Pizza box"
With in-house cable on roll-off carton, available in differnet cable lenghts

Subject to technical changes!

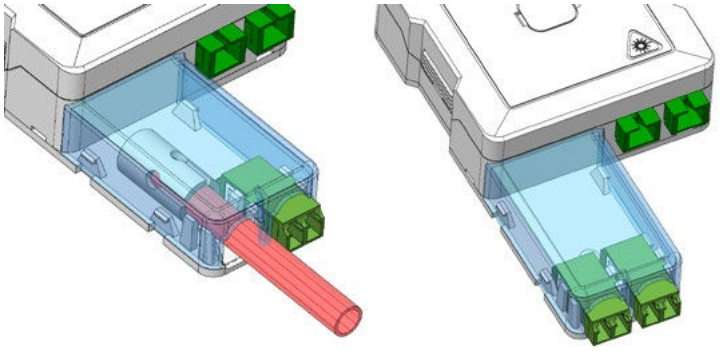
WAVE PACE

FWO-X1-APL-Kit

Universal wall outlet for FTTH applicatons



- 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 e.g.:
  - 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



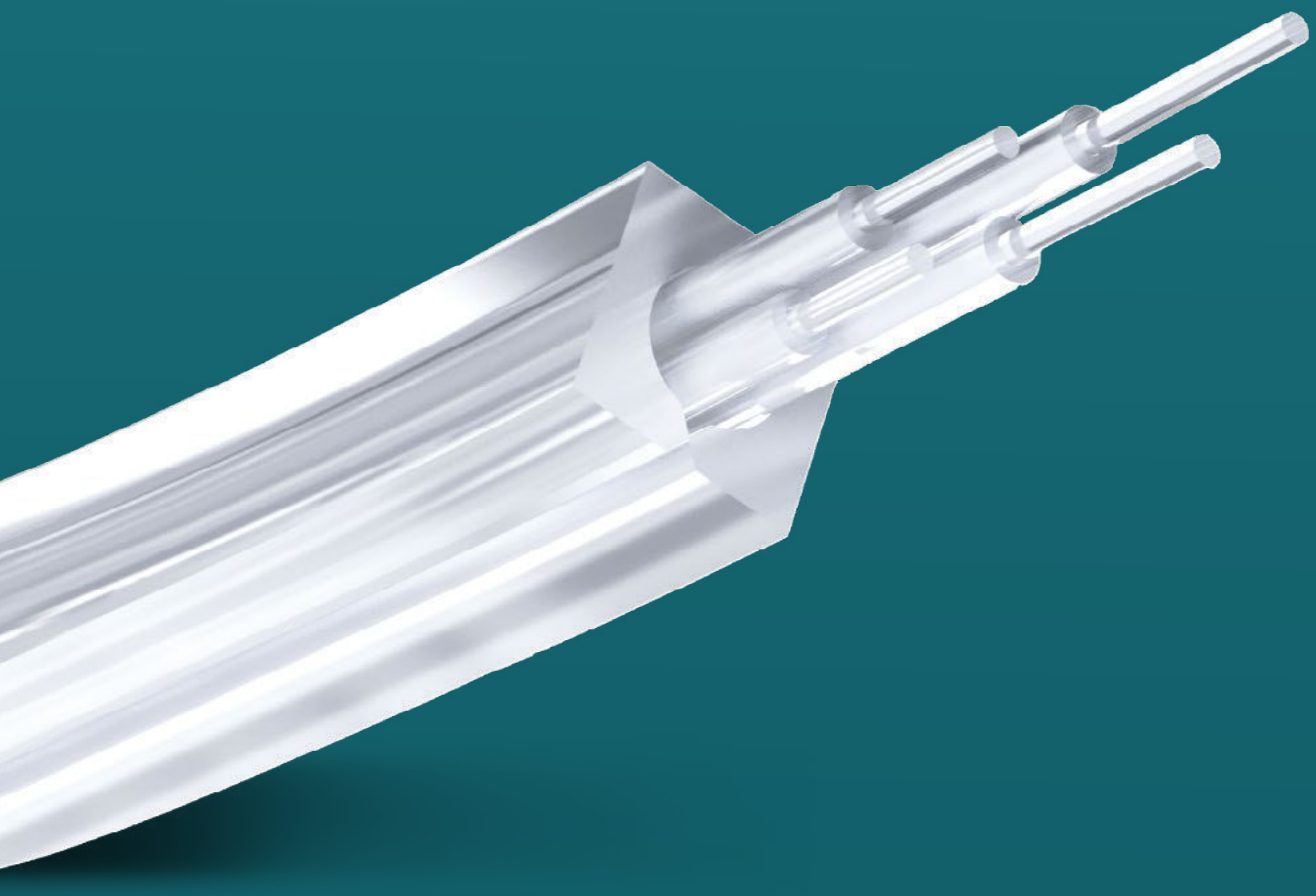
	FWO-X1-APL-Kit
Application	Indoor termination box combined with the FWO-X1
Interfaces	2 x micro duct up to Ø 10 mm and/or 2 x LC Duplex adapter / 2 x SC Simplex adapter
Dimensions (L x W x D) [mm]	140 x 80 x 32,5 (Extends the dimensions of FWO-X1 from 80 x 80 x 29 in die relevant area by 60 x 40 mm (L 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

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

	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

Further information at

wavepace.com



5.
SILWAY INDOOR DISTRIBUTION SYSTEM

Silway
Flexible indoor fiber distribution system

- 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

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

	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 Translucent system: not tested, as only used inside the living area			
Temperature resistance of adhesive	Long term (e. g. days/weeks): 90°C, 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			

Extensive accessories for the Silway system

	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

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
- Available in translucent or white color

Subject to

6.
PATCH CORDS

Standard patch cords
Simplex patch cords with a G.657.A2 fiber

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.

	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
Available lengths [m]	1,0 / 2,0 / 3,0 / 5,0 / 10,0					

Different connector types, lengths and cable colors are available on request.

Armored patch cords
No more undercutting of the bending radius!

Undercutting the bending radius is a thing of the past!

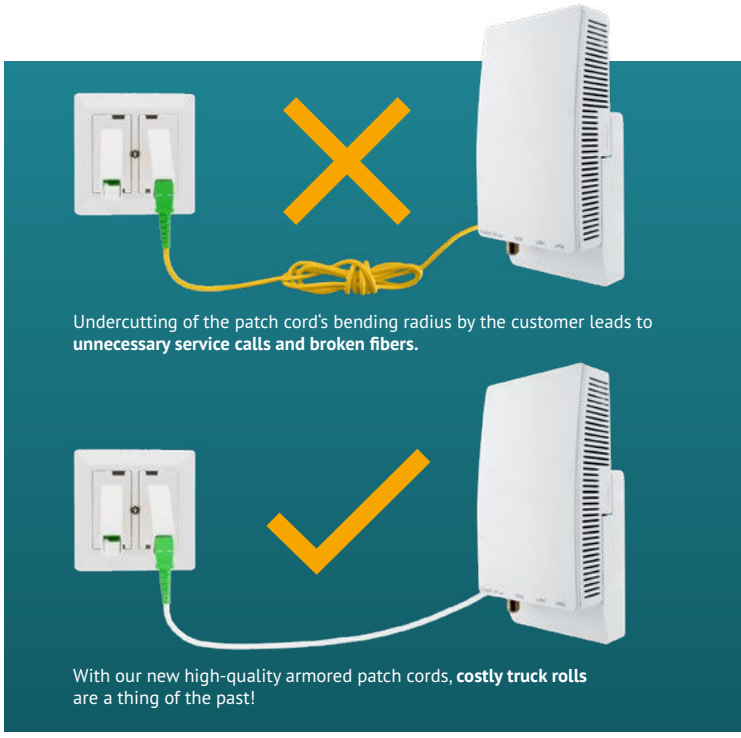
Today, many service calls within FTTH networks find its source in the customer in-home network. Experience teaches us, that, apart from un-powered CPEs, in most occasions the fiber patch cord connecting the passive FTU with the fiber CPE is causing the service call.

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.

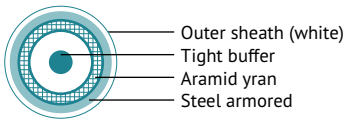
To overcome unnecessary and costly service calls and truck rolls, we have designed an LSZH steel armored patch cord so robust that bending radius issues or broken fiber cords are things of the past.

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 easy 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.



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



	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		
Available cable lengths [m]	1,0 / 1,5 / 3,0 / 5,0 For choosing a cable length, please replace the „xx" in the item name with the desired cable length.		
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

Different connector types, lengths and cable colors are available on request.

Subject to technical changes!

WAVE PACE

Get in touch!

Do you have any questions about a WAVEPACE® product or would you like to place an order? We will be happy to help you!

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