

Future Energy System

IBDN

(In Building Distribution Network

Prysmian VertiCasa Technology

Table of Contents

Introduction .1

IBDN Overview .2

Basement Cable Termination .3

Apartment Cable Termination .4

Vertical / Horizontal Cabling .5

EMI Protection .6

Administration and labeling .7

.Introduction 1 .

This Design Guide has been produced in order to standardize the method, design and .implementation of FTTx based IBDN system in multi tenant’s multi story apartment blocks

.IBDN Overview. 2

This design guide covers the three major parts of the IBDN. The following is a brief :description of these parts

Basement Cable Termination -2.1 .

The point where the lead-in cable and the cables to the apartments will be terminated. This .point will also house the passive splitters

Apartment Cable Termination-2.2 .

The point where the optical fiber cables and the In-Apartment copper cables will be terminated. This point will also house the Customer Premises Equipment (CPE)

Vertical / Horizontal Cabling-2.3 .

The vertical / horizontal cabling is the portion of the IBDN cabling system, which links the .Apartment Cable Termination to the Basement Cable Termination

.Basement Cable Termination. 3

The cross-connect hardware, to terminate the lead-in cable and the cables to the .apartments at the basement, depend on the number of cables to be terminated

:The following are the hardware required

Referenc e	Item	Notes
4.1	inch, Rack Assembly 19	Floor or Wall mounts depending on the .number of cables to be terminated
4.2	inch, Manager Shelf 19	shelf can take 12 connector modules
4.3	SC, 12 Fiber, Connector Module	module for each 12 fiber 1
4.4	SC, Single mode, Connector	connector for each Single mode fiber 1

The rack will also house the passive splitters to be provided by Batelco. A 1U splitter shelf is .required for each 25 apartments. This should be considered in the Rack space planning

.Apartment Cable Termination 4 .

The Customer Premises Equipment (CPE) will be installed at this point in the apartment. A termination Box only shall be provided with two SC/PC Connectors to terminate the 2 fibers allocated for each apartment of the vertical / horizontal fiber cable. The termination box .shall be compact and should fit in a Standard Electrical resist plastic box

The In-Apartment copper cabling shall be terminated at this point also to enable the patching of the required services to the designated telecommunication point in the .Apartment

The area where the CPE will be installed need to be air conditioned and a 13 Amp Socket .should be provided for power supply

.Vertical / Horizontal Cabling 5

A minimum of 2 fiber core cables shall be provided per Apartment to meet todays and future .requirements and cover for the maintenance requirements

The vertical / horizontal cabling shall be based on a cost effective system that enable the extension of the fibers from the basement cable termination to each apartment cable termination direct without or with minimal splices in between to minimise the optical losses .and improve the reliability

.The fibers used shall be in compliance with ITU standard G.657

The minimum bending radius of the conduit or tray should be based on the on the minimum .bending radius of the cable. The maximum pulling tension shall be respected

.Electromagnetic Interference (EMI Protection). . 6

Copper cables, especially those used for high-speed data systems; need to be protected from EMI sources by adequate spacing. The minimum recommended separation between :the various EMI sources and copper cables are as follows

Conditions	Minimum Separation Distance		
	(kava 2>)	(kava 2-5)	(Kava 5<)
Unshielded power lines or electrical equipment in proximity to open or nonmetal pathway	127mm	305mm	610mm
Unshielded power lines or electrical equipment in proximity to a grounded metal conduit pathway	64mm	152mm	305mm
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal conduit pathway	-	76mm	152mm
Fluorescent lighting		305mm	

Grounded metal conduit or trays provide adequate protection from electrical noise sources. Accordingly all metal trays shall be grounded. Open or non-metal trays (plastic) should be .placed with sufficient separation from noise sources

Administration & Labeling .7 .

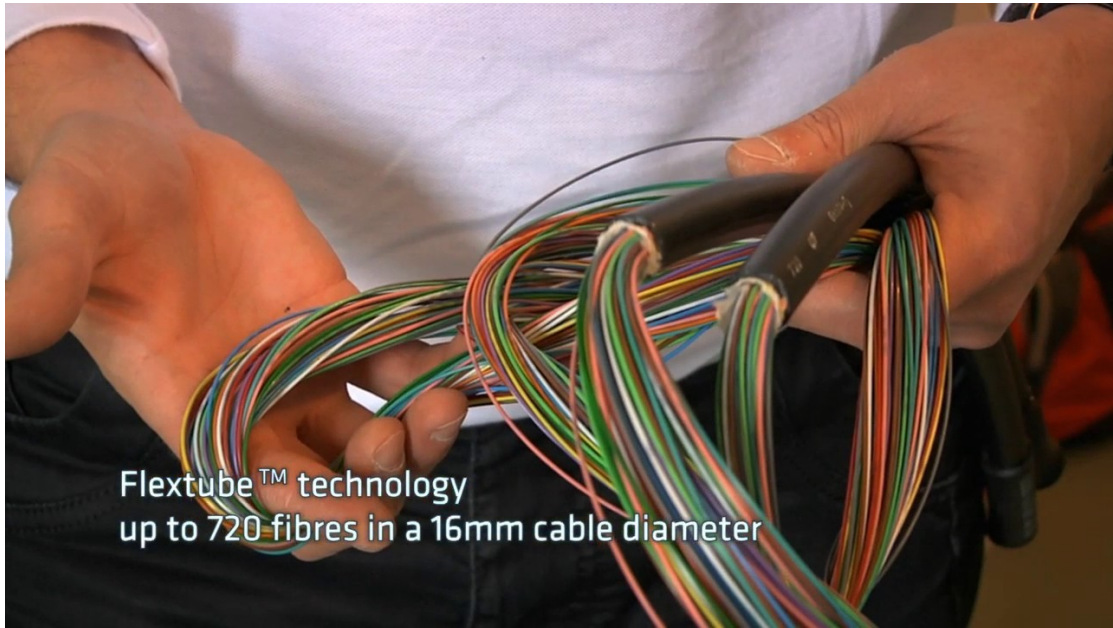
Each component of the telecommunication infrastructure should be labeled linking the component to its corresponding record. The Rack, Shelf shall be labeled with its number or letter as appropriate. All cables shall be labeled with it unique identifier at both ends. All

labels should be easily readable and resistant to environment condition and be printed by a .mechanical devise

Types of Premises in Bahrain



:Prysmian Material References



Flextube™ technology
up to 720 fibres in a 16mm cable diameter

MK2 Ultra Compact Termination Box

Prysmian Part Number: See Table Below



The MK2 Ultra Compact Termination Box is designed for use in residential and business applications for the termination of up to two fibres. The wall box enables the installation of a small cable to be spliced to up to two SC pigtails (PC or APC), which connect to shuttered adapters at the base of the unit. The unit can be quickly installed within an office, house or communication room environment.

Features and Benefits

- Compact and attractive design for internal use.
- Ability to allow cables to enter from rear, bottom, top or either side of the unit.
- All fibres are positively managed to maintain a 20mm minimum bend radius.
- Supplied with pre-installed fibre pigtails.
- Flip tray to allow access to connectorised tails and cable entry.
- Removable cover for easy access. Cover has a transparent label cover for identification.
- Supplied with a security screw to prevent unauthorised access.
- Unit manufactured from fire resistant UL94-V0 rated material.
- Patchcords exit unit on bottom face via two shuttered SC adapters.
- Standard colour white RAL 9016. Other colours available on request.
- Ability to accommodate field mounted connectors (Please contact Prysmian to discuss your requirements).

Kit Contents

The MK2 Ultra Compact Termination Box is supplied with wall fixings, a security screw, a label cover and cable ties. Pigtails and adaptors can be pre-installed or sold separately. See Part numbers opposite.

Additional Items

- Splice Protectors.

Optional Items

(if required as separate items)

- Patch Chords (refer to data sheet AC004).
- Adaptors.
- Pigtails.

Part Numbers

Supplied With	Part Number
1 SC/UPC adaptor (no pigtail)	XCPS01036
1 SC/APC adaptor (no pigtail)	XCPS01041
2 SC/UPC adaptors (no pigtails)	XCPS01037
2 SC/APC adaptors (no pigtails)	XCPS01042
1 SC/UPC pigtail and adaptor	XCPS00607
1 SC/APC pigtail and adaptor	XCPS00608
2 SC/UPC pigtails and adaptors	XCPS00609
2 SC/APC pigtails and adaptors	XCPS00610

C17 : Properties of cabled BendBright® Singlemode fibre

Low macro bending sensitive, low water peak fibre; G.657 A1, OS2, OS1

General and application

The optical fibres are made of a high grade doped silica core surrounded by a silica cladding; They are coated with a dual layer, UV cured acrylate based coating. This enhanced low macro bending sensitive, low water peak fibre, gives very good bending performance. The preferred use of the BendBright® fibre is in access networks. The BendBright® offers reduced bending radii for many cables types. The fibre fulfils the new ITU G.657 A1 specification (edition 2009), as well as G.652.D. The low macro bending sensitivity further guarantees that the 1625 nm window (L-band) will be available for future use in this bandwidth hungry environment

Standards and Norms

IEC/EN 60793-2-50 Category B.1.3 and B_6a	ANSI/CEA S-87-640
ITU Recommendation G.657.A1 (2009)	EN 50 173-1:2007, cat. OS2 and OS1
ITU Recommendation G.652 designations A, B, C and D (2009)	ISO/IEC 11801:2002, cat. OS1
Telcordia GR-20-CORE	ISO/IEC 24702:2006 cat. OS2 and OS1
	IEEE 802.3 – 2002 incl. 802.3ae

Attenuation (of cable with fibres)

IEC 60793-1-40

Maximum attenuation value in the range 1310 - 1625 nm*	≤ 0.39 dB/km
Maximum attenuation value at 1550 nm	≤ 0.22 dB/km
Inhomogeneity of OTDR trace for any two 1000 metre fibre lengths	Max. 0.1 dB/km

* including H2-ageing according to IEC 60793-2-60, type B.1.3, @1383nm

Group index of refraction

IEC 60793-1-22

Group index of refraction at 1310 nm and 1550 nm	1.467
Group index of refraction at 1625 nm	1.468

Other properties

IEC 60793-1-xx

Cladding diameter	IEC/EN 60793-1-20	µm	125.0 ± 0.7
Cladding non-circularity	IEC/EN 60793-1-20	%	≤ 0.7
Core (MDF) -cladding concentricity error	IEC/EN 60793-1-20	µm	≤ 0.5
Primary coating diameter – ColorLock [®] and natural	IEC/EN 60793-1-21	µm	242 ± 7
Primary coating non-circularity	IEC/EN 60793-1-21	%	≤ 5
Primary coating-cladding concentricity error	IEC/EN 60793-1-21	µm	≤ 12
Proof stress level	IEC/EN 60793-1-30	GPa	≥ 0.7 (≈ 1%)
Strip force (peak)	IEC/EN 60793-1-32	N	1.2 ≤ F _{peak,strip} ≤ 8.9
Static fatigue, aged n _s		-	>23
Chromatic dispersion coefficient:	IEC/EN 60793-1-42	ps/km · nm	
In the interval 1285 nm – 1330 nm			≤ 3
At 1550 nm			≤ 18.0
At 1625 nm			≤ 22.0
Zero dispersion wavelength, λ ₀		nm	1300 - 1322
Zero dispersion slope		ps/(nm ² · km)	≤ 0.090
Cut-off wavelength	IEC/EN 60793-1-44	λ _{cut} nm	≤ 1260 *
Mode field diameter at 1310 nm	IEC/EN 60793-1-45	µm	9.0 ± 0.4
Mode field diameter at 1550 nm		µm	10.1 ± 0.5
Macro bending loss	IEC/EN 60793-1-47	dB	
100 turns on a mandrel R = 25 mm, @1310 & 1550nm			≤ 0.02
100 turns on a mandrel R = 30 mm, @1625nm			≤ 0.05
10 turns on a mandrel R = 15 mm, @1550nm			≤ 0.25
10 turns on a mandrel R = 15 mm, @1625nm			≤ 1.0
1 turn on a mandrel R = 10 mm, @1550nm			≤ 0.75
1 turn on a mandrel R = 10 mm, @1625nm			≤ 1.5
Polarisation mode dispersion (PMD) coefficient, cabled	IEC/EN 60793-1-48	ps/√km	≤ 0.1
PMD ₀ Link Design Value**	IEC/EN 60794-3	ps/√km	≤ 0.06

* guaranteed value according to the ITU-T (ATM G650) method

** according to IEC 60794-3, Ed3 (Q=0.01%)

All measurements in accordance with ITU-T G650 recommendations.

Note: The Draka Comteq Cable Solutions policy of continuous improvement may cause in changed specifications without prior notice

www.draka.com/communications

Properties of cable with Bend Intensive SM fibre

Low water peak Bend Intensive SM fibre G.657.A1

General and application

The optical fibres are made of a high grade doped silica core surrounded by a silica cladding. They are coated with a dual layer, UV cured acrylate based coating. This bend intensive single mode fibre provides improved performance across the entire 1260 nm to 1625 nm wavelength spectrum. The main improvements are improved bending loss and tighter dimensional specifications, both for improved connectivity.

Standards and Norms

IEC / EN 60793-2-50 Category B.6

ITU-T Recommendation G.657

Optical properties

Attribute	Measurement method	Units	Limits
Mode field diameter at 1310 nm	IEC/EN 60793-1-45	µm	9.0 ± 0.4
Chromatic dispersion coefficient: In the interval 1285 nm – 1330 nm	IEC/EN 60793-1-42	ps/Km • nm	≤ 3.0
At 1550 nm		ps/Km • nm	≤ 18.0
At 1625 nm		ps/Km • nm	≤ 22
Zero dispersion wavelength, λ ₀	IEC/EN 60793-1-42	nm	1300 - 1322
Zero dispersion slope	IEC/EN 60793-1-42	Ps/(nm ² •Km)	≤ 0.09
Cut-off wavelength	IEC/EN 60793-1-44	λ _c nm	≤ 1260
Polarisation mode dispersion (PMD) coefficient	IEC/EN 60793-1-48	ps√Km	≤ 0.1
PMD ₀ Link Design Value (computed with Q=0.01%, N=20)	IEC/EN 60794-3	ps√Km	≤ 0.06

Attenuation

Attribute	Measurement method	Units	Limits
Maximum attenuation value of cable at 1310 nm	IEC/EN 60793-1-40	dB/km	≤ 0.38
Maximum attenuation value of cable at 1383 nm	IEC/EN 60793-1-40	dB/km	≤ 0.38
Maximum attenuation value of cable at 1550 nm	IEC/EN 60793-1-40	dB/km	≤ 0.22
Maximum attenuation value of cable at 1625 nm	IEC/EN 60793-1-40	dB/km	≤ 0.25
Attenuation uniformity @1310 & 1550 nm	IEC/EN 60793-1-40	dB/Km	≤ 0.05
Profile uniformity @1310 & 1550 nm	IEC/EN 60793-1-40	dB	≤ 0.05

SRS3000 Distribution Sub-Rack

Prysmian Part Number: See Below



The SRS3000 Distribution Sub-Rack is a modular sub-rack available in a variety of configurations for integration into 19" / ETSI / ANSI racks, street-side cabinets or wall mounted cabinets. The product consists of a metal chassis available in 1U, 2U and 3U into a which a choice of modules are loaded. The module types available are Splice and Patch, Patch Only, Splice Only, Patchcord Storage and connectorised splitter. This allows users to customise the product for different applications whilst using the same building blocks in each sub-rack.

The splice and patch, splice only and patch only modules can be supplied in 12, 24 or 48 fibre capacities in a 1U unit. They are supplied with a range of connector types for both singlemode and multimode fibre, which can be factory fitted or supplied as a kit. The cable anchoring systems allows all types of optical cables (including blown fibre) to be routed onto the sub-rack and modules.

Features and Benefits

- Modular system for installation into 19" / ETSI / ANSI racks, street-side cabinets and wall mounted cabinets.
- The sub-rack can be supplied fully configured or modules can be supplied empty for upgrading at a later date.
- Chassis are available in 1U, 2U and 3U options are supplied front mounted as standard. Rear mounting brackets are available as an option.
- Fibres are actively managed to minimum bend diameters throughout the Splicing and Patching, Patching only, Splicing only, Patchcord Storage and Splitter Modules.
- Splicing and bare fibre excess storage is performed inside a tray protected by a cover to prevent any accidental damage when open & closing the shelves.
- Modules pivot outwards for easy access.
- Cables are completely protected from entry to exit of the panel.
- Optical devices (i.e. Splitters & WDM's) can be mounted within the modules. Please contact Prysmian to discuss your requirements)
- Wall mount 19" and ETSI cabinets are also available. Please contact Prysmian for further details.
- Modules have drop down fronts for easier patchcord routing, enclosing patch-cords, and protecting adapters.
- 2 large labelling areas provided for identification recording per module.

Ordering information

The SRS 3000 Sub rack system is supplied with either splice and patch, patch only, splice only or patchcord storage modules pre-fitted. To order the item required refer to the part number section on page 3.

Kit Contents

The SRS 3000 Sub rack system is supplied with modules, 2 or 3 ARS cable anchor kit brackets (depending on whether 2U or 3U) and a rack fixing kit.

Additional Items - Required

- Splice Protectors

Additional Items - Optional

- ETSI Conversion Brackets
- Rear Mounting Bracket
- ARS Cable Anchor (additional)
- BEM Cable Anchor
- Upgrade Kits
- Blown Fibre Manifold
- Aramid Restraint KITS
- Patchcords (see datasheet AC004)

INDOOR OPTICAL CABLE

Cable Design

IEC/EN 60794-2-50



-2F version illustrated not to scale -

- **Fibers:** G.657A1 or G.657A2
- **Buffers:** 0.9 mm easy stripping buffers (ESFU).
- **Peripheral Strength Member:** aramid yarns.
- **Outer Sheath:** Flame retardant LSOH.

This dielectric optical cable is designed for indoor installation technique.

Technical data

No. of Fibres		1	2	4
Buffer diameter - ϕ	mm		0.900	
Sheath thickness	mm	1.20		0.90
Cable diameter - ϕ	mm		4.0	4.6
Cable weight	Kg/Km	18	15	20
Min. bending radius	mm	Under Tension: 15xCable- ϕ		Without Tension: 10xCable- ϕ
Temperature range	°C	Transport : -10 -> +60	Installation: -10 -> +40	Operation: -10 -> +60

Main characteristics

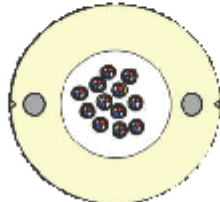
Test	Standard	Value	Requirement*
Tensile Strength (static)	IEC 60794-1-2-E1	90 N, 5 min.	Δ /l fibre \leq 0.20%, $\Delta\alpha \leq$ 0.05 dB under test, reversible
Tensile Strength (dynamic)	IEC 60794-1-2-E1	270N, 5 min.	Δ /l fibre \leq 0.60%, $\Delta\alpha \leq$ 0.10 dB under test, reversible
Crush	IEC 60794-1-2-E3	150 N/100mm, max. 15 min	$\Delta\alpha \leq$ 0.10 dB under test, reversible, no damage
Impact	IEC 60794-1-2-E4	5 J, 3 impacts, R=300 mm	$\Delta\alpha \leq$ 0.10 dB after test, no damage
Repeated Bending	IEC 60794-1-2-E6	R=15xOD, 50N, 100 cycles	No break of fibres or tensile performance elements
Torsion	IEC 60794-1-2-E7	\pm 180°, 1 m, 20N, 20 cycles	$\Delta\alpha \leq$ 0.10 dB under test, reversible, no damage
Bend (at low temperature)	IEC 60794-1-2-E11A	Test diameter=10xOD, 5 cycles	$\Delta\alpha \leq$ 0.05 dB under test, reversible, no damage
Temperature Cycling	IEC 60794-1-2-F1	-10 -> +60 °C, 2 cycles, time of cycle = 18h	$\Delta\alpha \leq$ 0.05 dB/Km, reversible
Kink	IEC 60794-1-2-E10	Test temperature: 23 °C \pm 3 °C, Test diameter=5xOD	No kink after test
Abrasion Resistance of Cable Marking	IEC 60794-1-2-E2B-1	3 cycles, load = 450 g	After the test the marking shall be legible
Flame Propagation	IEC 60332-1	-	As in IEC 60332-1
Halogen content	IEC 60754-1	-	Halogen content <0.5%
Corrosivity of Smoke Gases	IEC 60754-1	-	pH value \geq 4.3
Conductivity of Smoke Gases	IEC 60754-1	-	Conductivity > 10 μ S/mm

* values for single-mode fibres, all optical measurements performed at @1550 nm

INDOOR RISER OPTICAL CABLE

Cable Design

IEC/EN 60794-2-20



-24F version illustrated not to scale -

- **Fibers:** G.657.A1
- **Buffers:** 0.9 mm easy stripping buffers with 2 fibers (2f ESFU).
- **Outer Sheath:** Flame retardant LSOH, 2 glass fibers reinforced plastic material (GRP) embedded, disposed at 180°.

This dielectric optical cable is designed for indoor installation technique.

Technical data

No. of Fibres		12(6x2f)	16(8x2f)	24(12x2f)	36(18x2f)	48(24x2f)	72(36x2f)	96(48x2f)
Part number				60003301	60004575	60003302		60003836
Buffer diameter - ϕ	mm	0.900						
GRP - ϕ	mm		1.0			1.0		
Sheath thickness	mm		1.8			2.5		
Cable diameter - ϕ	mm		10			12.0		14.5
Cable weight	Kg/Km	74	75	80	125	130	165	175
Min. bending radius	mm	Under Tension: 20xCable- ϕ			Without Tension: 10xCable- ϕ			
Temperature range	°C	Transport : -10 -> +60			Installation: -10 -> +40		Operation: -10 -> +60	

Main characteristics

Test	Standard	Value	Requirement*
Tensile Strength (dynamic)	IEC 60794-1-2-E1	300N, 5 min.	ΔI / fibre \leq 0.60%, $\Delta\alpha \leq$ 0.10 dB under test, reversible
Crush	IEC 60794-1-2-E3	500 N/100mm, max. 15 min	$\Delta\alpha \leq$ 0.10 dB under test, reversible, no damage
Impact	IEC 60794-1-2-E4	5 J, 3 impacts, R=300 mm	$\Delta\alpha \leq$ 0.10 dB after test, no damage
Repeated Bending	IEC 60794-1-2-E6	R=20xOD, 100N, 100 cycles	No break of fibres or tensile performance elements
Bend	IEC 60794-1-2-E11A	R=10xOD, 5 cycles	$\Delta\alpha \leq$ 0.05 dB under test, reversible, no damage
Temperature Cycling	IEC 60794-1-2-F1	-10 -> +60 °C, 2 cycles	$\Delta\alpha \leq$ 0.05 dB/Km, reversible

* values for single-mode fibres, all optical measurements performed at @1550&1625 nm

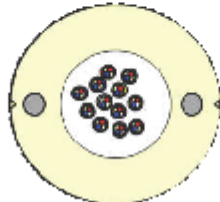
Optical Characteristics

See the attached cabled optical fiber G.657.A1 data sheet.

INDOOR RISER OPTICAL CABLE

Cable Design

IEC/EN 60794-2-20



-24F version illustrated not to scale -

- **Fibers:** G.657.A1
- **Buffers:** 0.9 mm easy stripping buffers with 2 fibers (2f ESFU).
- **Outer Sheath:** Flame retardant LSOH, 2 glass fibers reinforced plastic material (GRP) embedded, disposed at 180°.

This dielectric optical cable is designed for indoor installation technique.

Technical data

No. of Fibres		12(6x2f)	16(8x2f)	24(12x2f)	36(18x2f)	48(24x2f)	72(36x2f)	96(48x2f)
Part number				60003301	60004575	60003302		60003836
Buffer diameter - ϕ	mm	0.900						
GRP - ϕ	mm	1.0			1.0			
Sheath thickness	mm	1.8			2.5			
Cable diameter - ϕ	mm	10			12.0		14.5	
Cable weight	Kg/Km	74	75	80	125	130	165	175
Min. bending radius	mm	Under Tension: 20xCable- ϕ				Without Tension: 10xCable- ϕ		
Temperature range	°C	Transport : -10 -> +60			Installation: -10 -> +40		Operation: -10 -> +60	

Main characteristics

Test	Standard	Value	Requirement*
Tensile Strength (dynamic)	IEC 60794-1-2-E1	300N, 5 min.	ΔI / fibre \leq 0.60%, $\Delta\alpha \leq$ 0.10 dB under test, reversible
Crush	IEC 60794-1-2-E3	500 N/100mm, max. 15 min	$\Delta\alpha \leq$ 0.10 dB under test, reversible, no damage
Impact	IEC 60794-1-2-E4	5 J, 3 impacts, R=300 mm	$\Delta\alpha \leq$ 0.10 dB after test, no damage
Repeated Bending	IEC 60794-1-2-E6	R=20xOD, 100N, 100 cycles	No break of fibres or tensile performance elements
Bend	IEC 60794-1-2-E11A	R=10xOD, 5 cycles	$\Delta\alpha \leq$ 0.05 dB under test, reversible, no damage
Temperature Cycling	IEC 60794-1-2-F1	-10 -> +60 °C, 2 cycles	$\Delta\alpha \leq$ 0.05 dB/Km, reversible

* values for single-mode fibres, all optical measurements performed at @1550&1625 nm

Optical Characteristics

See the attached cabled optical fiber G.657.A1 data sheet.

Verticasa Breakout Unit – 4 Port

Prysmian Part Number: XCPSC00522



The Verticasa Breakout Unit – 4 Port is typically used in multi dwelling units to breakout and distribute the fibres from an in-line Verticasa cable into drop tubes, for routing to a customer premise. It has the capacity to accommodate Verticasa cables of up to 15mm in diameter. It enables a window to be cut in the cable to access the fibres, which can be spurred of into drop tubes of 5mm in diameter. Up to 4 drop tubes can be accommodated.

Features and Benefits

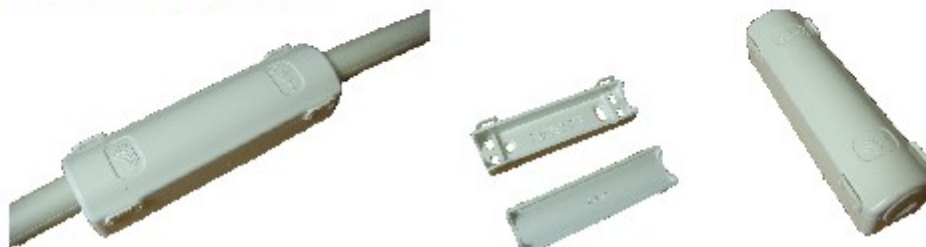
- Compact, low profile, wall mounted unit typically used in multi dwelling units.
- Unit manufactured from fire resistant material to UL94-V0.
- Supplied with all of the components required to mount the unit to a wall and secure an in-line Verticasa cable.
- Can accommodate Verticasa cables of up to 15mm in diameter.
- Can take out 4 drop tubes.
- Can be supplied to accommodate drop tubes of 5mm in diameter.
- Standard colour is white RAL9016. Other colours are available on request. Please contact the Prysmian sales desk.

Kit Contents

- Wall fixings
- Cable Ties

Verticasa Cable Protection Cover

Prysmian Part Number: XCPSC00524



The Verticasa Cable Protection Cover is typically used in multi dwelling units or office fibre cabling systems. It is used to cover and protect the window cut in a Verticasa cable. The unit can accommodate Verticasa cables of up to 15mm in diameter.

Features and Benefits

- Compact, low profile, wall mounted unit typically used in multi dwelling units or office fibre cabling systems.
- Unit manufactured from fire resistant material to UL94-V0.
- Supplied with all of the components required to mount the unit to a wall and secure an in-line Verticasa cable.
- Can accommodate Verticasa cables up to 15mm in diameter.
- Standard colour is white RAL9016. Other colours are available on request. Please contact the Prysmian sales desk.

Kit Contents

- Cable Ties

Technical Data

- Max number of input cables: 1 in-line
- Max diameter of in-line cable (mm): 15
- Cable Retention: > 70N
- Required space envelope (mm): (l) 90 x (w) 24 x (d) 27
- Operating temperature: -20°C to + 60°C (5 to 95% RH)
- Material: FR ABS
- Colour: White RAL 9016
- Flammability rating: UL94-V0

Logistics

- Packing Dimensions (mm): (h) 130 x (w) 130 x (d) 30
- Packed Weight (kg): 0.020
- Net weight (kg): 0.030

Please contact your local sales office listed on www.prysmiangroup.com

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