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**Konektorski sestavi in povezovalne komponente za optične komunikacijske sisteme - Specifikacije izdelka - 8-12. del: Simpleks LSH-APC, zaključen na enorodnem optičnem kablu po IEC 60793-2-50 kategorij B1.1 in B1.3 s tulko iz titanovega kompozita kategorije U**

Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications - Part 8-12: Type LSH-APC simplex terminated on IEC 60793-2-50 category B1.1 and B1.3 single mode fibre with titanium composite ferrule for Category U

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Steckverbindersätze und Verbindungsbaulemente für Lichtwellenleiter-Datenübertragungssysteme - Produktformen - Teil 8-12: Bauart LSH-APC-Simplex zum Anschluss an Einmodenfasern der Typen B1.1 und B1.3 nach IEC 60793-2-50 mit Titanium-Komposit-Stift für die Kategorie U

Jeux de connecteurs et composants d'interconnexion à utiliser dans les systèmes de communication par fibres optiques - Spécifications de produits - Partie 8-12: Type LSH-APC simplex raccordé sur des fibres unimodales de catégorie B1.1 et B1.3 de la CEI 60793-2-50, avec férule en composite de titane, pour utilisation en catégorie U

**Ta slovenski standard je istoveten z: EN 50377-8-12:2010**

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**ICS:**

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices
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**Connector sets and interconnect components to be used in optical fibre communication systems - Product specifications -  
Part 8-12: Type LSH-APC simplex terminated on IEC 60793-2-50 category B1.1 and B1.3 singlemode fibre with titanium composite ferrule for category U**

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European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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## Foreword

This European Standard was prepared by the Technical Committee CENELEC TC 86BXA, Fibre optic interconnect, passive and connectorised components. It was submitted to the formal vote and approved by CENELEC as EN 50377-8-12 on 2010-04-01.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2011-04-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2013-04-01

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**Connector sets and interconnect components  
to be used in optical fibre communication systems - Product specifications**

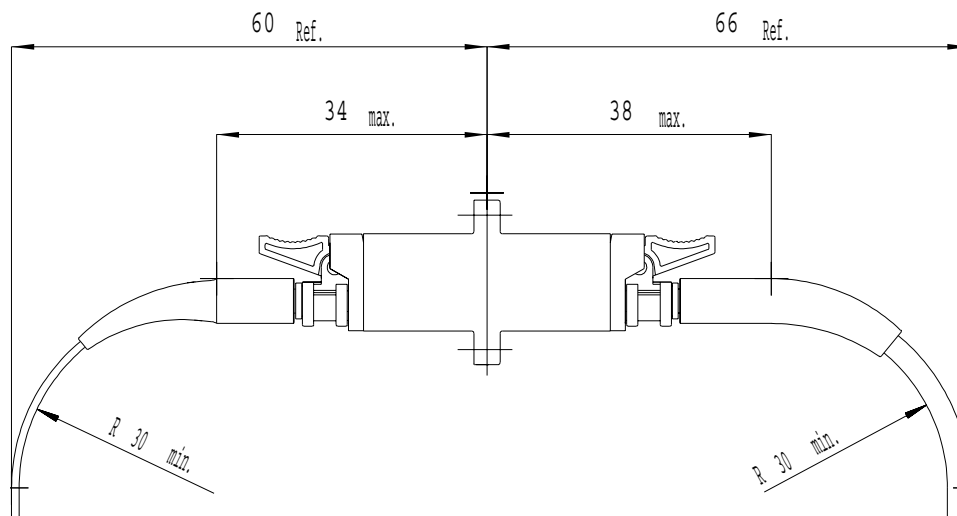
**Part 8-12: Type LSH-APC simplex terminated on IEC 60793-2-50 category B1.1 and B1.3  
single mode fibre with titanium composite ferrule for Category U**

Description		Application:	Performance
Coupling mechanism:	latched push-pull		For use in Category U (uncontrolled environment)
Configuration:	plug/adaptor/plug	Attenuation grades: (random mate)	B: $\leq 0,12$ dB mean $\leq 0,25$ dB for $> 97$ % of measurements C: $\leq 0,25$ dB mean $\leq 0,50$ dB for $> 97$ % of measurements
Fibre category:	EN 60793-2-50 type B1.1 and B1.3	Return loss grades:	1: $\geq 60$ dB (mated) $\geq 55$ dB (unmated)
Cable type:	see Table 3		

**Related documents:**

EN 60794-2	Optical fibre cables – Part 2: Indoor cables – Sectional specification (IEC 60794-2)
EN 61300 (series)	Fibre optic interconnecting devices and passive components – Basic test and measurement procedures (IEC 61300 series)
EN 61753-1	Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards (IEC 61753-1)
EN 61754-15	Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces – Part 15: Type LSH connector family (IEC 61754-15)
EN 61755-1	Fibre optic connector optical interfaces – Part 1: Optical interfaces for single mode non-dispersion shifted fibres – General and guidance (IEC 61755-1)
EN 61755-3-8	Fibre optic interconnecting devices and passive components – Fibre optic connector optical interfaces – Part 3-8: Optical interface, 2,5 mm and 1,25 mm diameter cylindrical 8 degrees angled-APC composite ferrule using titanium as fibre surrounding material, single mode fibre (IEC 61755-3-8)

**Outline and maximum dimensions:**



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## 1 Scope

### 1.1 Product definition

This standard contains the initial, start of life dimensional, optical, mechanical and environmental performance requirements which a terminated and assembled singlemode resilient alignment sleeve LSH-APC 8° simplex connector set (plug-adaptor-plug), adaptor and patchcord must meet in order for it to be categorised as an EN standard product.

Since different variants and grades of performance are permitted, product marking details are given in 3.5.

### 1.2 Intermateability

Although all products conforming to the requirements of this standard will intermate, the resulting level of random attenuation performance will only be ensured in accordance with Table 1. The intention is that this will be true irrespective of the manufacturing source(s) of the product.

When intermating plug variants having different attenuation grades the resulting level of attenuation can not be assured to be any better than the worst attenuation grade.

The intermating of a grade C plug with a grade B plug will result in an uncertain level of random attenuation performance.

**Table 1 – Ensured level of random attenuation**

Plug variant/Attenuation grade	C	B
C	C	C
B	C	B

### 1.3 Operating environment

The tests selected combined with the severities and durations are representative of a Category U environment as defined in EN 61753-1.

### 1.4 Reliability

Whilst the anticipated service life expectancy of the product in this environment is 20 years, compliance with this standard does not guarantee the reliability of the product. This should be predicted using a recognised reliability assessment programme.

### 1.5 Quality assurance

Compliance with this standard does not guarantee the manufacturing consistency of the product. This should be maintained using a recognised quality assurance programme.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 60793-2-50	Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres (IEC 60793-2-50)
EN 61300-2-1	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 2-1: Tests - Vibration (sinusoidal) (IEC 61300-2-1)
EN 61300-2-2	Part 2-2: Tests – Mating durability (IEC 61300-2-2)



EN 61300-2-4	Part 2-4: Tests – Fibre/cable retention (IEC 61300-2-4)
EN 61300-2-5	Part 2-5: Tests - Torsion/twist (IEC 61300-2-5)
EN 61300-2-6	Part 2-6: Tests – Tensile strength of coupling mechanism (IEC 61300-2-6)
EN 61300-2-7	Part 2-7: Tests - Bending moment (IEC 61300-2-7)
EN 61300-2-12	Part 2-12: Tests – Impact (IEC 61300-2-12)
EN 61300-2-17	Part 2-17: Tests – Cold (IEC 61300-2-17)
EN 61300-2-18	Part 2-18: Tests – Dry heat – High temperature endurance (IEC 61300-2-18)
EN 61300-2-22	Part 2-22: Tests - Change of temperature (IEC 61300-2-22)
EN 61300-2-26	Part 2-26: Tests - Salt mist (IEC 61300-2-26)
EN 61300-2-42	Part 2-42: Tests – Static side load for connectors (IEC 61300-2-42)
EN 61300-2-44	Part 2-44: Tests – Flexing of the strain relief of fibre optic devices (IEC 61300-2-44)
EN 61300-2-46	Part 2-46: Tests - Damp heat (cyclic) (IEC 61300-2-46)
EN 61300-3-4	Part 3-4: Examinations and measurements – Attenuation (IEC 61300-3-4)
EN 61300-3-6	Part 3-6: Examinations and measurements – Return loss (IEC 61300-3-6)
EN 61300-3-10	Part 3-10: Examinations and measurements – Gauge retention force (IEC 61300-3-10)
EN 61300-3-15	Part 3-15: Examinations and measurements – Dome eccentricity of a convex polished ferrule endface (IEC 61300-3-15)
EN 61300-3-16	Part 3-16: Examinations and measurements – Endface radius of spherically polished ferrules (IEC 61300-3-16)
EN 61300-3-23	Part 3-23: Examination and measurements – Fibre position relative to ferrule endface (IEC 61300-3-23)
EN 61300-3-28	Part 3-28: Examinations and measurements – Transient loss (IEC 61300-3-28)
EN 61300-3-34	Part 3-34: Examinations and measurements – Attenuation of random mated connectors (IEC 61300-3-34)
EN 61300-3-42	Part 3-42: Examinations and measurements - Attenuation of single mode alignment sleeves and or adaptors with resilient alignment sleeves (IEC 61300-3-42)
EN 61753-1	Fibre optic interconnecting devices and passive components performance standard – Part 1: General and guidance for performance standards (IEC 61753-1)
EN 61755-1	Fibre optic connector optical interfaces – Part 1: Optical interfaces for single mode non-dispersion shifted fibres – General and guidance (IEC 61755-1)
ISO 8015	Technical drawings – Fundamental tolerancing principle

### 3 Description

The LSH-APC connector is a single position plug connector set of plug-adaptor-plug configuration characterised by a cylindrical, spring loaded butting ferrule of 2,5 mm nominal diameter and a latched push-pull coupling mechanism. The optical alignment mechanism of the connectors is of a resilient sleeve style.

#### 3.1 Plug

The plug features a cylindrical composite ferrule using titanium as fibre surrounding material and a push-pull mechanism. It has a single male key which is used to limit and may be used to orientate, the relative rotation between mated connectors. The plug has mechanical and colour coding.

### 3.2 Adaptor

The adaptor has a zirconia ceramic resilient alignment sleeve. The mounting style can be:

- square flange – 2 hole fixing;
- square flange – side clip fixing;
- square flange – top bottom clip fixing.

Covers (dust caps) shall be provided to protect each port of the adaptor. The adaptor has a mechanical colour coding.

### 3.3 Materials

Materials which are not specified or which are not specifically described are left to the discretion of the manufacturer.

### 3.4 Dimensions

Outline dimensions and other dimensions necessary to ensure intermateability or which affect performance are specified. All other dimensions are left to the discretion of the manufacturer. Where the mating face limit dimensions are not in agreement with an EN Interface Standard this is clearly stated.

### 3.5 Colour and marking

Marking of the product shall be in the following order of precedence:

- identification of manufacturer;
- manufacturing date code: year/week;
- manufacturers part number;
- variant identification number.

The following colour scheme is preferred:

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**Table 2 – Preferred colour scheme**

Adaptor	Delatch housing
Green	Green
Preferred RAL number 6018	

## 4 Variants

### 4.1 Terminated plug

The following variants are permitted:

Table 3 – Plug variants

E	N	5	0	3	7	7	-	8	-	12	-	*	*	*	-	*	1
---	---	---	---	---	---	---	---	---	---	----	---	---	---	---	---	---	---

No.	Fibre/Cable Ø mm	Structure
01	0,6 - 1,4	Buffered fibre
02	2,0 ± 0,2	Reinforced Cable
03	2,5 ± 0,2	Reinforced Cable
04	2,8 ± 0,2	Reinforced Cable
05	3,0 ± 0,2	Reinforced Cable
06	3,2 ± 0,2	Reinforced Cable

Mechanical code	Colour code for the latch	Note
0	Green	See NOTE, not coded
1	Red, RAL 3020	SIST EN 50377-8-12:2010
2	Brown, RAL 8004	http://www.itch.ai/catalog/standards/sist/30153ffc-7616-4a28-8adf-2136dec56abb1/sist-en-50377-8-12-2010
3	Yellow, RAL 1016	
4	Orange, RAL 2003	
5	Violet, RAL 4008	
6	White, RAL 9010	

NOTE Universal, intermatable to all mechanical and colour coded adaptors.

Code	Attenuation grade
B	B
C	C

Code	Return loss grade
1	1

## 4.2 Adaptor

The following variants are permitted:

Table 4 – Adaptor variants

E N 5 0 3 7 7 - 8 - 1 2 - D \* \* \*

No.	Format
01	Square flange 2 hole screw fixing
02	Square flange side clip fixing
03	Square flange top-bottom clip fixing

Mechanical code	Colour code for the frame	Note
0	Green	See NOTE, not coded
1	Red, RAL 3020	
2	Brown, RAL 8004	
3	Yellow, RAL 1016	
4	Orange, RAL 2003	
5	Violet, RAL 4008	
6	White, RAL 9010	

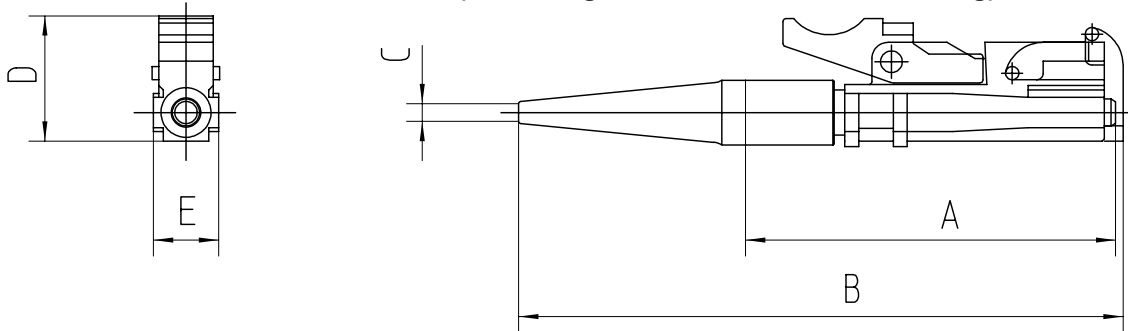
NOTE Universal, intermatable to all mechanical and colour coded plugs.

## 5 Dimensional requirements

### 5.1 Outline dimensions

#### 5.1.1 Plug variants

Variant No. 01\* (\*, third digit related to mechanical coding)

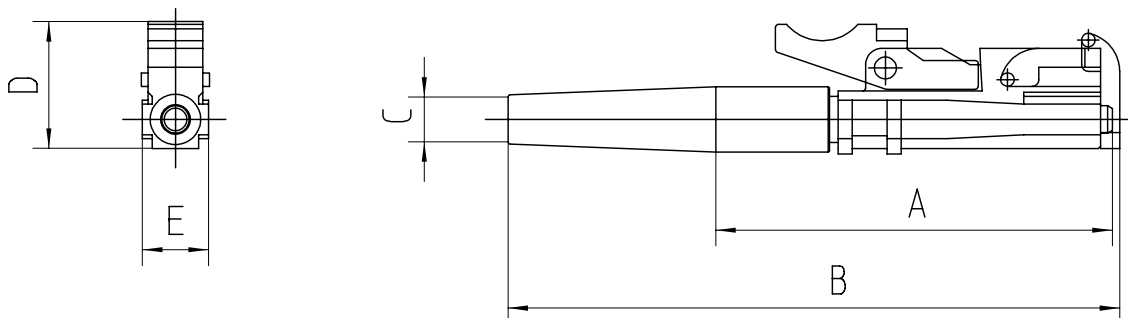


Ref.	Dimensions		Note
	min.	max.	
A	-	34	See NOTE
B	-	60	
C	0,7	1,4	
D	-	13,05	
E	5,95	5,98	

NOTE Rigid length.

Variant No. 02\*/03\*/04\*/05\*/06\*

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Ref.	Dimensions		Note
	min.	max.	
A	-	38	See NOTE
B	-	60	
C	1,8	3,5	
D	-	13,05	
E	5,95	5,98	

NOTE Rigid length.

Figure 1 – Outline dimensions – Plug