SLOVENSKI STANDARD
SIST EN 50516-3-1:2014

01-september-2014

Sestavi industrijskih konektorjev in povezovalne komponente za optične krmilne in komunikacijske sisteme - Specifikacije izdelkov - 3-1. del: Enorodno vlakno tipa ODVA APC kategorij B1.1 in B1.3, ki ustreza zahtevam kategorije I (industrijska okolja), določenim v EN 50173-1 in IEC 61753-1-3

Industrial connector sets and interconnect components to be used in optical fibre control and communication systems - Product specifications -- Part 3-1: Type ODVA APC terminated on EN 60793-2-50 category B1.1 and B1.3 singlemode fibre to meet the requirements of category I (industrial environments) as specified in EN 50173-1 and IEC 61753-1-3

Ta slovenski standard je istoveten z: **EN 50516-3-1:2014**

ICS:

33.180.20	Povezovalne naprave za optična vlakna	Fibre optic interconnecting devices

SIST EN 50516-3-1:2014 **en**

EUROPEAN STANDARD

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English Version

Industrial connector sets and interconnect components to be used in optical fibre control and communication systems - Product specifications - Part 3-1: Type ODVA APC terminated on EN 60793-2-50 category B1.1 and B1.3 singlemode fibre to meet the requirements of category I (industrial environments) as specified in EN 50173-1 and IEC 61753-1-3

Industrie-Steckverbindersätze und Verbindungsbauelemente für Lichtwellenleiter-Steuerungs- und Datenübertragungssysteme - Produktnormen - Teil 3-1: Industriesteckverbinder der Bauart ODVA-APC zum Anschluss an Einmodenfasern der Typen B1.1 und B1.3 nach EN 60793-2-50 für die Kategorie I (Industrieumgebung) nach den Festlegungen in EN 50173-1 und IEC 61753-1-3

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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 document (EN 50516-3-1:2014) has been prepared by CLC/TC 86BXA, "Fibre optic interconnect, passive and connectorised components".

The following dates are fixed:

• latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2014-12-23
• latest date by which the national standards conflicting with this document have to be withdrawn	(dow)	2016-12-23

EN 50516, *Industrial connector sets and interconnect components to be used in optical fibre control and communication systems — Product specifications*, is currently divided in the following parts:

– *Part 1-1: Type SC-RJ PC industrial terminated on EN 60793-2-10 category A1a and A1b multimode fibre to meet the requirements of category I (industrial environments) as specified in IEC/PAS 61753-1-3*;

– *Part 2-1: Type ODVA PC industrial terminated on EN 60793-2-10 category A1a and A1b multimode fibre to meet the requirements of category I (industrial environments) as specified in EN 50173-1 and IEC 61753-1-3*;

– *Part 3-1: Type ODVA APC terminated on EN 60793-2-50 category B1.1 and B1.3 singlemode fibre to meet the requirements of category I (industrial environments) as specified in EN 50173-1 and IEC 61753-1-3* [the present document].

CENELEC draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning ODVA industrial connectors (see declaration in Annex E).

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

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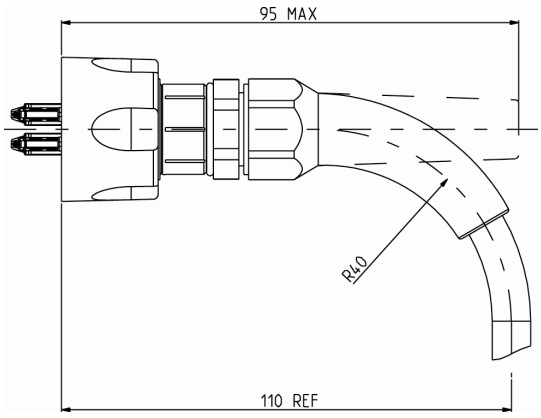
Industrial connector sets and interconnect components to be used in optical fibre control and communication systems — Product specifications	
Part 3-1: Type ODVA APC terminated on EN 60793-2-50 category B1.1 and B1.3 singlemode fibre to meet the requirements of category I (industrial environments) as specified in EN 50173-1 and IEC 61753-1-3	
Description	**Performance**
Coupling mechanism: Twist and lock with sealing	Application: For the use in category I (industrial environment)
Configuration: Plug / adaptor / with one side of the configuration having a seal and a protective shell	Attenuation (random mate) factory terminated: B: ≤ 0,12 dB mean ≤ 0,25 dB for > 97 % of measurements C: ≤ 0,25 dB mean ≤ 0,50 dB for > 97 % of measurements
Fibre category: EN 60793-2-50 Type B1.1 and B1.3	Attenuation (random mate) FSOC: C: ≤ 0,25 dB mean ≤ 0,50 dB for > 97 % of measurements
Cable type: See Table 3	Return loss: 1: ≥ 60 dB (mated) ≥ 55 dB (unmated)

Related documents:

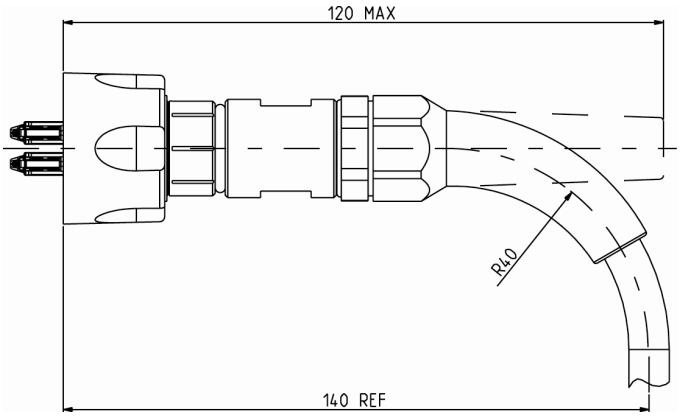
EN 50173-1	Information technology — Generic cabling systems — Part 1: General requirements
EN 50173-3	Information technology — Generic cabling systems — Part 3: Industrial premises
EN 60529	Degrees of protection provided by enclosures (IP Code) (IEC 60529)
EN 60794-3	Optical fibre cables — Part 3: Sectional specification — Outdoor cables (IEC 60794-3)
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)
FprEN 61753-1-3 [1)]	Fibre optic interconnecting devices and passive components — Performance standard — Part 1-3: General and guidance for single-mode fibre optic connector and cable assembly for harsh industrial environment, Category I (IEC 61753-1-3:201X (86B/3496/CDV))
EN 61754-28	Fibre optic interconnecting devices and passive components — Fibre optic connector interfaces — Part 28: Type LF3 connector family (IEC 61754-28)

1) At draft stage.

Outline and maximum dimensions: ODVA connector plug with protective shell in sealed adaptor.



factory terminated



FSOC

1 Scope

1.1 Product definition

This European Standard contains the initial, start of life dimensional, optical, mechanical and environmental performance requirements which an ODVA (factory terminated) (Open DeviceNet Vendors Association) or ODVA fusion splice on connector (FSOC) terminated with cylindrical composite titanium APC ferrules with one side protected by an industrial housing, an adaptor fitted with resilient alignment sleeve and patchcord shall meet in order for it to be categorised as an EN standard product. The product is rated IP67.

Since different variants are permitted, product marking details are given in 3.6.

1.2 Intermateability

Products conforming to the requirements of this specification will inter mate and give the specified level of random attenuation and random return loss performance provided the same fibre type is used. The intention is that this will be true irrespective of the manufacturing source(s) of the product.

When intermating plug variants with different attenuation grades, the resulting level of attenuation cannot 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, specified as Category I, are intended to reflect, although they do not necessarily satisfy all the requirements of, the boundary conditions of $M_3I_3C_3E_3$.

1.4 Reliability

Whilst the anticipated service life expectancy of the product in this environment is 20 years, compliance with this specification 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 specification does not guarantee the manufacturing consistency of the product. This should be maintained using a recognised quality assurance programme.

2 Normative references

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

EN 60068-2-60	Environmental testing — Part 2: Tests — Test Ke: Flowing mixed gas corrosion test (IEC 60068-2-60)
EN 60529	Degrees of protection provided by enclosures (IP Code) (IEC 60529)
EN 60874-1	Fibre optic interconnecting devices and passive components — Connectors for optical fibres and cables — Part 1: Generic specification (IEC 60874-1)
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	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-2: Tests — Mating durability (IEC 61300-2-2)
EN 61300-2-4	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-4: Tests — Fibre/cable retention (IEC 61300-2-4)
EN 61300-2-5	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-5: Tests — Torsion (IEC 61300-2-5)
EN 61300-2-6	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-6: Tests — Tensile strength of coupling mechanism (IEC 61300-2-6)
EN 61300-2-7	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-7: Tests — Bending moment (IEC 61300-2-7)
EN 61300-2-9	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-9: Tests — Shock (IEC 61300-2-9)
EN 61300-2-10	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-10: Tests — Crush resistance (IEC 61300-2-10)
EN 61300-2-12:2005	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-12: Tests — Impact (IEC 61300-2-12:2005)
EN 61300-2-22	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-22: Tests — Change of temperature (IEC 61300-2-22)
EN 61300-2-26	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-26: Tests — Salt mist (IEC 61300-2-26)
EN 61300-2-27	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-27: Tests — Dust — Laminar flow (IEC 61300-2-27)
EN 61300-2-34	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-34: Tests — Resistance to solvents and contaminating fluids of interconnecting components and closures (IEC 61300-2-34)
EN 61300-2-35	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-35: Tests — Cable nutation (IEC 61300-2-35)

EN 61300-2-46	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-46: Tests — Damp heat cyclic (IEC 61300-2-46)
IEC 61300-2-53[2)]	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 2-53: Test — Degrees of protection provided by fibre optic enclosures (IP Codes 65 and 67)
EN 61300-3-1	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-1: Examinations and measurements — Visual examination (IEC 61300-3-1)
EN 61300-3-6	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-6: Examinations and measurements — Return loss (IEC 61300-3-6)
EN 61300-3-15	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-15: Examinations and measurements — Dome eccentricity of a convex polished ferrule endface (IEC 61300-3-15)
EN 61300-3-16	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-16: Examinations and measurements — Endface radius of spherically polished ferrules (IEC 61300-3-16)
EN 61300-3-23	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-23: Examination and measurements — Fibre position relative to ferrule endface (IEC 61300-3-23)
EN 61300-3-28	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-28: Examinations and measurements — Transient loss (IEC 61300-3-28)
EN 61300-3-34	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-34: Examinations and measurements — Attenuation of random mated connectors (IEC 61300-3-34)
EN 61300-3-35	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-35: Examinations and measurements — Fibre optic connector endface visual and automated inspection (IEC 61300-3-35)
EN 61300-3-47[2)]	Fibre optic interconnecting devices and passive components — Basic test and measurement procedures — Part 3-47: Examinations and measurements — Endface geometry of PC/APC spherically polished ferrules using interferometry (IEC 61300-3-47)
EN 61754-28	Fibre optic interconnecting devices and passive components — Fibre optic connector interfaces — Part 28: Type LF3 connector family (IEC 61754-28)

2) At draft stage.

3 Description

3.1 General

The ODVA industrial connector is a duplex plug connector set of plug / adaptor / plug configuration with one side having a protective shell characterised by two cylindrical, spring loaded butting ferrules of 1,25 mm nominal diameter and a twist and lock coupling mechanism. The optical alignment mechanism of the connectors is of a resilient sleeve style.

3.2 Plug

The plug consists of an ODVA connector interface and a housing part. These two parts have to be in the defined position to each other (see Figures 1a), 1b) and 5) to guarantee correct mating. Sealing is made between an o-ring (placed on the housing) and the adaptor frame. A cover (dust cap) to protect the ferrule endface when the plug is in the unmated condition shall be provided. Sealing shall also be guaranteed between the connector and the dust cap.

The plug features two cylindrical composite titanium ferrules and a push-pull coupling mechanism. Alternative materials may be used for the ferrule that have directly compatible material properties, but the endface and performance requirements shall be met under all conditions.

The plug has three male keys to provide the orientation to the duplex connector in relation with the adaptor.

The plug can be either a complete factory terminated version or a fusion splice on connector (FSOC) version. The fusion splice is located within the sealed housing.

3.3 Adaptor

The adaptor consists of an ODVA adaptor as it is described in this specification and a duplex LF3 adaptor in a mounting frame. Sealing is made between the connector housing and the adaptor mounting frame. The mounting frame shall be mounted in a protected area with a gasket to ensure sealing between the adaptor and the protected area. Preferred cut out dimensions to maintain sealing are given in Figure 3 and Figure 4.

At the rear of the adaptor there are two LF3 simplex connectors.

The adaptor consists of two zirconia ceramic resilient alignment sleeves and two push-pull coupling mechanisms, one for each sleeve. Alternative materials may be used for the sleeve that have directly compatible material properties as zirconia but the performance requirements shall be met under all conditions.

The adaptor housing has three female keys.

Covers (dust caps) shall be provided to protect each duplex port of the adaptor.

3.4 Materials

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

3.5 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.

3.6 Colour and marking

Marking of the product shall be in accordance with EN 60874-1, in the following order of precedence:

a) identification of manufacturer;

b) manufacturing date code: year / week;

c) manufacturers part number;

d) variant identification number.

The preferred colour scheme is given in Table 1.

Table 2 — Preferred colour scheme

ODVA housing	
black	
LF3 Plug	**LF3 Adaptor**
green	green
NOTE The preferred black is 9005 and green is RAL 6018. Other not listed parts could also be of the preferred colour to show the colour scheme.	

4 Variants

4.1 Terminated plug

The following cable variants are permitted:

Table 3 — Terminated plug — Plug variants

Variant number	Cable diameter	Structure	Remarks
B1	5,0 mm – 8,5 mm	Reinforced duplex cable	The roundness shall be < 0,2 mm. ⌀0,2 mm
C1	5,0 mm – 8,5 mm	Reinforced duplex cable	The roundness shall be < 0,2 mm. ⌀0,2 mm
C1 FSOC	5,0 mm – 8,5 mm	Reinforced duplex cable	The roundness shall be < 0,2 mm. ⌀0,2 mm