BS EN IEC 61754-6:2022



BSI Standards Publication

Fibre optic interconnecting devices and passive components — Fibre optic connector interfaces

Part 6: Type MU connector family

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National foreword

This British Standard is the UK implementation of EN IEC 61754-6:2022. It is identical to IEC 61754-6:2022. It supersedes BS EN 61754-6:2013, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/86/2, Fibre optic interconnecting devices and passive components.

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NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61754-6

April 2022

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Supersedes EN 61754-6:2013 and all of its amendments and corrigenda (if any)

English Version

Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 6: Type MU connector family (IEC 61754-6:2022)

Dispositifs d'interconnexion et composants passifs fibroniques - Interfaces de connecteurs fibroniques - Partie 6: Famille de connecteurs de type MU (IEC 61754-6:2022)

Lichtwellenleiter - Verbindungselemente und passive Bauteile - Steckgesichter von Lichtwellenleiter-Steckverbindern - Teil 6: Steckverbinderfamilie der Bauart MU (IEC 61754-6:2022)

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European foreword

The text of document 86B/4562/FDIS, future edition 3 of IEC 61754-6, prepared by SC 86B "Fibre optic interconnecting devices and passive components" of IEC/TC 86 "Fibre optics" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61754-6:2022.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2023-01-04
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-04-04

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Endorsement notice

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61300-2-55	NOTE	Harmonized as EN 61300-2-55
IEC 61755-3-1	NOTE	Harmonized as EN 61755-3-1
IEC 61755-3-2	NOTE	Harmonized as EN 61755-3-2

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 61300-3-22	-	Fibre optic interconnecting devices and passive components - Basic test and measurement procedures - Part 3-22: Examinations and measurements - Ferrule compression force	EN 61300-3-22	-
IEC 61754-1	-	Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 1: General and guidance	EN 61754-1	-

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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC CONNECTOR INTERFACES –

Part 6: Type MU connector family

FOREWORD

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IEC 61754-6 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics. It is an International Standard.

This third edition cancels and replaces the second edition published in 2013 and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) the test method IEC 61300-3-22 for the compression force of the ferrule was added;
b) Annex D (informative) with cut out dimension requirements for testing the strength of mounted adaptors was added.

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The text of this International Standard is based on the following documents:

Draft	Report on voting
86B/4562/FDIS	86B/4585/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts of the IEC 61754 series, under the general title *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces,* can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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FIBRE OPTIC INTERCONNECTING DEVICES AND PASSIVE COMPONENTS – FIBRE OPTIC CONNECTOR INTERFACES –

Part 6: Type MU connector family

1 Scope

This part of IEC 61754 specifies the standard interface dimensions for type MU family of connectors.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

IEC 61300-3-22, *Fibre optic interconnecting devices and passive components – Basic test and measurement procedures – Part 3-22: Examinations and measurements – Ferrule compression force*

IEC 61754-1, *Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces – Part 1: General and guidance*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 61754-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Description

The parent connector for type MU connector family is a miniature single-position plug which is characterized by a cylindrical, spring-loaded butting ferrule(s) of a 1,25 mm typical diameter, and a push-pull coupling mechanism. The optical alignment mechanism of the connectors is of a rigid hole or a resilient sleeve style.

This document type MU connector family defines the standard interface dimensions of active device receptacles for the type MU connectors. The receptacles are used to retain the connector plugs and mechanically maintain the optical datum target of the plugs at a defined position within the receptacle housings.

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5 Interfaces

This document contains the standard interfaces showed in Table 1.

Table 1 – Interfaces

Interface IEC 61754-6-1	Simplex plug connector interface – Push/pull (see Figure 1)
Interface IEC 61754-6-2	4,5 mm duplex plug connector interface – Push/pull (see Figure 2)
Interface IEC 61754-6-3	Simplex adaptor connector interface – Push/pull (see Figure 3)
Interface IEC 61754-6-4	4,5 mm duplex adaptor connector interface – Push/pull (see Figure 5)
Interface IEC 61754-6-5	8-port adaptor connector interface – Push/pull (see Figure 6)
Interface IEC 61754-6-6	Plug connector interface – for printed board housings (see Figure 7)
Interface IEC 61754-6-7	Sleeve holder interface – for printed board housings (see Figure 8)
Interface IEC 61754-6-8	2-port backplane housing interface – Self-retentive (see Figure 9)
Interface IEC 61754-6-9	2-port printed board housing interface – Self-retentive (see Figure 10)
Interface IEC 61754-6-10	8-port backplane housing interface – Self-retentive (see Figure 11)
Interface IEC 61754-6-1	8-port printed board housing interface – Self-retentive (see Figure 12)
Interface IEC 61754-6-12	Simplex active device receptacle interface – for physical contact (PC) connector plug (see Figure 13)
Interface IEC 61754-6-13	4,5 mm duplex active device receptacle interface – for PC connector plug (see Figure 15)
Interface IEC 61754-6-14	6,25 mm duplex active device receptacle interface – for PC connector plug (see Figure 17)
Interface IEC 61754-6-15	Plug connector interface – for printed board housings, angled PC (APC) 8 degrees (see Figure 19)
Interface IEC 61754-6-16	Simplex plug connector interface – Push/pull, APC 8 degrees (see Figure 20)
Interface IEC 61754-6-17	4,5 mm duplex plug connector interface – Push/pull, APC 8 degrees (see Figure 21)
Interface IEC 61754-6-18	6,25 mm duplex plug connector interface – Push/pull, APC 8 degrees (see Figure 22)
Interface IEC 61754-6-19	6,25 mm duplex plug connector interface – Push/pull (see Figure 23)
Interface IEC 61754-6-20	6,25 mm duplex adaptor connector interface – Push/pull (see Figure 24)
Interface IEC 61754-6-21	Horizontal duplex plug connector interface – Push/pull (see Figure 25)
Interface IEC 61754-6-22	Horizontal duplex adaptor connector interface – Push/pull (see Figure 26)

The plugs of interfaces IEC 61754-6-1, IEC 61754-6-2, IEC 61754-6-6, IEC 61754-6-19 and IEC 61754-6-21 have a ferrule(s) with a spherically polished endface, and realize physical contact (PC). The plugs of interfaces IEC 61754-6-15, IEC 61754-6-16, IEC 61754-6-17 and IEC 61754-6-18 have a ferrule(s) with a spherically polished angled endface and realize angled PC (APC).

The type MU connector family comprises two types of connector set: MU-A connector set (see Annex A) and MU-B connector set (see Annex B). The MU-A connector set is a plug/adaptor configuration with a push-pull coupling mechanism. The MU-B connector set is a plug-in type back-plane connector configuration which is plug/backplane and printed board housings/plug for printed board housing/sleeve holder configuration and is equipped with a self-retentive mechanism.

The type MU-A connector set consists of simplex and duplex plugs, and simplex, duplex and 8-port adaptors. The plugs are common to the backplane connector housings of the type MU-B connector set.

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The type MU-B connector set consists of 2-port and 8-port backplane and printed board connector housings, simplex and duplex plugs, plug for printed board connector housings, and sleeve holder. The plug for printed board connector housing is used as a jack together with the sleeve holder. The jack is attached into the printed board connector housing.

Table 2, Table 3 and Table 4 show the intermateablitiy of the standard interfaces. It shall be noted however that in order to obtain the designated optical performance, any plug shall be connected to a counterpart plug whose ferrule end is polished to the same condition.

Table 2 – Intermateability of MU-A connectors

Plugs	Adaptors				
	61754-6-3	61754-6-4	61754-6-5	61754-6-20	61754- 6-22
61754-6-1	Mate	Mate	Mate	Mate	Mate
61754-6-2	Not mate	Mate	Mate	Not mate	Not mate
61754-6-16	Mate	Mate	Mate	Mate	Mate
61754- 6-17	Not mate	Mate	Mate	Not mate	Not mate
61754-6-18	Not mate	Not mate	Not mate	Mate	Not mate
61754-6-19	Not mate	Not mate	Not mate	Mate	Not mate
61754-6-21	Not mate	Not mate	Not mate	Not mate	Mate

Table 3 – Intermateability of MU-B connectors

Plugs	Connector housings			
	Backplane connector housing		Printed board connector housing	
	61754-6-8	61754-6-10	61754-6-9	61754-6-11
61754-6-1	Mate	Mate	Not mate	Not mate
61754-6-2	Mate	Mate	Not mate	Not mate
61754-6-6 with 61754-6-7	Not mate	Not mate	Mate	Mate
61754-6-15 with 61754- 6-7	Not mate	Not mate	Mate	Mate
61754-6-16	Mate	Mate	Not mate	Not mate
61754-6-17	Mate	Mate	Not mate	Not mate
61754-6-18	Not mate	Not mate	Not mate	Not mate
61754-6-19	Not mate	Not mate	Not mate	Not mate
61754-6-21	Not mate	Not mate	Not mate	Not mate

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Table 4 – Intermateability of MU receptacles

Plugs	Receptacles		
	61754-6-12	**61754-6-13**	**61754-6-14**
61754-6-1	Mate	Mate	Mate
61754-6-2	Not mate	Mate	Not mate
61754-6-16	Not mate	Not mate	Not mate
61754-6-17	Not mate	Not mate	Not mate
61754-6-18	Not mate	Not mate	Not mate
61754-6-19	Not mate	Not mate	Mate
61754-6-21	Not mate	Not mate	Not mate

Figure 1 is an example of a simplex plug connector interface. Table 5 gives dimensions of the simplex plug connector interface and Table 6 gives the grade of the simplex plug connector interface.

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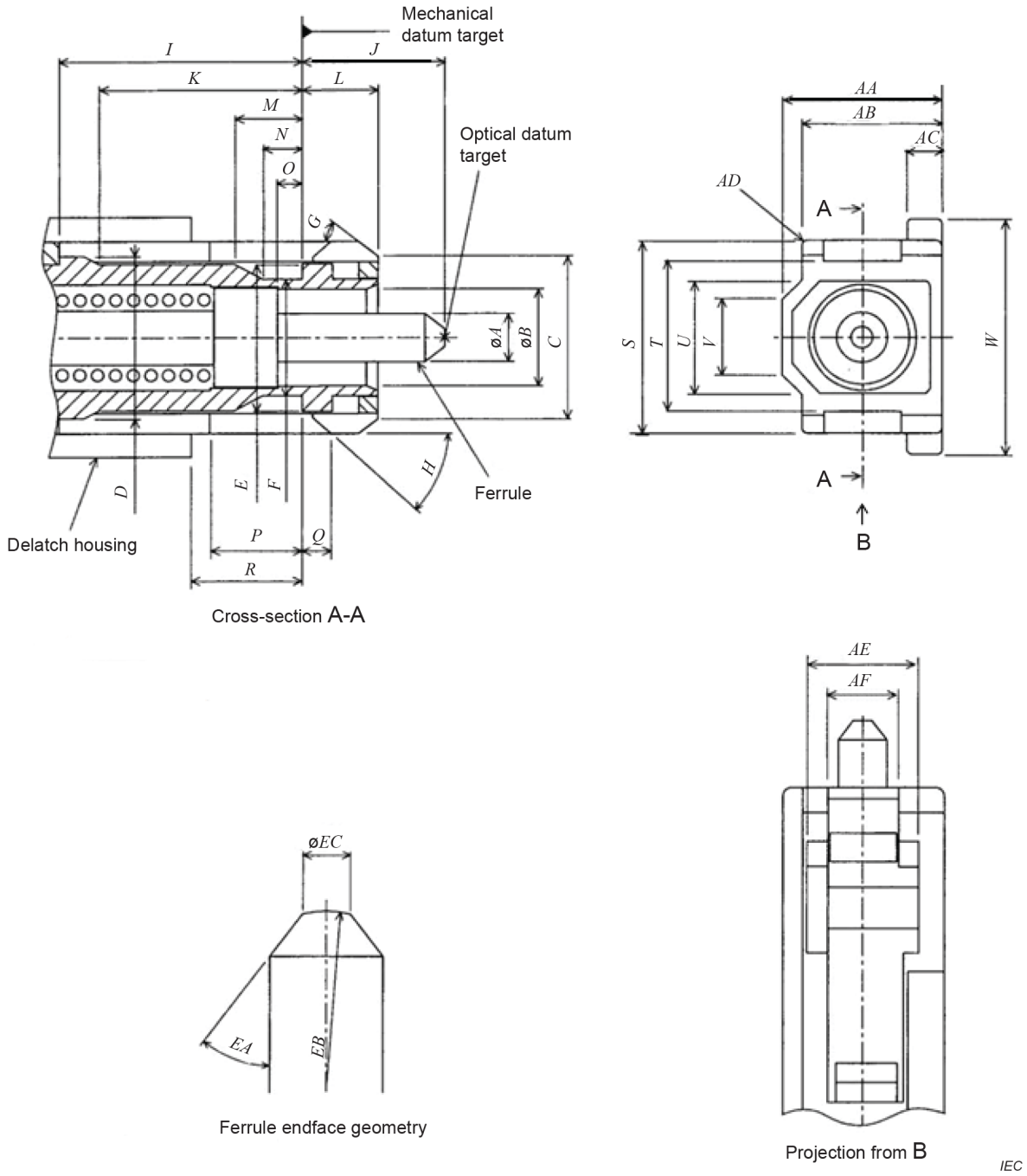


Figure 1 – Simplex plug connector interface – Push/pull

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Table 5 – Dimensions of the simplex plug connector interface

Reference	Dimensions		Remarks
	Minimum	Maximum	
A	See Table 6		[a]
B	2,6 mm	2,7 mm	
C	4,6 mm	4,8 mm	
D	4,65 mm	4,75 mm	
E	4,3 mm	4,4 mm	
F	3,3 mm	3,4 mm	
G	25°	35°	Angle, unit in degrees
H	25°	35°	Angle, unit in degrees
I	6,55 mm	–	[b]
J	4,2 mm	4,5 mm	[c]
K	5,5 mm	–	
L	2,4 mm	2,5 mm	
M	1,5 mm	–	
N	0,6 mm	–	
O	0,5 mm	–	
P	2,6 mm	–	[b]
Q	1 mm	1,1 mm	[b] [d]
R	2,65 mm	2,9 mm	[b]
S	5,5 mm	5,6 mm	
T	4,3 mm	4,5 mm	
U	–	3,7 mm	
V	–	2,4 mm	
W	6,5 mm	6,6 mm	
AA	4,3 mm	4,4 mm	
AB	3,85 mm	3,95 mm	
AC	0,7 mm	0,9 mm	
AD	0,2 mm	–	Radius
AE	3 mm	–	
AF	2,2 mm	2,3 mm	
EA	32,5°	45°	Angle, unit in degrees [e]
EB	5 mm	30 mm	Radius [f]
EC	0,45 mm	0,73 mm	Diameter

[a] A chamfer or radius is allowed to a maximum depth of 0,5 mm from the ferrule endface.

[b] The delatch housing shall be movable to the right or left. Dimensions *L*, *M* and *V* are given when the delatch housing is at the furthest right.

[c] Dimension *J* is given for the plug endface when not mated. The ferrule is movable by a certain axial compression force with direct contacting endfaces, and therefore dimension *J* is variable. Ferrule compression force shall be 5,5 N to 6,5 N when the position of the optical datum target from the mechanical datum target is moved in the range of 3,9 mm to 4,1 mm. In addition, dimension *J* shall become less than 3,25 mm with a relatively large axial compression force. The compression force shall be measured according to IEC 61300-3-22.

[d] *Q* is to the right of the mechanical datum target when the delatch housing is to the right (connected state) and to the left of the mechanical datum target when the delatch housing is to the left (disconnected state).

[e] 40° to 45° are desirable to minimize debris for backplane connectors.

[f] Dome eccentricity of the spherically polished ferrule endface shall be less than 50 μm.

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Table 6 – Grade of the simplex plug connector

Grade	Dimensions mm		Remarks
	A		
	Minimum	Maximum	
A	See IEC 61755-3-1		[a]
B	See IEC 61755-3-1		[a]
C	See IEC 61755-3-1		[a]
D	See IEC 61755-3-1		[a]
A_m	Grade not specified at this time		[a] [b]
B_m	1,246 7	1,249 5	[a] [b]
C_m	Grade not specified at this time		[a] [b]

[a] Add grade number to the interface reference number.

[b] See IEC 61755-6-1[1] for guidance.

Figure 2 is an example of a 4,5 mm duplex plug connector interface. Table 7 gives dimensions of the 4,5 mm duplex plug connector interface and Table 8 gives the grade of the 4,5 mm duplex plug connector interface.

[1] Under preparation. Stage at the time of publication: IEC/CDM 61755-6-1:2021.

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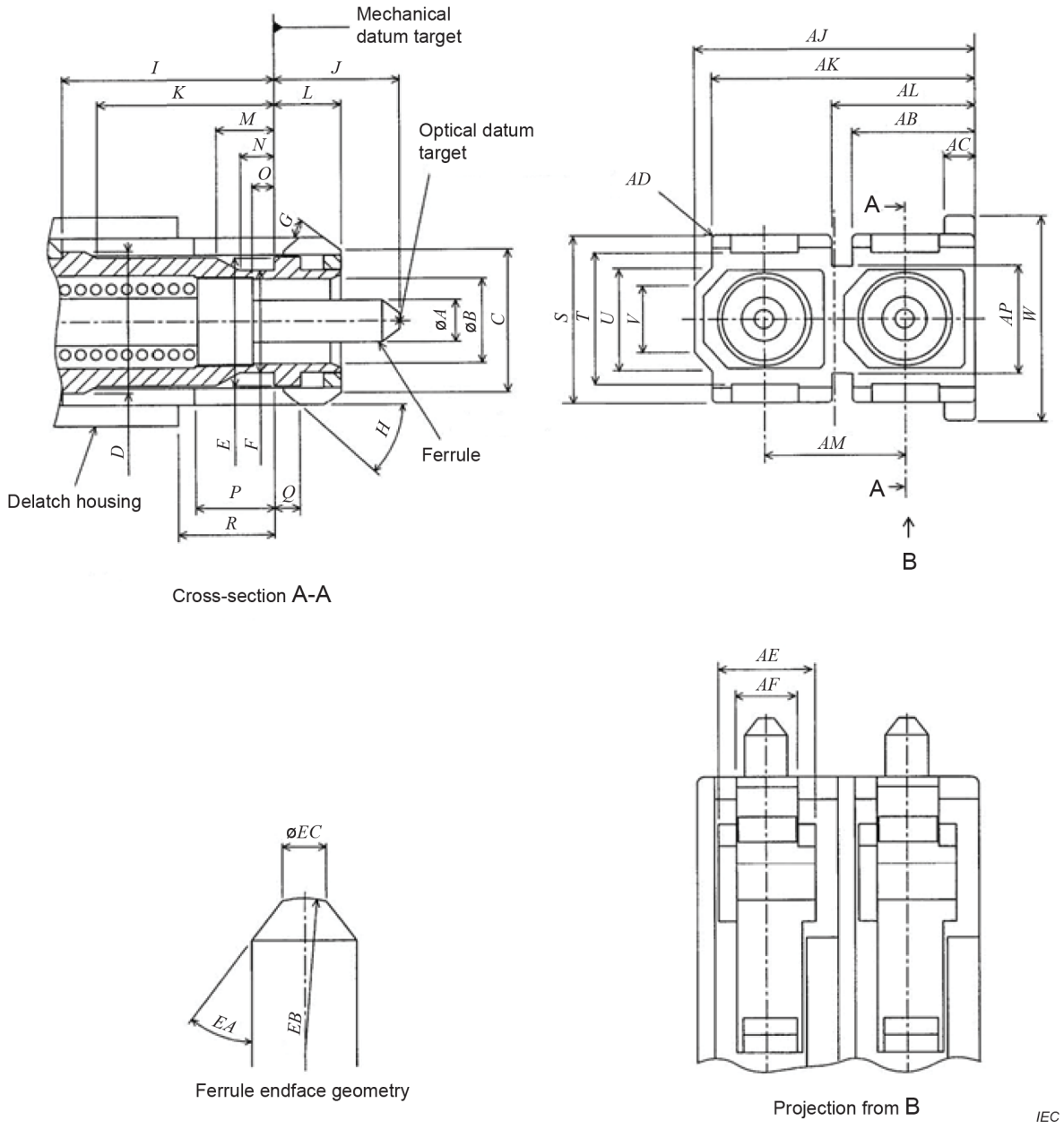


Figure 2 – 4,5 mm duplex plug connector interface – Push/pull

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Table 7 – Dimensions of the 4,5 mm duplex plug connector interface

Reference	Dimensions		Remarks
	Minimum	Maximum	
A	See Table 8		[a]
B	2,6 mm	2,7 mm	
C	4,6 mm	4,8 mm	
D	4,65 mm	4,75 mm	
E	4,3 mm	4,4 mm	
F	3,3 mm	3,4 mm	
G	25°	35°	Angle, unit in degrees
H	25°	35°	Angle, unit in degrees
I	6,55 mm	–	[b]
J	4,2 mm	4,5 mm	[c]
K	5,5 mm	–	
L	2,4 mm	2,5 mm	
M	1,5 mm	–	
N	0,6 mm	–	
O	0,5 mm	–	
P	2,6 mm	–	[b]
Q	1,0 mm	1,1 mm	[b d]
R	2,65 mm	2,9 mm	[b]
S	5,5 mm	5,6 mm	
T	4,3 mm	4,5 mm	
U	–	3,7 mm	
V	–	2,4 mm	
W	6,5 mm	6,6 mm	
AB	3,7 mm	3,85 mm	
AC	0,7 mm	0,9 mm	
AD	0,2 mm	–	Radius
AE	3,0 mm	–	
AF	2,2 mm	2,3 mm	
AJ	8,8 mm	8,9 mm	
AK	8,35 mm	8,45 mm	
AL	4,55 mm	4,7 mm	
AM	4,45 mm	4,55 mm	
AP	–	3,7 mm	
EA	32,5°	45°	Angle, unit in degrees [e]
EB	5 mm	30 mm	Radius [f]
EC	0,45 mm	0,73 mm	Diameter

[a] A chamfer or radius is allowed to a maximum depth of 0,5 mm from the ferrule endface.

[b] The delatch housing shall be movable to the right or left. Dimensions *L*, *M* and *V* are given when the delatch housing is at the furthest right.

[c] Dimension *J* is given for the plug endface when not mated. The ferrule is movable by a certain axial compression force with direct contacting endfaces, and therefore dimension *J* is variable. Ferrule compression force shall be 5,5 N to 6,5 N when the position of the optical datum target from the mechanical datum target is moved in the range of 3,9 mm to 4,1 mm. In addition, dimension *J* shall become less than 3,25 mm with a relatively large axial compression force. The compression force shall be measured according to IEC 61300-3-22.

[d] *Q* is to the right of the mechanical datum target when the delatch housing is to the right (connected state) and to the left of the mechanical datum target when the delatch housing is to the left (disconnected state).

[e] 40° to 45° are desirable to minimize debris for backplane connectors.

[f] Dome eccentricity of the spherically polished ferrule endface shall be less than 50 µm.

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Table 8 – Grade of the 4,5 mm duplex plug connector

Grade	Dimensions		Remarks
	A		
	Minimum	Maximum	
A	See IEC 61755-3-1		[a]
B	See IEC 61755-3-1		[a]
C	See IEC 61755-3-1		[a]
D	See IEC 61755-3-1		[a]
A_m	Grade not specified at this time		[a] [b]
B_m	1,246 7	1,249 5	[a] [b]
C_m	Grade not specified at this time		[a] [b]

[a] Add grade number to the interface reference number.

[b] See IEC 61755-6-1 for guidance.

Figure 3 is an example of a simplex adaptor connector interface. Table 9 gives dimensions of the simplex adaptor connector interface and Table 10 gives the grade of the simplex adaptor connector interface.

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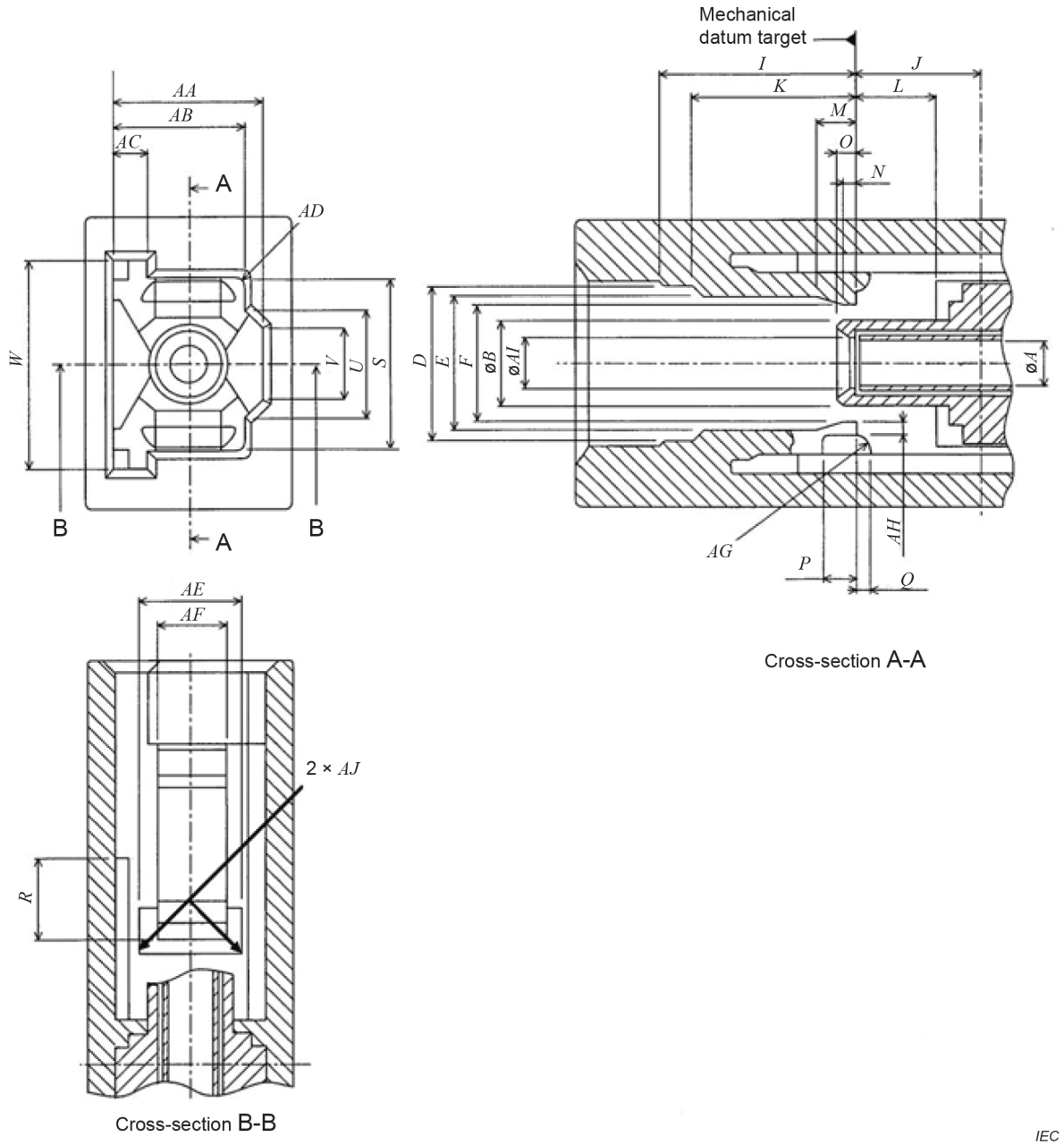


Figure 3 – Simplex adaptor connector interface – Push/pull

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Table 9 – Dimensions of the simplex adaptor connector interface

Reference	Dimensions mm		Remarks
	Minimum	Maximum	
A	See Table 10		Diameter
B	2,39	2,59	Diameter
D	4,8	5	
E	4,55	–	
F	2,9	3,5	[a]
I	–	6,5	
J	3,9	4,1	
K	–	5,4	
L	2,55	2,7	
M	–	1,4	
N	–	0,55	
O	–	0,6	
P	–	1,2	
Q	–	0,4	
R	–	2,55	
S	5,65	5,75	
U	3,8	4	
V	3,3	–	
W	6,7	–	
AA	4,45	4,55	
AB	4,01	4,11	
AC	0,95	1,15	
AD	–	0,2	Radius
AE	2,8	2,95	
AF	1,9	2,1	
AG	0,3	–	Radius
AH	0,4	0,55	
AI	1,34	1,44	Diameter
AJ	–	0,3	Radius

[a] Dimension *F* shall become greater than 4,5 mm when a plug is coupled to or removed from the adaptor.

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Table 10 – Grade of the simplex adaptor connector

Grade	Dimensions mm		Remarks
	Minimum	Maximum	
1	–	–	Resilient sleeve [a]

[a] The connector alignment feature is a resilient alignment sleeve. The feature shall accept a pin gauge to the centre of the adaptor with a force of 1,0 N to 2,5 N under the condition that another pin gauge is inserted into the feature from the other side. The centre of the adaptor is defined by the right-side position of dimension *J*. The pin gauge is shown in Figure 4 and Table 11.

Figure 4 is an example of a pin gauge for resilient alignment sleeve. Table 11 gives pin gauge dimensions.

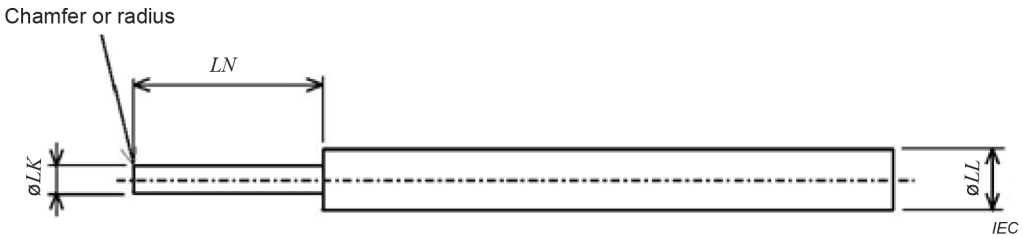


Figure 4 – Pin gauge for resilient alignment sleeve

Table 11 – Pin gauge dimensions

Reference	Dimensions mm		Remarks
	Minimum	Maximum	
LK	1,248 5	1,249 5	Surface roughness grade N4 (0,2 µm radius)
LL	2,6	2,8	
LN	4,7	–	

Figure 5 is an example of a 4,5 mm duplex adaptor connector interface. Table 12 gives dimensions of the 4,5 mm duplex adaptor connector interface and Table 13 gives the grade of the 4,5 mm duplex adaptor connector interface.

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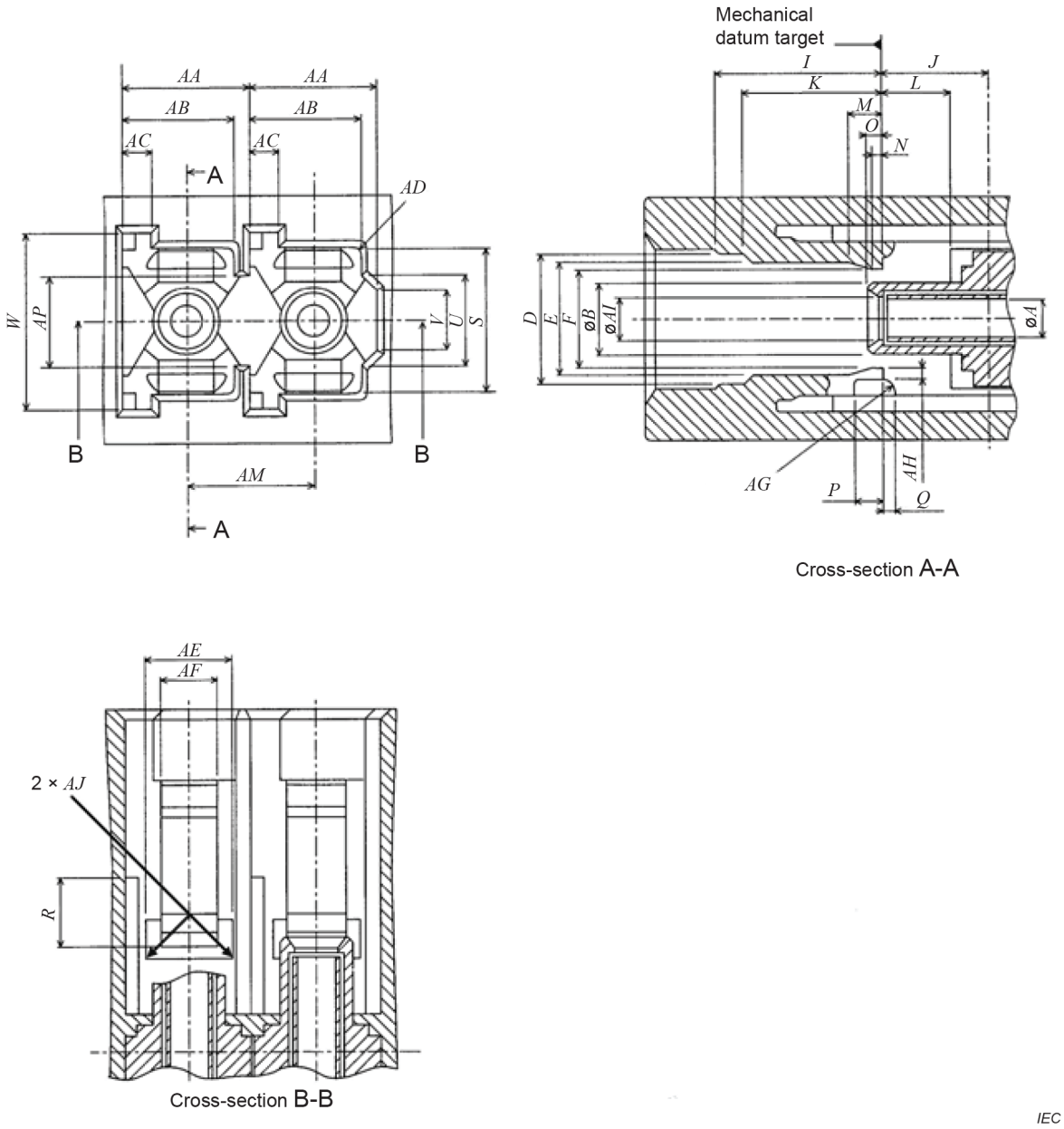


Figure 5 – 4,5 mm duplex adaptor connector interface – Push/pull

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Table 12 – Dimensions of the 4,5 mm duplex adaptor connector interface

Reference	Dimensions mm		Remarks
	Minimum	Maximum	
A	See Table 13		
B	2,39	2,59	
D	4,8	5	
E	4,55	–	
F	2,9	3,5	[a]
I	–	6,5	
J	3,9	4,1	
K	–	5,4	
L	2,55	2,7	
M	–	1,4	
N	–	0,55	
O	–	0,6	
P	–	1,2	
Q	–	0,4	
R	–	2,55	
S	5,65	5,75	
U	3,8	4	
V	3,3	–	
W	6,7	–	
AA	4,45	4,55	
AB	4,01	4,11	
AC	0,95	1,15	
AD	–	0,2	Radius
AE	2,8	2,95	
AF	1,9	2,1	
AG	0,3	–	Radius
AH	0,4	0,55	
AI	1,34	1,44	Diameter
AJ	–	0,3	Radius
AM	4,45	4,55	
AP	3,8	4	

[a] Dimension *F* shall become greater than 4,5 mm when a plug is coupled to or removed from the adaptor.

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Table 13 – Grade of the 4,5 mm duplex adaptor connector

Grade	Dimensions mm		Notes
	Minimum	Maximum	
1	–	–	Resilient sleeve [a]

[a] The connector alignment feature is a resilient alignment sleeve. The feature shall accept a pin gauge to the centre of the adaptor with a force of 1,0 N to 2,5 N under the condition that another pin gauge is inserted into the feature from the other side. The centre of the adaptor is defined by the right-side position of dimension J. The pin gauge is shown in Figure 4 and Table 11.

Figure 6 is an example of an 8-port adaptor connector interface. Table 14 gives dimensions of the 8-port adaptor connector interface and Table 15 gives the grade of the 8-port adaptor connector interface.

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