IEC 61754-7-2

Edition 1.0 2017-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fibre optic interconnecting devices and passive components – Fibre optic connector interfaces –
Part 7-2: Type MPO connector family – Two fibre rows

Dispositifs d'interconnexion et composants passifs fibroniques – Interfaces de connecteurs fibroniques –
Partie 7-2: Famille de connecteurs de type MPO – Deux rangées de fibres

IEC 61754-7-2:2017-12(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 33.180.20

ISBN 978-2-8322-8694-4

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 7-2: Type MPO connector family – Two fibre rows

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International Standard IEC 61754-7-2 has been prepared by subcommittee 86B: Fibre optic interconnecting devices and passive components, of IEC technical committee 86: Fibre optics.

This first edition of IEC 61754-7-2, along with the first edition of IEC 61754-7-1, cancels and replaces the third edition of IEC 61754-7 published in 2008.

This first edition of IEC 61754-7-2 includes the two fibre row MPO variants including the addition of active device receptacles and up-angled plugs.

The first edition of IEC 61754-7-1 includes the one fibre row MPO variants and related active device receptacles and up-angled plugs.

Following the publication of both IEC 61754-7-1 and IEC 61754-7-2, IEC 61754-7 will be withdrawn.

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

FDIS	Report on voting
86B/4099/FDIS	86B/4110/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://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.

INTRODUCTION

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning MPO connectors.

The IEC takes no position concerning the evidence, validity and scope of these patent rights.

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

Part 7-2: Type MPO connector family – Two fibre rows

1 Scope

This part of IEC 61754 defines the standard interface dimensions for the type MPO family of connectors with two rows of fibres.

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.

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

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4 Description

The parent connector for the type MPO connector family is a multiway plug connector characterized by a rectangular ferrule normally 6,4 mm × 2,5 mm which utilizes two pins of 0,7 mm diameter as its alignment. The variant in this document provides a joint of 16 to 24 fibres by arraying them between two pin-positioning holes in the ferrule in a two-layer (two-row) arrangement. The connector includes a push-pull coupling mechanism and a ferrule spring loaded in the direction of the optical axis. The connector has a single male key which may be used to orient and limit the relative position between the connector and the component to which it is mated.

Connector interfaces are configured using a female plug without pins, a male plug with pins fixed and an adaptor as shown in Figure 1. The female plug is intermateable with the male plug. There are two angled-interface plugs, one called down-angled and the other up-angled. They are defined for both male and female plugs. The up and down descriptors refer to the tilt direction of the ferrule's angled end face relative to the fibre axis when looking toward the end face with the plug's key feature on the top. For down-angled plugs, the angled surface faces slightly downward. For up-angled plugs, the angled surface faces slightly upward. These different angles affect intermateability for the two adaptor types. An opposed keyway adaptor mates two plugs with the keys in opposite orientations, for example one side keyway-up and the other keyway-down. In contrast, an aligned keyway adaptor mates two plugs with the keys

in the same orientation. When using an opposed keyway adaptor with angled interfaces, two down-angled plugs or two up-angled plugs shall be connected. For aligned keyway adaptors with angled interfaces, one down-angled plug and one up-angled plug shall be connected.

Moreover, connector interfaces between the female plug and the male plug are configured by applying a backplane housing and a printed board housing instead of the adaptor.

Additionally, the female plug interface is intermateable with the active device receptacle.

5 Interfaces

This document contains the following standard interfaces:

Interface IEC 61754-7-2-1: MPO female plug, down-angled interface for 16 to 24 fibres
Interface IEC 61754-7-2-2: MPO male plug, down-angled interface for 16 to 24 fibres
Interface IEC 61754-7-2-3: MPO adaptor interface – Opposed keyway configuration
Interface IEC 61754-7-2-4: MPO female plug, flat interface for 16 to 24 fibres
Interface IEC 61754-7-2-5: MPO male plug, flat interface for 16 to 24 fibres
Interface IEC 61754-7-2-6: MPO backplane housing interface
Interface IEC 61754-7-2-7: MPO printed board housing interface
Interface IEC 61754-7-2-8: MPO adaptor interface – Aligned keyway configuration
Interface IEC 61754-7-2-9: MPO active device receptacle, angled interface
Interface IEC 61754-7-2-10: MPO active device receptacle, flat interface
Interface IEC 61754-7-2-11: MPO female plug, up-angled interface for 16 to 24 fibres
Interface IEC 61754-7-2-12: MPO male plug, up-angled interface for 16 to 24 fibres

The interfaces showed in Table 1 are intermateable.

Table 1 – Intermateability between plugs and adapters/housings/receptacles

Female plugs	Adaptors/housings/receptacles	Male plugs
61754-7-2-1	61754-7-2-3	61754-7-2-2
61754-7-2-1	61754-7-2-8	61754-7-2-12
61754-7-2-11	61754-7-2-8	61754-7-2-2
61754-7-2-4	61754-7-2-3 and 61754-7-2-8	61754-7-2-5
61754-7-2-1 or 61754-7-2-11	61754-7-2-6 and 61754-7-2-7	61754-7-2-2 or 61754-7-2-12
61754-7-2-4	61754-7-2-6 and 61754-7-2-7	61754-7-2-5
61754-7-2-1	61754-7-2-9	N/A
61754-7-2-4	61754-7-2-10	N/A

NOTE Connector interfaces with 16 to 24 fibres will intermate and will correctly align the lower defined numbers of optical datum targets (see Figure 4).

Figure 1 shows MPO connector configurations.

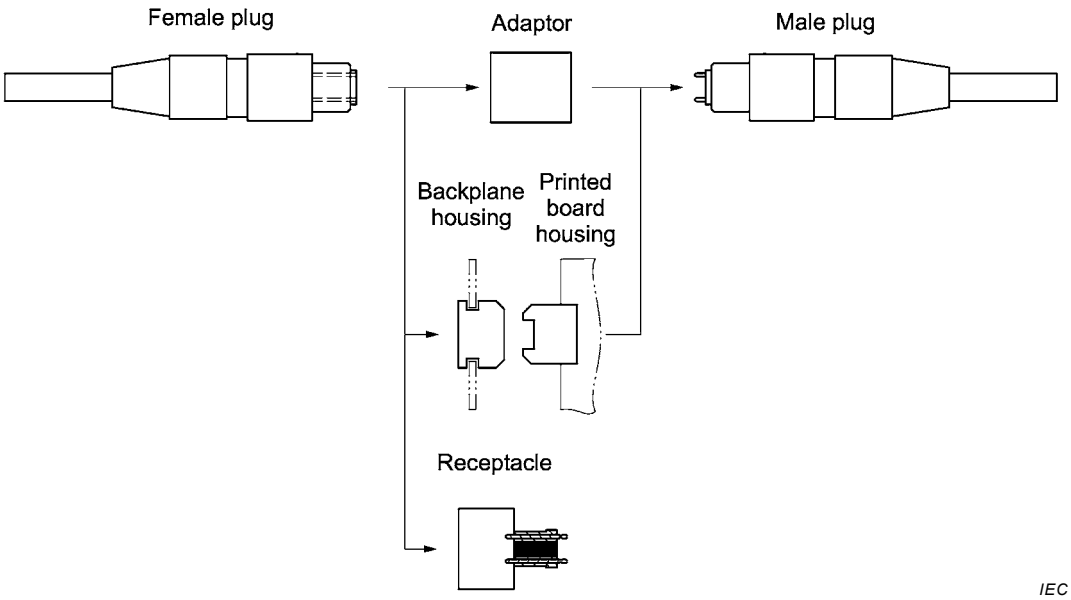


Figure 1 – MPO connector configurations

Figures 2 and 3 show the down-angled and up-angled interface of the MPO female plug. Table 2 gives the dimensions of the down- or up-angled interfaces of the MPO female plug.

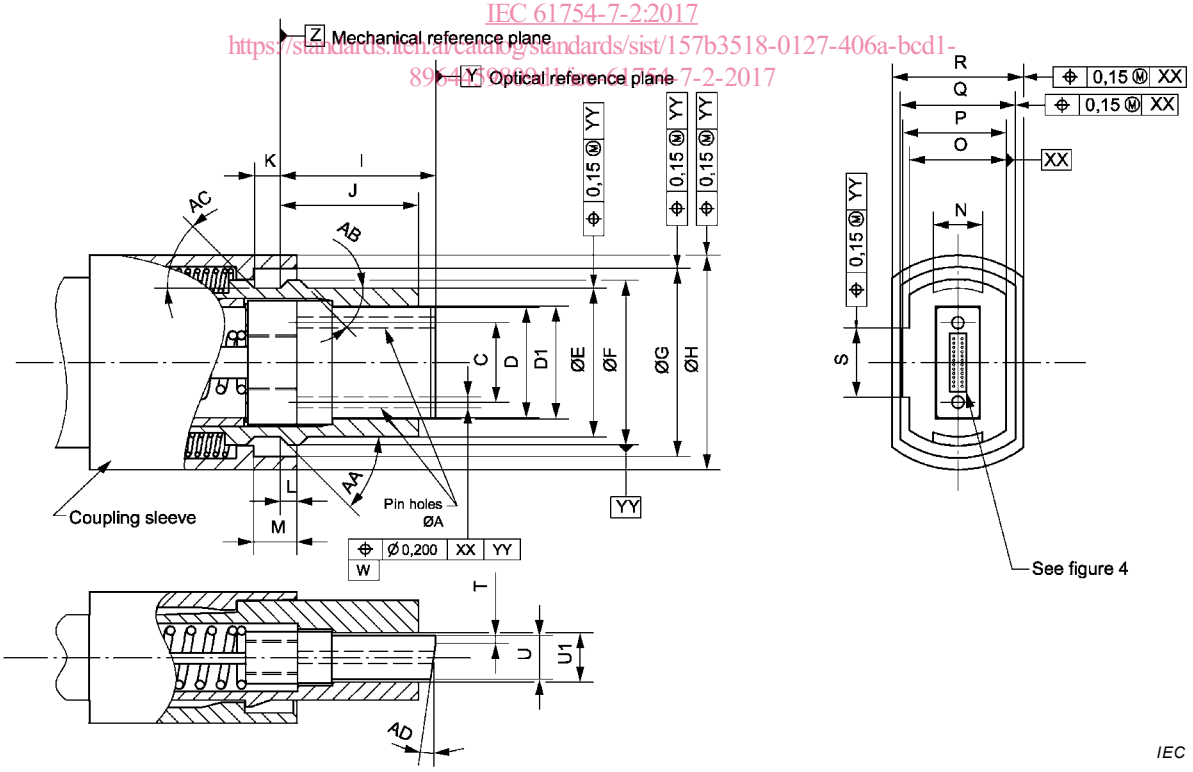


Figure 2 – MPO female plug, down-angled interface

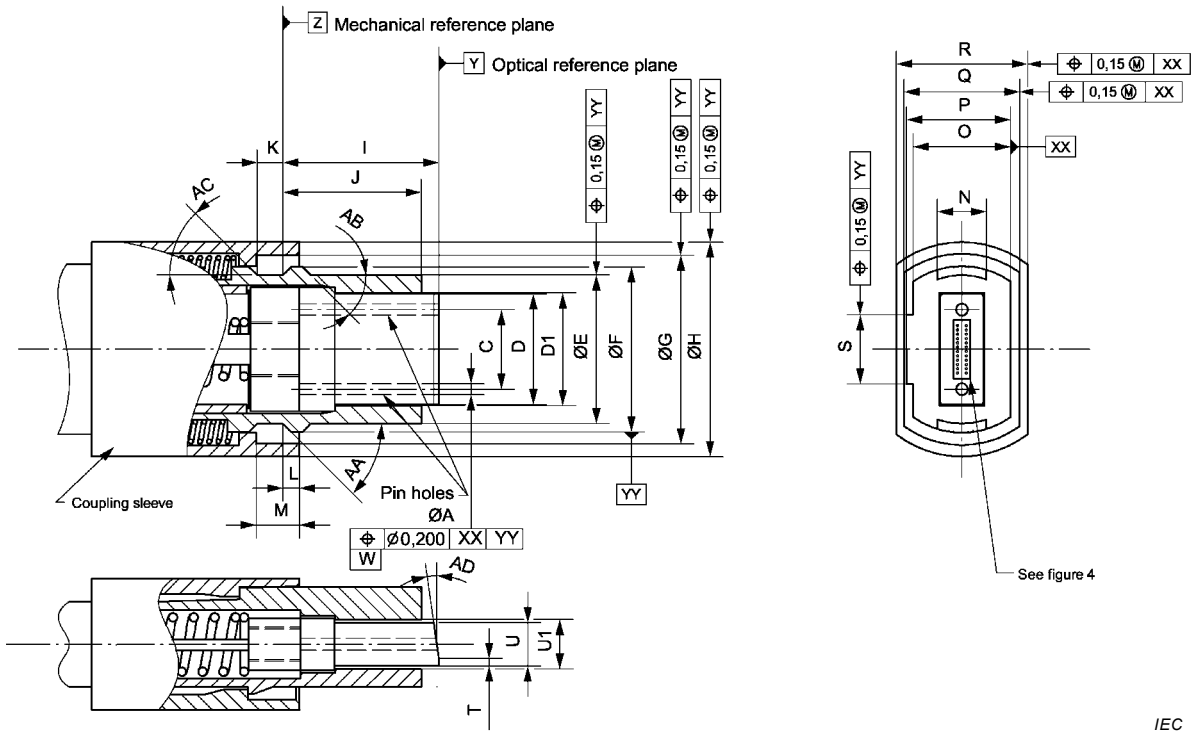


Figure 3 – MPO female plug, up-angled interface

Table 2 – Dimensions of the MPO female plug, down or up-angled interface

Reference	Dimensions		Remarks
	Minimum	Maximum	
A[a]	0,699 mm	0,701 mm	
C[b]	4,597 mm	4,603 mm	
D	6,3 mm	6,5 mm	
D1[g]	6,7 mm	-	
E	8,34 mm	8,54 mm	
F	9,49 mm	9,59 mm	
G	10,85 mm	11,05 mm	
H	12,19 mm	12,59 mm	
I[c,f]	8,8 mm	9,2 mm	
J	7,9 mm	8,1 mm	
K	1,4 mm	–	
L[d,e]	0,2 mm	0,8 mm	
M	2,4 mm	2,6 mm	
N	2,8 mm	3,0 mm	
O	4,89 mm	4,99 mm	
P	5,59 mm	5,69 mm	
Q	5,7 mm	–	
R	–	7,7 mm	
S	2,9 mm	3,1 mm	
T	–	0,8 mm	
U	2,4 mm	2,5 mm	
U1[g]	2,7 mm	-	
AA	42°	45°	
AB	–	45°	
AC	–	45°	
AD[h,i]	7,5°	8,5°	
The mating/unmating force between an MPO connector and adaptor shall not exceed 40,0 N.			

[a] Each pin-hole shall accept a gauge pin as shown in Figure 5 to a depth of 5,5 mm with a maximum force of 1,7 N. In addition, two pin-holes of a plug shall accept a gauge as shown in Figure 6 to a depth of 5,5 mm with a maximum force of 3,4 N.

[b] Dimension C is defined as the distance between two pin-hole centres.

[c] Dimension I is given for a fibre end face centre of a plug end when not mated. It is noticed that a ferrule is movable by a certain axial compression force, and therefore dimension I is variable. Ferrule compression force shall be 18,0 N to 22,0 N when a position of the fibre end face from datum Z is in the range of 8,2 mm to 8,4 mm.

[d] The coupling sleeve shall be movable by a certain axial compression force. Dimension L is given for a coupling sleeve end when not mated. Coupling sleeve compression force shall be 2,9 N to 6,9 N when the position of the coupling sleeve end face from datum Z is in the range of 0 mm to 0,1 mm to the right or to the left of datum Z.

[e] An adaptor coupling part shall be unlocked by a left-direction movement of a coupling sleeve, when it is separate from an adaptor. When the coupling sleeve is moved for unlocking, the position of the coupling sleeve end face shall be larger than 2,0 mm in the left direction from datum Z.

[f] Dimension I is defined at the centre line between the two pin-hole centres.

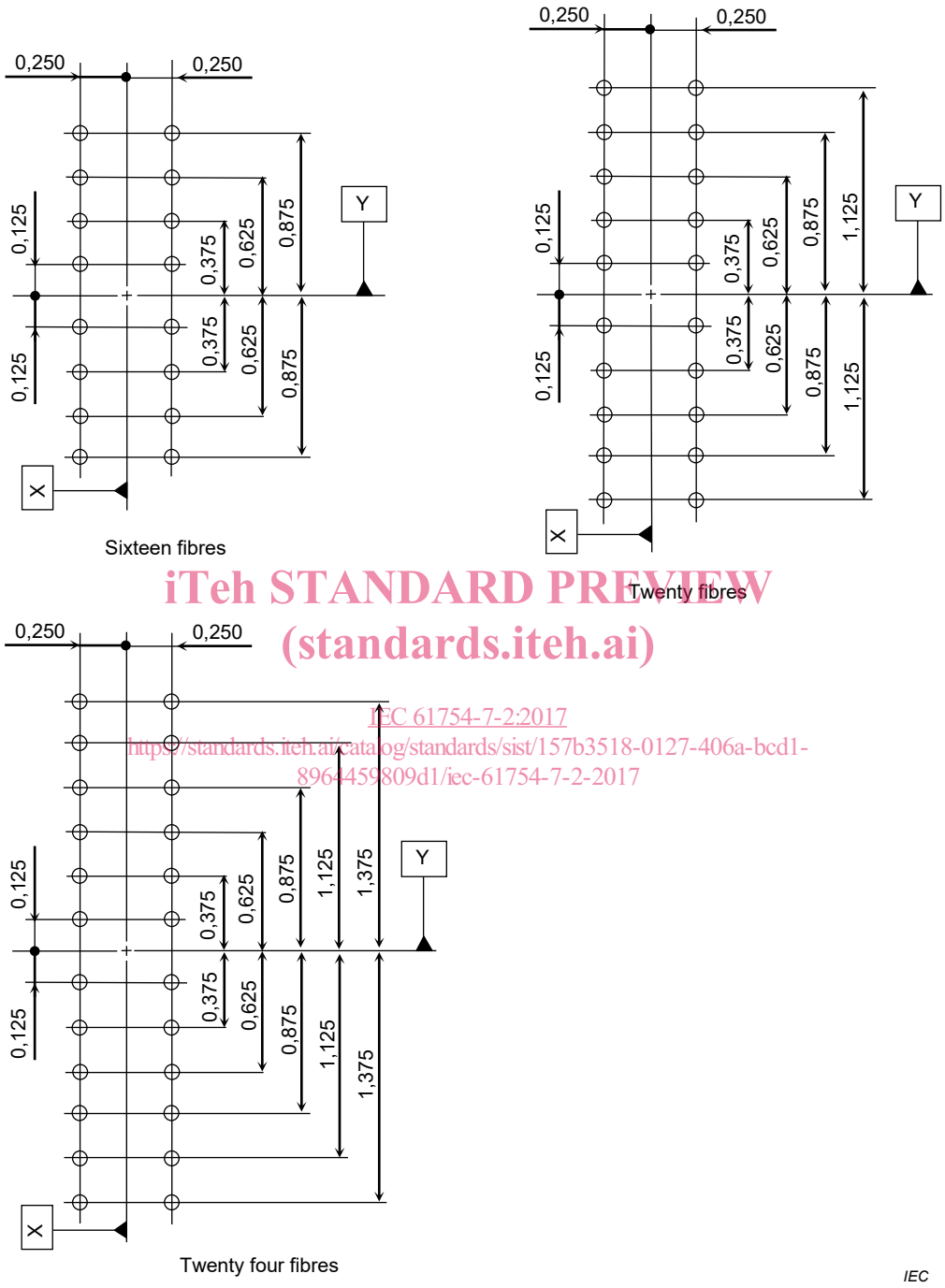
[g] Dimensions D1 and U1 are defined only at the end of the connector as shown.

[h] The down-angled and up-angled plugs shall be clearly marked to distinguish them from each other and flat interfaces through the use of colour, labelling, or other appropriate identification method. This identification method shall be visible when the plug is in the mated or unmated condition.

[i] Since angled MPO connectors require a Y-offset of the fibre holes in relation to the guide pin holes, and the Y-offset is referenced from the epoxy window of the ferrule, the angle shall be polished as a down-angle from the epoxy window. The orientation of the ferrule epoxy window may be reversed in the MPO connector to produce the up-angle variant.

Figure 4 shows the optical datum target location diagrams. Figure 5 shows the gauge pin, and its dimensions are given in Table 3.

Dimensions in millimetres



NOTE The optical datum target location diagram is shown in the figure. Here, datum X is defined as the line passing through two pin-hole centres, and datum Y is defined as the line perpendicular to datum X and passing through the midpoint of two pin-hole centres.

Figure 4 – Optical datum target location diagrams

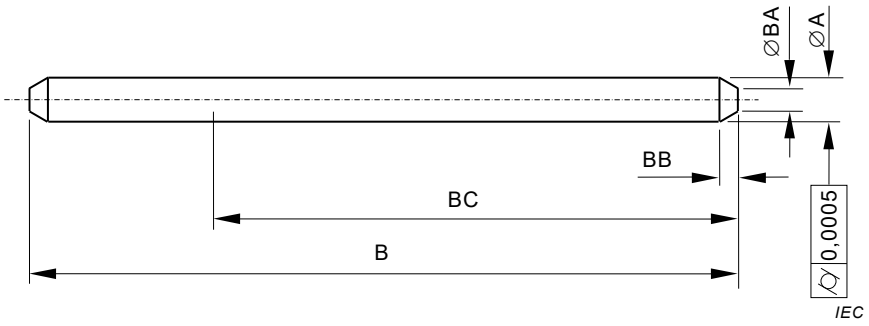


Figure 5 – Gauge pin

Table 3 – Dimensions of the gauge pin

Reference	Dimensions mm		Remarks
	Minimum	Maximum	
A[a]	0,698 5	0,699 0	
B[b]	10,8	11,2	
BA	0,2	0,4	
BB	0,2	0,5	
BC	6,0	–	
[a] Surface roughness R_z = 0,1 µm for the length of dimension BC.			
[b] Typical dimensions.			

Figure 6 shows the gauge for the plug, and its dimensions are given in Table 4.

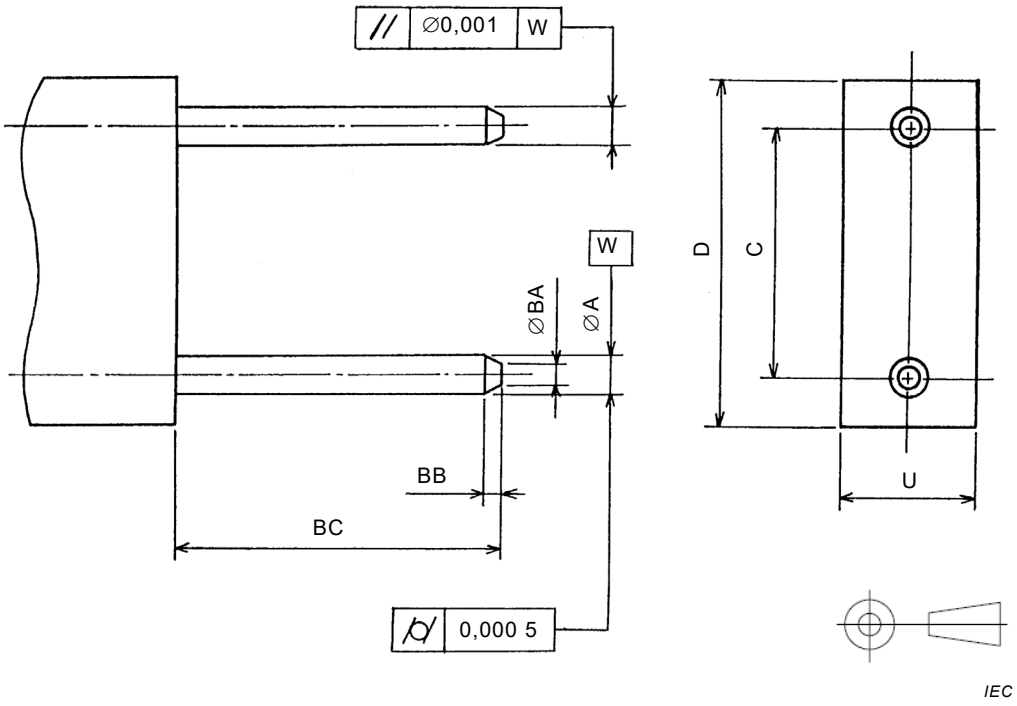


Figure 6 – Gauge for plug