

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Connectors for electrical and electronic equipment – Product requirements –
Part 3-122: Detail specification for 8-way, shielded, free and fixed connectors for
I/O and data transmission with frequencies up to 500 MHz and current-carrying
capacity in industrial environments**

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**Connecteurs pour équipements électriques et électroniques – Exigences de
produit –**

**Partie 3-122: Spécification particulière pour les fiches et les embases écrantées
à 8 voies pour les entrées/sorties et la transmission des données à des
fréquences jusqu'à 500 MHz avec courant limite admissible dans des
environnements industriels**



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Connectors for electrical and electronic equipment – Product requirements – Part 3-122: Detail specification for 8-way, shielded, free and fixed connectors for I/O and data transmission with frequencies up to 500 MHz and current-carrying capacity in industrial environments

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –
PRODUCT REQUIREMENTS –****Part 3-122: Detail specification for 8-way, shielded, free and fixed
connectors for I/O and data transmission with frequencies up to
500 MHz and current-carrying capacity in industrial environments**

FOREWORD

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International Standard IEC 61076-3-122 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

This second edition cancels and replaces the first edition published in 2017. This edition constitutes a technical revision.

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

- a) Title modified.
- b) Introduction of two sets of requirements for connectors of "class A" and "class B" where class A matches the requirements defined in the previous edition.

- c) Definition of new performance requirements for frequencies up to 500 MHz in addition to the performance requirements up to 100 MHz provided with the previous edition.
- d) Re-structuring to reflect the commonalities of and differences between connector Type I and Type II.
- e) Revision of drawings to clarify some dimensions.
- e) The derating diagram has been corrected to align it with the upper limiting temperature in the climatic category, with no reduction of performance for the target applications.

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

FDIS	Report on voting
48B/2864/FDIS	48B/2877/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.

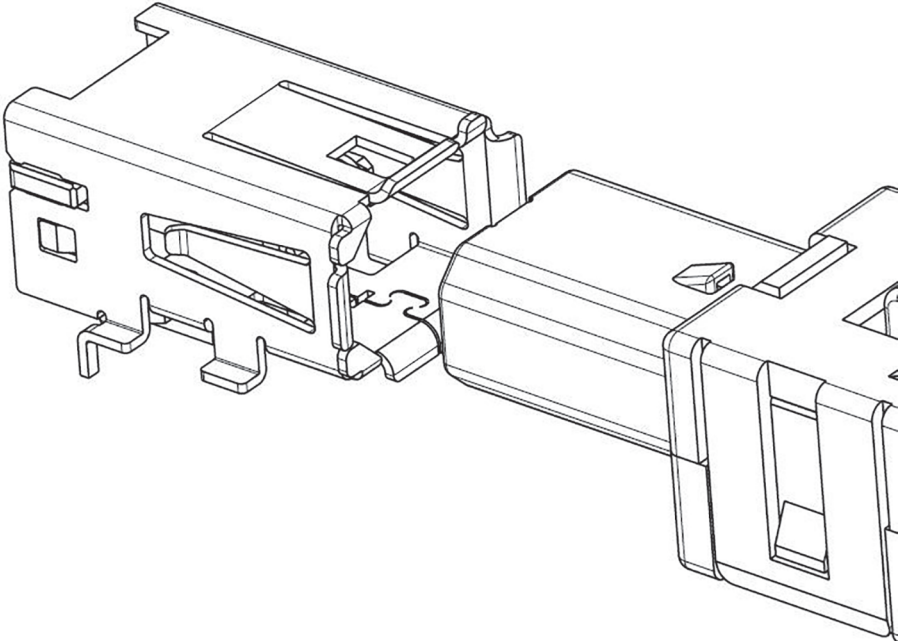
This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61076 series, published under the general title *Connectors for electrical and electronic equipment – Product requirements*, 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.

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Subcommittee 48B: Electrical connectors	IEC 61076-3-122 Ed. 2
 <p>Figure 1 – Product overview</p>	<p>Detail specification for 8-way, shielded, free and fixed connectors for I/O and data transmission with frequencies up to 500 MHz and current-carrying capacity in industrial environments</p>
<p>NOTE Figure 1 shows a Type I connector pair, with coding edges on a short side; for Type II connectors the coding edges are located on a long side.</p>	<p>Fixed connectors are mounted on printed circuit board by means of soldering or press-in, the free connector is attached to wires by means of soldering, crimping, IDC or other termination technology.</p>

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 3-122: Detail specification for 8-way, shielded, free and fixed connectors for I/O and data transmission with frequencies up to 500 MHz and current-carrying capacity in industrial environments

1 Scope

This part of IEC 61076 covers 8-way, shielded, free and fixed rectangular connectors for I/O and data transmission with frequencies up to 500 MHz. It is intended to specify the common dimensions, mechanical, electrical and environmental characteristics and tests for this family of connectors.

Connectors complying with this document provide an ingress protection level of IP20; however, they are particularly suited for industrial environments with a high level of vibration.

NOTE 1 In terms of the MICE system as defined in ISO/IEC 11801-1, the connector matches the requirements of the M₃I₁C₃E₃ levels.

There are two classes of connectors defined in this document, indicated by "class A" and "class B" which are distinguished by some electrical and mechanical characteristics to meet the particular sets of requirements of some industrial applications.

NOTE 2 Class A meets the requirements defined in Ed.1 of this document.

NOTE 3 With the two classes A and B, the two codings Type I and II and the two sets of transmission requirements according to the component categories Cat 5 and Cat 6_A as defined in ISO/IEC 11801-1, this document specifies $2 \times 2 \times 2 = 8$ variants.

All connectors covered by this document feature a current-carrying capacity beyond the minimum requirement of 0,75 A per pin for an ambient temperature of 60° C as defined in ISO/IEC 11801-1.

NOTE 4 The current-carrying capacity is given by the current-temperature derating defined in this document and is dependent on the wire size of the cable attached to the connector.

NOTE 5 With a current-carrying capacity of 0,5 A per pin and with matching the requirement of withstanding the test current of 2 A for unmating under load as defined in IEC 60512-99-002, the connectors covered by this document support the highest Power over Ethernet level as defined by IEEE 802.3bt (100 W PoE++ Type 4).

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 60050-581, *International Electrotechnical Vocabulary (IEV) – Part 581: Electromechanical components for electronic equipment*

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-38, *Basic environmental testing procedures – Part 2-38: Tests – Test Z/AD: Composite temperature/humidity cyclic test*

IEC 60512-1, *Connectors for electrical and electronic equipment – Tests and measurements – Part 1: Generic specification*

IEC 60512-1-1, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

IEC 60512-1-2, *Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass*

IEC 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-3-1, *Connectors for electronic equipment – Tests and measurements – Part 3-1: Insulation tests – Test 3a: Insulation resistance*

IEC 60512-4-1, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-5-2, *Connectors for electronic equipment – Tests and measurements – Part 5-2: Current-carrying capacity tests – Test 5b: Current-temperature derating*

IEC 60512-6-3, *Connectors for electronic equipment – Tests and measurements – Part 6-3: Dynamic stress tests – Test 6c: Shock*

IEC 60512-6-4, *Connectors for electronic equipment – Tests and measurements – Part 6-4: Dynamic stress tests – Test 6d: Vibration (sinusoidal)*

IEC 60512-9-1, *Connectors for electronic equipment – Tests and measurements – Part 9-1: Endurance tests – Test 9a: Mechanical operation*

IEC 60512-11-3, *Connectors for electronic equipment – Tests and measurements – Part 11-3: Climatic tests – Test 11c: Damp heat, steady state*

IEC 60512-11-4, *Connectors for electronic equipment – Tests and measurements – Part 11-4: Climatic tests – Test 11d: Rapid change of temperature*

IEC 60512-11-7, *Connectors for electronic equipment – Tests and measurements – Part 11-7: Climatic tests – Test 11g: Flowing mixed gas corrosion test*

IEC 60512-11-9, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 60512-11-10, *Connectors for electronic equipment – Tests and measurements – Part 11-10: Climatic tests – Test 11j: Cold*

IEC 60512-13-2, *Connectors for electronic equipment – Tests and measurements – Part-13-2: Mechanical operation tests – Test 13b: Insertion and withdrawal forces*

IEC 60512-15-6, *Connectors for electronic equipment – Tests and measurements – Part 15-6: Connector tests (mechanical) – Test 15f: Effectiveness of connector coupling devices*

IEC 60512-26-100, *Connectors for electronic equipment – Tests and measurements – Part 26-100: Measurement setup, test and reference arrangements and measurements for connectors according to IEC 60603-7 – Tests 26a to 26g*

IEC 60512-28-100, *Connectors for electrical and electronic equipment – Tests and measurements – Part 28-100: Signal integrity tests up to 2 000 MHz – Tests 28a to 28g*

IEC 60512-99-002, *Connectors for electrical and electronic equipment – Tests and measurements – Part-99-002: Endurance test schedules – Test 99b, Test schedule for unmating under electrical load*

IEC 60664-1, *Insulation coordination for equipment within low-voltage supply systems – Part 1: Principles, requirements and tests*

IEC 61076-1:2006, *Connectors for electronic equipment – Product requirements – Part 1: Generic specification*
IEC 61076-1:2006/AMD1:2019

IEC 61076-3, *Connectors for electronic equipment – Product requirements – Part 3: Rectangular connectors – Sectional specification*

IEC TR 63040, *Guidance on clearances and creepage distances in particular for distances equal to or less than 2 mm – Test results of research on influencing parameters*

ISO/IEC 11801-1, *Information technology – General cabling for customer premises – Part 1: General requirements*

3 Terms and definitions

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For the purposes of this document, the terms and definitions given in IEC 60050-581, IEC 61076-1, IEC 61076-3 and IEC 60512-1 apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
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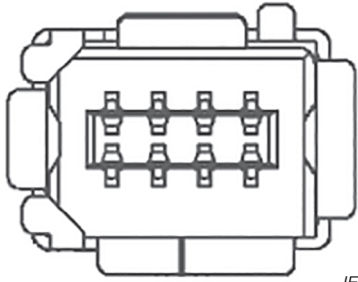
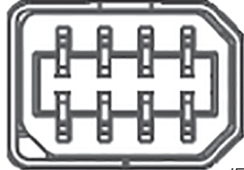
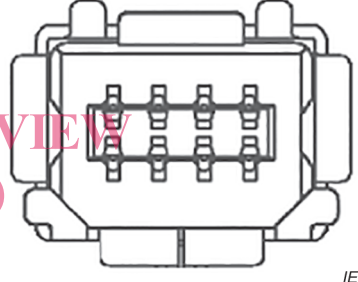
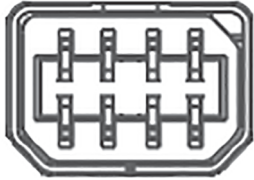
4 Mating information

4.1 General

Dimensions are given in millimetres. Drawings are shown in third-angle projection. The shape of connectors may deviate from those given in Table 1 and Figure 2 through Figure 4 as long as the dimensions specified are not changed.

Two types of connectors are defined, which can be used to distinguish between different networks within the same building or premises.

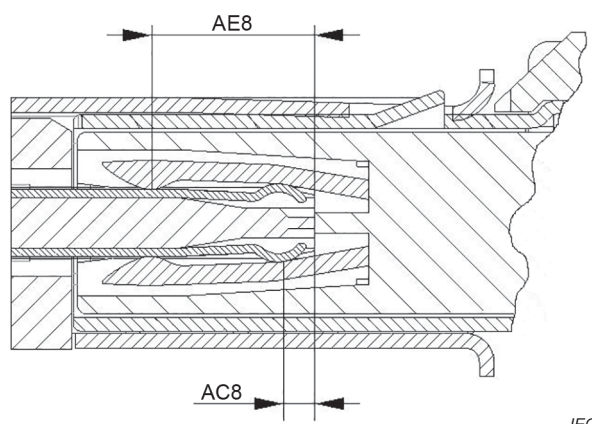
Table 1 – Mating faces of the individual connector styles

Style	Description	Mating face view
Fixed connector Type I	D-shaped fixed female connector	 IEC
Free connector Type I	D-shaped free male connector	 IEC
Fixed connector Type II	U-shaped fixed female connector	 IEC
Free connector Type II	U-shaped free male connector	 IEC

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4.2 Contacts – Mating conditions

For dimensions see Table 2.



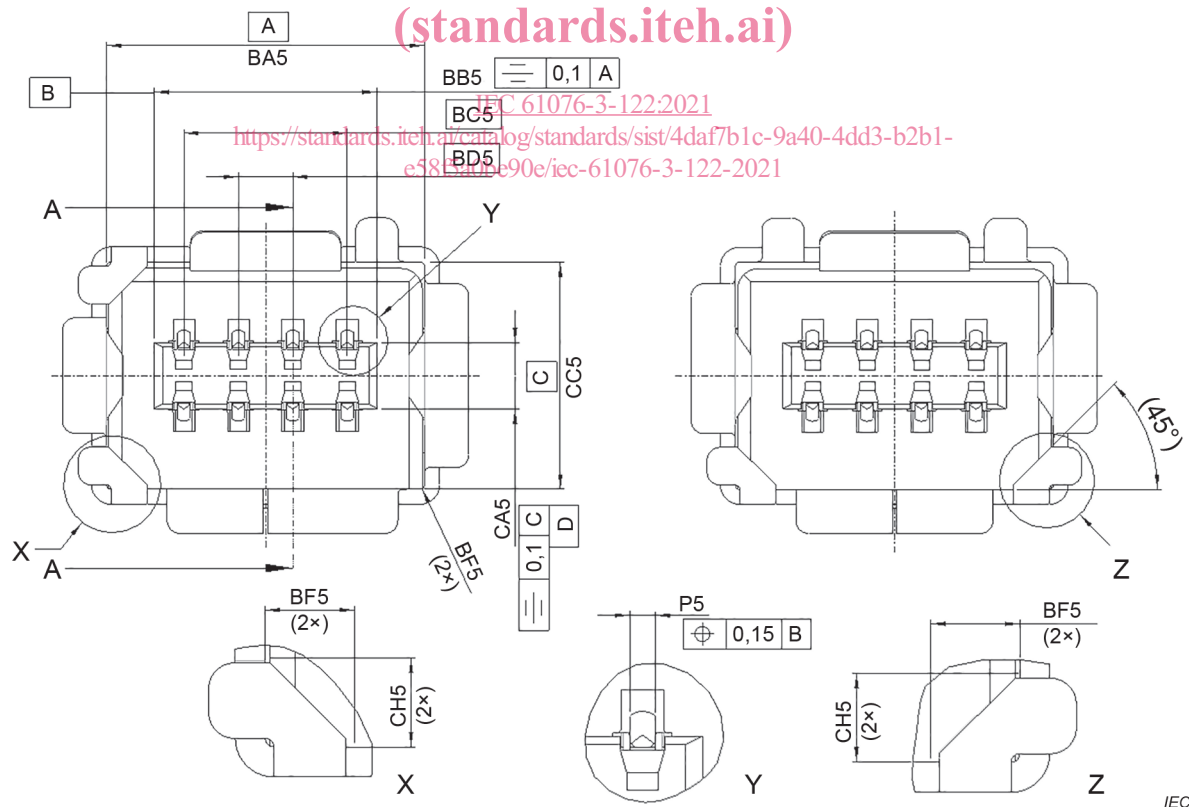
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Figure 2 – Contact interface of a free male connector (right side) mated with a fixed female connector (left side)

4.3 Fixed connectors Type I and II

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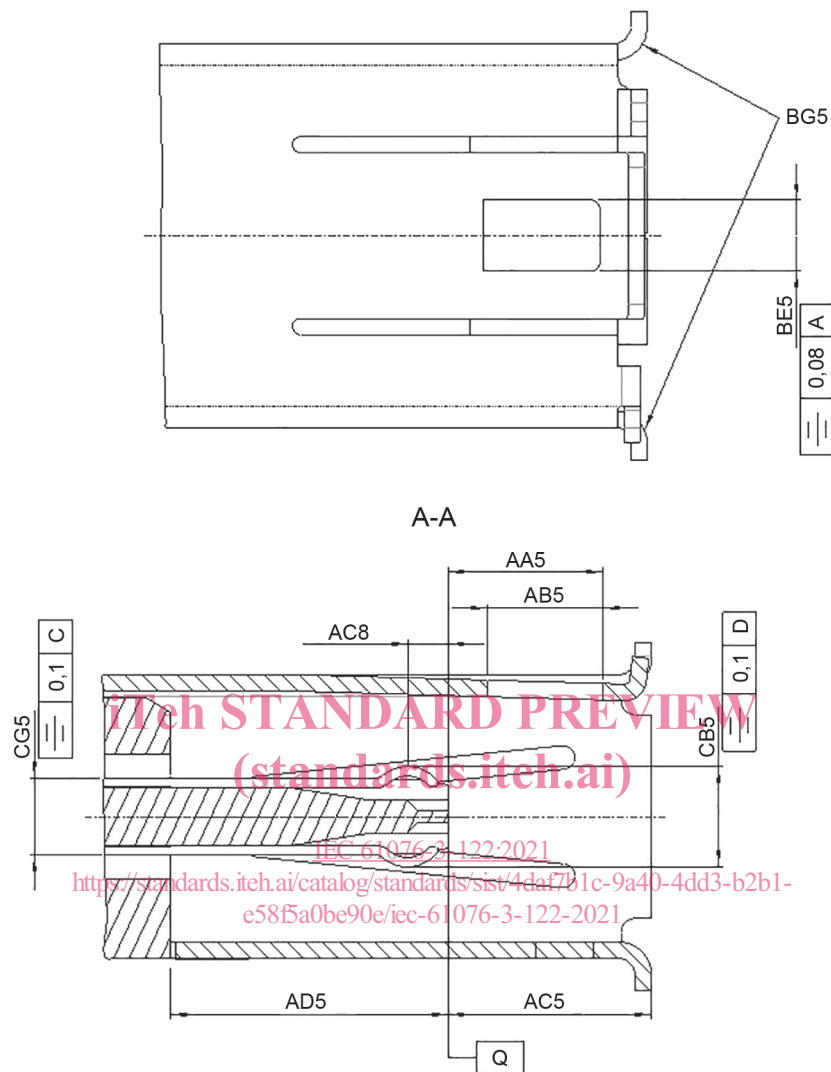
Dimensions in millimetres



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Figure 3a) – Mating side view: Type I (left), Type II (right)

Dimensions in millimetres



IEC

Datum Q is the preferred free connector stop surface.

Figure 3b) – Section A-A with top view of Type I

Figure 3 – Fixed connectors

Table 2 – Dimensions for Figure 2 and Figure 3

Dimensions in millimetres

Dimension designation	Minimum	Nominal	Maximum
AA5	3,15	3,3	3,45
AB5	2,37	2,47	2,57
AC5	4,2	4,3	4,4
AD5	5,77	5,85	5,9
AC8	0,75	0,85	1
AE8	3,85	4	4,2
BA5	7,36	7,41	7,46
BB5	5,16	5,21	5,26
BC5	N/A	3,81	N/A
BD5	N/A	1,27	N/A
BE5	1,45	1,5	1,55
BF5	1	1,05	1,1
BG5	R 0,6	R 0,7	R 0,8
CA5	1,49	1,54	1,59
CB5	2	2,12	2,22
CC5	5,25	5,3	5,35
CD5	R 0,6	R 0,7	R 0,8
CE5	R 0	R 0,1	R 0,3
CG5	1,54	1,62	1,66
CH5	1	1,05	1,1
P5	0,25	0,3	0,35