

Connectors for electronic equipment — Product requirements —

**Part 3-110: Rectangular connectors —
Detail specification for shielded, free
and fixed connectors for data
transmission with frequencies up
to 1 000 MHz**

ICS 31.220.10

National foreword

This British Standard is the UK implementation of EN 61076-3-110:2008. It is identical to IEC 61076-3-110:2007.

The UK participation in its preparation was entrusted to Technical Committee EPL/48, Electromechanical components and mechanical structures for electronic equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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**Connectors for electronic equipment -
Product requirements -
Part 3-110: Rectangular connectors -
Detail specification for shielded, free and fixed connectors
for data transmission with frequencies up to 1 000 MHz
(IEC 61076-3-110:2007)**

Connecteurs pour équipements
électroniques -
Exigences de produit -
Partie 3-110: Connecteurs rectangulaires -
Spécification particulière pour les fiches
et les embases écrantées
pour la transmission de données
à des fréquences jusqu'à 1 000 MHz
(CEI 61076-3-110:2007)

Steckverbinder für elektronische
Einrichtungen -
Produktanforderungen -
Teil 3-110: Rechteckige Steckverbinder -
Bauartspezifikation für geschirmte freie
und feste Steckverbinder
für Datenübertragungen bis 1 000 MHz
(IEC 61076-3-110:2007)

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European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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Foreword

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Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61076-3-110:2007 was approved by CENELEC as a European Standard without any modification.

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INTRODUCTION

This part of IEC 61076 describes connectors according to IEC 61076-3 series connectors requirements.

The connectors are similar to and compatible with IEC 60603-7 series connectors.

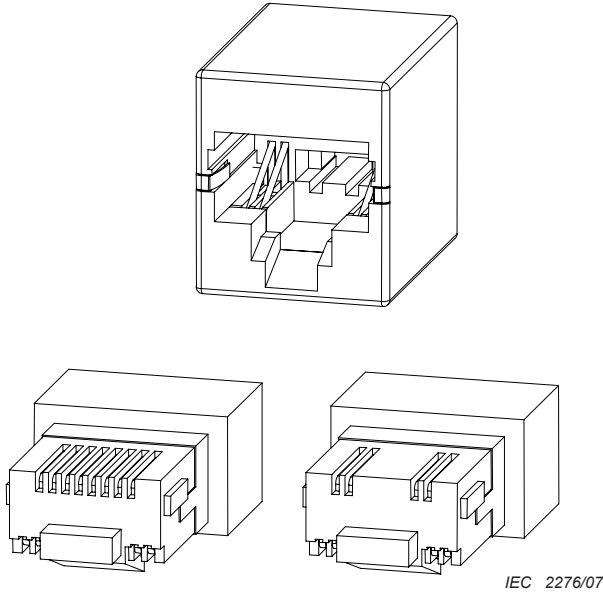
The IEC 61076-3-110 free connector can be used in data communication cabling systems with the IEC 60603-7-7 and IEC 60603-7-71 fixed connector.

The IEC 61076-3-110 connector includes up to 12 contacts, including up to 8 contacts (1,2,3,4,5,6,7,8) that are similar to a standard IEC 60603-7 series connector. In addition, the IEC 61076-3-110 connector includes up to 4 additional contacts (6',3',4',5') located on the opposite side from the original contact positions of a basic IEC 60603-7 series connector.

For use in high speed communications cabling systems, IEC 60603-7-7 and IEC 60603-7-71 fixed connectors include a switch or other means to engage these two different sets of four contacts to enable backward compatibility for transmission performance. In this application the IEC 61076-3-110 free connector simply uses 8 contacts (1,2,3',4',5',6',7,8) and no switch.

The IEC 61076-3-110 fixed connector includes a board mounted style in addition to the cable mounted style.

The complete requirements for the connectors described in this specification correspond to this detail specification and the current issues of IEC 61076-3 and IEC 60603-7 series, which are referenced herein accordingly.

IEC SC 48B: CONNECTORS Specification available from: IEC Central Office or from the addresses shown on the inside cover	IEC 61076-3-110
 IEC 2276/07	Detail specification for two-part connector used in: – high speed communications applications up to 1 000 MHz – up to 6 balanced contact pairs (up to 12 contacts) – compatible with IEC 60603-7 series connectors 4 balanced contact pairs (1,2,3,4,5,6,7,8) up to 500 MHz and 4 balanced contact pairs (1,2,3',4',5',6',7,8) of IEC 60603-7-7 up to 600 MHz and IEC 60603-7-71 up to 1 000 MHz – intended for inside-building cabling systems
	Fixed connector: cable mount or for mounting on printed boards
	Free connector: cable mount only
	Performance level(s): 1, 2
	Assessment level(s): not specified
	Reference data: not available

CONNECTORS FOR ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 3-110: Rectangular connectors – Detail specification for shielded, free and fixed connectors for data transmission with frequencies up to 1 000 MHz

1 General

1.1 Scope

This part of IEC 61076 is a detail specification, forming part of IEC 61076-3, for IEC 61076-3-110, two-part connector.

It covers mechanical and environmental requirements, and electrical transmission requirements for frequencies up to 1 000 MHz.

These connectors can be used as category 7 connectors in class F cabling systems, as specified in ISO/IEC 11801:2002.¹

The connectors are intermateable with IEC 60603-7-X series connectors.²

The connectors are interoperable with IEC 60603-7-7 and IEC 60603-7-71 connectors.³

The connectors are backward compatible with IEC 60603-7-7 and IEC 60603-7-71 connectors.⁴

1.2 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.

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

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

IEC 60352 (all parts), *Solderless connections*

IEC 60352-2, *Solderless connections – Part 2: Crimped connections – General requirements, test methods and practical guidance*

IEC 60352-3, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-4, *Solderless connections – Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance*

¹ ISO/IEC 11801 contains various 'category' designations corresponding to various frequency ranges.

² Intermateability definition and requirements are given in 2.2.2.

³ Interoperability definition and requirements are given in 2.2.3.

⁴ Backward compatibility definition and requirements are given in 2.2.4.

IEC 60352-5, *Solderless connections – Part 5: Press-in connections – General requirements, test methods and practical guidance*

IEC 60352-6, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*

IEC 60352-7, *Solderless connections – Part 7: Spring clamp connections – General requirements, test methods and practical guidance*

IEC 60512 (all parts), *Connectors for electronic equipment – Tests and measurements*

IEC 60512-1-100, *Connectors for electronic equipment – Tests and measurements – Part 1-100: General – Applicable publications*

IEC 60603-7 (all parts), *Connectors for frequencies below 3 MHz for use with printed boards – Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality*

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

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

IEC 61076-3, *Connectors for electronic equipment – Product requirements – Part 3: Rectangular connectors with assessed quality – Sectional specification*⁵

IEC 61156 (all parts), *Multicore and symmetrical pair/quad cables for digital communications*

IEC 61156-2, *Multicore and symmetrical pair/quad cables for digital communications – Part 2: Horizontal floor wiring – Sectional specification*

IEC 61156-3, *Multicore and symmetrical pair/quad cables for digital communications – Part 3: Work area wiring – Sectional specification*

IEC 61156-4, *Multicore and symmetrical pair/quad cables for digital communications – Part 4: Riser cables – Sectional specification*

IEC 61156-5, *Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Horizontal floor wiring – Sectional specification*

IEC 61156-6, *Multicore and symmetrical pair/quad cables for digital communications – Part 6: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz – Work area wiring – Sectional specification*

ISO/IEC 11801:2002, *Information technology – Generic cabling for customer premises*

ISO 1302, *Geometrical product specifications (GPS) – Indication of surface texture in technical product documentation*

⁵ This second edition of IEC 61076-3, is yet to be published.

ITU-T K.20, *Resistibility of telecommunication equipment installed in a telecommunications centre to overvoltages and overcurrents*

ITU-T K.44:2000, *Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents – Basic recommendation*

EN 50289-1-14, *Communication cables – Specification for test methods – Part 1-14: Electrical test methods – Coupling attenuation or screening attenuation of connecting hardware*

2 Technical information

2.1 Terms and definitions

The terminology used in and applicable to this specification is stated in 2.1 of IEC 61076-1. IEC 60512-1 also contains applicable terms.

2.2 Systems of levels

2.2.1 Interchangeability level

These connectors are intermateable, interoperable and backward compatible with IEC 61076-3-110 and IEC 60603-7 series connectors.

The interchangeability of these connectors, insofar as intermateability, interoperability and backward compatibility requirements are concerned, are ensured for mated connectors when individual connector halves are from different sources.

2.2.2 Intermateability

Intermateability is ensured by applying the “GO” and “NO-GO” gauge requirements as well as adherence to the dimensional requirements.

2.2.3 Interoperability

Interoperability of different IEC 61076-3-110 connectors is ensured by compliance with all transmission requirements when the connector is mated with the respective test-connector as described in Annex C.

These connectors are interoperable with IEC 60603-7-7 and IEC 60603-7-71 series connectors.

NOTE In this detail specification, the term “category”, when used in reference to transmission performance, refers to those categories defined by ISO/IEC 11801.

2.2.4 Backward compatibility

The backward compatibility requirement ensures that a free connector or fixed connector, which is in compliance with this detail specification, mated with a fixed connector or free connector in compliance with IEC 60603-7-7 or IEC 60603-7-71 connectors, shall fully comply with the respective requirements of IEC 60603-7-7 or IEC 60603-7-71 connectors.

2.3 Complete connectors (pairs)

Complete connectors engage a total of up to 12 contacts.

These connectors are interoperable with IEC 60603-7 series connectors.

The IEC 61076-3-110 connector includes up to 12 contacts including up to 8 contacts (1,2,3,4,5,6,7,8) that are similar to a standard IEC 60603-7 series connector. In addition, the IEC 61076-3-110 connector includes up to 4 additional contacts (6',3',4',5') located on the opposite side from the original contacts' positions of a basic IEC 60603-7 series connectors.

2.4 Fixed connectors

IEC 61076-3-110 fixed connectors may include a rear cavity and side channels.

These features accommodate the switch actuator protrusions on IEC 60603-7-7 and IEC 60603-7-71 free connectors.

2.5 Free connectors

IEC 61076-3-110 free connectors may include front and side protrusions.

The free connector front switch actuator protrusion may be provided for operating the IEC 60603-7-7 or IEC 60603-7-71 fixed connector switch actuator, if present.

The free connector side protrusions may be provided for precluding mating with lower frequency IEC 60603-7-X series fixed connectors.

2.6 Classification into climate categories

Classification into climatic categories is specified in 4.2.

2.7 Clearance and creepage distances

Clearance and creepage distances are specified in 4.4.1.

2.8 Current carrying capacity

Current carrying capacity is specified in 4.4.3.

3 Dimensional information

3.1 General

The shape of the connectors may deviate from those given in the following drawings as long as the specified dimensions are not influenced.

Dimensions are given in millimetres.

Drawings are shown in first angle projection unless specifically stated otherwise in the figure.

3.2 Isometric view and common features

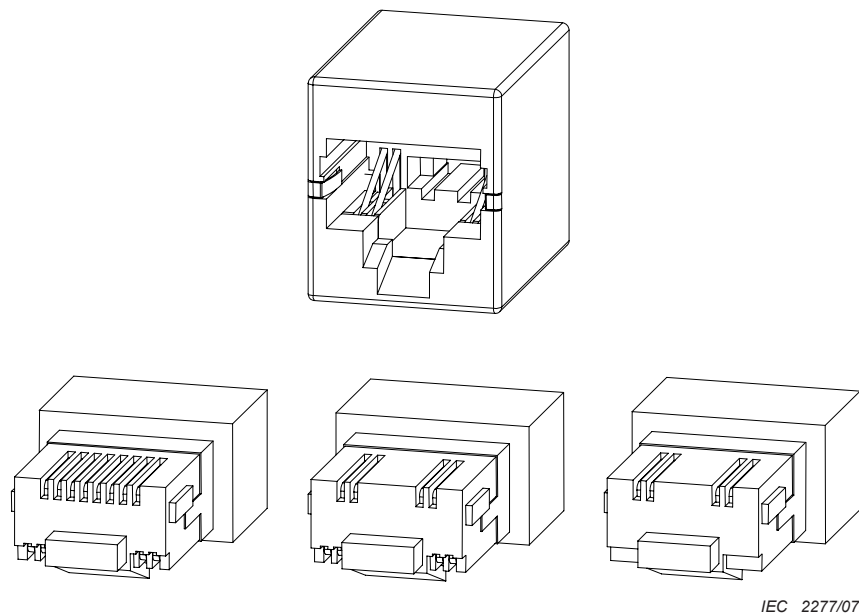


Figure 1 – Isometric view, fixed 8 and 12 pole and free 8, 12 and 4 pole connectors

These connectors have common features, i.e. contacts arrangement, mating information and coupling device.

These connectors have the same common features as IEC 60603-7 series connectors.

Mating alignment is controlled by a vertical and horizontal reference plane and by the centring of the coupling device (latch)

3.3 Mating information

Common dimensions are given in Figure 2 and in Table 1.

Care shall be taken that contacts avoid interference with the plastic of the free connector.

The mating information shown can only be achieved with a free connector with a cable attached.

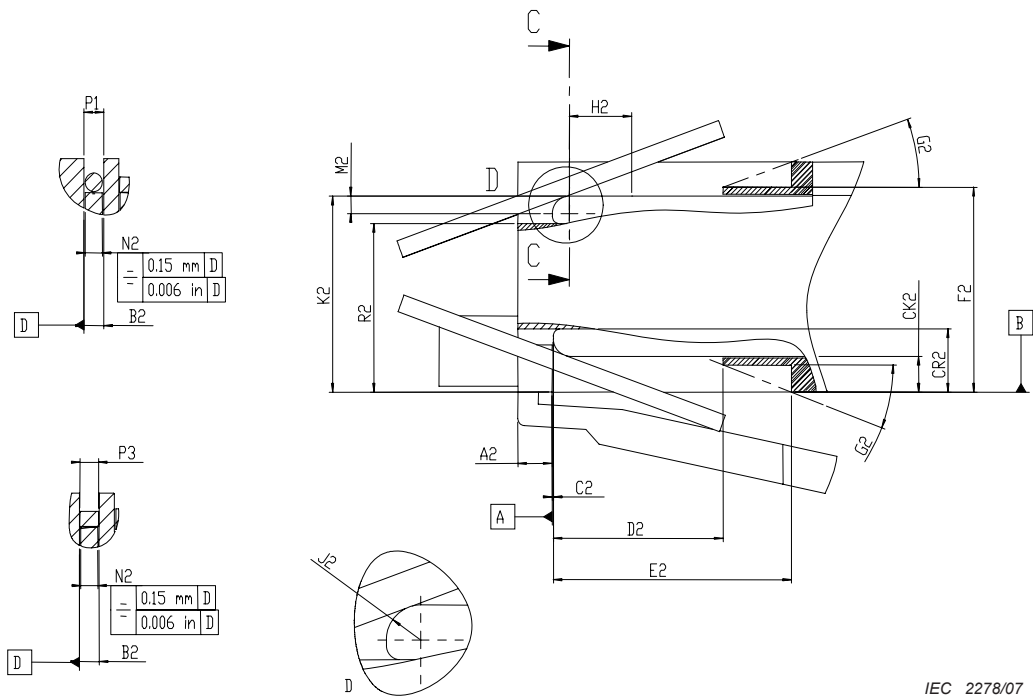


Figure 2 – Physical interface, contacts interface dimensions

Table 1 – Physical interface, contacts interface – Dimensions

Letter	Maximum	Minimum
	mm	mm
A2	1,45	0,89
B2	0,61	0,51
C2	0,46	0,03
D2		2,79
E2		4,11
F2	6,22	
H2 ^a		0,38
J2	0,64	0,38
K2	6,15	5,89
M2 ^b		0,30
N2		0,28
P1 ^c	0,50	0,45
P3 ^d	0,50	0,36
R2	4,83	
CK2	0,60	0,50
CR2		1,70
G2 (angle)	10°	
^a H2: Burrs shall not project above top of contact in this area. ^b M2: Minimum preferred contact configuration. ^c P1: preferred fixed connector contact configuration. ^d P3: optional fixed connector contact configuration. View D: preferred contact interface detail.		

3.4 Fixed connectors

3.4.1 Common dimensions for fixed connectors

Common dimensions are given in Figure 3 and Figure 4 and in Table 2.

All internal corners in the connector cavity shall have a 0,38 mm radius maximum unless otherwise specified.

Contacts are shown at rest. Contacts shall always be contained inside guide slots. Contacts shall move freely within their guide slots.

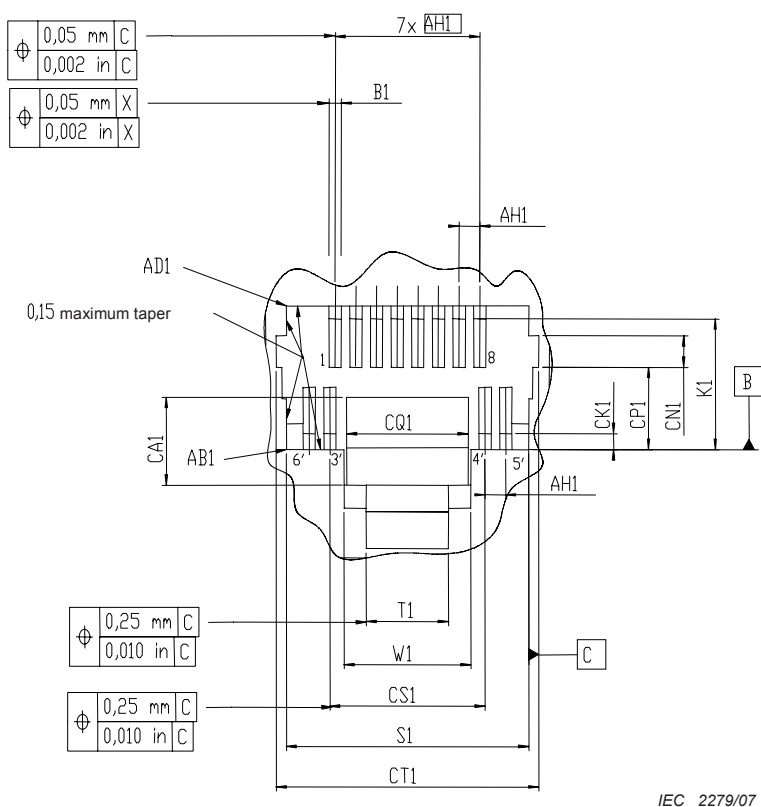


Figure 3 – Physical interface, fixed connector, front view – Dimensions

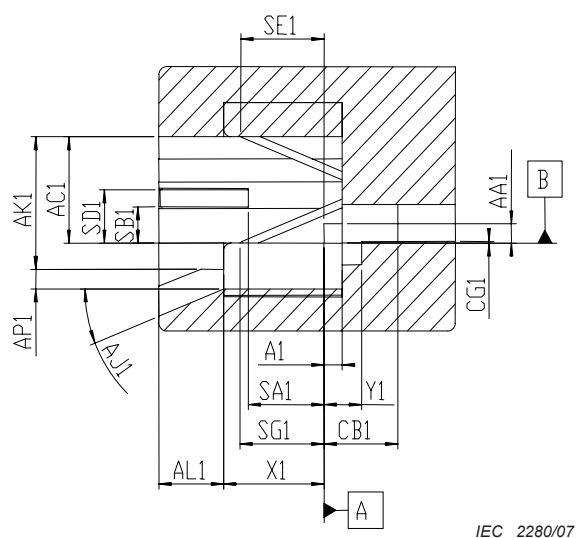


Figure 4 – Physical interface, fixed connector, side view – Dimensions

Table 2 – Fixed connector common dimensions

Letter	Maximum	Minimum	Nominal
	mm	mm	mm
A1		1,47	
B1	0,71		
K1 ^a	5,84		
S1	12,04	11,84	11,94
T1	4,19	3,94	
W1	6,38	6,22	
X1	6,86	6,68	
Y1		2,34	
AA1 ^b	1,24		
AB1	0,38		
AC1	6,96	6,76	6,86
AD1	0,13		
AH1 ^c			1,02
AK1	8,66	8,38	
AL1 ^d		1,40	
AP1 ^e		1,27	
CA1	2,30	2,20	
CB1		3,95	
CG1	0,10		
CK1 ^a		0,65	
CN1	1,40	1,30	
CP1	5,05	4,95	
CQ1	6,00	5,80	
CS1			7,66
CT1	13,0	12,9	
SA1		5,31	
SB1		2,16	
SD1	4,90		
SE1 ^f	5,80		
SG1 ^{g, h}	5,80		
AJ1 (angle)			15°

^a K1, CK1: Contact zone. Contacts shall be completely within their individual contact zone in the area indicated.
^b AA1: Preferred male free connector stop.
^c AH1: True position.
^d AL1: Front surface need not be planar or coincident with the surface below the locking device, as long as insertion, latching and unlatching of free connectors is not inhibited. Projections beyond AL1 dimension shall not prevent finger access to the free connector locking (coupling) device.
^e AP1: Flat surface.
^f SE1: Maximum forward extension of contacts below surface AC1 to avoid contact with shields of free connectors. Applies in the mated state.
^g SG1: To maintain the clearance requirement between signal conductors 6',3',4',5' of the fixed connector and the screen of the free connector when the fixed connector is mated with a IEC 60603-7-1,2,3,4,5 free connector. Note that SG1 is typically 0,0 mm in the mated state with a IEC 60603-7-1,2,3,4,5 free connector.
^h SG1: Maximum forward extension of contacts above surface reference plane B, to avoid contact with shields of free connectors. Applies in the mated state.

Care shall be taken that all screen contacts of the fixed connector always make contact with the screen contacts of the free connector in worst case condition to ensure reliable performance.

3.4.2 Fixed connector styles

3.4.2.1 Style A, fixed connector, cable mounted

Outside dimensions for cable mounted fixed connectors are not specified.