

Connectors for electronic equipment —

**Part 4-110: Printed board connectors
with assessed quality — Detail
specification for latched cable
connector system having a basic grid of
2,0 mm including full shielding and
latching function**

The European Standard EN 61076-4-110:2002 has the status of a
British Standard

ICS 31.220.10

National foreword

This British Standard is the official English language version of EN 61076-4-110:2002. It is identical with IEC 61076-4-110:2001.

The UK participation in its preparation was entrusted by Technical Committee EPL/48, Electromechanical components for electronic equipment, to EPL/48/2, Connectors for electronic equipment, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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Connectors for electronic equipment
Part 4-110: Printed board connectors with assessed quality -
Detail specification for latched cable connector system
having a basic grid of 2,0 mm
including full shielding and latching function
(IEC 61076-4-110:2001)

Connecteurs pour équipements électroniques
Partie 4-110: Connecteurs pour cartes imprimées sous assurance de la qualité -
Spécification particulière pour connecteur de câble pour carte et fond de panier, pas de base 2 mm incluant un blindage complet et la fonction verrouillage
(CEI 61076-4-110:2001)

Steckverbinder für elektronische Einrichtungen
Teil 4-110: Steckverbinder für gedruckte Schaltungen mit bewerteter Qualität -
Bauartspezifikation für ein verriegelbares Kabelsteckverbindersystem, Raster 2,0 mm, einschließlich vollständiger Schirmung und Rastung
(IEC 61076-4-110:2001)

This European Standard was approved by CENELEC on 2002-02-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 48B/1113/FDIS, future edition 1 of IEC 61076-4-110, prepared by SC 48B, Connectors, of IEC TC 48, Electromechanical components and mechanical structures for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61076-4-110 on 2002-02-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
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- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-02-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annex ZA is normative.

Endorsement notice

The text of the International Standard IEC 61076-4-110:2001 was approved by CENELEC as a European Standard without any modification.

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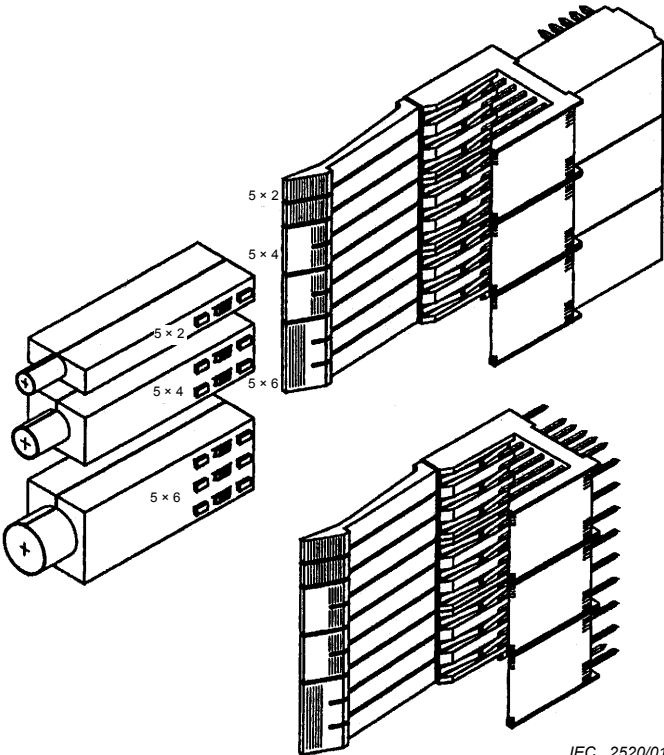
CONNECTORS FOR ELECTRONIC EQUIPMENT –

Part 4-110: Printed board connectors with assessed quality –

Detail specification for latched cable connector system

having a basic grid of 2,0 mm including full shielding

and latching function

IEC SC 48B: Connectors Specification available from: IEC Central office or from the addresses shown on the inside cover. Electronic components of assessed quality	IEC 61076-4-110 QC 480301XX0011
DETAIL SPECIFICATION in accordance with IEC 61076-1:1995	
	Cable connector system for printed boards and backplanes, grid of 2,0 mm, including full shielding and latching function Modular, five-row connector with shielding and latching - Fixed board connectors: (5 × 6) and multiple. - Free cable connectors: (5 × 2) (5 × 4) (5 × 6) Performance levels (PL): 1, 2 Assessment level: G (1G and 2G)

Information on the availability of components qualified to this detail specification is given in the qualified products list.

1 General data

Dimensions are in millimetres and shall be indicated in all figures or tables.

This document specifies a connector family having a basic grid of 2,0 mm, which consists of a fixed connector with shielded shroud, where a plurality of shielded free cable connectors may be plugged in.

The fixed connectors and shroud have 30 contacts or a multiple of this value.

The free connectors have 10, 20, or 30 contacts; they may be stacked end to end and fit in all slots of the shroud.

Electrically, the shielding braid of the round cables is connected to the housing shells to the free connectors. These shells may be brought into contact with the shielding contacts on the two sides of the slots in the modular header. The shields of the modular shroud are connected with the chassis and/or the printed-circuit board.

Mechanically, the round cables are clamped to the housing shells of the free connectors. These housings snap under the locking latches of the modular header. The locking latches are inserted on the modular header.

1.1 Recommended method of mounting

The free cable connector shall be connected to a round cable.

The shield of the cable shall be connected to the conductive shell of the free connector housing, and the insulation of the cable shall be retained by a strain relief device.

The signal wires shall be connected direct to the female contacts by insulation displacement connections.

The cable-to-board connectors are recommended for use in three different applications:

- Application A: front and rear plug-up cable connection
- Application B: connection to printed board
- Application C: rear plug-up connection

See figure 1 for location of the above-mentioned reference letters.

Depending on the application the fixed board connectors shall be attached to the backplane or to the daughter board through the press-in connections.

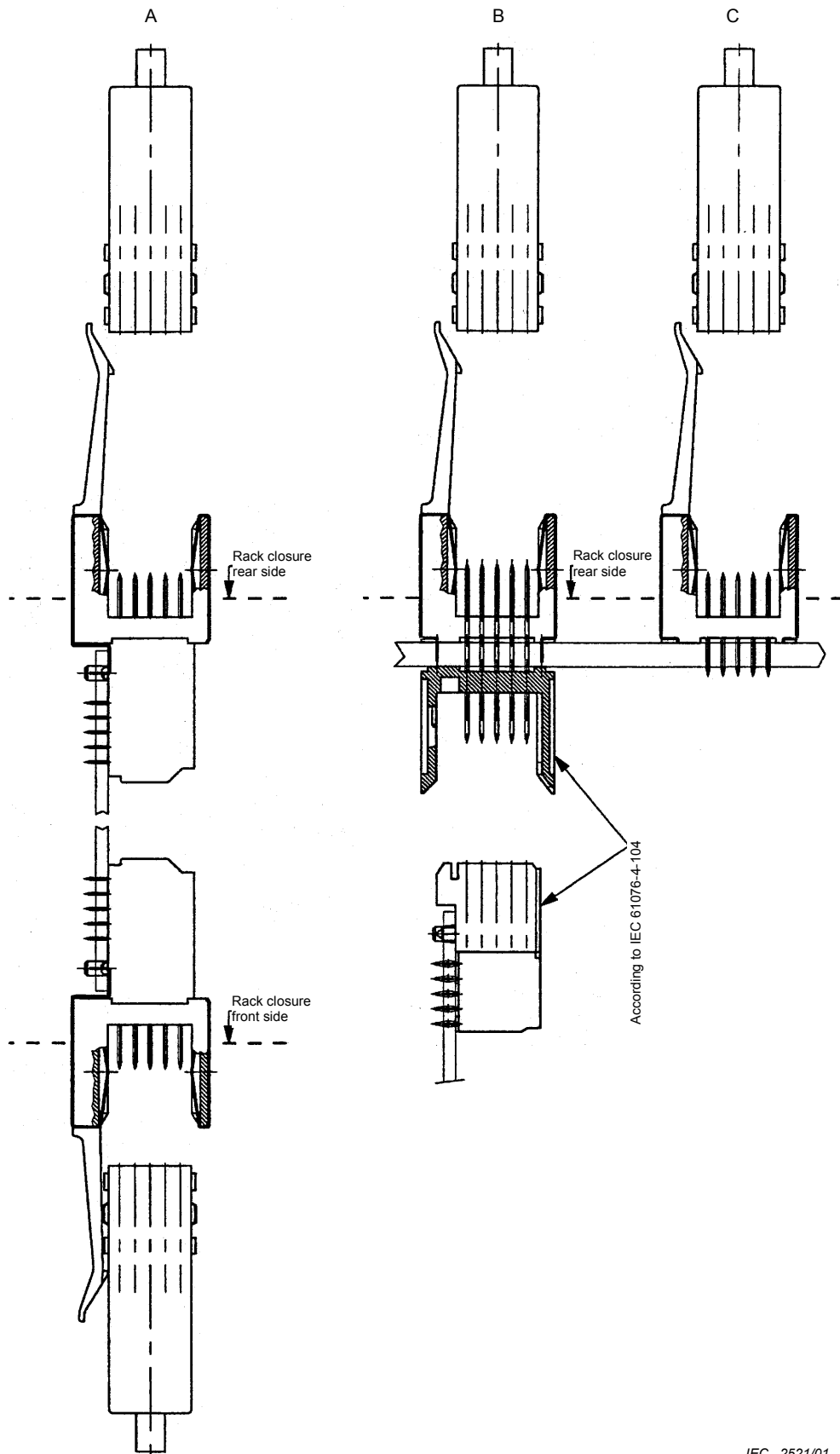
Application A: For front or rear plug-up connections, the right-angle fixed board connector accommodates the plug-up terminations of the cable connector, which is mounted on the front side or the rear side of the backplane closure.

Application B: For daughter board connections, the fixed board connector shall be equipped with a shroud to accommodate the male contacts.

Application C: For rear-plug connections, the fixed board connector shall be equipped with male contacts, which are pressed into the backplane.

The shielding connection variants are as follows (see figure 3):

- Application a1, b1 and c1
- Application a2, b2 and c2



IEC 2521/01

Figure 1 – Recommended installation

1.1.1 Number of signal contacts and contact cavities

Table 1 – Number of contacts and contact cavities for free cable connectors

Styles (see 1.5)	Shape of housing	Connection	Cable connector width mm		
			(5 × 2)	(5 × 4)	(5 × 6)
A	Straight	IDC			
Width			4	8	12

Table 2 – Number of contacts and contact cavities for fixed board connectors

Styles (see 1.5)	Number of cavity rows	Number of contact cavities per module width 12 mm
B-C-D	5	30

1.2 Ratings and characteristics

Rated voltage:	contact/contact 100 V r.m.s.
Current rating:	1 A at 70 °C (all signal contacts loaded)
Voltage proof:	contact to contact 250 V r.m.s. contact to shield 250 V r.m.s.
Insulation resistance:	5 000 MΩ
Climatic category:	PL1: 40/100/56 PL2: 40/100/21
Shielding effectiveness:	initial 70 dB min. average value
Printed board:	plated-through hole diameter 0,65 mm to 0,80 mm according to IEC 61076-4-104

1.3 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 60352-2, *Solderless connections – Part 2: Solderless crimped 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*

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

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC 60512-2, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests*

IEC 60512-3, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 3: Current-carrying capacity tests*

IEC 60512-4, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 4: Dynamic stress tests*

IEC 60512-8, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 8: Connector tests (mechanical) and mechanical tests on contacts and terminations*

IEC 60512-9, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 9: Miscellaneous tests*

IEC 60512-23-3, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 23-3: Test 23c: Shielding effectiveness of connectors and accessories*

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

IEC 60917-2-2, *Modular order for the development of mechanical structures for electronic equipment practices – Part 2: Sectional specification – Interface co-ordination dimensions for the 25 mm equipment practice – Section 2: Detail specification – Dimensions for subracks, chassis, backplanes, front panels and plug-in units*

IEC 61076-1, *Connectors with assessed quality, for use in d.c., low frequency analogue and in digital high speed data applications – Part 1: Generic specification*

IEC 61076-4, *Connectors with assessed quality, for use in d.c., low-frequency analogue and in digital high speed data applications – Part 4: Printed board connectors*

IEC 61076-4-104, *Connectors for use in d.c., low-frequency analogue and digital high speed data applications – Part 4-104: Printed board connectors with assessed quality – Detail specification for two-part modular connectors, basic grid of 2,0 mm, with terminations on a multiple grid of 0,5 mm*

ISO 1302, *Technical drawings – Method of indicating surface texture*

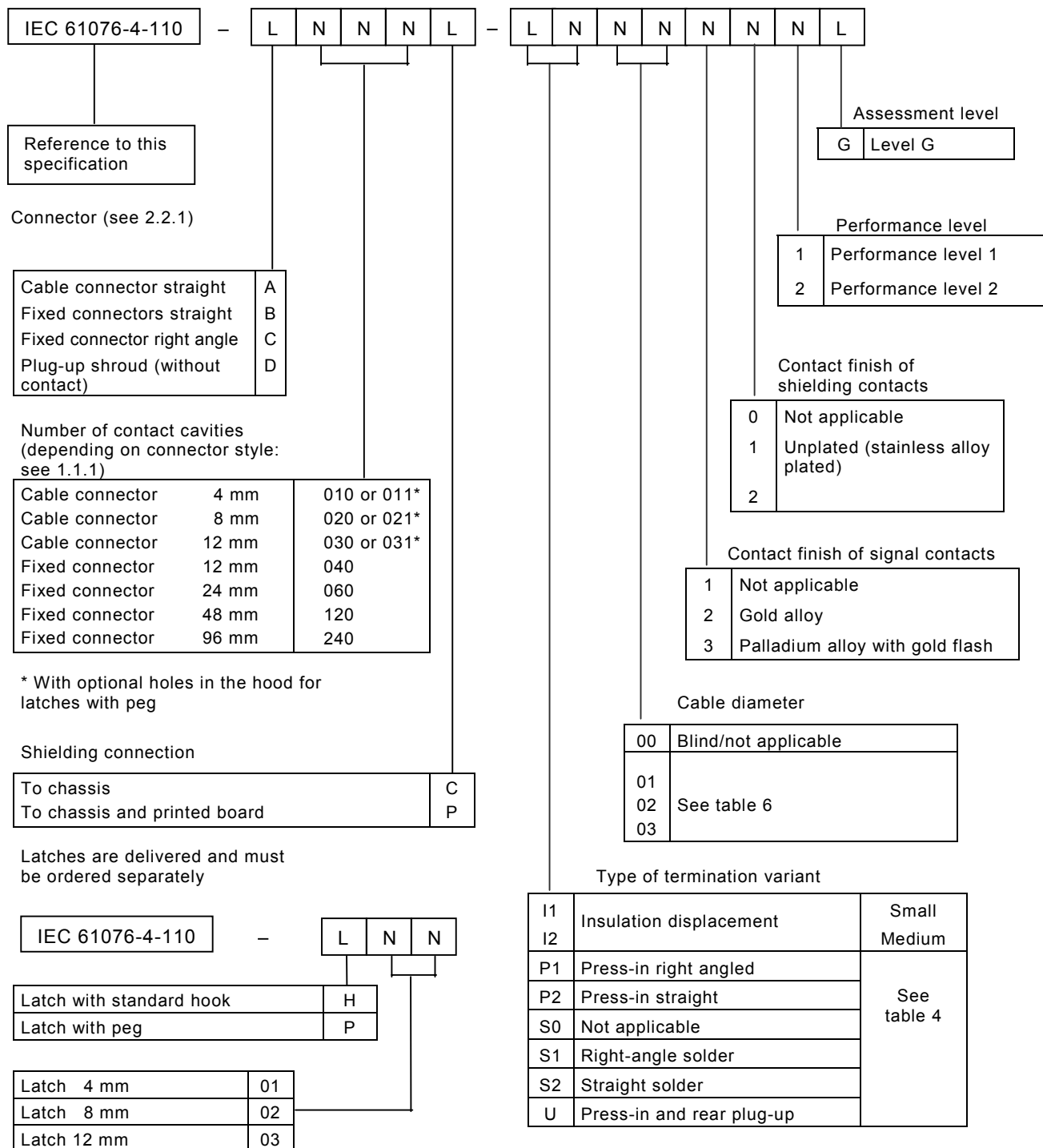
1.4 Marking

The marking of the connector and the package shall be in accordance with 2.6 of the sectional specification IEC 61076-4.

1.5 IEC type designation

See 2.1 for definitions and 2.2 for designation of styles and variants.

The designation shall be derived in accordance with 2.5 of the sectional specification IEC 61076-4.



Example for free cable connector:

IEC 61076-4-110-A-010-11-01-0-1-G

Example for fixed connector:

IEC 61076-4-110 – B040C – P200111 G

Example for a latch:

IEC 61076-4-110 – H03

1.6 Ordering information

For ordering connectors according to this detail specification, the type designation described in 1.5 shall be used.

2 Technical information

2.1 Definitions

2.1.1

location pegs

posts, protruding from the connector housing, fitting into corresponding holes in the printed board or backplane, preventing a wrong assembly and giving an accurate position

2.1.2

locking latches

elastic levers which snap above the hood of the free cable connector housing on full insertion

2.1.3

contact range

minimum to maximum distance between the reference planes of the fixed and free board connectors, within which the specified contact resistance is met

2.1.4

rear plug-up contact

termination post, usually pressed in into backplane and emerging on the rear side as a male contact, to be connected to a free board connector

2.1.5

contact level

contacts may be provided with different mating lengths which feature different points of mating per specified contact length

2.1.6

contact sequence

sequence in which contacts with a different mating length are mating with the purpose to provide stepped insertion forces and/or stepped electrical continuity (for example, first make/last break)

2.2 Surveys of styles and variants

2.2.1 Styles of connectors

See also figures 16, 17, 18.

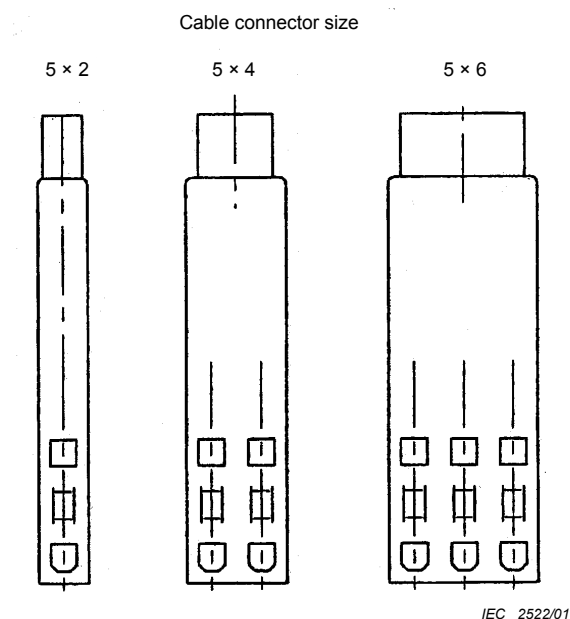


Figure 2 – Survey of free cable connector styles

Table 3 – Shielding connection variants

Shielding connection variants	Connector shield to chassis	Connector shield to chassis (and/or) to printed board
Male straight	a1	a2
Male right angle	b1	b2
Rear plug-up shroud	c1	c2

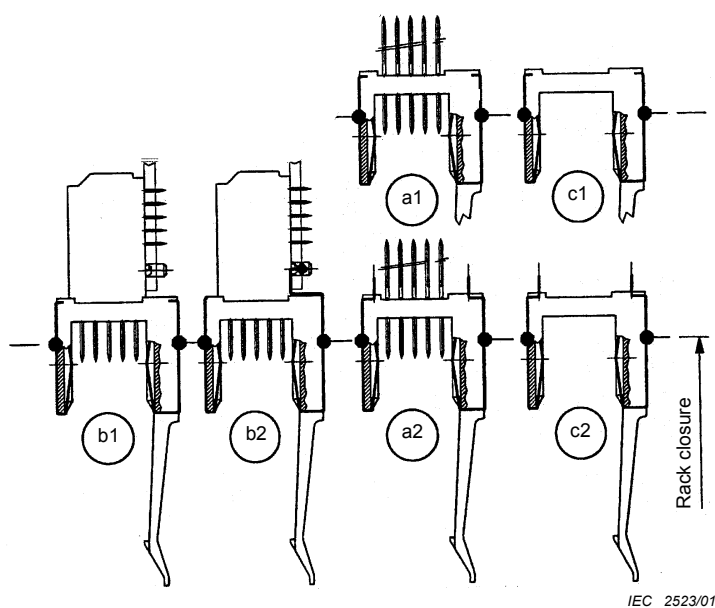


Figure 3 – Survey of fixed connectors styles

2.2.2 Survey of termination variants

Table 4 – Termination variants

Basic type of termination		Variant	Length or wire gauge mm or mm ²
I	Insulation displacement connection, according to IEC 60352-4	I1	Solid wire: Ø 0,25 mm to 0,32 mm 7-stranded wire: 0,05 mm ² to 0,08 mm ²
		I2	Solid wire: Ø 0,4 mm to 0,50 mm 7-stranded wire: 0,12 mm ² to 0,22 mm ²
P	90° angled compliant press-in connection for plated-through hole 0,7 mm in diameter, according to IEC 60352-5	P1	2,9 mm
	Straight compliant press-in connection for plated-through hole 0,7 mm in diameter, according to IEC 60352-5	P2	4,3 mm
U	Straight compliant press-in with rear plug-up area	U1 U2	11,8 mm 13,6 mm
S	Right-angle solder for PCB of 1,6 mm Right-angle solder for PCB of 2,4 mm	S1	2,9 mm
		S2	3,7 mm

Table 5 – Wire size

		Solid wire mm	Stranded wire mm ²
I1	Small	0,25 to 0,32	0,05 to 0,08
I2	Medium	0,40 to 0,50	0,12 to 0,22

2.2.3 Survey of cable diameters

Table 6 – Cable diameters

Type	Designation in 1.5	Maximum cable diameter outer braid	Maximum insulation diameter of one wire
	00	Blind mm	
(5 × 2)	01	3,5	1,0
(5 × 4)	02	6	
(5 × 6)	03	8	

2.3 Information on application

2.3.1 Complete connectors (pairs)

Description

The fixed board connector is an elongated component, subdivided into modules of 12 mm partitions, where several free cable connectors shall be plugged in, stacked end to end.

Once the free cable connector is fully engaged, it locks up under the locking latches.