

Connectors for electronic equipment

**Part 4-100: Printed board connectors
with assessed quality — Detail
specification for two-part connector
modules having a grid of 2,5 mm for
printed boards and backplanes**

The European Standard EN 61076-4-100:2001 has the status of a
British Standard

ICS 31.220.10

National foreword

This British Standard is the official English language version of EN 61076-4-100:2001. It is identical with IEC 61076-4-100:2001. It supersedes BS EN 61076-4-100:1998 which is withdrawn.

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

- aid enquirers to understand the text;
- present to the responsible 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.

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

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Cross-references

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This British Standard, having been prepared under the direction of the Electrotechnical Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 18 January 2002

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Connectors for electronic equipment
Part 4-100: Printed board connectors with assessed quality -
Detail specification for two-part connector modules having
a grid of 2,5 mm for printed boards and backplanes
(IEC 61076-4-100:2001)

Connecteurs pour équipements
électroniques
Partie 4-100: Connecteurs pour cartes
imprimées -
Spécification particulière pour les modules
de connecteurs en deux parties pour
cartes imprimées et fonds de panier,
au pas de 2,5 mm
(CEI 61076-4-100:2001)

Steckverbinder für elektronische
Einrichtungen
Teil 4-100: Steckverbinder für gedruckte
Schaltungen mit bewerteter Qualität -
Bauartspezifikation für indirekte
Steckverbinder für gedruckte Schaltungen
und Rückplatten, modulare Bauweise,
Raster 2,5 mm
(IEC 61076-4-100:2001)

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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/1086/FDIS, future edition 2 of IEC 61076-4-100, 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 61076-4-100 on 2001-12-01.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2002-09-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2004-12-01

Annexes designated "normative" are part of the body of the standard.

In this standard, annexes A and ZA are normative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61076-4-100:3001 was approved by CENELEC as a European Standard without any modification.

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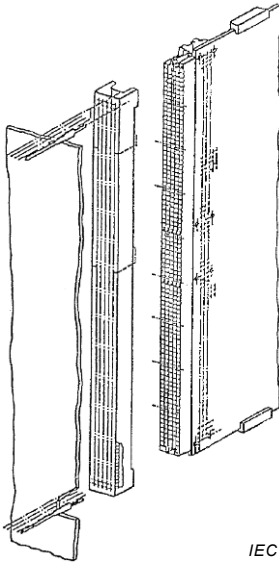
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CONNECTORS FOR ELECTRONIC EQUIPMENT –

Part 4-100: Printed board connectors with assessed quality – Detail specification for two-part connector modules having a grid of 2,5 mm for printed boards and backplanes

IEC SC 48B: LF connectors Specification available from: IEC Central Office or from the addresses shown on the inside cover. ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH: – GENERIC SPECIFICATION IEC 61076-1 First edition:1995	IEC 61076-4-100 QC 480301XX0001 Page 15 of 138 pages
See clause 3 for dimensions  IEC 1839/01	Modular two-part connector for printed boards and backplanes, grid of 2,5 mm in accordance with IEC 60917 Connector with height multiple modules $n \times 25$ mm, (with $n = 1, 2, 4, 9, 10$) five rows Performance levels (PL): 1, 2, 3 Assessment levels: B and G ^{*)} Combinations of performance and assessment levels: 1G, 2B, 2G, 3B
^{*)} See 6.2 and 6.3.	

1 General data

1.1 Recommended method of mounting

The free board connectors are provided either with solder or with press-in contacts. The mounting of the free board connector is achieved by press-in pivots. The terminations of the free board connectors shall fit into holes in the printed board according to IEC 60326-3, located on a grid of 2,5 mm.

The fixed board connectors are provided either with:

- press-in contacts;
- press-in and wrap contacts;
- press-in and wrap and mating area contacts.

The connector is fixed on the press-in contacts. Fixing holes on the backplane are not necessary. The distance of termination centre lines is 2,5 mm or a multiple of it. The terminations of the fixed board connectors are suited for backplanes having a grid dimension of 2,5 mm.

NOTE Information about manufacturers who have components qualified to this detail specification is given in the Qualified Products List.

1.2 Ratings and characteristics

Rated voltage: Contact/contact for fully loaded connector
 (arrangement 1)

Table 1 – Rated voltage

Material group	Pollution degree	Rated voltage V
I, II, IIIa/b	1	250
II, IIIa/b	2	32
NOTE Reference is made to table 14 of this specification, and table 4 of IEC 60664-1 listing the relation between creepage distances, pollution degree and material groups versus voltages r.m.s.		

Current rating: 1 A at 70 °C for fully loaded connector (arrangement 1)

Insulation resistance: 10⁶ MΩ min. for PL1 and PL2
 10⁵ MΩ min. for PL3

Climatic category: PL1: 55/125/56
 PL2: 55/125/21
 PL3: 25/100/00

Printed board thickness: 1,6 mm to 3,2 mm for free board connector
 1,6 mm min. for fixed board connector

Contact spacing: 2,5 mm

1.3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61076. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61076 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*
Amendment 1 (1992)

IEC 60297-3:1984, *Dimensions of mechanical structures of the 482,6 mm (19 in) series – Part 3: Subracks and associated plug-in units*

IEC 60326-3:1991, *Printed boards – Part 3: Design and use of printed boards*

IEC 60352-1:1997, *Solderless connections - Part 1: Wrapped connections - General requirements, test methods and practical guidance*

IEC 60352-5:1995, *Solderless connections – Part 5: Solderless press-in connections – General requirements, test methods and practical guidance*

IEC 60410:1973, *Sampling plans and procedures for inspections by attributes*

IEC 60512 (all parts): *Connectors for electronic equipment – Tests and measurements* (see IEC 60512-1-100, 2001)

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60917-2-2:1994, *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 61076-1:1995, *Connectors with assessed quality, for use in d.c., low-frequency analogue and in digital high-speed data applications – Part 1: Generic specification*
Amendment 1 (1996)

IEC 61076-4:1995, *Connectors with assessed quality, for use in d.c., low-frequency analogue and in digital high-speed data applications – Part 4: Sectional specification – Printed board connectors*

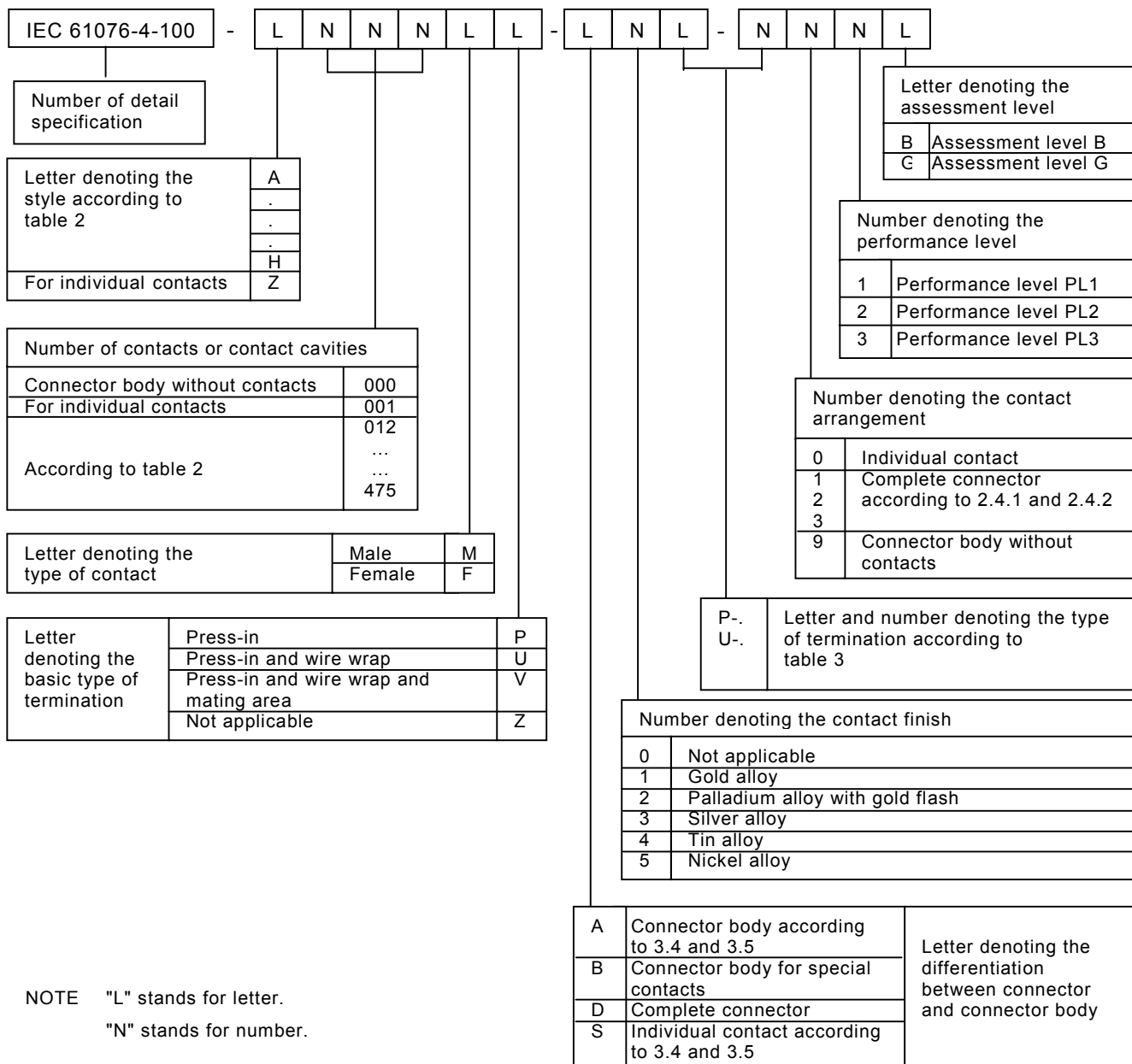
IEC 61076-4-102:1997, *Connectors with assessed quality, for use in d.c., low-frequency analogue and in digital high-speed data applications – Part 4: Printed board connectors – Section 102: Detail specification for two-part single-pole connectors for multiple uses on plug-in units with pre-centring coding and early mating features, having a metric grid in accordance with IEC 60917.*

1.4 Marking

Marking of the connector and the package shall be in accordance with 2.6 of IEC 61076-4.

1.5 IEC type designation

Connectors, connector bodies and contacts according to this standard shall be designated by the following system:



EXAMPLE – Connector style B, having 85 female contacts with gold alloy contact finish with press-in terminations. Complete free board connector for boards with a thickness of 1,6 mm to 4 mm, with performance level 2 and assessment level G:

IEC 61076 – 4 – 100 – B 085 FP – D1P – 312G

1.6 Ordering information

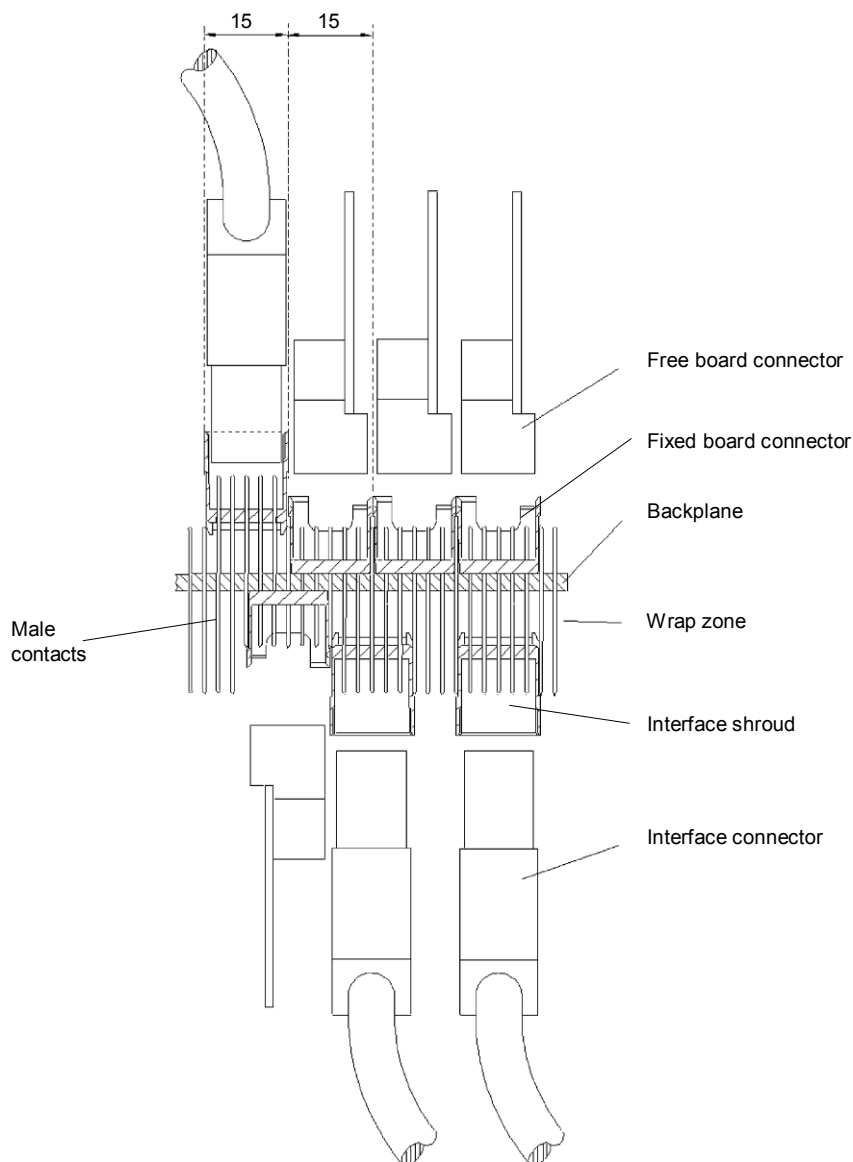
To order connectors according to this detail specification, the type designation described in 1.5 shall be used.

2 Technical information

2.1 Definitions

2.1.1 Backplane male contact arrangement

Figure 1 shows a backplane male contact arrangement for a continuous grid of 2,5 mm, i.e. male contacts on the pitch line of two connectors are permitted in height and width. Free and fixed board connector bodies are designed to accept a continuous 2,5 mm grid of male contacts.



IEC 1840/01

Free board connector body: moulding for female connector
 Fixed board connector body: moulded shroud for fixed board connector
 Fixed board connector: shroud with contacts
 Interface shroud: shroud without contacts
 FMLB contact: First mate last break contact

Figure 1 – Backplane male contact arrangement

2.2 Survey of styles and variants

From 1 to 10 system-units (SU) and from 12 to 475 mated lines, for details see table 2.

Table 2 – Contact arrangement and number of contacts

Styles		A	B	D	G ²⁾	H
Height of styles (mm)		25	50	100	225	250
Contact arrangement ¹⁾ 1	Number of contacts	35	85	185	425	475
Contact arrangement ¹⁾ 2	Number of contacts	18	43	93	214	239
Contact arrangement ¹⁾ 3	Number of contacts	12	27	57	132	147
1) Contact arrangements according to 2.4.1 and 2.4.2.						
2) This style allows a limited downward compatibility to equipment practice according to IEC 60297-3.						

Table 3 – Styles of termination

Identification letter and number for style of termination	
P – 1	P – 2
Termination for press-in with compliant pin on free board connector to a printed board with a thickness of 1,6 mm to 3,2 mm, and through metallized holes, diameter: 1 according to IEC 60352-5	Termination for press-in with solid pin on free board connector to a printed board with a thickness of 1,6 mm to 3,2 mm, and plated through holes, diameter: 1 according to IEC 60352-5
P – 3	P – 4
Termination for press-in with compliant pin on fixed board connector to a printed board with a thickness of 1,6 mm to 4,0 mm, and through metallized holes, diameter: 1 according to IEC 60352-5	Termination for press-in with solid pin on fixed board connector to a printed board with a thickness of 1,6 mm to 4,0 mm, and plated through holes, diameter: 1 according to IEC 60352-5
U – 1	U – 2
Termination as P-3 with posts 0,6 mm × 0,6 mm for one wrap, wire diameter: 0,25 mm according to IEC 60352-1 and male mating area for rear I/O connection	Termination as P-4 with posts 0,6 mm × 0,6 mm for one wrap, wire diameter: 0,25 mm according to IEC 60352-1 and male mating area for rear I/O connection
U – 3	U – 4
Termination as P-3 with posts 0,6 mm × 0,6 mm for two wraps, wire diameter: 0,25 mm according to IEC 60352-1 and male mating area for rear I/O connection	Termination as P-4 with posts 0,6 mm × 0,6 mm for two wraps, wire diameter: 0,25 mm according to IEC 60352-1 and male mating area for rear I/O connection
U – 5	U – 6
Termination as P-3 with posts 0,6 mm × 0,6 mm for three wraps, wire diameter: 0,25 mm according to IEC 60352-1 and male mating area for rear I/O connection	Termination as P-4 with posts 0,6 mm × 0,6 mm for three wraps, wire diameter: 0,25 mm according to IEC 60352-1 and male mating area for rear I/O connection

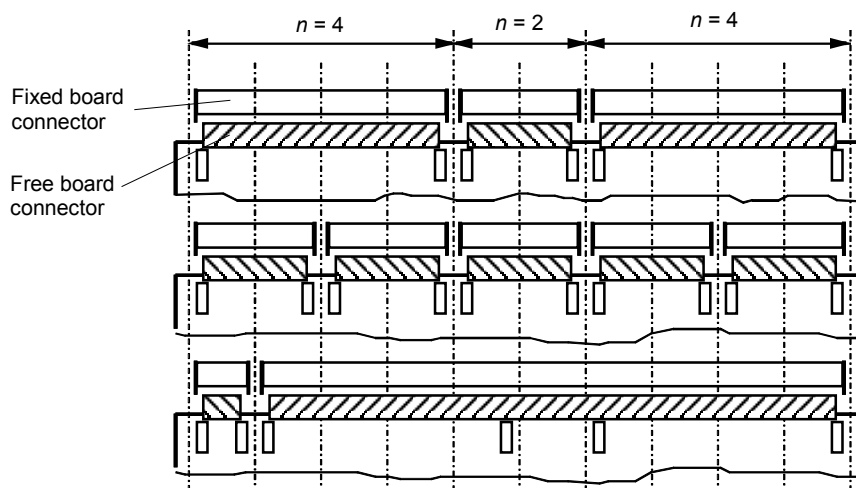
2.3 Information on application

2.3.1 Complete connectors (pairs)

Based on the multi-module 25 mm, the connector styles may be stackable in height at random. The arrangement of the free board connectors are normally the same as the arrangements of the fixed board connectors.

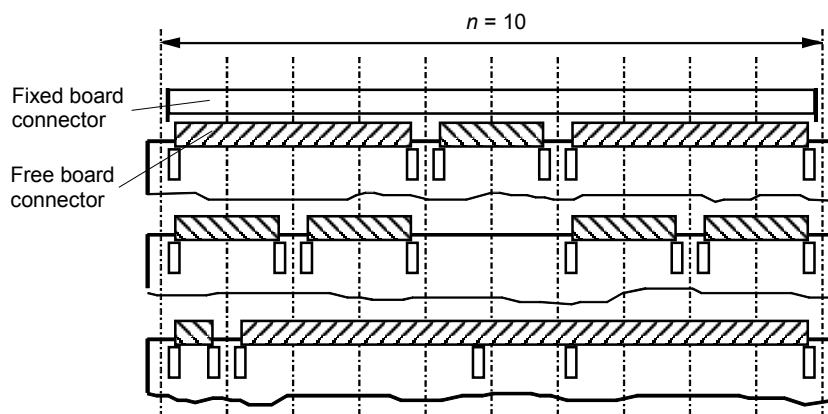
Examples for arrangements of fixed and free board connectors.

– Same connector styles



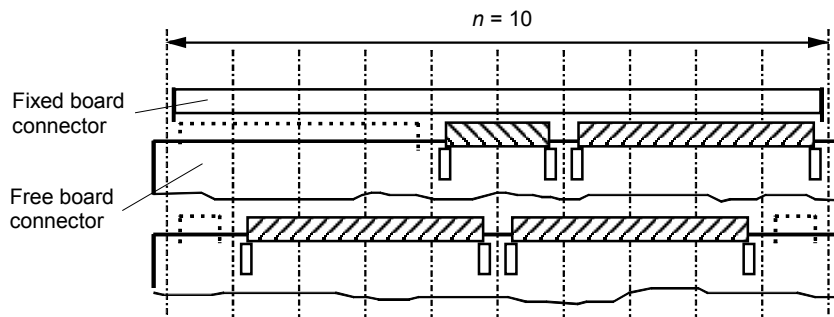
– Different connector styles

acceptable if bending and offsetting of assembled connectors do not exceed 0,5 mm



– Combinations not permitted

mating conditions are not guaranteed because of missing guidance at the ends



IEC 1841/01

Figure 2– Free and fixed board connectors for modular arrangement

2.3.2 Fixed board connectors

Planarity before press-in operation to backplane according to 3.4.1 and after press-in to backplane according to 5.1.7.

2.3.3 Free board connectors

Planarity before press-in operation to printed board according to 3.5.1 and after press-in to printed board according to 5.1.7.

2.3.4 Accessories

2.3.4.1 Special contacts

Not applicable.

2.3.4.2 Coding devices

According IEC 61076-4-102.

2.3.4.3 Mounting devices

Not applicable.

2.3.5 Shielding/grounding

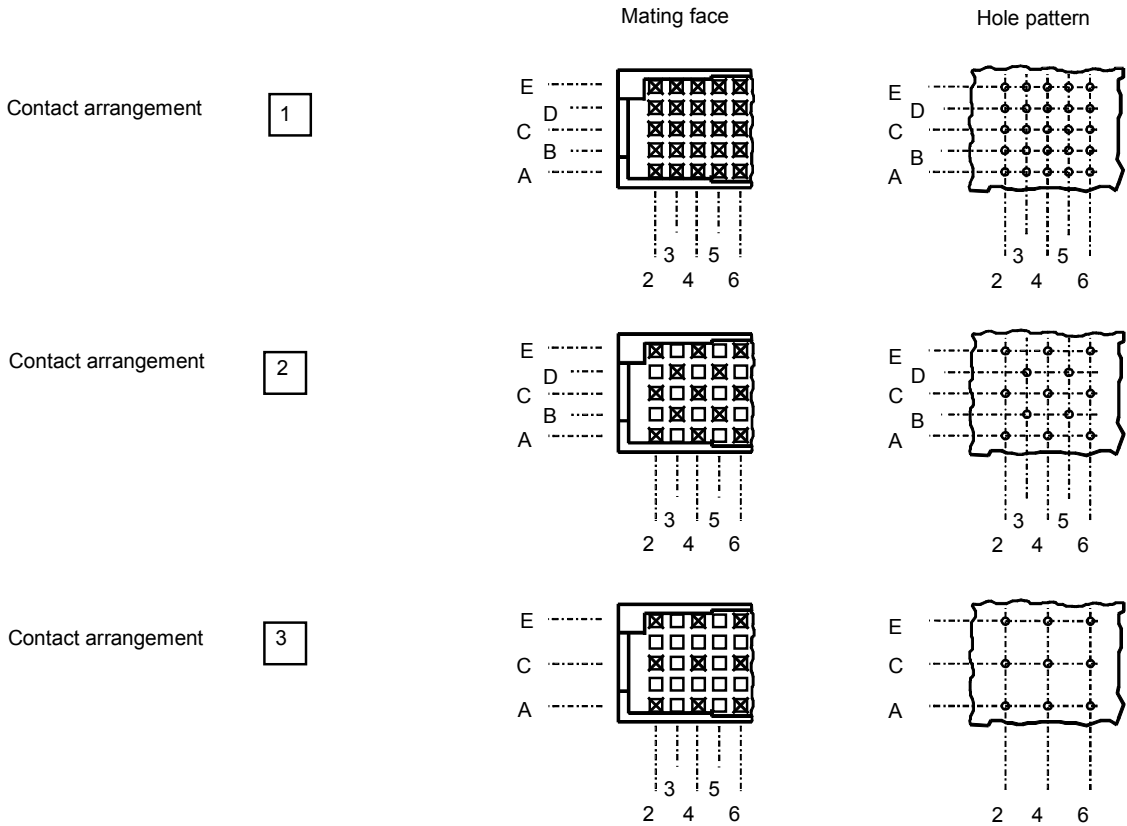
Not applicable.

2.3.6 Basic type of termination

Not applicable.

2.4 Contact arrangements

2.4.1 Fixed board connectors

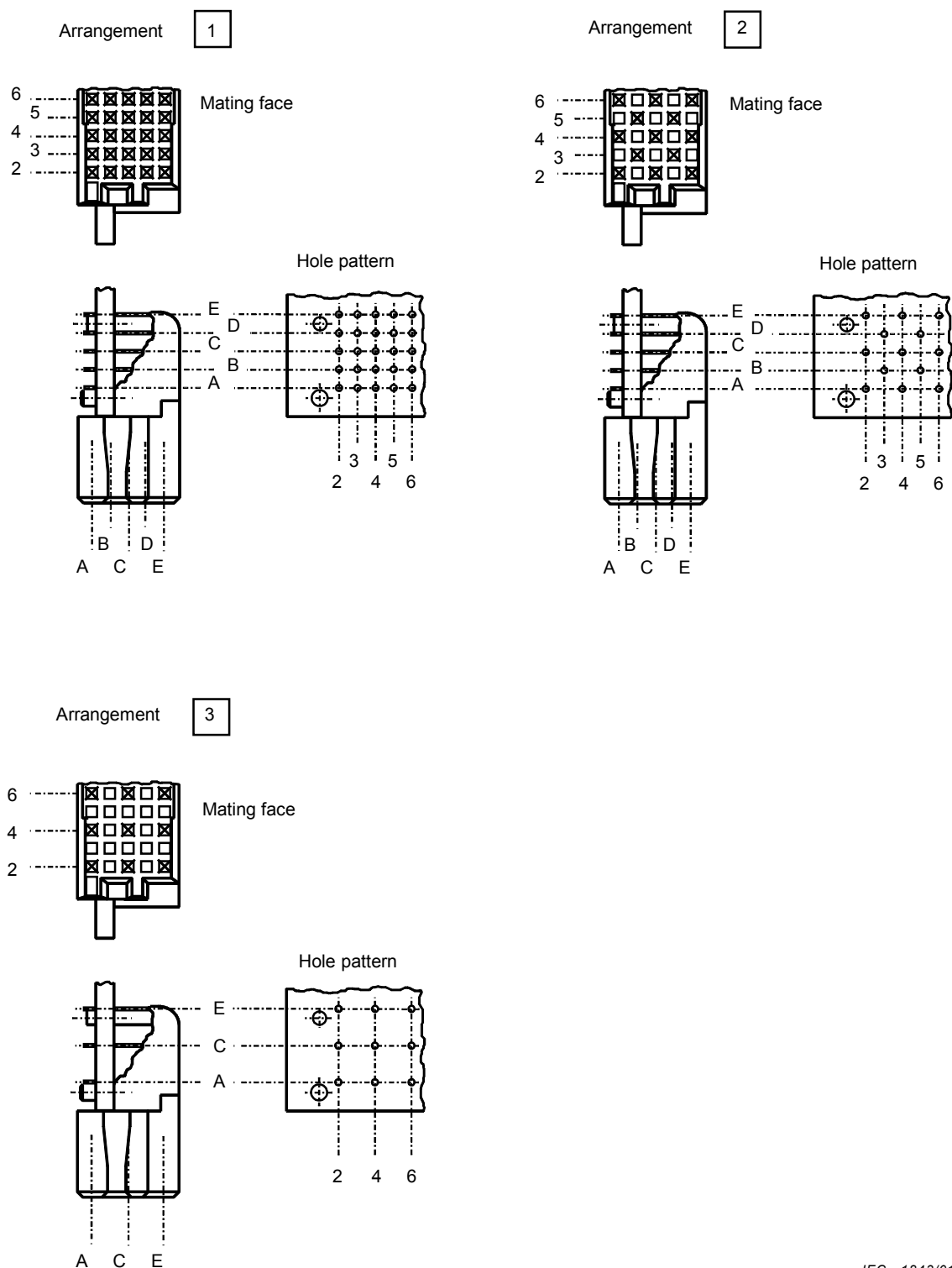


IEC 1842/01

Figure 3 – Contact arrangements

NOTE For mounting information see 3.7.1 (hole pattern).

2.4.2 Free board connectors



IEC 1843/01

Figure 4 – Contact arrangements

NOTE For mounting information see 3.8.1 (hole pattern).

3 Dimensional information

3.1 General

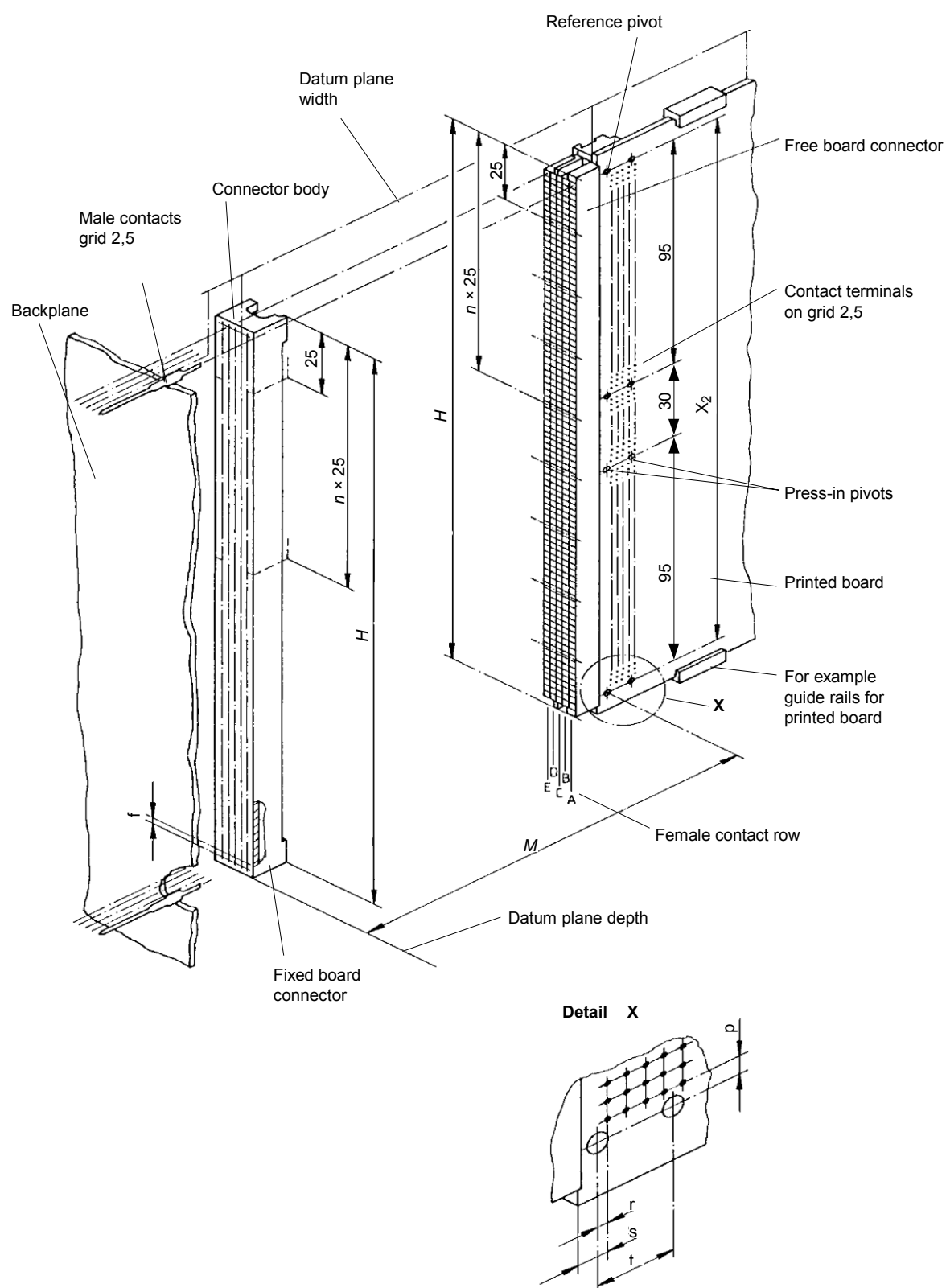
All dimensions are in millimetres.

Drawings are shown in the first angle projection. The shape of the connectors may deviate from those given in the following figures as long as the specified dimensions are not influenced.

The information about the bending in 3.3.3 and 5.1.7 is valid for the condition of delivery. The permissible bending of the mounted connector is stated in 5.1.7.

Missing dimensions can be chosen according to the common characteristics and the intended use.

3.2 Isometric view and common features



IEC 1844/01

Figure 5 – Isometric view

Table 4 – Isometric view and common features

Reference letter	Dimensions mm	Legend
H	$n \times 25$	Maximum height of the modular fixed board connector with $n = 1, 2, 4, 9, 10$
M	15 – 17,5	Contact range in plug-in direction (see figure 9) NOTE For information only see 3.3.
X2	$H - 5$	Distance between centre lines of the press-in pivots of the free board connector
f	2,5	Grid dimensions of the terminations of the fixed board connector
P	2,5	Distance between the centre lines of the press-in pivots and the first (or last) row of holes for contact termination of the free board connector
r	1,25	Distance between the centre lines of the press-in pivots and the first row of holes for contact termination of the free board connector
s	3,75	Distance between the edge of the printed board and the centre lines of the first row of holes for contact termination of the free board connector
t	10	Distance between centre lines of the press-in pivots of the free board connector

3.2.1 Common features

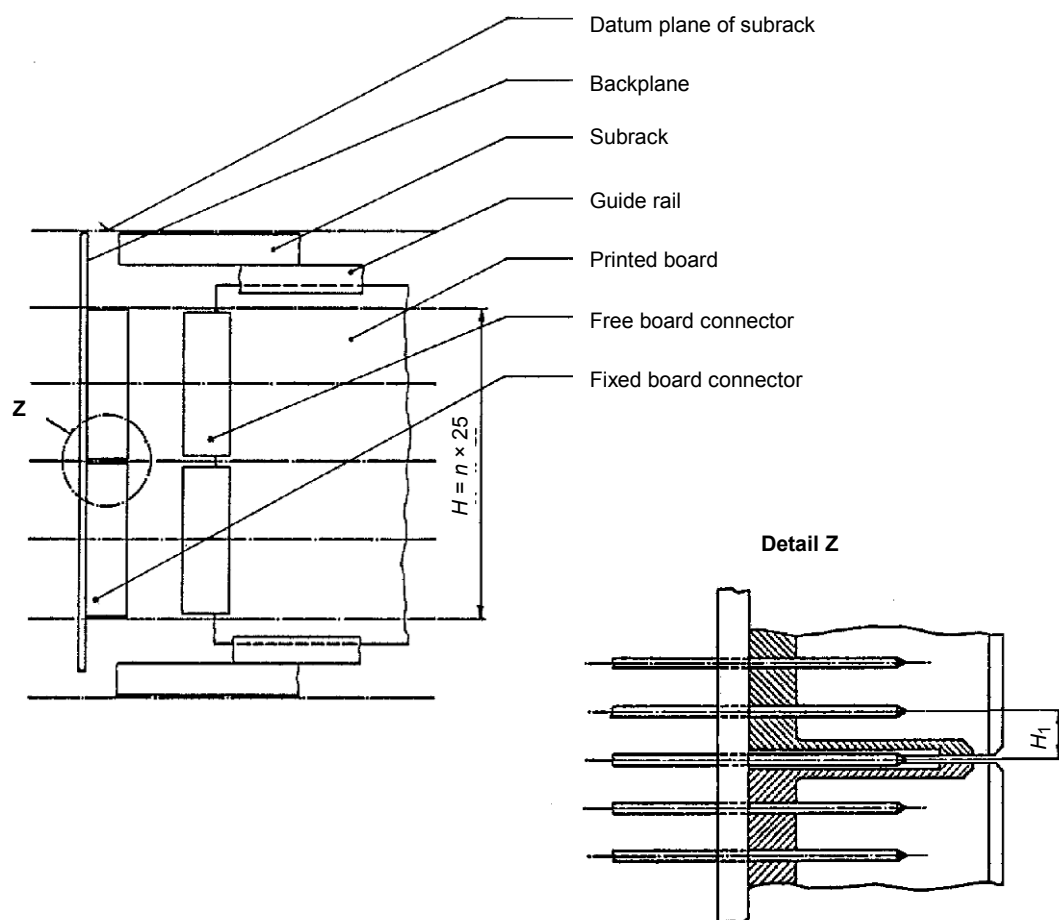
Not applicable.

3.2.2 Reference system

Coordination dimensions are dimensions without tolerances and indicate the maximum dimension to guarantee the modular arrangement.

These coordination dimensions are based upon the 0,5 mm module and the multi-modules 2,5 mm and 25 mm specified in IEC 60917. The datum planes are indicated in 3.2.3, 3.2.4 and 3.2.5.

3.2.3 Height dimensions



IEC 1845/01

Figure 6 – Height dimensions

Table 5 – Height dimensions

Number of multi-modules	1	2	4	9	10
H = connector height mm	25	50	100	225	250
H_1 = spacing of terminations mm	2,5				

3.2.4 Width dimensions

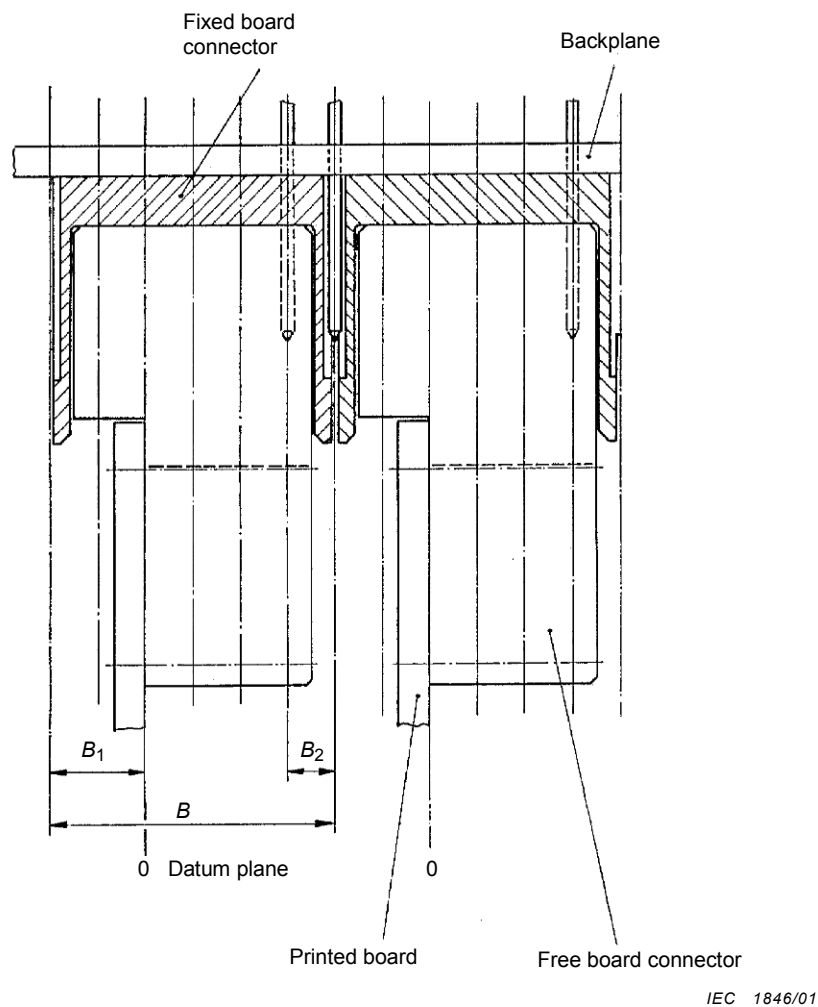


Figure 7 – Width dimensions

Table 6 – Width dimensions

	Without coding
B = connector width	$6 \times 2,5 = 15 \text{ mm}$
B_1 = width reference to printed board	$2 \times 2,5 = 5 \text{ mm}$
B_2 = spacing of terminations	2,5 mm