

Connectors for electronic equipment —

**Part 7-1: Detail specification for 8-way,
shielded free and fixed connectors with
common mating features, with assessed
quality**

The European Standard EN 60603-7-1:2002 has the status of a
British Standard

ICS 31.220.10

National foreword

This British Standard is the official English language version of EN 60603-7-1:2002. It is identical with IEC 60603-7-1:2002.

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

- aid enquirers to understand the text;
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Part 7-1: Detail specification for 8-way, shielded free and fixed connectors
with common mating features, with assessed quality
(IEC 60603-7-1:2002)

Connecteurs pour équipements
électroniques
Partie 7-1: Spécification particulière
pour connecteurs blindés à 8 voies
comprenant des fiches et des embases
avec caractéristiques d'accouplement
communes, avec assurance
de la qualité
(CEI 60603-7-1:2002)

Steckverbinder für elektronische
Einrichtungen
Teil 7-1: Bauartspezifikation für
geschirmte freie und feste Steckverbinder,
8polig, mit gemeinsamen
Steckmerkmalen und bewerteter Qualität
(IEC 60603-7-1:2002)

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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/1120/FDIS, future edition 1 of IEC 60603-7-1, 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 60603-7-1 on 2002-03-01.

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) 2002-12-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2005-03-01

Annexes designated "normative" are part of the body of the standard.
In this standard, annexes A, B, C, D, E and ZA are normative.
Annex ZA has been added by CENELEC.

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CONNECTORS FOR ELECTRONIC EQUIPMENT –

Part 7-1: Detail specification for 8-way, shielded free and fixed connectors with common mating features, with assessed quality

1 General

1.1 Scope

This part of IEC 60603 covers an 8-way shielded connector system of 4, 6 or 8 contacts consisting of a range of free and fixed connectors. The connectors cover a variety of different mounting configurations and termination types with a common mating configuration.

Fixed connectors are provided with terminations suitable for solder, insulation displacement, screw terminal, crimp, insulation piercing termination and printed-board mounting.

Free connectors are provided for crimp, insulation piercing and insulation displacement terminations to cable assemblies with tinsel, stranded or solid wire conductors. At the present time, free connectors may only be available with a limited range of terminations and variants.

1.2 Normative references

The following referenced documents are indispensable for the application of this part of IEC 60603. 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):1978, *International Electrotechnical Vocabulary (IEV) – Chapter 581: Electro-mechanical components for electronic equipment*

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*

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

IEC 60352-2:1990, *Solderless connections – Part 2: Solderless crimped connections – General requirements, test methods and practical guidance*

IEC 60352-3:1993, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-4:1994, *Solderless connections – Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance*

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

IEC 60512-2:1985, *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 60512-3:1976, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 3: Current-carrying capacity tests*

IEC 60512-4:1976, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 4: Dynamic stress tests*

IEC 60512-5:1992, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 5: Impact tests (free components), static load tests (fixed components), endurance tests and overload tests*

IEC 60512-6:1984, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 6: Climatic tests and soldering tests*

IEC 60512-7:1993, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 7: Mechanical operating tests and sealing tests*

IEC 60512-8:1993, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 8: Connector tests (mechanical) and mechanical tests on contacts and terminations*

IEC 60512-11-7:1996, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 11: Climatic tests – Section 7: Test 11g: Flowing mixed gas corrosion test*

IEC 60603-1:1991, *Connectors for frequencies below 3 MHz for use with printed boards – Part 1: Generic specification – General requirements and guide for the preparation of detail specifications, with assessed quality*
Amendment 1 (1992)

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests¹⁾*
Amendment 1 (2000)

IEC 60807-1:1991, *Rectangular connectors for frequencies below 3 MHz – Part 1: Generic specification – General requirements and guide for the preparation of detail specifications for connectors with assessed quality*

IEC 61196 (all parts), *Radio-frequency cables*

QC 001001:2000, *IEC Quality Assessment System for Electronic Components (IECQ) – Basic rules*

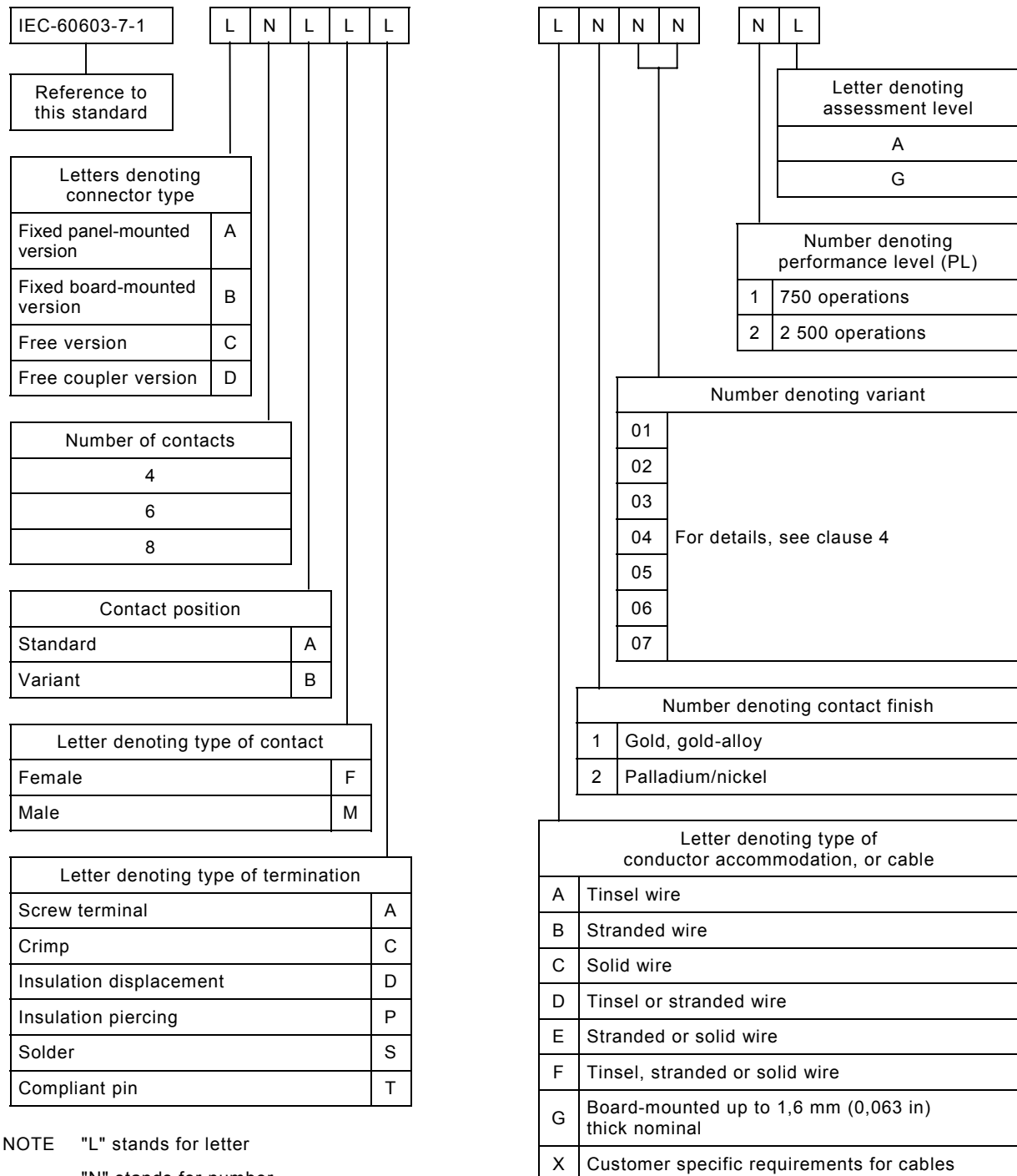
QC 001002 (all parts), *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of Procedure*

ITU-T K.20:2000, *Resistibility of telecommunication equipment installed in a telecommunication centre to overvoltages and overcurrents*

¹⁾ There exists a consolidated edition 1.1 (2000) that includes edition 1.0 and its amendment.

2 IEC type designation

Connectors, connector bodies and connectors with pre-inserted contacts according to this standard shall be designated by the following system:



Example:

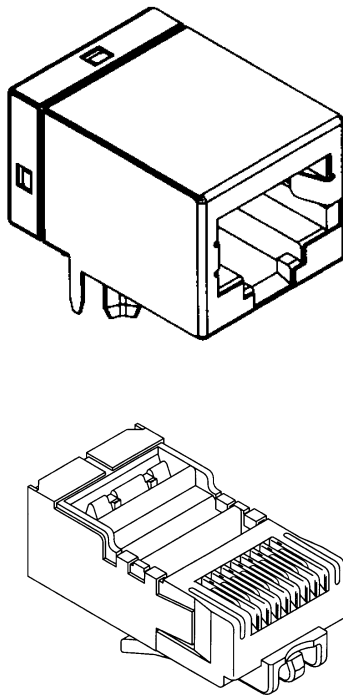
IEC 60603-7-1 B8AFS-G101-2G: Fixed shielded connector, board-mounted, unkeyed having 8 female contacts in standard contact positions, gold plated to be soldered into a printed board having a thickness of 1,6 mm nominal variant 01, meeting performance level 2, assessment level G.

2.1 Terminology

For definitions of terms used, refer to IEC 60050(581).

3 Common features and isometric view

3.1 Isometric view



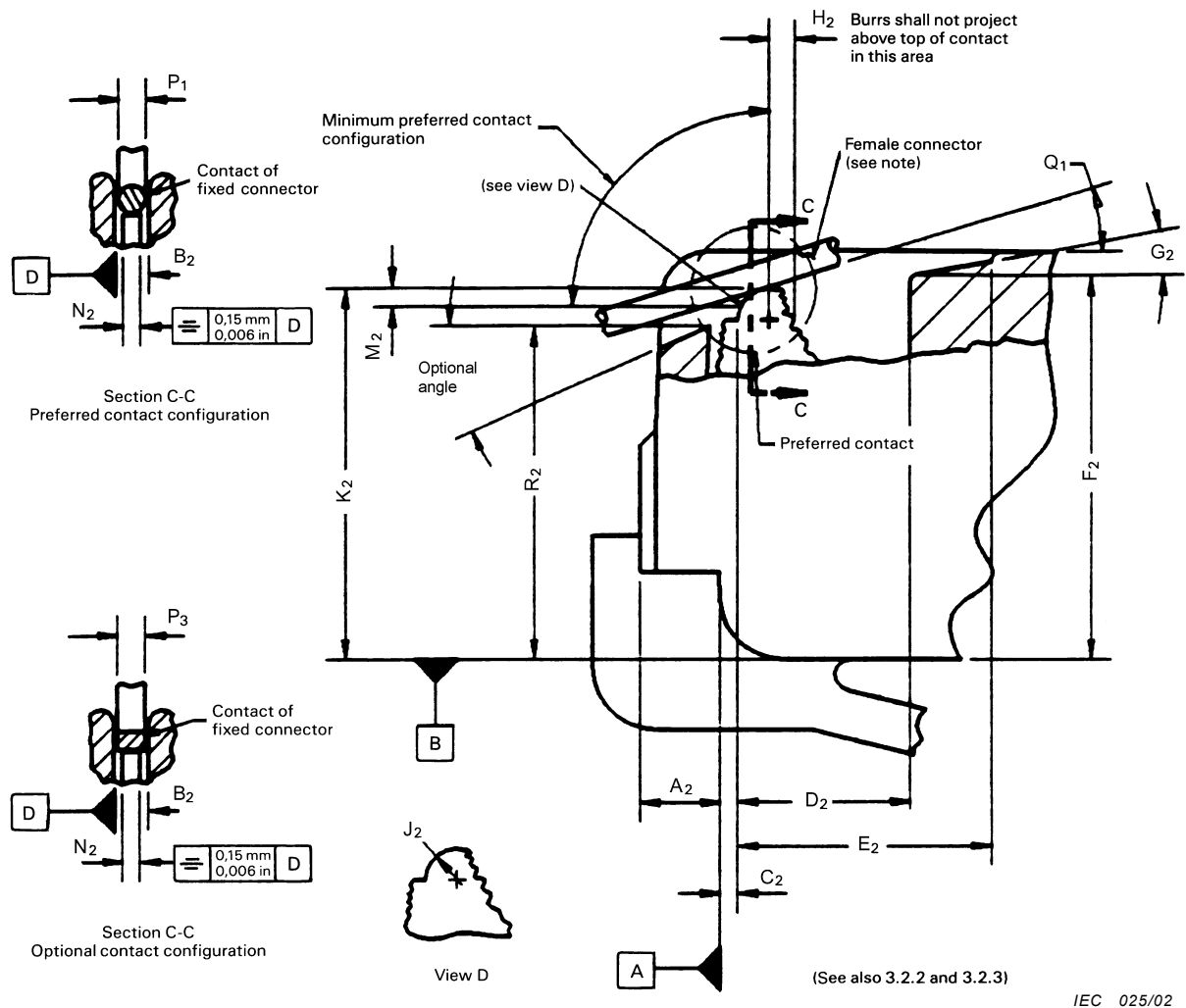
IEC 024/02

Figure 1

3.2 Mating information

For the purpose of this specification, dimensional information in excess of that specified in IEC 60603-1 (and IEC 60807-1) is detailed. It is, therefore, necessary to read 3.2.1 to 3.2.3 inclusive in conjunction with each other.

3.2.1 Contacts



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

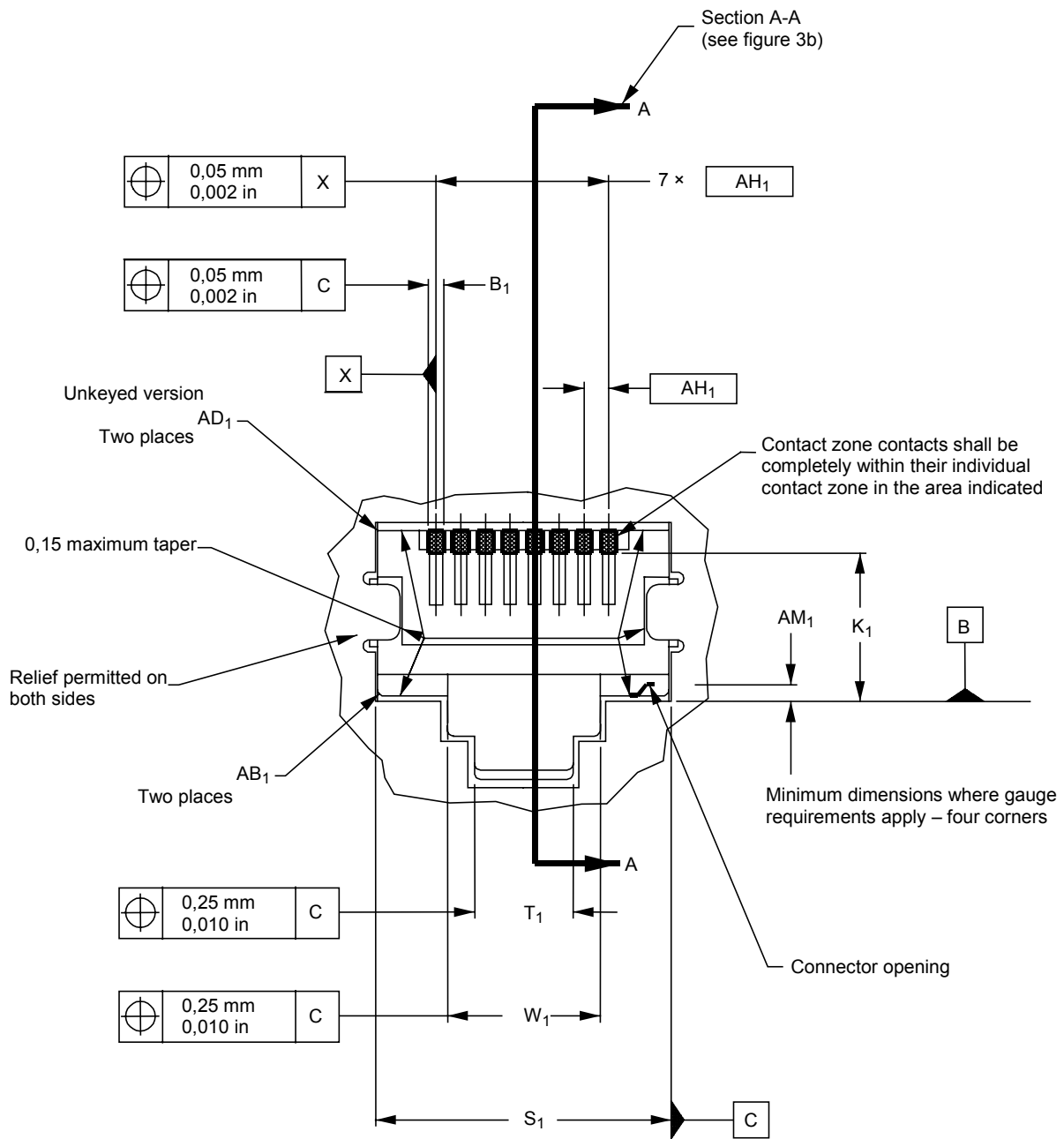
Figure 2

Table 1

Letter	Maximum		Minimum	
	mm	in	mm	in
A ₂	1,45	0,057	0,89	0,035
B ₂	0,61	0,024	0,51	0,020
C ₂	0,46	0,018	0,03	0,001
D ₂			2,79	0,110
E ₂			4,11	0,162
F ₂	6,22	0,245		
H ₂			0,38	0,015
J ₂	0,64	0,025	0,38	0,015
K ₂	6,15	0,242	5,89	0,232
M ₂			0,30	0,012
N ₂			0,28	0,011
P ₁	0,50	0,0195	0,45	0,0177
P ₃	0,50	0,0195	0,36	0,014
R ₂	4,83	0,190		

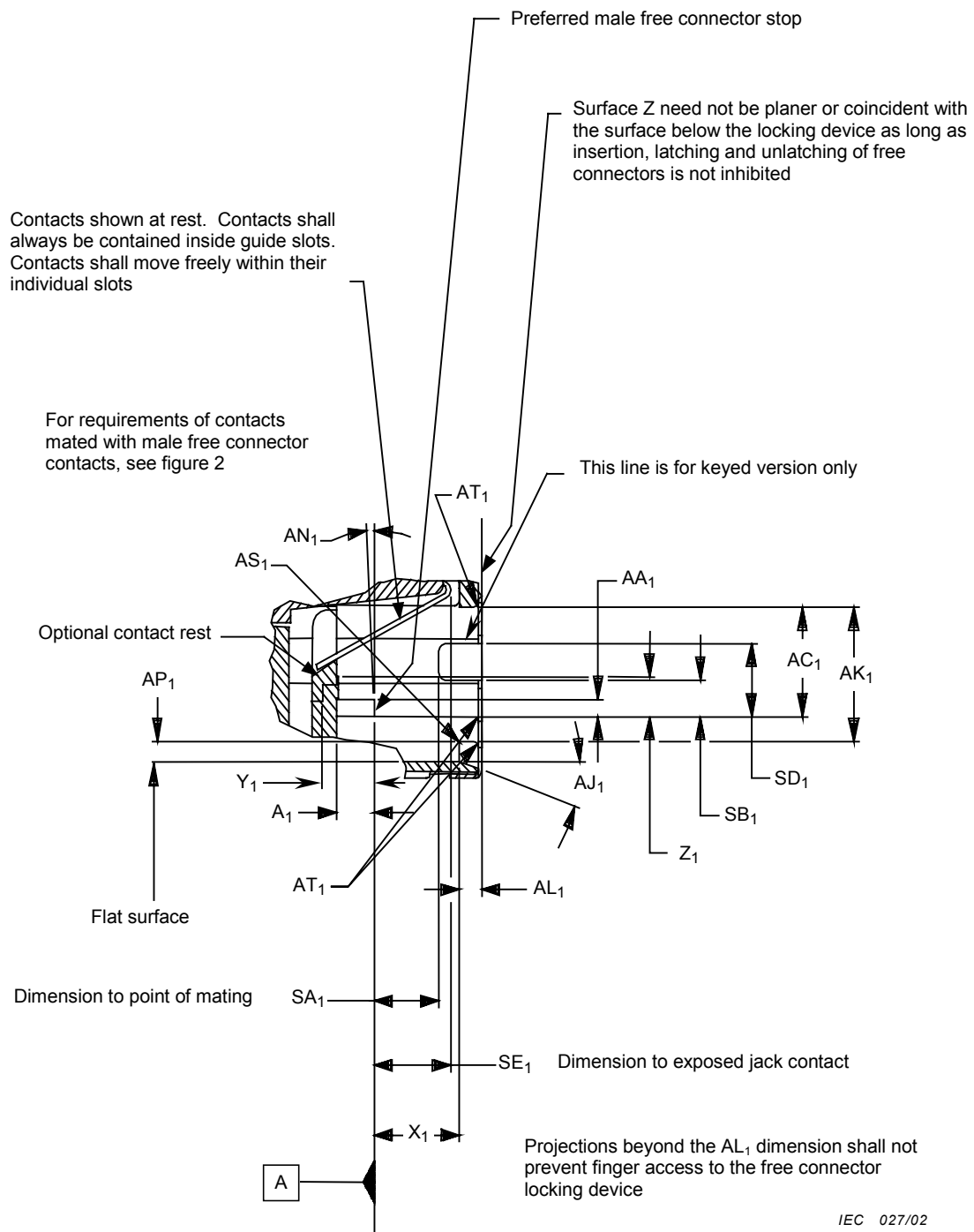
Letter	Maximum	Suggested minimum
G ₂	10°	
Q ₁	24°	11°

3.2.2 Fixed connector



IEC 026/02

Figure 3a – View of contact zone



NOTE All internal corners in the connector cavity shall be 0,38 mm (0,015 in) radius maximum unless otherwise specified.

Figure 3b – Section A-A

Table 2

Letter	Maximum		Minimum		Nominal (ref)	
	mm	in	mm	in	mm	in
A ₁			1,47	0,058		
B ₁	0,71	0,028				
K ₁	5,84	0,230				
S ₁	12,04	0,474	11,84	0,466	11,94	0,470
T ₁	4,19	0,165	3,94	0,155		
W ₁	6,38	0,251	6,22	0,245		
X ₁	6,86	0,270	6,68	0,263		
Y ₁			2,34	0,092		
Z ₁			2,08	0,082		
AA ₁	1,24	0,049				
AB ₁	0,38	0,015				
AC ₁	6,96	0,274	6,76	0,266	6,86	0,270
AD ₁	0,13	0,005				
AH ₁					1,02 TP ^a	0,040 TP ^a
AK ₁	8,66	0,341	8,38	0,330		
AL ₁			1,40	0,055		
AM ₁			1,52	0,060		
AP ₁			1,27	0,050		
AQ ₁			0,97	0,038		
AR ₁			0,71	0,028		
AS ₁	0,08	0,003				
AT ₁					0,76	0,030
SA ₁			5,31	0,209		
SB ₁			2,16	0,085		
SD ₁	4,90	0,193				
SE ₁	5,80	0,228				

^a TP indicates true position.

Letter	Maximum	Suggested minimum
AJ ₁		15°
AN ₁	3°30'	

Table 3

Letter	Maximum		Minimum		Nominal (ref)	
	mm	in	mm	in	mm	in
A ₂ ^a	a	a	a	a	1,17	0,046
B ₂	a	a	a	a	0,56	0,022
S ₂	11,79	0,464	11,58	0,456	11,68	0,460
T ₂	3,38	0,133	3,12	0,123		
W ₂	6,17	0,243	6,02	0,237		
X ₂	6,02	0,237	5,77	0,227		
Y ₂	2,34	0,092				
Z ₂	2,06	0,081				
AA ₂			1,24	0,049		
AB ₂	0,64	0,025	0,38	0,015		
AC ₂	6,71	0,264	6,50	0,256	6,60	0,260
AD ₂	0,64	0,025	0,13	0,005		
AH ₂					1,02	0,040
AW ₂	0,38	0,015	0,13	0,005	0,25	0,010
AX ₂	1,32	0,052				
AY ₂	2,87	0,113	2,67	0,105		
AZ ₂	0,64	0,025				
BA ₂			12,32	0,485		
BE ₂	1,09	0,043				
BF ₂	0,64	0,025				
BG ₂	0,64	0,025	0,38	0,015		
BH ₂					0,13	0,005
BL ₂	8,36	0,329				
BM ₂	15,88	0,625	14,61	0,575		
BN ₂	8,00	0,315				
BP ₂	23,11	0,910				
SA ₂	4,22	0,166				
SB ₂	2,11	0,083				
SC ₁	1,02	0,040	0,51	0,020		
SC ₂			4,95	0,195		
SD ₂			6,85	0,270		
^a See table 1.						

Letter	Maximum	Nominal (ref)
BJ ₂		Full radius
BK ₂	3°30'	

3.3 Survey of types

Table 4

Type and number of contacts	A8F	B8F	C8M
Number of variants	2	7	1
Current-carrying capacity at 70 °C (see clause 6)	0,2 A		
Minimum creepage and clearance distances ^a			
Creepage distance between contacts and shield or chassis	1,4 mm (0,055 in)		
Clearance distance between contacts and shield or chassis	0,51 mm (0,020 in)		
Creepage distance between adjacent contacts	0,36 mm (0,014 in)		
Clearance distance between adjacent contacts	0,36 mm (0,014 in)		
^a Application information: Permissible operating voltages depend on the application or specified safety requirements. Insulation co-ordination is not required for this connector; therefore, the creepage and clearance distance in IEC 60664-1 are reduced and covered by overall performance requirements. Reductions in creepage or clearance distances may occur due to the printed board or the wiring used and shall duly be taken into account.			

4 Dimensions

4.1 General

Dimensions are given in millimetres, with inch equivalents. The original dimensions are in inches. Drawings are shown in third-angle projection. The shape of connectors may deviate from those shapes given in the following figures as long as the specified dimensions are not influenced.

4.1.1 Contact arrangement of all connector types

Table 5

Number of contacts	Contact position designation	Contact position							
		1	2	3	4	5	6	7	8
4	A			x	x	x	x		
6	A		x	x	x	x	x	x	
8	A	x	x	x	x	x	x	x	x

4.2 Type A – Fixed connectors (panel-mounted)

4.2.1 Dimensions

4.2.1.1 Fixed connector, female contacts with insulation displacement terminations – variant 01

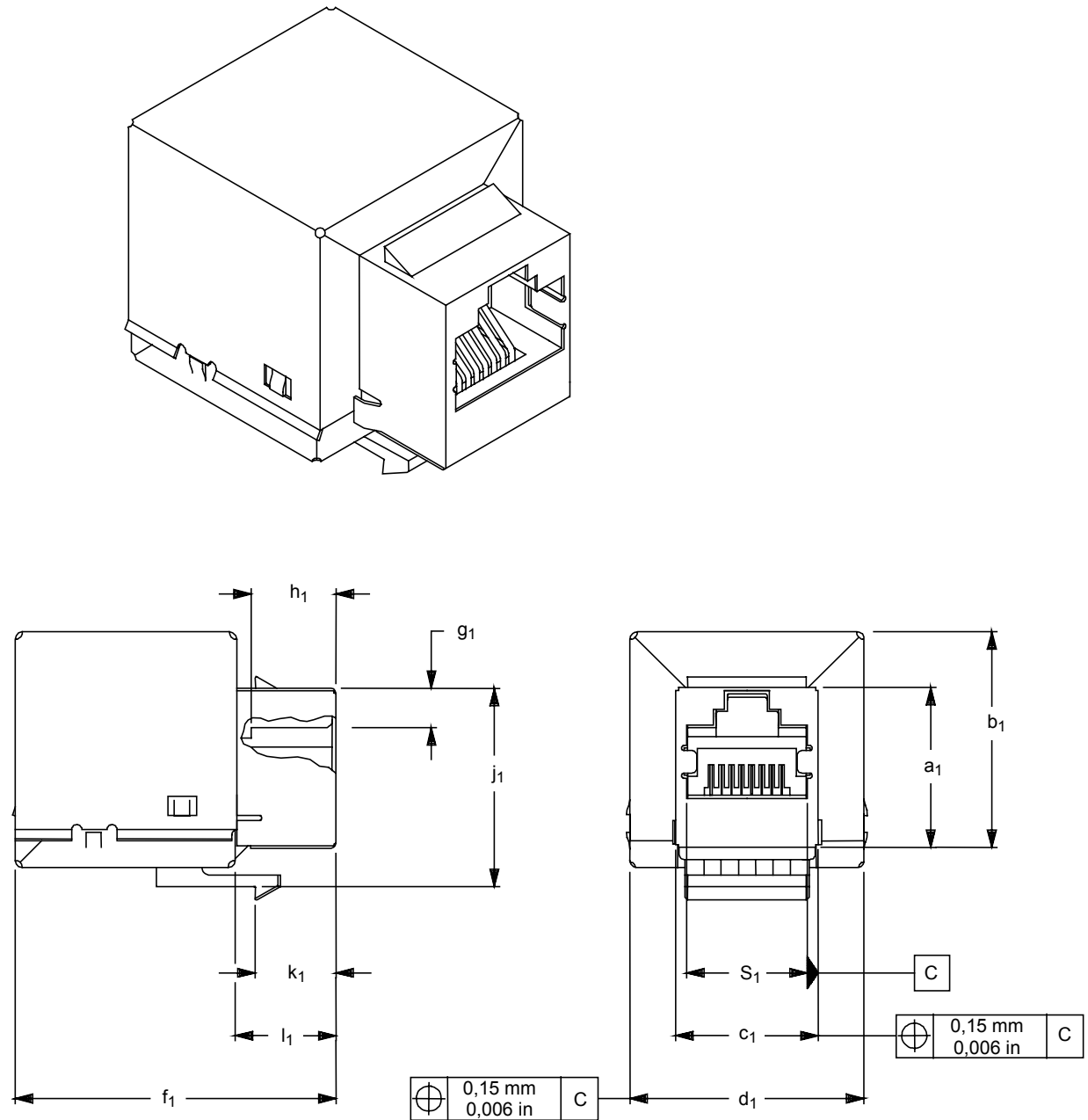


Figure 5

Table 6

Letter	Maximum		Minimum		Nominal (ref)	
	mm	in	mm	in	mm	in
a ₁	16,266	0,640	16,00	0,630		
b ₁	23,87	0,939	23,37	0,920		
c ₁	14,60	0,575	14,35	0,565		
d ₁	24,63	0,970	24,23	0,950		
f ₁	32,00	1,260	31,50	1,240		
g ₁	4,17	0,164	3,25	0,128		
h ₁	9,90	0,390	9,40	0,370		
j ₁	20,17	0,792	19,35	0,762		
k ₁	8,38	0,330	7,88	0,310		
l ₁					9,85	0,388
S ₁					11,94	0,470

4.2.1.2 Fixed connector, female contacts with insulation displacement terminations – variant 02

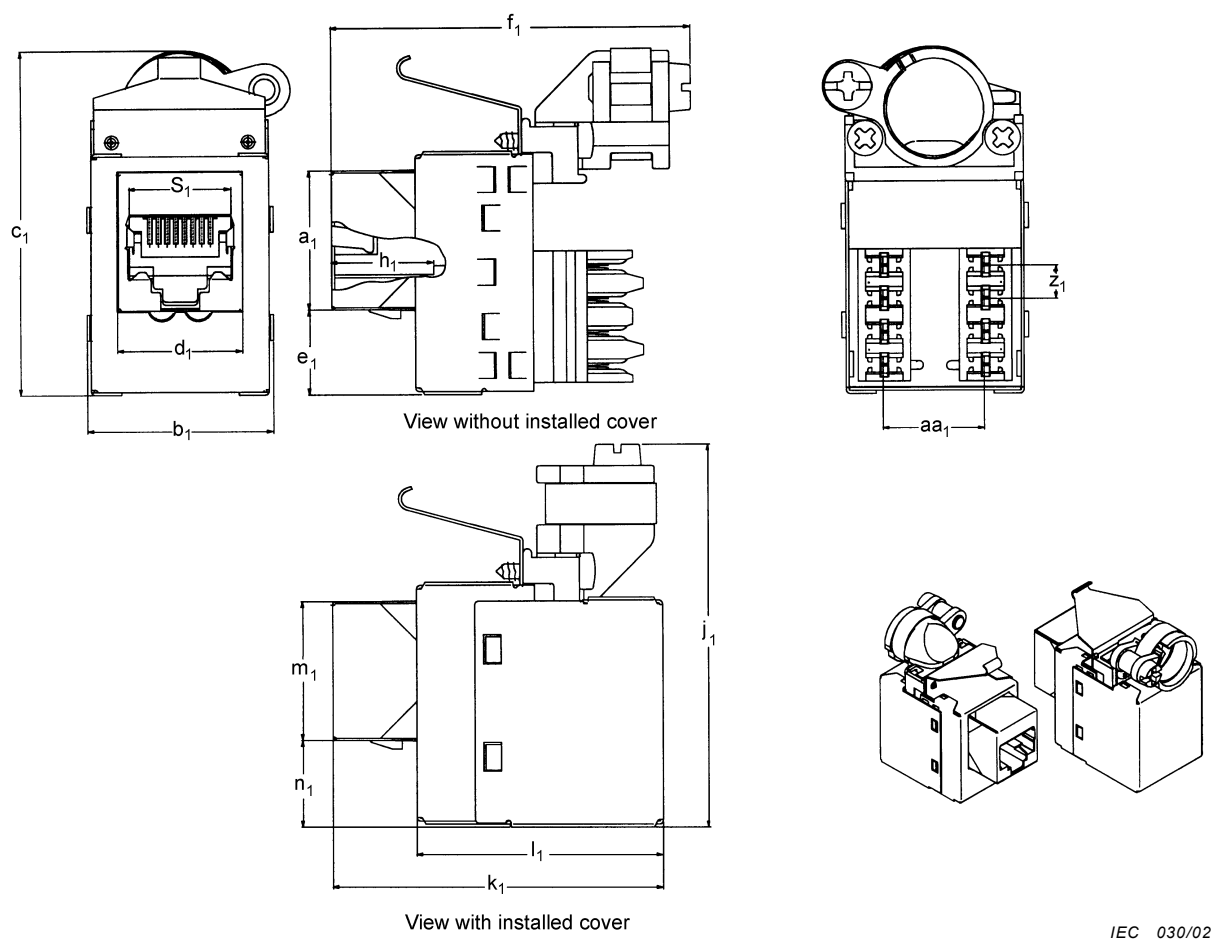


Figure 6

Table 7

Letter	Nominal (ref)	
	mm	in
a ₁	16,1	0,63
b ₁	21,6	0,85
c ₁	40,0	1,57
d ₁	14,6	1,75
e ₁	9,8	0,38
f ₁	42,0	1,65
h ₁	9,6	0,38
j ₁	44,5	1,75
k ₁	38,6	1,52
l ₁	28,8	1,14
m ₁	16,2	0,63
n ₁	10,2	0,40
z ₁	3,81	0,15
aa ₁	11,8	0,46
S ₁	11,9	0,47

4.2.2 Terminations

4.2.2.1 Solder terminations (under consideration)

4.2.2.2 Insulation displacement terminations (under consideration)

See IEC 60352-3 or IEC 60352-4.

4.2.2.3 Screw terminal terminations (under consideration)

4.2.2.4 Crimp terminations (under consideration)

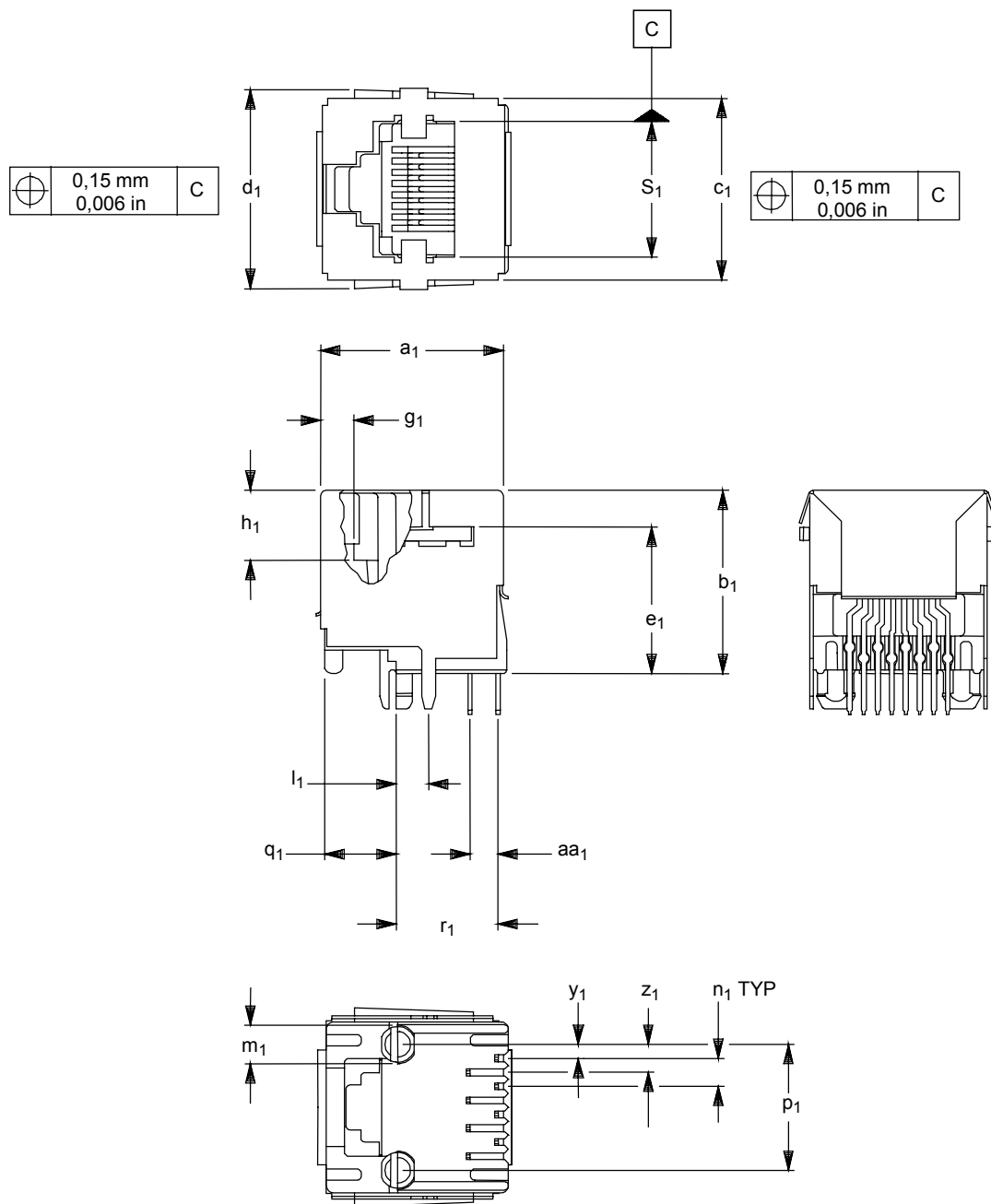
See IEC 60352-2.

4.2.2.5 Insulation piercing terminations (under consideration)

4.3 Type B – Fixed connectors (board-mounted)

4.3.1 Dimensions

4.3.1.1 Fixed connector, female contacts (board-mounted) – variant 01



IEC 031/02

Figure 7

Table 8

Letter	Maximum		Minimum		Nominal (ref)	
	mm	in	mm	in	mm	in
a ₁	16,77	0,660				
b ₁	16,64	0,655				
c ₁	16,51	0,650				
d ₁	18,17	0,715				
e ₁	13,24	0,525				
g ₁					2,92	0,115
h ₁					6,35	0,250
l ₁					2,95	0,116
m ₁					3,52	0,138
n ₁					2,54	0,100
p ₁					11,43	0,450
q ₁					6,48	0,255
r ₁					8,89	0,350
y ₁					1,27	0,050
z ₁					2,54	0,100
aa ₁					2,54	0,100
S ₁					11,94	0,470

4.3.1.2 Fixed connector, female contacts (board-mounted) – variant 02

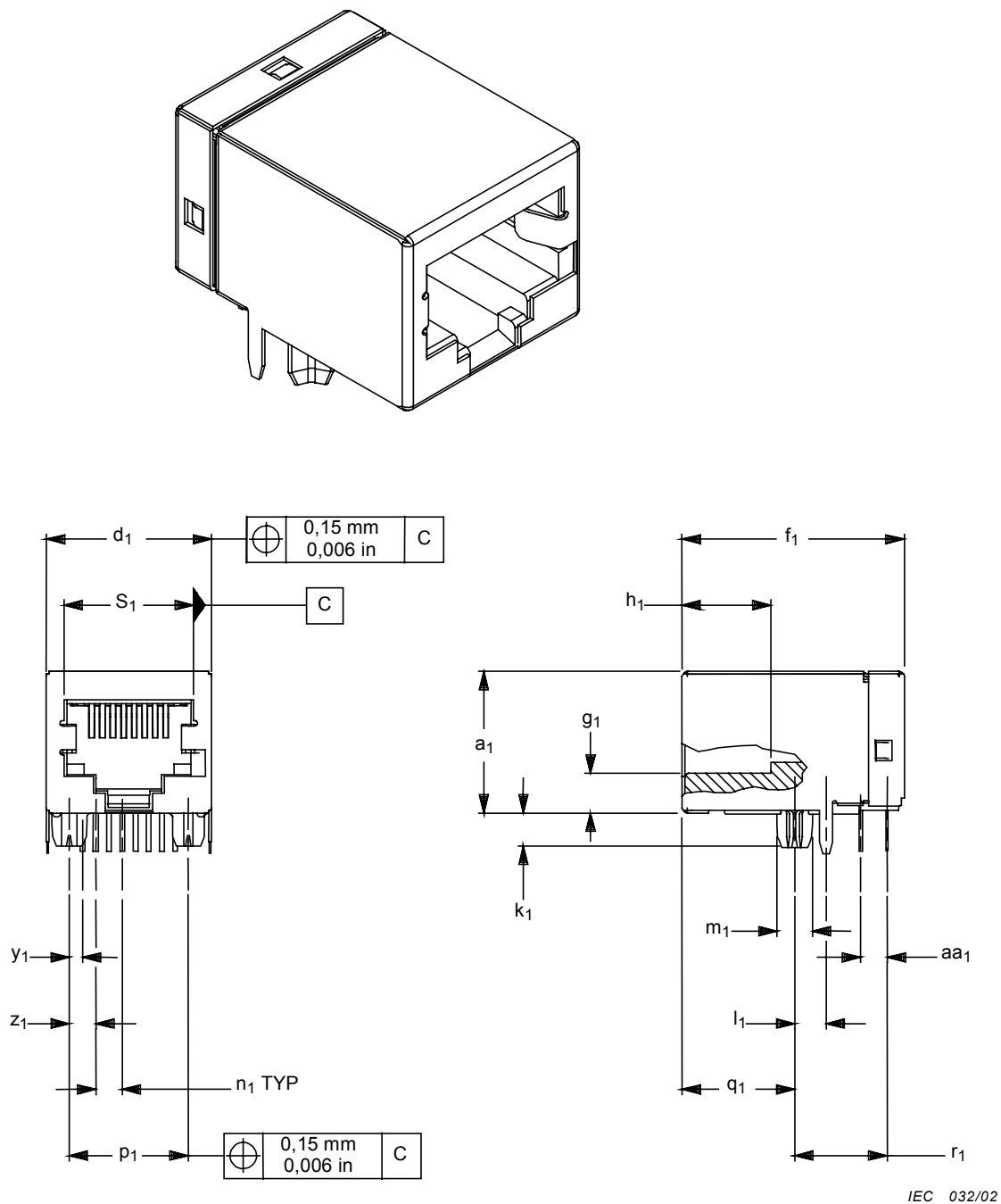


Figure 8