

Connectors for electronic equipment —

**Part 7-7: Detail specification for 8-way,
shielded, free and fixed connectors for
data transmission with frequencies up
to 600 MHz**

The European Standard EN 60603-7-7:2006 has the status of a
British Standard

ICS 31.220.10

National foreword

This British Standard is the official English language version of EN 60603-7-7:2006. It is identical with IEC 60603-7-7:2006. It supersedes BS EN 60603-7-7:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee EPL/48, Electromechanical components and mechanical structures 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 UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 85 and a back cover.

The BSI copyright notice displayed in this document indicates when the document was last issued.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 August 2006

© BSI 2006

ISBN 0 580 49061 0

Amendments issued since publication

Amd. No.	Date	Comments

English version

**Connectors for electronic equipment
Part 7-7: Detail specification for 8-way, shielded,
free and fixed connectors for data transmission
with frequencies up to 600 MHz
(IEC 60603-7-7:2006)**

Connecteurs pour équipements
électroniques
Partie 7-7: Spécification particulière
pour les fiches et les embases blindées
à 8 voies pour la transmission
des données à des fréquences
jusqu'à 600 MHz
(CEI 60603-7-7:2006)

Steckverbinder für elektronische
Einrichtungen
Teil 7-7: Bauartspezifikation
für geschirmte freie und feste
Steckverbinder, 8-polig, für
Datenübertragungen bis 600 MHz
(IEC 60603-7-7:2006)

This European Standard was approved by CENELEC on 2006-07-01. 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.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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/1664/FDIS, future edition 2 of IEC 60603-7-7, 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 60603-7-7 on 2006-07-01.

This European Standard supersedes EN 60603-7-7: 2002.

The following changes have been made:

- Many minor detail changes concerning the harmonization of this document, its specifications and its test procedures with those contained in the other IEC/EN 60603-7 series standards.
- Significant performance improvements have been made to insertion loss and return loss, now specified to 1 000 MHz, for special applications (ISO/IEC 15018).

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) 2007-04-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2009-07-01

The International Electrotechnical Commission (IEC) and CENELEC draw attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning the switch given in 2.2.2.

The IEC and CENELEC take no position concerning the evidence, validity and scope of this patent right.

The holder of this patent right has assured the IEC that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statement of the holder of this patent right is registered with the IEC. Information may be obtained from:

Nexans
16, rue de Monceau
75008 Paris
France

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights other than those identified above. IEC and CENELEC shall not be held responsible for identifying any or all such patent rights.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60603-7-7:2006 was approved by CENELEC as a European Standard without any modification.

CONTENTS

INTRODUCTION	7
1 General	9
1.1 Scope	9
1.2 Normative references	9
2 Technical information	10
2.1 Terms and definitions	10
2.2 Information on application	10
2.2.1 Transmission performance categories	11
2.2.2 Complete connectors (pairs)	11
2.2.3 Interchangeability level	11
2.2.4 Shielding/grounding	12
2.2.5 Terminations	12
2.3 IEC type designation	12
3 Dimensional information	14
3.1 General	14
3.2 Isometric view	14
3.3 Common features	15
3.4 Engagement (mating) information	15
3.5 Fixed connectors	17
3.6 Free connectors	20
4 Terminations	22
4.1 Referenced termination types	22
4.1.1 Insulation displacement terminations	22
4.1.2 Crimp terminations	22
4.1.3 Insulation piercing terminations	22
4.1.4 Compliant pin (press-in)	22
4.1.5 Spring clamp terminations	22
4.1.6 Non-referenced termination types	22
4.1.7 Solder terminations	23
4.2 Switch function	23
4.2.1 Basic switch function	23
4.2.2 Additional switch function	23
4.3 Accessories	23
4.4 Mounting information for fixed connectors	23
4.4.1 Hole pattern on printed boards	23
4.4.2 Mounting on panels	23
4.5 Mounting information for free connectors	23
5 Gauges	23
5.1 Fixed connectors	23
5.2 Free connectors	28
5.3 Probes	32
5.4 Contact resistance gauge	32
5.5 Test panel (for voltage proof test)	32

6	Characteristics	32
6.1	General.....	32
6.2	Pin and pair grouping assignment.....	33
6.3	Climatic category.....	34
6.4	Electrical characteristics.....	34
6.4.1	Creepage and clearance distance	34
6.4.2	Voltage proof	35
6.4.3	Current-carrying capacity	35
6.4.4	Initial contact resistance	36
6.4.5	Input to output d.c. resistance	36
6.4.6	Input to output d.c. resistance unbalance	36
6.4.7	Insulation resistance	36
6.4.8	Transfer impedance	37
6.5	Transmission characteristics.....	37
6.5.1	Insertion loss	37
6.5.2	Return loss	37
6.5.3	Propagation delay.....	38
6.5.4	Delay skew	38
6.5.5	NEXT loss	38
6.5.6	Power sum NEXT loss (for information only).....	38
6.5.7	FEXT loss.....	38
6.5.8	Power sum FEXT loss (for information only).....	38
6.5.9	Transverse conversion loss.....	39
6.5.10	Transverse conversion transfer loss.....	39
6.5.11	Coupling attenuation.....	39
6.6	Mechanical characteristics.....	39
6.6.1	Mechanical operation	39
6.6.2	Effectiveness of connector coupling devices.....	40
6.6.3	Insertion and withdrawal forces	40
7	Tests and test schedule.....	40
7.1	General.....	40
7.2	Test procedures and measuring methods.....	40
7.3	Preconditioning	40
7.4	Wiring and mounting of specimens	41
7.4.1	Wiring.....	41
7.4.2	Mounting	41
7.5	Contact resistance measurement arrangement and procedure	41
7.5.1	Arrangement for contact resistance measurement	41
7.5.2	Test procedure for contact resistance measurement.....	42
7.6	Arrangement for dynamic stress tests (test phase CP1)	42
7.7	Test schedules	42
7.7.1	Basic (minimum) test schedule.....	43
7.7.2	Full test schedule.....	43
	Annex A (normative) Gauging continuity procedure	52
	Annex B (normative) Locking device mechanical operation – Test procedure and requirements	55
	Annex C (normative) High frequency (category 7) transmission interoperability testing	56

Annex D (normative) General requirements for the measurement set-up.....	58
Annex E (normative) Insertion loss.....	64
Annex F (normative) Return loss.....	66
Annex G (normative) Near end cross talk (NEXT).....	68
Annex H (normative) Far end cross talk (FEXT)	70
Annex I (normative) Transfer impedance.....	72
Annex J (normative) Transverse conversion loss (TCL) and transverse conversion transfer loss (TCTL).....	78
Annex K (normative) Termination of balun.....	81
Annex L (normative) Gauging requirements	82
Annex ZA (normative) Normative references to international publications with their corresponding European publications	83
Figure 1 – Isometric view, example fixed and free connector, free connector shown with both switch positions	14
Figure 2 – Contact interface dimensions with terminated free connector	15
Figure 3 – Physical interface, fixed connector, front view	17
Figure 4 – Physical interface, fixed connector, side view	18
Figure 5 – Physical interface, free connector.....	20
Figure 6 – “Go” gauge	24
Figure 7 – Fixed connector additional go gauge	24
Figure 8 – “No-go” gauge width.....	25
Figure 9 – “No-go” gauge height	25
Figure 10 – Fixed connector additional no-go gauges.....	26
Figure 11 – “No-go” gauges	28
Figure 12 – Free connector additional no-go gauges	29
Figure 13 – “Go” gauge.....	30
Figure 14 – Free connector additional go gauges	31
Figure 15 – Fixed connector pin and pair grouping assignment (front view of connector).....	33
Figure 16 – Basic switch function	33
Figure 17 – Additional switch function	34
Figure 18 – Connector de-rating curve	35
Figure 19 – Arrangement for contact resistance measurement.....	41
Figure 20 – Arrangement for dynamic stress tests	42
Figure A.1 – Gauge	53
Figure A.2 – Gauge insertion	54
Figure C.1 – Free connector precision test fixture	56
Figure C.2 – Fixed connector precision test fixture	57
Figure D.1 – 180° hybrid used as a balun.....	59
Figure D.2 – Calibration of reference loads	60
Figure D.3 – Resistor load	61
Figure D.4 – Screened pyramid.....	62
Figure D.5 – Definition of reference planes	63
Figure E.1 – Calibration	64

Figure E.2 – Measuring set-up	65
Figure G.1 – NEXT measurement differential and common mode terminations	68
Figure H.1 – FEXT measurement differential and common mode terminations	70
Figure I.1 – Preparation of test specimen	73
Figure I.2 – Triaxial test set-up	74
Figure I.3 – Impedance matching for $R_1 < 50 \Omega$	75
Figure I.4 – Impedance matching for $R_1 > 50 \Omega$	76
Figure J.1 – TCL measurement	78
Figure J.2 – TCTL measurement	79
Figure K.1 – Balanced attenuator for balun centre tap grounded	81
Figure K.2 – Balanced attenuator for balun centre tap open	81
Table 1 – Physical interface, contacts interface	16
Table 2 – Fixed connector common dimensions	19
Table 3 – Common dimensions – free connector	21
Table 4 – Fixed connector gauge dimensions	27
Table 5 – Fixed connector, additional, gauge dimensions	27
Table 6 – Free connector NO-GO gauge dimensions	30
Table 7 – Free connector GO gauges dimensions	31
Table 8 – Free connector additional gauges dimensions	32
Table 9 – Climatic categories – selected values	34
Table 10 – Minimum distances	35
Table 11 – Test group P	43
Table 12 – Test group AP	44
Table 13 – Test group BP	46
Table 14 – Test group CP	47
Table 15 – Test group DP	48
Table 16 – Test group EP	49
Table 17 – Test group FP	50
Table 18 – Test group GP	51
Table A.1 – Continuity gauge dimensions	54
Table D.1 – Test balun performance characteristics	60
Table F.1 – Uncertainty band of return loss measurement at frequencies below 100 MHz	67
Table F.2 – Uncertainty band of return loss measurement at frequencies above 100 MHz	67

INTRODUCTION

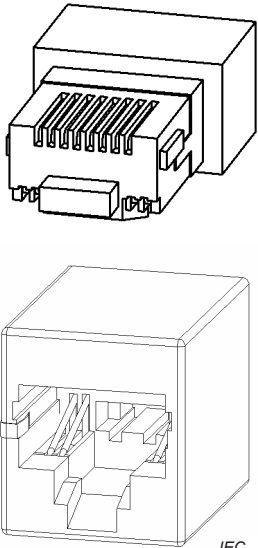
This detail specification describes connectors according to IEC 60603-7 series connectors requirements.

This detail specification describes connectors that are similar to and backward compatible with IEC 60603-7 series connectors. Backward compatibility definition and requirements are given in 2.2.

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

CONNECTORS FOR ELECTRONIC EQUIPMENT –

Part 7-7: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 600 MHz

IEC SC 48B: LF connectors Specification available from: IEC Central Office or the addresses shown on the inside cover.	IEC 60603-7-7
 IEC 1068/06	Detail specification for two-part cable to cable connector used in: - high speed communications applications up to 600 MHz - 4 balanced contact pairs (8 contacts) - compatible with IEC 60603-7 series connectors - intended for inside-building cabling systems
	Typical construction is for cable mount for use in communication cabling systems
	Performance level(s): 1, 2 Assessment level(s): not applicable
	Reference data: not applicable
Information on the availability of components qualified to this detail specification is not covered.	

1 General

1.1 Scope

This part of IEC 60603, which is part of the IEC 60603-7 series, covers 8 way connectors, up to 4 pairs, and specifies mechanical and environmental requirements, and electrical transmission requirements for frequencies up to 600 MHz. These connectors are typically used as category 7 connectors in class F cabling systems 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-X series connectors.³

The connectors are backward compatible with IEC 60603-7-X series 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 60050(581), *International Electrotechnical Vocabulary (IEV) – Chapter 581: Electro-mechanical components for electronic equipment*

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

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

IEC 60169-16, *Radio-frequency connectors – Part 16: R.F. coaxial connectors with inner diameter of outer conductor 7 mm (0.276 in) with screw coupling – Characteristic impedance 50 ohms (75 ohms) (Type N)*

IEC 60352-2, *Solderless connections – Part 2: Solderless 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*

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*

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

² Intermateability definition and requirements are given in 2.2.

³ Interoperability definition and requirements are given in 2.2.

⁴ Backward compatibility definition and requirements are given in 2.2.

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

IEC 60603-1, *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*

IEC 60603-7, *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*

IEC 60603-7-5, *Connectors for electronic equipment – Part 7-5: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz*⁵

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

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

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

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*

ITU-T G.117, *Transmission aspects of unbalance about earth*

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

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

ITU-T O.9, *Measuring arrangements to assess the degree of unbalance about earth*

EN 50289-1-14, *Communication Cables – Specifications for Test Methods – Part 1-14: Electrical Test Methods – Coupling attenuation or screening attenuation of connecting hardware*

2 Technical information

This detail specification covers connectors intended for use in inside-building communication cabling systems.

2.1 Terms and definitions

For the purposes of this part of IEC 60603, the terms and definitions given in 2.1 of IEC 61076-1 and IEC 60050(581) apply. Some applicable terms are also covered in IEC 60512-1.

2.2 Information on application

These connectors are interoperable with lower frequency or “category” IEC 60603-7 series connectors.

⁵ To be published.

2.2.1 Transmission performance categories

In this detail specification, the term “category”, when used in reference to transmission performance, refers to those categories defined by ISO/IEC 11801:2002.

2.2.2 Complete connectors (pairs)

The complete connectors engage a total of 8 contacts.

The IEC 60603-7-7 connector includes the 8 contacts (1,2,3,4,5,6,7,8) of a standard IEC 60603-7 series connector. In addition, the IEC 60603-7-7 connector includes 4 alternative contacts (6',3',4',5') located on the opposite side to the original contacts of a basic IEC 60603-7 series connector.

A switch is employed within the connectors to engage transmission paths between 4 pairs of terminations and the respective 4 out of 6 pairs of contacts, which operate above or below 250 MHz, see 4.2.

Switch operation is implemented by means of moving switch actuator protrusions on the free connector (see 2.2.2.1 and 2.2.2.2).

2.2.2.1 Fixed connectors

IEC 60603-7-7 fixed connectors include a rear switch actuator and side channels.

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

The fixed connector (rear) switch actuator is operated by the free connector front switch actuator protrusion placed in the extended position.

2.2.2.2 Free connectors

IEC 60603-7-7 free connectors include front and side switch actuator protrusions.

The free connector front switch actuator protrusion, when placed in the extended position, operates the fixed connector switch actuator.

The free connector side switch actuator protrusions operate the free connector switch. The absence of fixed connector side channels (as in lower frequency or “category” IEC 60603-7-X series fixed connectors) cause the extended free connector switch actuator protrusions to move into the retracted position upon insertion.

NOTE A free connector with fixed protrusions, which is not backward compatible with IEC 60603-7 series connectors, but is intermateable and interoperable with IEC 60603-7-7 fixed connectors, is specified in IEC 61076-3-110⁶.

2.2.3 Interchangeability level

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

Interoperability of a IEC 60603-7-7 connector with a lower frequency IEC 60603-7 series connector is assured by compliance with all transmission requirements of the lower frequency IEC 60603-7 series connector when the fixed connector is mated with a full range of “test”

⁶ Under consideration.

free connectors, or “test plugs”, as described in the lower frequency IEC 60603-7 series connector.

2.2.3.1 Intermateability

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

2.2.3.2 Interoperability

Interoperability of different IEC 60603-7-7 connectors is assured by compliance with all transmission requirements when the connector is mated with the respective “test” connector as described in Annex C.

Interoperability of a IEC 60603-7-7 connector with a lower frequency IEC 60603-7 series connector is assured by compliance with all transmission requirements of the lower frequency IEC 60603-7 series connector when the fixed connector is mated with a full range of “test” free connectors, or “test plugs”, as described in the lower frequency IEC 60603-7 series connector.

2.2.3.3 Backward Compatibility

The backward compatibility requirement ensures that a plug or jack which is in compliance with this detail specification, mated with a jack or plug in compliance with any lower frequency IEC 60603-7 series connector, shall fully comply with the requirements of the lower frequency IEC 60603-7 series connector.

2.2.4 Shielding/grounding

Shielding features form an integral part of these connectors and they are specified herein.

2.2.5 Terminations

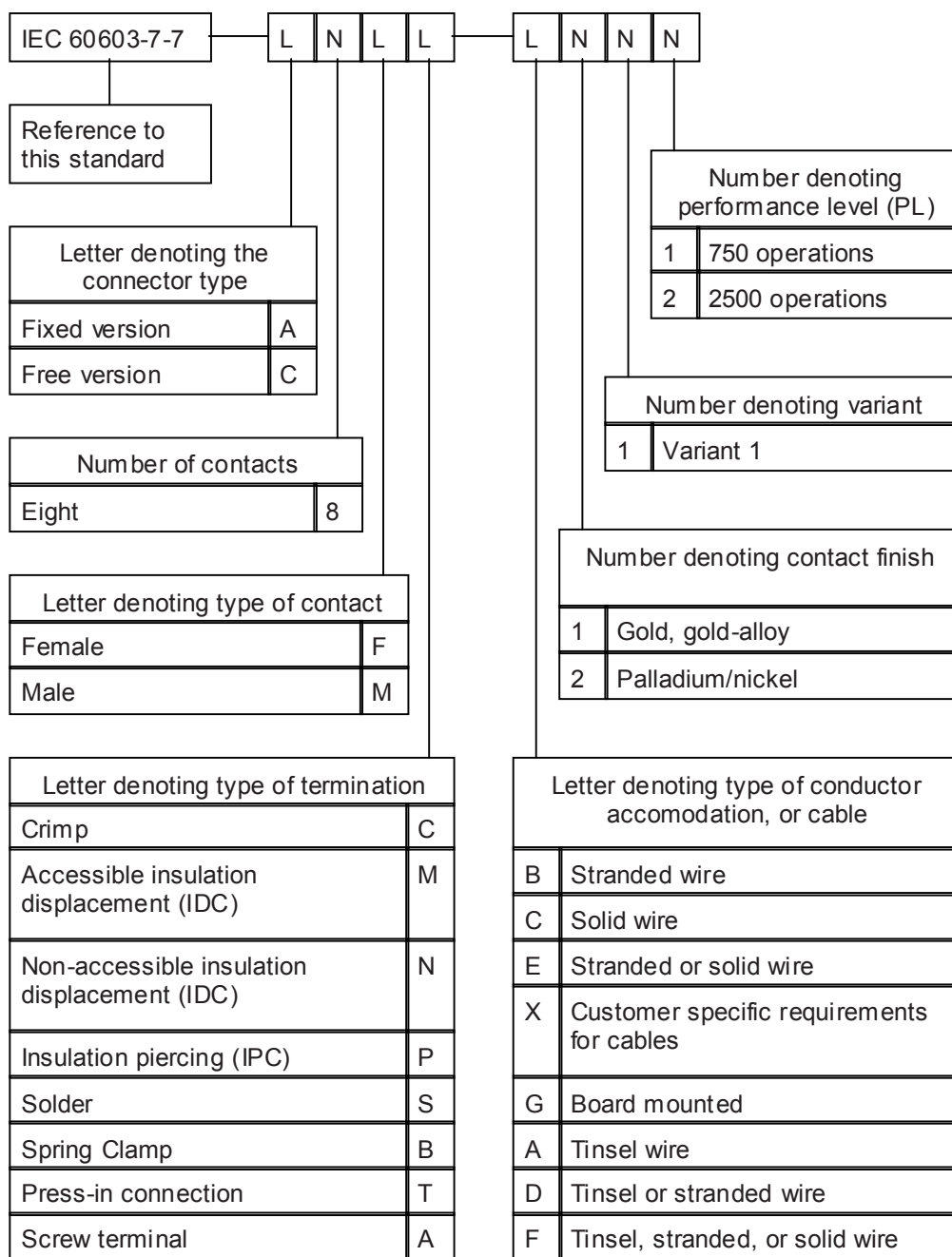
These cable connectors are terminated to the signal line and screen of the cable with specified terminations.

Fixed and free connector terminations are specified in Clause 4 and shall conform to the requirements of Clause 6.

Screen terminations shall conform to the requirements of Clause 6.

2.3 IEC type designation

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



NOTE "L" stands for letter.
"N" stands for number.

Example:

IEC 60603-7-7 A8FM-E111: Fixed shielded connector, having 8 female contacts with accessible IDC contacts, for stranded or solid wires, gold plated, meeting performance level 1.

3 Dimensional information

Common characteristics are given herein for fixed connectors and free connectors.

3.1 General

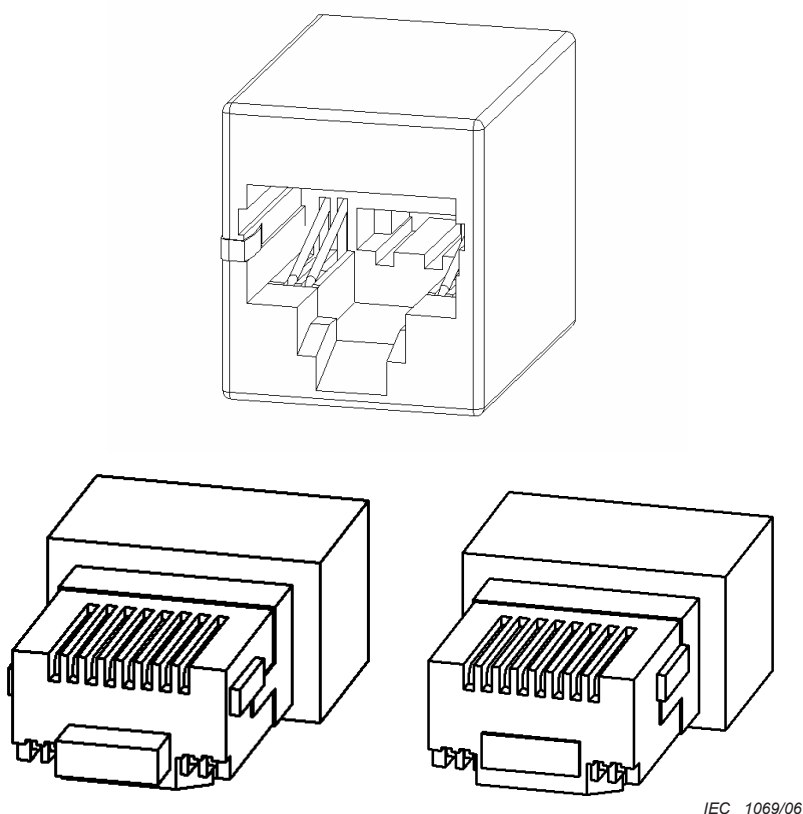
The shape of the connectors may deviate from those given in the following drawings as long as the specified dimensions are not influenced.

Dimensions are given in millimetres.

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

3.2 Isometric view

See Figure 1.



NOTE The free connector protrusions move together, between the extended position and the retracted position, to activate the switch within the free connector, see 2.2.

**Figure 1 – Isometric view, example fixed and free connector,
free connector shown with both switch positions**

3.3 Common features

These connectors have common features concerning the arrangement of the contacts, mating information, and the coupling device.

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

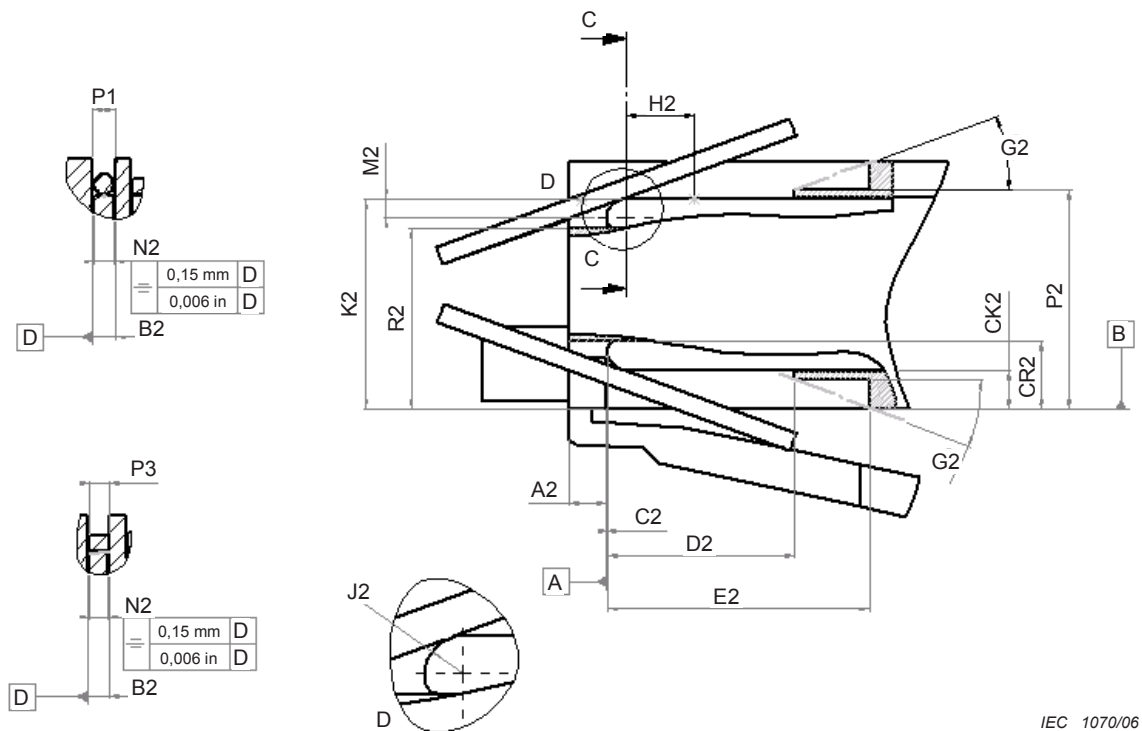
Mating alignment is controlled by a vertical and horizontal reference position and the centering of the coupling device (latch).

3.4 Engagement (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.



NOTE View D: preferred contact interface detail.

Figure 2 – Contact interface dimensions with terminated free connector

Table 1 – Physical interface, contacts interface

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 ^c		0,38
J2	0,64	0,38
K2	6,15	5,89
M2 ^d		0,30
N2		0,28
P1 ^a	0,50	0,45
P3 ^b	0,50	0,36
R2	4,83	
CK2	0,60	0,50
CR2		1,70
G2 (Angle)	10°	
^a P1: preferred fixed connector contact configuration. ^b P3: optional fixed connector contact configuration. ^c H2: Burrs shall not project above top of contact in this area, since it may be a contact area. ^d M2: Minimum preferred contact configuration.		

3.5 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 maximum radius of 0,38 mm unless otherwise specified.

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

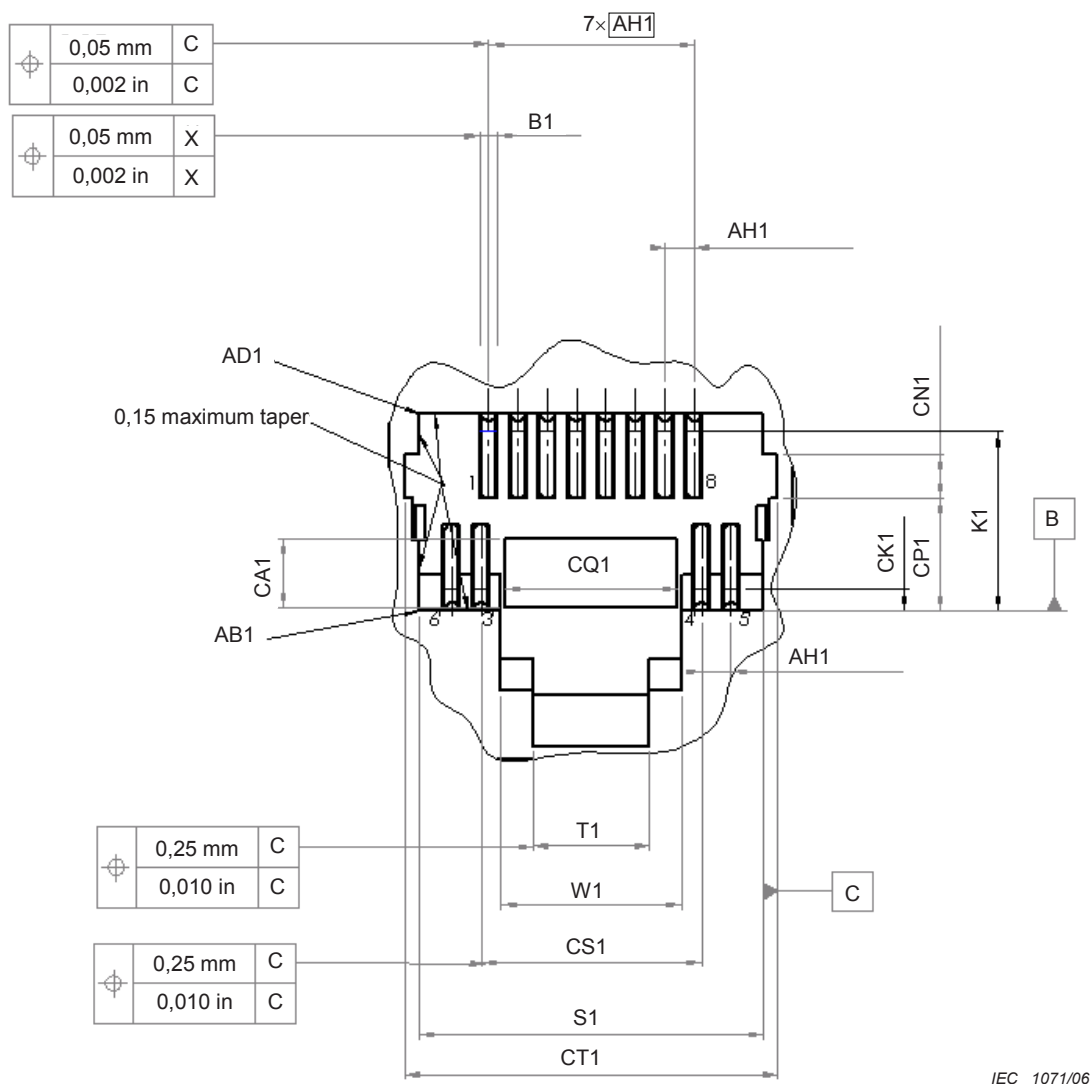


Figure 3 – Physical interface, fixed connector, front view

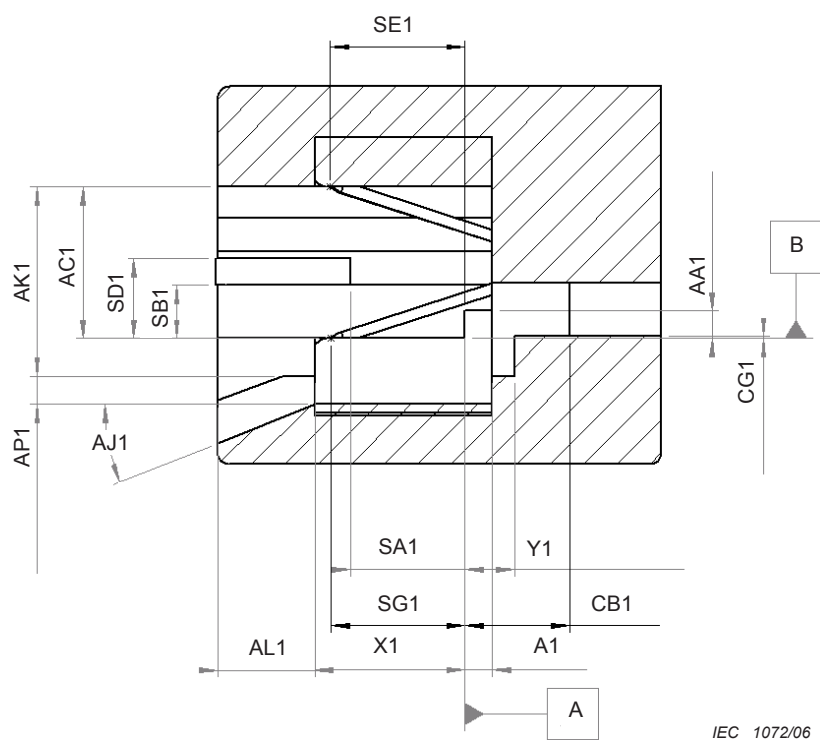


Figure 4 – Physical interface, fixed connector, side view

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 ^h			1,02
AK1	8,66	8,38	
AL1 ^c		1,40	
AP1 ^g		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 ^d	5,80		
SG1 ^{e, f}	5,80		
Letter			
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 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.

^d SE1: Maximum forward extension of contacts below surface AC1, to avoid contact with shields of free connectors. Applies in the mated state.

^e SG1: Maximum forward extension of contacts above surface reference plane B, to avoid contact with shields of free connectors. Applies in the mated state.

^f SG1: When this dimension is greater than 2,5 mm, and the fixed connector is mated with a lower frequency IEC 60603-7 series free connector, then "additional switch function" (see 4.2) should be utilised. The clearance requirement between signal conductors 6',3',4',5' of the fixed connector and the screen of a lower frequency IEC 60603-7 series free connector are maintained when this dimension is 2,5 mm or less while the "basic switch function" (see 4.2) is utilised. SG1 is typically 0,0 mm in the mated state with a IEC 60603-7-1,2,3,4,5 free connector.

^g AP1: Flat surface.

^h AH1: True position.

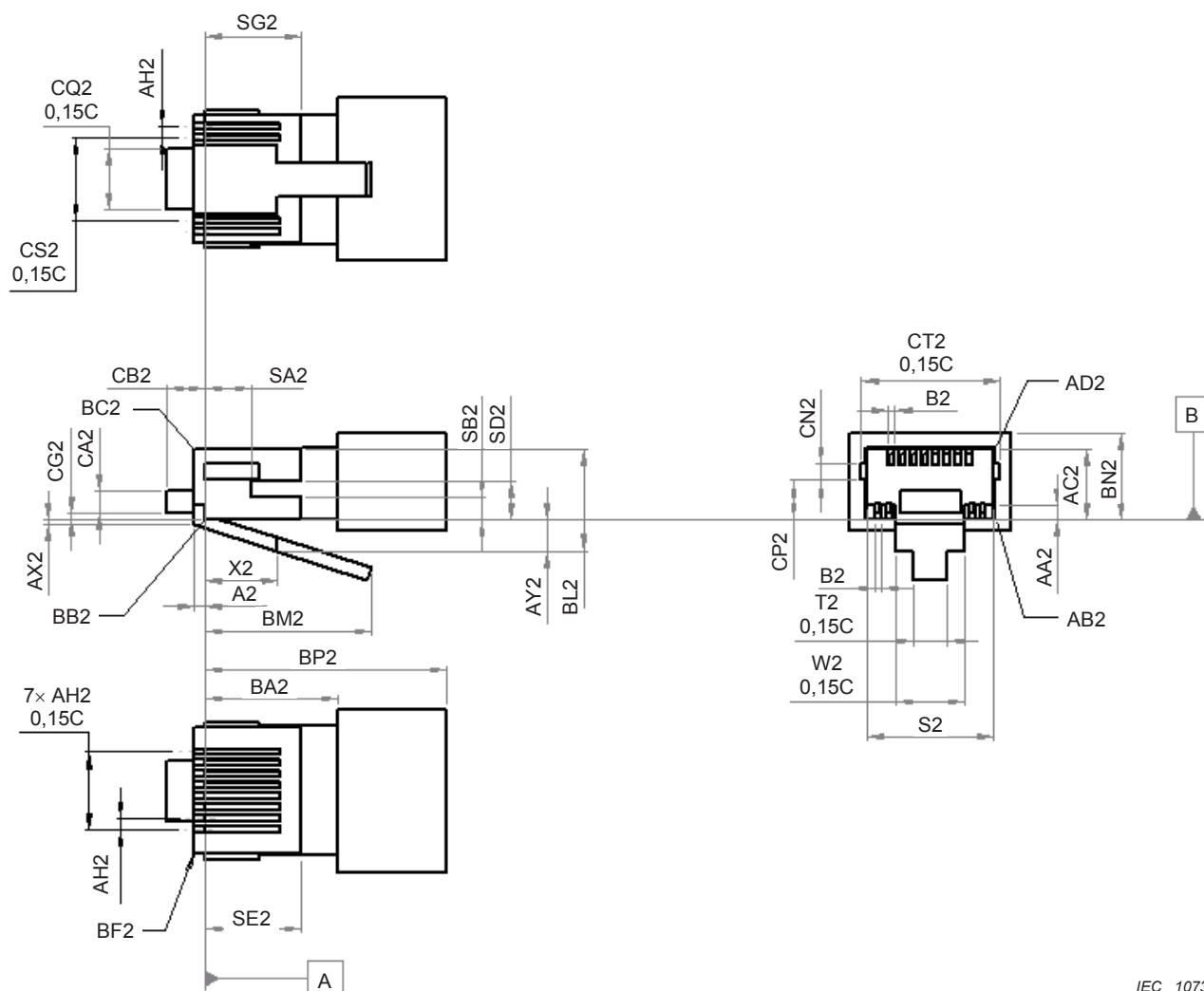
NOTE 1 Care should be taken that all screen contacts of the fixed connector always make contact with the screen contacts of the free connector in worst case condition to ensure reliable performance.

NOTE 2 All internal corners in the connector cavity should be 0,38 mm radius maximum unless otherwise specified.

3.6 Free connectors

Common dimensions are given in Figure 5 and in Table 3.

Full radius permitted on all contact slots.



IEC 1073/06

Figure 5 – Physical interface, free connector

Table 3 – Common dimensions – free connector

Letter	Maximum	Minimum	Nominal
	mm	mm	mm
A2	1,45	0,89	1,17
B2	0,61	0,51	0,56
S2	11,79	11,58	11,68
T2	3,38	3,12	
W2	6,17	6,02	
X2	6,51	6,36	
AA2		1,24	
AB2	0,64	0,38	
AC2	6,71	6,50	6,60
AD2	0,64	0,13	
AH2 ^a			1,02
AX2	1,32		
AY2	2,87	2,67	
BA2		12,32	
BB2	1,14	0,38	
BC2	1,02	0,51	
BF2	0,64		
BL2 ^b	8,36		
BM2	15,88	14,61	
BN2	9,24		
BP2	23,11		
CA2	2,20	2,00	
CB2	3,95	3,75	
CG2	0,22	0,12	
CN2	1,30	1,20	
CP2	5,05	4,95	
CQ2	5,70	5,50	
CS2 ^a			7,66
CT2	12,85	12,75	
SA2	4,22		
SB2	2,11		
SD2		4,95	
SE2		6,85	
SG2		6,85	

^a AH2, CS2: These dimensions apply to the locations of the contact slots.

^b BL2: Applies with locking device depressed.

NOTE Full radius permitted on all slots.

4 Terminations

A connector may include multiple terminations between the cable termination and the separable contact interface. These may include press-in (compliant pin) connections of jack springs into PCBs, for example. All terminations shall meet the relevant termination requirements.

In the case where a type of solderless termination is used which is not covered by any IEC standard and the supplier cannot demonstrate similar level of performance or there is no applicable IEC 60352 standard to be used as a reference, the supplier shall show conformance with the full test schedule in 7.7 for all possible variations of terminations, for example each cable construction type (screen construction types, wire construction (solid, flexible)) the connector is intended to be used for.

Free connectors are intended to be terminated to cable to provide connector and cable assemblies. The connector type designation provides basic terminations concerning the type of conductor (tinsel, stranded, solid) to which the conductor may be applied, and the type of connection used (solder, insulation displacement, etc.). Specific details concerning wire gauge size, type and thickness of conductor insulation, size and shape of cordage or cable jacket, etc., are not intended to be part of this specification. Minor variations in a free connector's interior details to accommodate differing wire gauge sizes, outer jackets, etc., do not require the generation of new free connector specifications.

If the connector is able to be used with multiple cable types, the manufacturer shall assure that all terminations comply with the relevant IEC standards with each of the cable types.

4.1 Referenced termination types

If a type of solderless termination which is covered by a IEC 60352 series specification is used, the supplier shall assure its reliability by performing tests and demonstrating a level of performance, according to IEC 60352 specifications.

4.1.1 Insulation displacement terminations

Shall conform to IEC 60352-3 or IEC 60352-4.

4.1.2 Crimp terminations

Shall conform to IEC 60352-2.

4.1.3 Insulation piercing terminations

Shall conform to IEC 60352-6.

4.1.4 Compliant pin (press-in)

Shall conform to IEC 60352-5.

4.1.5 Spring clamp terminations

Shall conform to IEC 60352-7.

4.1.6 Non-referenced termination types

If a type of termination is used, which is not covered by any IEC 60352 series specification, the supplier shall assure its reliability by performing similar tests, and demonstrating a similar level of performance, to those covered by IEC 60352 series.

4.1.7 Solder terminations

Solder terminations are not covered in IEC 60352 series and are allowed.

4.2 Switch function

Minimum switch function requirements are given and are identified as “basic switch function”.

Additional switch functions are given and are identified as “additional switch function”.

Switch functions are illustrated in 6.2 and Figure 16 and Figure 17.

4.2.1 Basic switch function

The basic switch function uses a single pole switch for each alternate contact to connect the respective standard contact to either the screen or the alternate contact. The alternate contact is permanently connected to the termination.

4.2.2 Additional switch function

The additional switch function uses a double pole switch for each alternate contact to connect the respective standard contact to either the screen or the termination while the alternate contact is respectively connected to the termination or the screen. Neither the alternate contact nor the respective standard contact is permanently connected to the termination.

4.3 Accessories

Accessories are not specified.

4.4 Mounting information for fixed connectors

Fixed connector mounting information is not specified.

4.4.1 Hole pattern on printed boards

Fixed connector printed board mounting is not specified.

4.4.2 Mounting on panels

Fixed connector mounting on panels is not specified.

4.5 Mounting information for free connectors

Mounting information for free connectors onto cables is not specified.

5 Gauges

5.1 Fixed connectors

Gauges shall be made according to the following requirements:

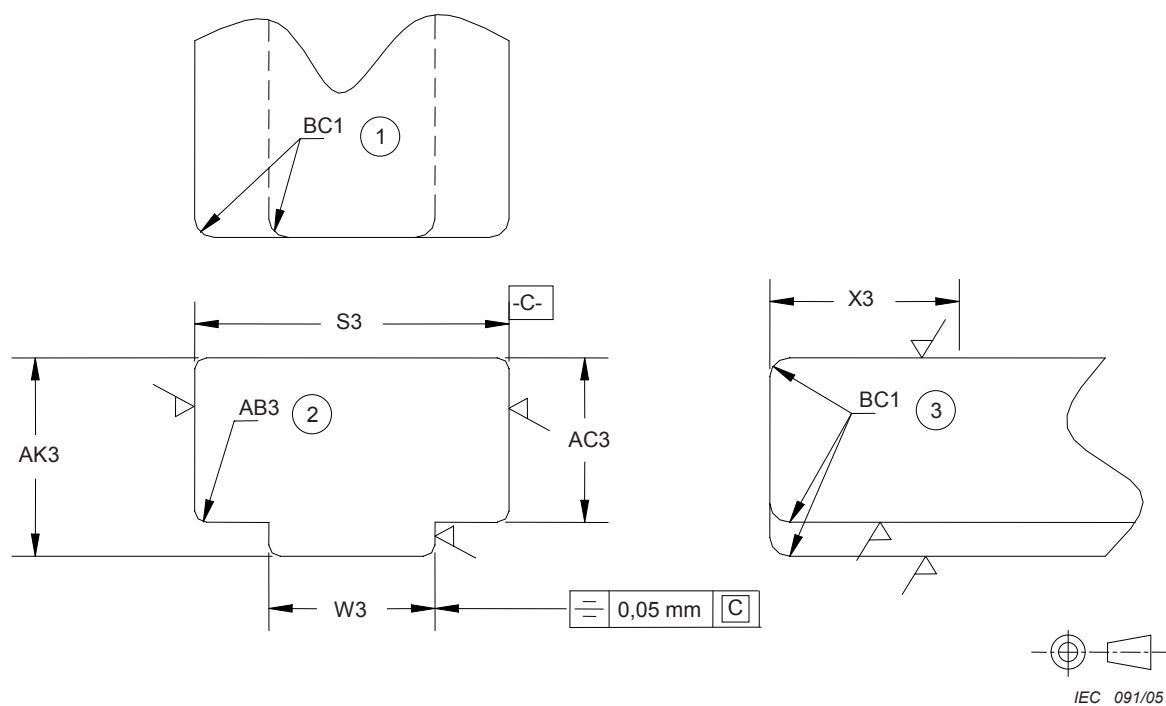
Material: tool steel, hardened.

v = Surface roughness, according to ISO 1302.

R_a = 0,25 μm maximum

A 0,01 mm wear tolerance shall be applied.

Clearance shall be provided for signal contacts and screen contacts (not shown on drawings).



NOTE 1 Four places.

NOTE 2 Six places.

NOTE 3 All around.

Figure 6 – “Go” gauge

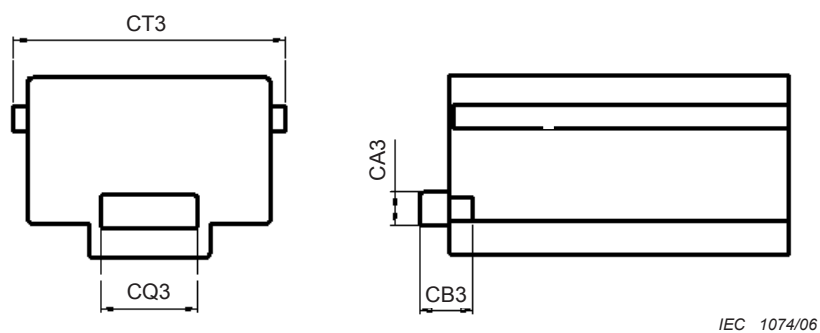
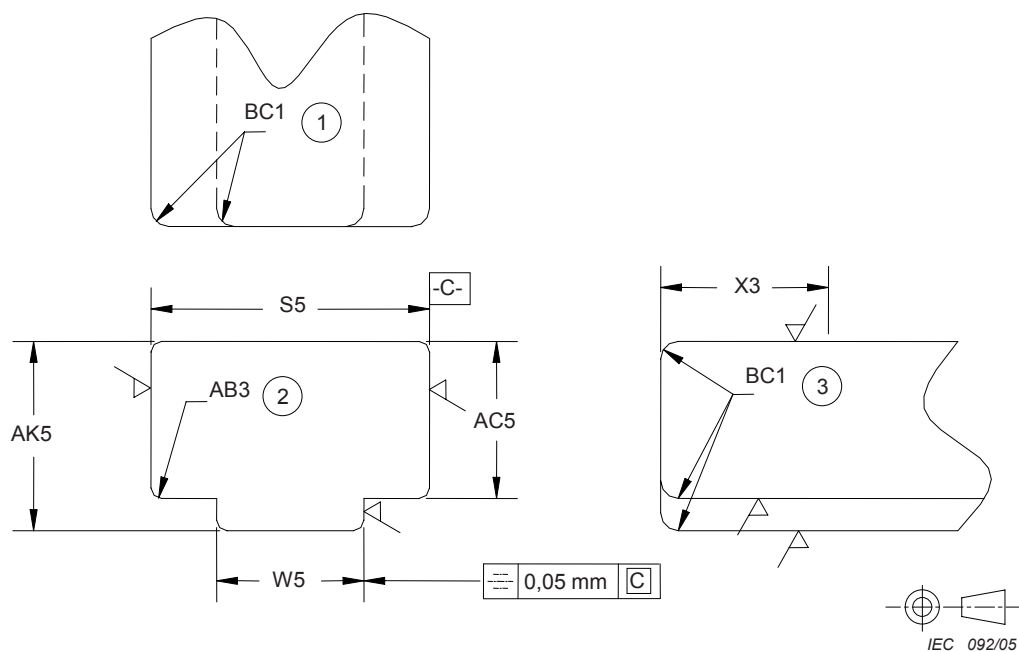


Figure 7 – Fixed connector additional go gauge

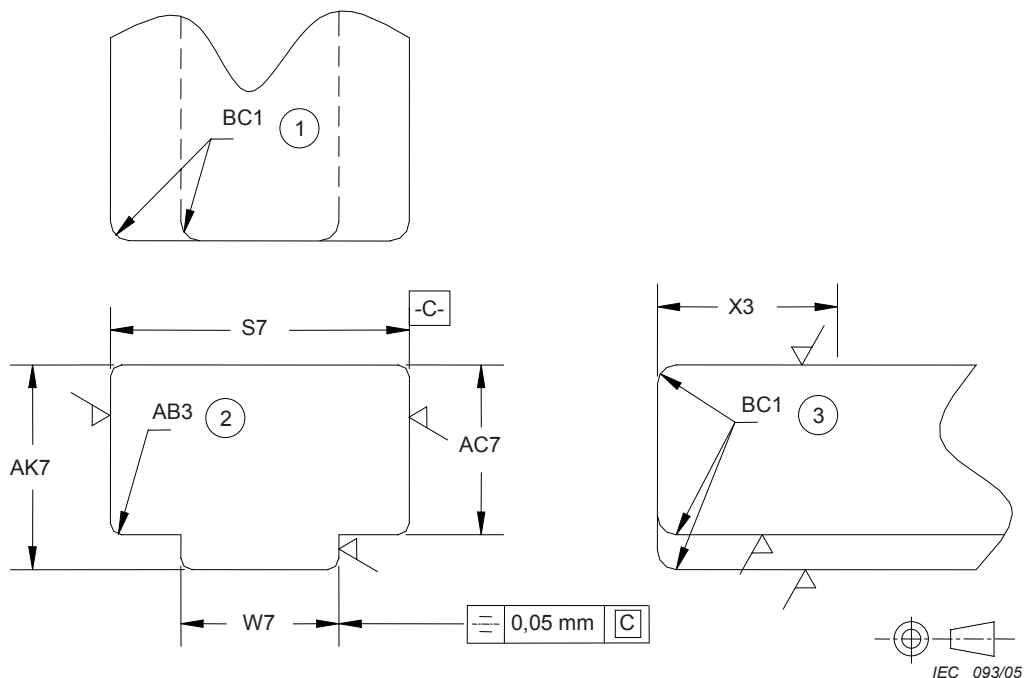


NOTE 1 Four places.

NOTE 2 Six places.

NOTE 3 All around.

Figure 8 – “No-go” gauge width



NOTE 1 Four places

NOTE 2 Six places

NOTE 3 All around.

Figure 9 – “No-go” gauge height