

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Connectors for electronic equipment –
Part 7-1: Detail specification for 8-way, shielded, free and fixed connectors**

**Connecteurs pour équipements électroniques –
Partie 7-1: Spécification particulière pour les fiches et les embases blindés à
8 voies**



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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 General.....	7
2 Terms and definitions.....	7
3 Common features and isometric view.....	8
3.1 Isometric view.....	8
3.2 Mating information.....	8
3.2.1 General.....	8
3.2.2 Fixed connector.....	9
3.2.3 Free connector.....	10
4 Cable terminations and internal connections – Fixed and free connectors.....	11
4.1 Internal connections.....	11
4.2 Cable termination.....	11
5 Gauges.....	11
6 Characteristics.....	11
6.1 General.....	11
6.2 Pin and pair grouping assignment.....	11
6.3 Classification into climatic category.....	11
6.4 Electrical characteristics.....	12
6.4.1 Creepage and clearance distances.....	12
6.4.2 Voltage proof.....	12
6.4.3 Current-carrying capacity.....	12
6.4.4 Initial contact resistance – interface only (between separable fixed and free connectors).....	12
6.4.5 Input to output d.c. resistance.....	12
6.4.6 Initial insulation resistance.....	13
6.4.7 Transfer impedance.....	13
6.4.8 Coupling attenuation.....	13
6.5 Mechanical.....	13
6.5.1 Mechanical operation.....	13
6.5.2 Insertion and withdrawal forces.....	13
7 Tests and test schedule.....	13
7.1 General.....	13
7.2 Arrangement for contact resistance tests.....	14
7.3 Arrangement for vibration tests.....	14
7.4 Test procedures and measuring methods.....	14
7.5 Preconditioning.....	14
7.6 Wiring and mounting of specimens.....	14
7.6.1 Wiring.....	14
7.6.2 Mounting.....	14
7.7 Test schedules.....	14
7.7.1 Basic (minimum) test schedule.....	14
7.7.2 Full test schedule.....	14
Annex A (normative) Gauging continuity test.....	21
Bibliography.....	25

Figure 1 – IEC 60603-7 document structure	6
Figure 2 – Isometric view	8
Figure 3 – Fixed connector details	9
Figure 4 – Free connector view	10
Figure A.1 – Gauge	23
Figure A.2 – Gauge insertion	24
Table 1 – Dimensions for Figure 3	10
Table 2 – Dimensions for Figure 4	11
Table 3 – Creepage and clearance distances	12
Table 4 – Test group P	15
Table 5 – Test group AP	16
Table 6 – Test group BP	17
Table 7 – Test group CP	18
Table 8 – Test group DP	19
Table 9 – Test group GP	20
Table A.1 – Dimensions for Figure A.1	22

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CONNECTORS FOR ELECTRONIC EQUIPMENT –**Part 7-1: Detail specification for 8-way, shielded,
free and fixed connectors**

FOREWORD

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International Standard IEC 60603-7-1 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This second edition cancels and replaces the first edition published in 2002. This edition constitutes a technical revision.

This edition included the following significant technical changes with respect to the previous edition:

- 1) The basic connector dimensions were removed from the edition 1 standard and referenced to IEC 60603-7.
- 2) Several other subclauses were removed (e.g. 4.1, 5, 6.1, 6.2) from the edition 1 standard and referenced to IEC 60603-7.
- 3) The electrical characteristics, subclause 6.4, was revised.
- 4) The test schedules were revised.

The text of this standard is based on the following documents:

FDIS	Report on voting
48B/2004/FDIS	48B/2038/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 60603 series, under the general title *Connectors for electronic equipment*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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INTRODUCTION

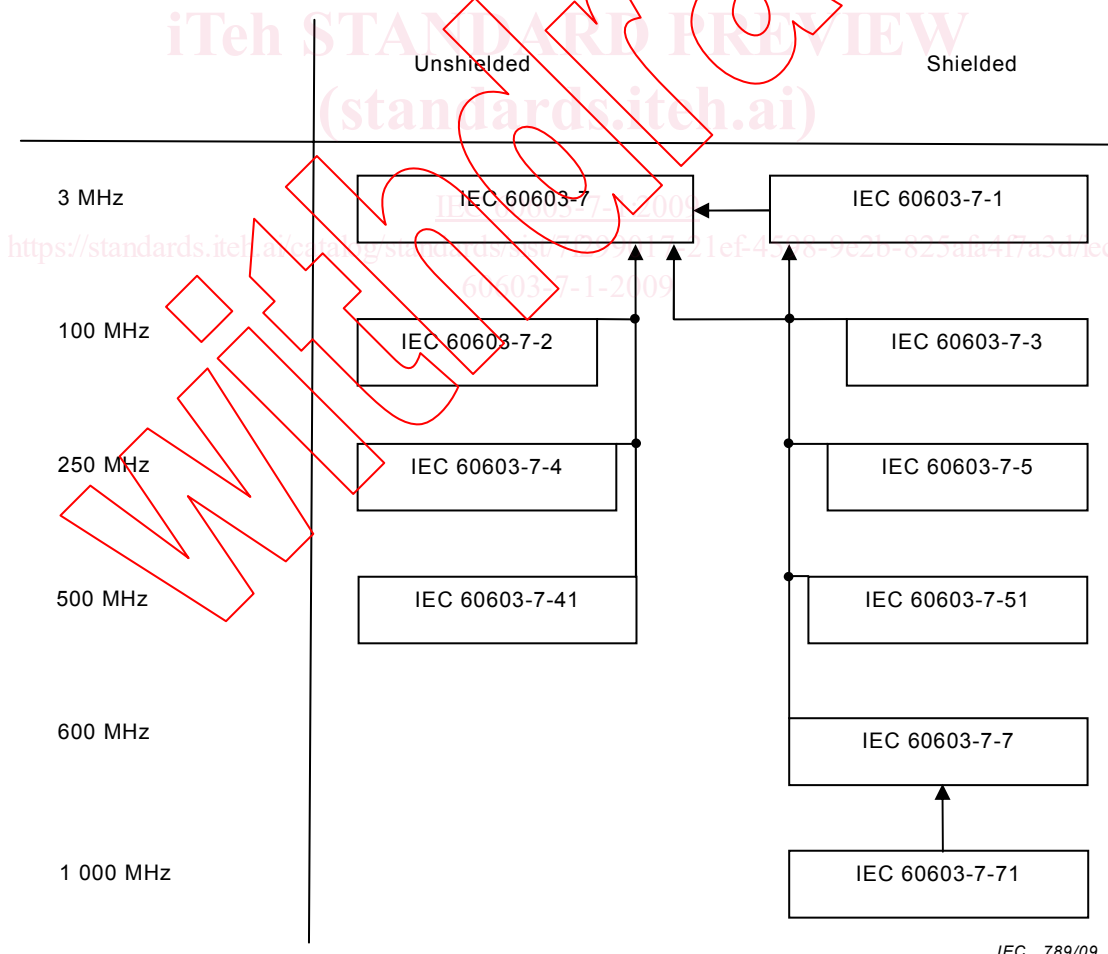
Applications have emerged which require the use of the interface described in IEC 60603-7 with certain performance specifications at higher frequencies. Therefore, a series of detail specifications have been issued the past few years in support of these new applications. In order to improve readability and ease of maintenance, IEC Subcommittee 48B (SC 48B) decided to rearrange and restructure these existing documents.

This part of IEC 60603-7 contains only the necessary information regarding the shield of the connection and is designed to be used as a base document for all shielded connectors in the IEC 60603-7 series.

For further information regarding the IEC 60603-7 style connection, reference to the unshielded base document IEC 60603-7 is made.

IEC 60603-7 is the base specification of the whole series. Subsequent specifications do not duplicate information given in the base document, but list only additional requirements. For a complete specification regarding a component of a higher number document, all lower numbered documents are also to be considered.

The following illustration shows the IEC 60603-7 document structure:



IEC 789/09

Figure 1 – IEC 60603-7 document structure

CONNECTORS FOR ELECTRONIC EQUIPMENT –

Part 7-1: Detail specification for 8-way, shielded, free and fixed connectors

1 General

1.1 Scope

This part of IEC 60603-7 covers 8-way shielded free and fixed connectors. It specifies the dimensions, mechanical, electrical and environmental characteristics and tests, in relation to the shield, additional to those in IEC 60603-7.

These connectors are intermateable and interoperable with other IEC 60603-7 series connectors as defined in IEC 60603-7.

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

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 electronic equipment*

IEC 60603-7:2008, *Connectors for electronic equipment – Part 7: Detail specification for 8-way, unshielded, free and fixed connectors*

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

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*

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

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 Terms and definitions

See IEC 60603-7 Clause 2 for terms and definitions.

3 Common features and isometric view

3.1 Isometric view

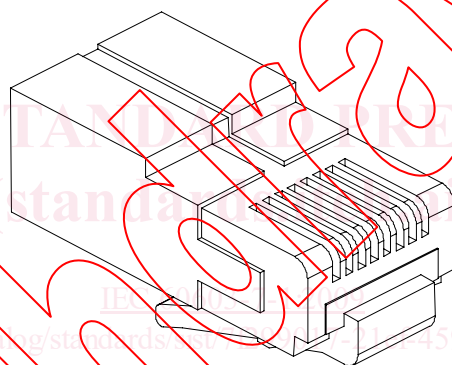
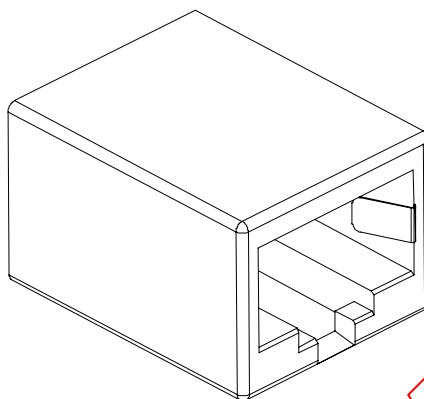


Figure 2 – Isometric view

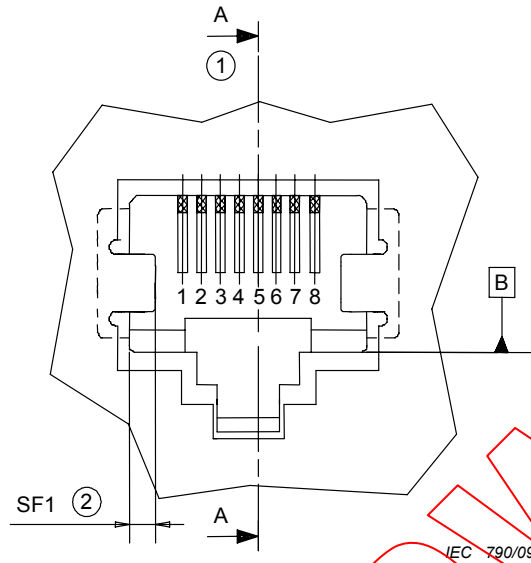
3.2 Mating information

3.2.1 General

Dimensions are given in millimetres. Drawings are shown in third-angle projections. The shape of connectors may deviate from those shapes given in Figures 2 to 4 as long as the dimensions specified are not influenced.

The overall dimensions and the design of the signal contacts of connectors according IEC 60603-7-1 shall conform to all relevant requirements specified by IEC 60603-7.

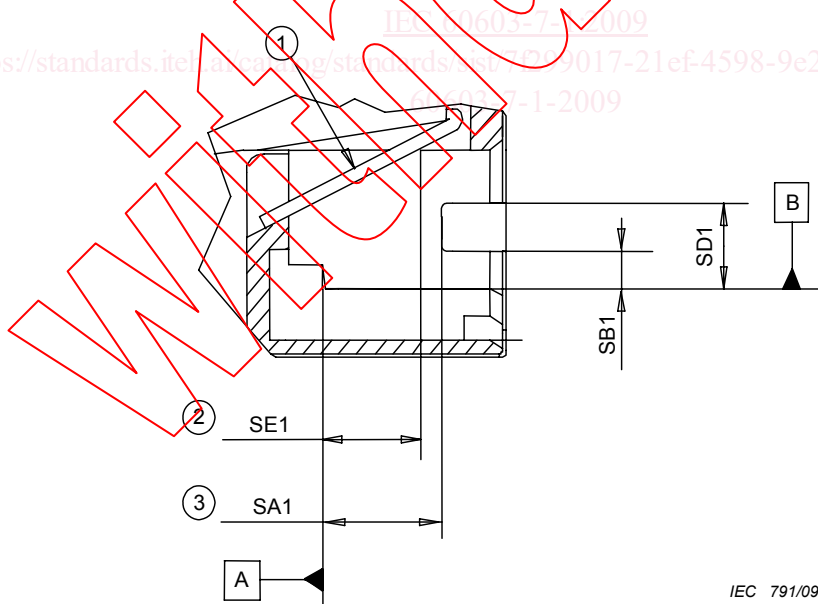
3.2.2 Fixed connector



Key

- 1 Section A-A: see Figure 3b).
- 2 Distance between wall of the fixed connector and the contact area of the shield contact SF1 applies on both sides of the connector.

Figure 3a) - View of contact zone



Key

- 1 Contacts shown at rest.
- 2 Maximum forward extension of contacts below surface AC1 (see IEC 60603-7) to avoid contact with shields of free connectors. Applies in the mated state.
- 3 Dimension to point of shield mating contact.

Figure 3b) - View of contact zone, section A-A

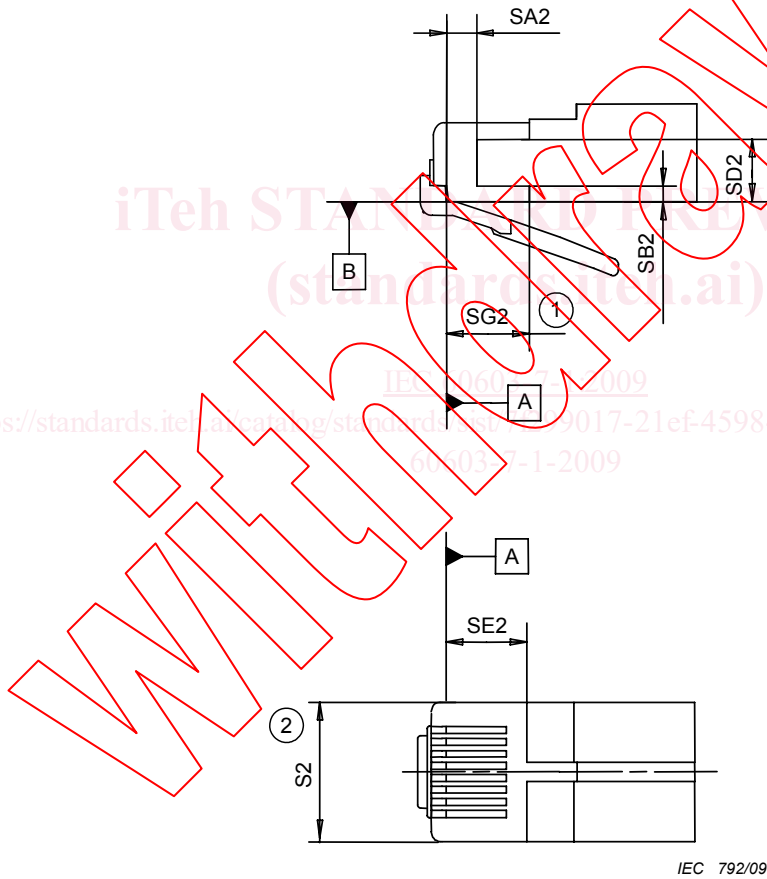
Figure 3 - Fixed connector details

Table 1 – Dimensions for Figure 3

Letter	Maximum mm	Minimum mm	Nominal (ref) mm
SA1		5,31	
SB1		2,16	
SD1	4,90		
SE1	5,80		
SF1		a	

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

3.2.3 Free connector



Key

- 1 SG2 refers to foremost extension of the shield at the bottom of the plug.
- 2 The dimension S2 (see IEC 60603-7) applies to both plastic housing and shield.

Figure 4 – Free connector view

Table 2 – Dimensions for Figure 4

Letter	Maximum mm	Minimum mm	Nominal (ref) mm
SA2	4,22		
SB2	1,66		
SD2		4,95	
SE2		6,85	
SG2		1,50 ^a	

a) When this dimension is less than 6,85 mm and the free connector is mated with a IEC 60603-7-7 fixed connector, utilising switch option 1, there is a possibility that signal conductors 3,4,5,6 of the fixed connector may make contact with the shield of this free connector.

4 Cable terminations and internal connections – Fixed and free connectors

4.1 Internal connections

Internal connections of the shield shall conform to Clause 4 of IEC 60603-7.

4.2 Cable termination

The connector shall be compliant with the full test schedule in 7.7.2 for all possible variations of terminations, for example each cable screen construction type the connector is intended to be used for.

5 Gauges

There are no shield specific gauges for IEC 60603-7-1 connectors. For overall dimensions, the gauges as defined by Clause 5 of IEC 60603-7 shall apply.

6 Characteristics

6.1 General

Compliance to the test schedules is intended to ensure the reliability of all performance parameters, over the range of operating climatic conditions. Stable and compliant contact resistance is a good indication of the stability of shield performance.

The characteristics of the signal contacts of connectors according IEC 60603-7-1 shall conform to all relevant requirements specified by IEC 60603-7.

6.2 Pin and pair grouping assignment

The pin and pair grouping assignment of 6.2 of IEC 60603-7 applies.

6.3 Classification into climatic category

Connectors according to IEC 60603-7-1 are classified in the same climatic categories as defined by IEC 60603-7.

6.4 Electrical characteristics

6.4.1 Creepage and clearance distances

Insulation coordination is not required for this connector; therefore, the creepage and clearance distances in IEC 60664-1 are reduced and covered by overall performance requirements.

Therefore, the creepage and clearance distances are given as operating characteristics of mated connectors.

In practice, reductions in creepage or clearance distances may occur due to the conductive pattern of the printed board or the wiring used, and shall duly be taken into account.

Table 3 – Creepage and clearance distances

Minimum distance between contacts and shield or chassis	
Creepage mm	Clearance mm
1,40	0,51

6.4.2 Voltage proof

Conditions:

IEC 60512, Test 4a, Method A

Standard atmospheric conditions

Mated connectors

All variants: 1 500 V d.c. or a.c. peak, contact to shield and test panel

6.4.3 Current-carrying capacity

The current carrying capacity of the screen shall be two times the current carrying capacity of the signal contacts as specified by IEC 60603-7 Clause 6.

6.4.4 Initial contact resistance – interface only (between separable fixed and free connectors)

Conditions:

IEC 60512, Test 2a

Mated connectors

Shield contact: 20 mΩ maximum

6.4.5 Input to output d.c. resistance

Conditions:

IEC 60512, Test 2a

Mated connectors

Connection points: Cable termination to cable termination

Shield: 100 mΩ maximum

6.4.6 Initial insulation resistance

Conditions:

IEC 60512, Test 3a

Method A

Mated connectors

Test voltage: 100 V d.c.

Between all signal contact together and shield: 500 M Ω minimum

6.4.7 Transfer impedance

Conditions:

IEC 60512-26-100, Test 26e

Mated connectors, terminated with each cable construction intended to be allowed for these connectors

All types: $\leq 0,1f^{0,3} \Omega$ from 1 MHz to 10 MHz

$\leq 0,02f \Omega$ from 10 MHz to 80 MHz

where f is the frequency in MHz

6.4.8 Coupling attenuation

Conditions:

According to EN 50289-1-14

Mated connectors

All types: ≥ 45 dB from 30 MHz to 100 MHz

$\geq 85 - 20\log(f)$ dB from 100 MHz to 1 000 MHz

where f is the frequency in MHz

NOTE Coupling attenuation is assumed to be fulfilled when transverse conversion loss and transverse conversion transfer loss are met on the full bandwidth.

6.5 Mechanical

6.5.1 Mechanical operation

The mechanical operation specification of 6.6 of IEC 60603-7 applies.

6.5.2 Insertion and withdrawal forces

Conditions:

IEC 60512, Test 13b

Speed: 10 mm/s maximum

All types, insertion and withdrawal: 30 N maximum

7 Tests and test schedule

7.1 General

See 7.1 of IEC 60603-7.