IEC 61076-3-106

Edition 2.0 2023-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Connectors for electrical and electronic equipment – Product requirements – Part 3-106: Rectangular connectors – Detail specification for protective housings for use with 8-way shielded and unshielded connectors for industrial environments incorporating the IEC 60603-7 series interface

Connecteurs pour équipements électriques et électroniques – Exigences de produit – Partie 3-106: Connecteurs rectangulaires – Spécification particulière pour boîtiers de protection utilisés avec des connecteurs blindés et non blindés 8 voies pour des environnements industriels incorporant l'interface série IEC 60603-7

IEC 61076-3-106:2023-07(en-fr)

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IEC 61076-3-106 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment. It is an International Standard.

This second edition cancels and replaces the first edition published in 2006. This edition constitutes a technical revision.

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

a) improvement of drawings and addition of dimensions.

The text of this International Standard is based on the following documents:

Draft	Report on voting
48B/3034/FDIS	48B/3045/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61076 series, published under the general title *Connectors for electrical and electronic equipment – Product requirements*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

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- withdrawn,
- replaced by a revised edition, or
- amended.

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INTRODUCTION

This document, originally issued in 2006 and including 10 variants, describes now 5 variants of connector housing with different geometries (rectangular or circular) and locking systems (locking lever, snap-in, bayonet coupling) suitable for all the connector interfaces of the IEC 60603-7 series, either shielded or unshielded.

The purpose of this set of variants, now reduced to reflect their market relevance, is to provide several competing ways to upgrade the degree of protection of the resulting data transmission connectors, to IP65/IP67, mainly in view of their use in industrial environments, while maintaining all the original performance of the housed IEC 60603-7 compliant connectors, which can be of different source than these 5 variants of connector housings.

Each variant may be available on the market by multiple sources and based on different materials (i.e. either metallic or thermoplastic insulating, particularly for the main part of the housing, but also regarding the locking means) to suit the needs of various industrial applications.

Some of these variants have been endorsed by other IEC technical committees and/or by external consortia as the reference interface for specific applications.

Being the basic interface of series IEC 60603-7 a rectangular one, this standard document was originally issued as a Part 106 detail product specifications under the IEC 61076-3 sectional specification covering rectangular connectors for electrical and electronic equipment, although half of the original variants described in this document (variants 01, 03, 08, 09 and 10), currently only variant 01 is included in this document – own a circular connector interface, all the variants having nonetheless in common the purpose to upgrade the IP degree of protection to IP65/IP67, and the incorporated IEC 60603-7 series connector interface.

NOTE It is worthwhile to inform users of this document that further variants 11 through 14 referring this document were successively published from 2007 to 2009 as IEC 61076-3-114 trough IEC 61076-3-117. Among these variants, for which reference should be made to the relevant publication (see Bibliography), variants 11 and 12 have circular geometry, while variants 13 and 14 have square (rectangular geometry).

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 3-106: Rectangular connectors – Detail specification for protective housings for use with 8-way shielded and unshielded connectors for industrial environments incorporating the IEC 60603-7 series interface

1 Scope

This part of IEC 61076 constitutes a detail product specification for 8-way connectors for data transmission with frequencies up to 600 MHz.

It covers protective housings for upgrading existing 8-way shielded and unshielded connectors utilizing the interface described in the IEC 60603-7 series to IP65/IP67 rating according to IEC 60529, for use in industrial environments.

The housings cover a variety of different locking mechanisms according to this document and a variety of different mounting configurations and termination types which are detailed in the IEC 60603-7 series.

Common mating configurations for all variants are defined in IEC 60603-7. The mating dimensions for the housings under Clause 3 allow the mating conditions under IEC 60603-7 to be fulfilled.

The fully assembled variants (connectors) described in this document incorporate fully compliant IEC 60603-7 series fixed and free connectors.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12 h cycle)*

IEC 60512-1-1, *Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination*

IEC 60512-1-2, *Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass*

IEC 60512-2-1:2002, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-2-5, *Connectors for electronic equipment – Tests and measurements – Part 2-5: Electrical continuity and contact resistance tests – Test 2e: Contact disturbance*

IEC 60512-3-1:2002, *Connectors for electronic equipment – Tests and measurements – Part 3-1: Insulation tests – Test 3a: Insulation resistance*

IEC 60512-4-1:2003, *Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof*

IEC 60512-6-3, *Connectors for electronic equipment – Tests and measurements – Part 6-3: Dynamic stress tests – Test 6c: Shock*

IEC 60512-6-4, *Connectors for electronic equipment – Tests and measurements – Part 6-4: Dynamic stress tests – Test 6d: Vibration (sinusoidal)*

IEC 60512-8-1:2010, *Connectors for electronic equipment – Tests and measurements – Part 8-1: Static load tests (fixed connectors) – Test 8a: Static load, transverse*

IEC 60512-9-1:2010, *Connectors for electronic equipment – Tests and measurements – Part 9-1: Endurance tests – Test 9a: Mechanical operation*

IEC 60512-11-3, *Connectors for electronic equipment – Tests and measurements – Part 11-3: Climatic tests – Test 11c: Damp heat, steady state*

IEC 60512-11-4, *Connectors for electronic equipment – Tests and measurements – Part 11-4: Climatic tests – Test 11d: Rapid change of temperature*

IEC 60512-13-1:2006 *Connectors for electronic equipment – Tests and measurements – Part 13-1: Mechanical operation tests – Test 13a: Engaging and separating forces*

IEC 60512-13-5, *Connectors for electronic equipment – Tests and measurements – Part 13-5: Mechanical operation tests – Test 13e: Polarizing and keying method*

IEC 60512-15-6:2008*, Connectors for electronic equipment – Tests and measurements – Part 15-6: Connector tests (mechanical) – Test 15f: Effectiveness of connector coupling devices*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

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

IEC 60603-7-1, *Connectors for electronic equipment – Part 7-1: Detail specification for 8-way, shielded, free and fixed connectors*

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

IEC 61076-1:2006, *Connectors for electronic equipment – Product requirements – Part 1: Generic specification*

IEC 61156-2, *Multicore and symmetrical pair/quad cables for digital communications – Part 2: Symmetrical pair/quad cables with transmission characteristics up to 100 MHz – Horizontal floor wiring – Sectional specification*

IEC 61156-3, *Multicore and symmetrical pair/quad cables for digital communications – Part 3: Work area cable – Sectional specification*

IEC 61156-4, *Multicore and symmetrical pair/quad cables for digital communications – Part 4: Riser cables – Sectional specification*

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

4 Dimensional information

4.1 Common features

The industrial connectors described in this document are composed of IEC 60603-7 style fixed and free connectors, either shielded or unshielded, housed in unique, industrial rated connector hood (shell) or housing.

NOTE Usually, an adapter is also employed to fit the IEC 60603-7 fixed or free connector in the relevant connector hood (shell) or housing.

The mating information and contact requirements of the IEC 60603-7 interface portion of these industrial connectors shall be compliant with the appropriate clauses of the relevant part of the IEC 60603-7 series.

The following requirements apply to the complete connector comprised of both the free and fixed connectors in one of the described variant shells/outer housing.

4.2 General

Dimensions are given in millimeters, drawings are shown in first/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.

4.3 Contact arrangement of all connector types

Contact arrangements shall be in accordance with the relevant parts of IEC 60603-7.

4.4 IP65/IP67 sealing

Connectors meant to comply with IP ratings per IEC 60529 require sealing of the components in order to meet the requirements detailed in the test schedules in 7.8.

4.5 Industrial IEC 60603-7 variant 01 – bayonet coupling

4.5.1 Industrial IEC 60603-7 variant 01, fixed connector

Figure 1 shows a fixed connector with female contacts and Table 1 shows the related dimensions.

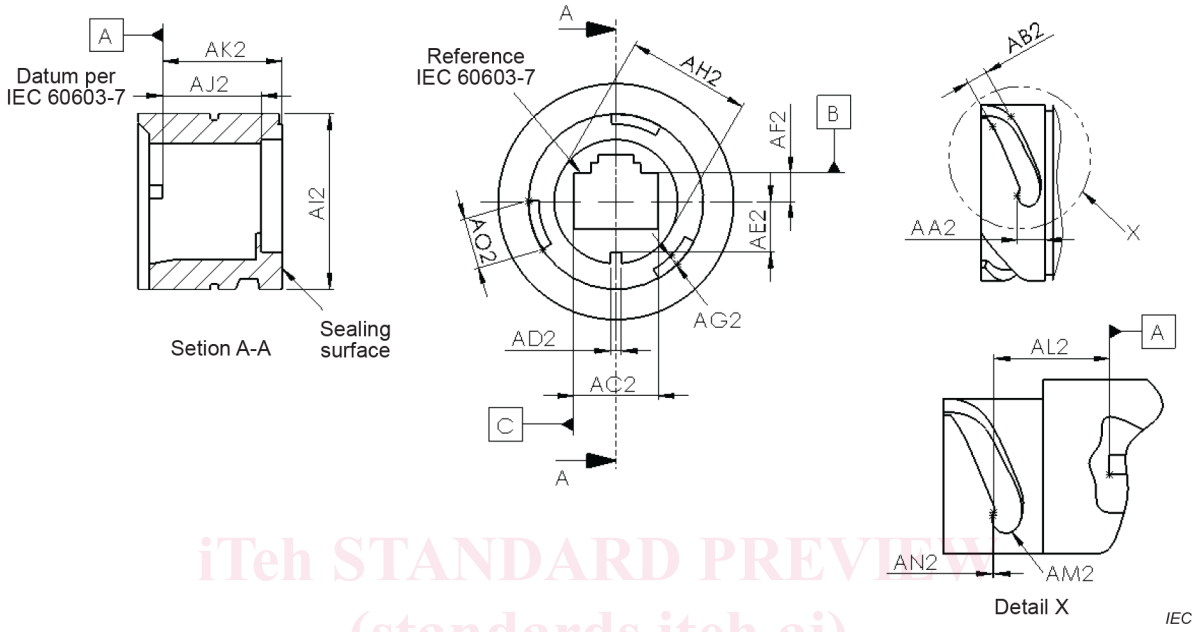

Figure 1 – Variant 01, fixed connector

Table 1 – Dimensions for fixed connector variant 01

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
AA2	5,46	-	-
AB2	2,74	3,15	3,56
AC2	11,78	11,91	12,03
AD2	1,40	1,52	1,65
AE2	6,68	6,90	7,11
AF2	3,88	4,01	4,14
AG2	1,35	1,47	1,57
AH2	17,3	17,45	17,6
AI2	24,46	24,55	24,64
AJ2	-	-	10,69
AK2	13,33	13,46	13,58
AL2	8,25	8,38	8,50
AM2	2,75	2,95	3,15
AN2	0,152	0,229	0,304
AO2	7,62	-	-

4.5.2 Industrial IEC 60603-7 variant 01, free connector

Figure 2 shows a free connector with male contacts and Table 2 shows the related dimensions.

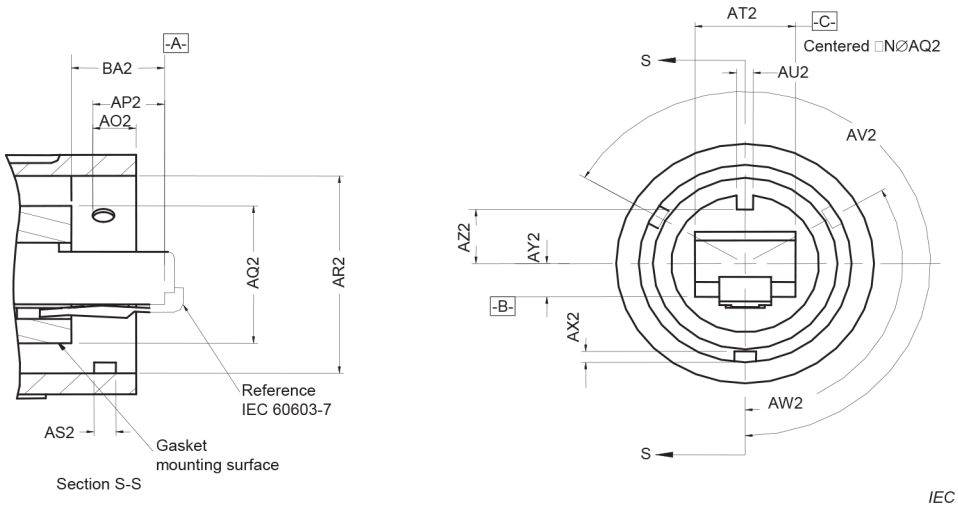

Figure 2 – Variant 01, free connector

Table 2 – Dimensions for free connector variant 01

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
AO2	-	-	5,08
AP2	7,85	7,98	8,1
AQ2	16,8	16,94	17,1
AR2	24,74	24,87	25,0
AS2	2,49	2,54	2,59
AT2	11,58	11,68	11,78
AU2	1,75	2,01	2,25
AX2	1,04	1,17	1,30
AY2	3,89	4,01	4,14
AZ2	6,35	6,48	6,60
BA2	10,19	-	-
AV2	239°	-	241°
AW2	119°	-	121°
NOTE AT2 centred on AQ2.			

4.5.3 Mounting information for variant 01, fixed connector

4.5.3.1 General

There are two types of mounting dimensions for variant 01.

4.5.3.2 Mounting style 1 for variant 01

Figure 3 shows the mounting and Table 3 shows the related dimensions.

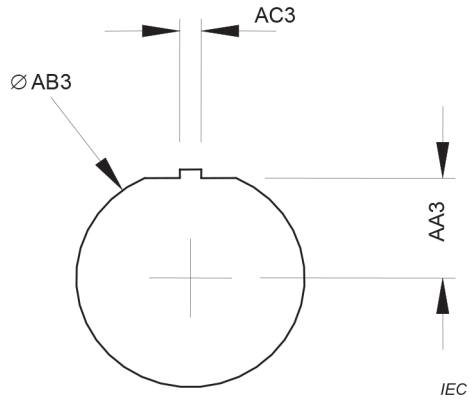

Figure 3 – Variant 01, style 1 mounting drawing

Table 3 – Variant 01, style 1 mounting information

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
AA3	12,34	12,56	12,77
AB3	26,92	27,41	27,89
AC3	2,49	2,55	2,69

4.5.3.3 Mounting style 2 for variant 01

Figure 4 shows the mounting and Table 4 shows the related dimensions.

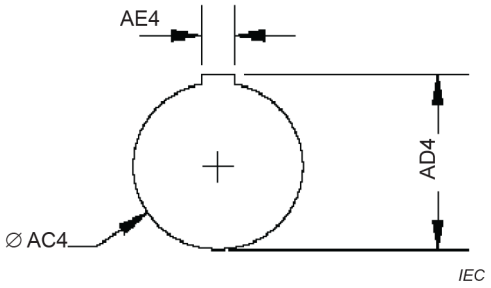

Figure 4 – Variant 01, style 2 mounting drawing

Table 4 – Variant 01, style 2 mounting information

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
AC4	-	30,55	-
AD4	-	32,26	-
AE4	-	4,37	-