

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Connectors for electronic equipment – Product requirements –
Part 3-117: 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 – Variant 14 related
to IEC 61076-3-106 – Push-pull coupling**

**Connecteurs pour équipements électroniques – Exigences de produit –
Partie 3-117: Connecteurs rectangulaires – Spécification particulière pour
boîtiers de protection utilisés avec des connecteurs blindés et non blindés à
8 voies dans des environnements industriels incorporant l'interface série
CEI 60603-7 – Variante 14 liée à la CEI 61076-3-106 – Type d'accouplement
pousser-tirer**



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRONIC EQUIPMENT –
PRODUCT REQUIREMENTS –****Part 3-117: 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 –
Variant 14 related to IEC 61076-3-106 –
Push-pull coupling**

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International Standard IEC 61076-3-117 has been prepared by subcommittee 48B: Connectors, of IEC technical committee 48: Electromechanical components and mechanical structures for electronic equipment.

This International Standard cancels and replaces IEC/PAS 61076-3-117 (2006).

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

FDIS	Report on voting
48B/1996/FDIS	48B/2014/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 IEC 61076 series, under the general title *Connectors for electronic equipment – Product requirements*, 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

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- withdrawn,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

CONNECTORS FOR ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 3-117: 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 – Variant 14 related to IEC 61076-3-106 – Push-pull coupling

1 Scope

This part of IEC 61076 covers rectangular protective housings with push-pull coupling for upgrading existing 8-way shielded and unshielded connectors utilizing the interface described in IEC 60603-7-2, IEC 60603-7-3, IEC 60603-7-4, IEC 60603-7-41, IEC 60603-7-5, IEC 60603-7-51, IEC 60603-7-7 and IEC 60603-7-71 to IP65 and IP67 ratings according to IEC 60529, for use in industrial environments.

Common mating configurations for all variants of the 8-way shielded and unshielded connectors 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.

This standard covers a further variant of IEC 61076-3-106 housing known as variant 14.

The fully assembled variant 14 connectors described in this document incorporate fixed and free connectors which are fully compliant with the relevant part of IEC 60603-7.

2 General data

2.1 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 60050-581:2008, *International Electrotechnical Vocabulary (IEV) – Part 581: Electro-mechanical components for electronic equipment*

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

IEC 60603-7 (all parts), *Connectors for electronic equipment*

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

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

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

2.2 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581 apply.

3 Dimensional information

3.1 Common features

The industrial connectors referenced in this specification are composed of IEC 60603-7 style fixed and free connectors housed in unique, industrial rated interfaces. The mating information and contact requirements of the 60603-7 interface portion of these industrial connectors shall be compliant with the relevant part of IEC 60603-7.

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

3.2 General

Dimensions are given in millimetres, drawings are shown in first 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.

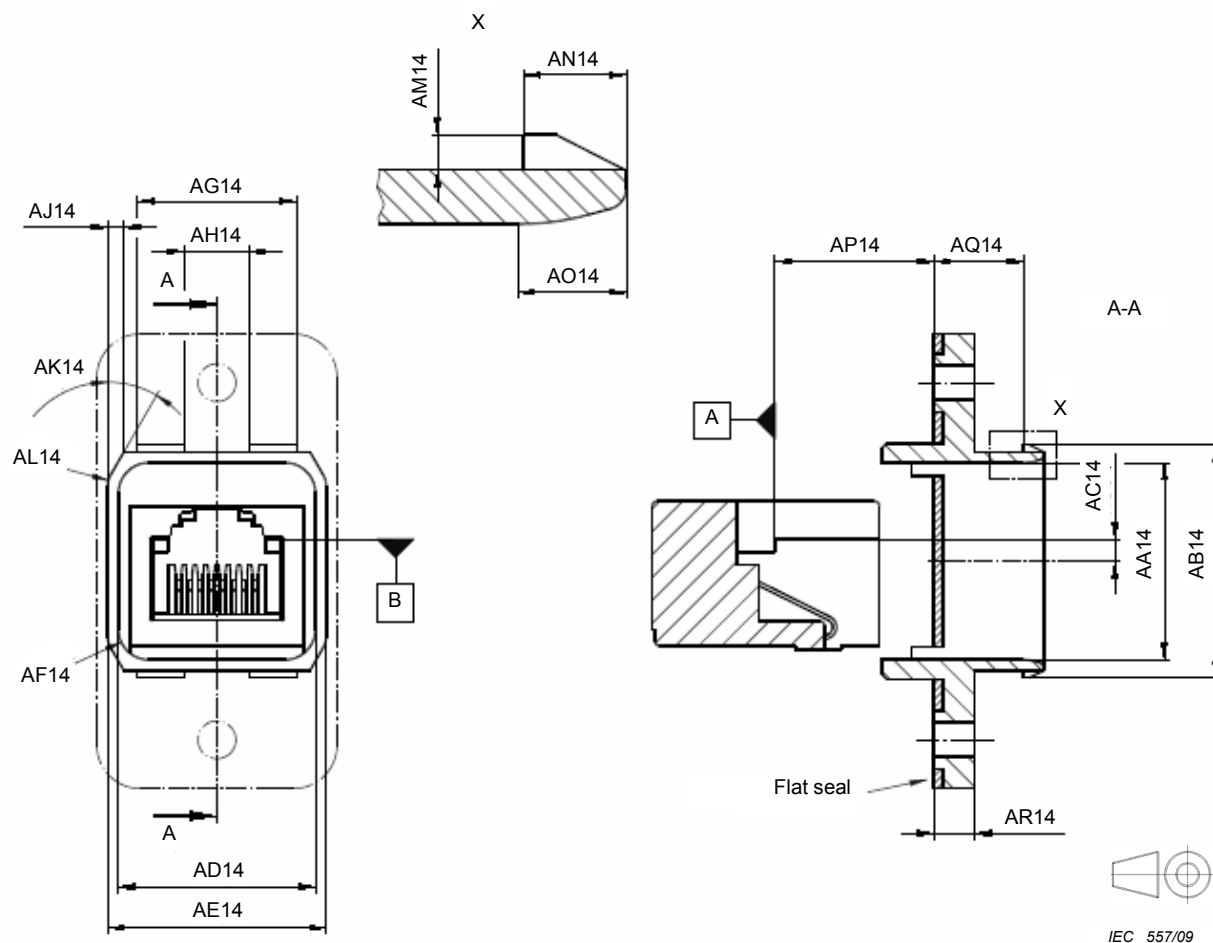
3.3 Contact arrangement of all connector types

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

3.4 IP65 and 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 6.8.3 through 6.8.8.

3.5 Dimensions, fixed connector



NOTE Fixing hole shall be sufficient for screw M3, see also Figure 3.

Figure 1 – Fixed connector

Table 1 – Dimensions, fixed connector

Letter	Maximum mm	Minimum mm	Nominal mm
AA14	18,23	18,17	18,2
AB14	21,55	21,45	21,5
AC14	2,11	1,99	2,05
AD14	18,23	18,17	18,2
AE14	20,3	20,1	20,2
AF14	2,83	2,77	2,8
AG14	14,85	14,75	14,8
AH14	6,05	5,95	6
AJ14	1,7	1,3	1,5
AK14	31	29	30
AL14	2,1	1,9	2
AM14	0,7	0,6	0,65
AN14	1,95	1,85	1,9
AO14	2,1	1,9	2
AP14	14,85	14,45	14,65
AQ14	8,35	8,25	8,3
AR14	3,9	3,7	3,8

3.6 Dimensions, free connector

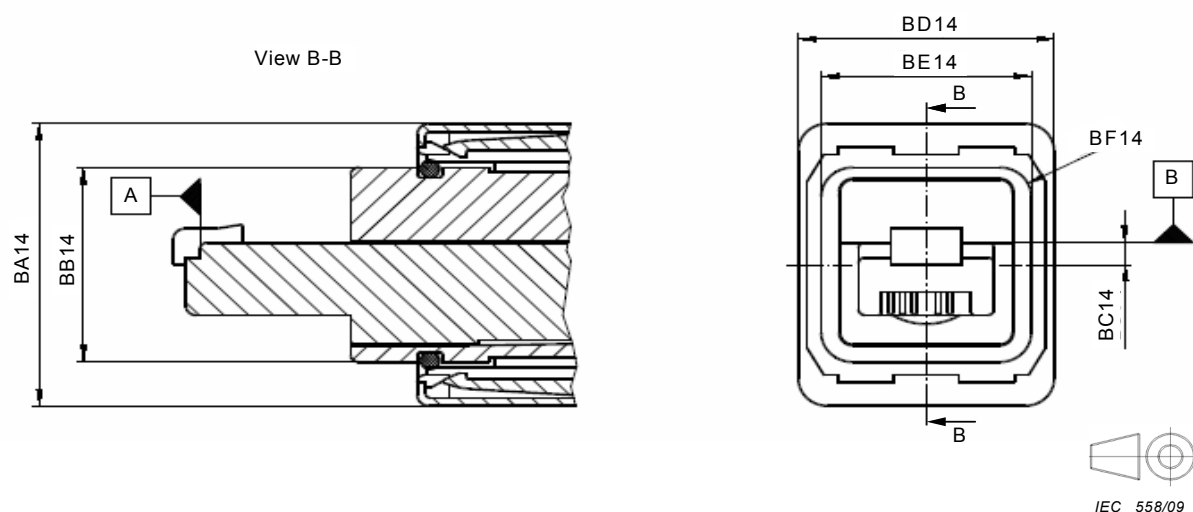


Figure 2 – Free connector

Table 2 – Dimensions, free connector

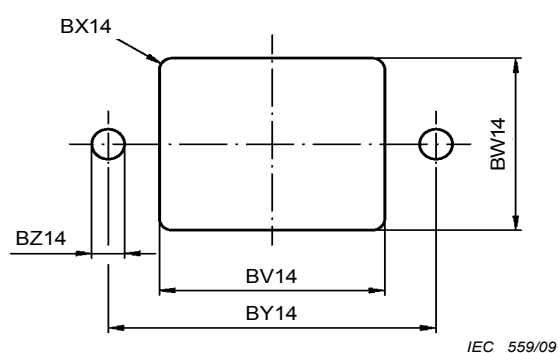
Letter	Maximum mm	Minimum mm	Nominal mm
BA14	29	-	-
BB14	18,09	18,03	18,06
BC14	2,11	1,99	2,05
BD14	22,8	-	-
BE14	18,09	18,03	18,06
BF14	2,73	2,67	2,7

3.7 Termination and mounting information

3.7.1 General

Terminations shall be in accordance with the relevant IEC 60603-7 specification.

3.7.2 Mounting information for fixed connector



NOTE Instead of BZ14 as thread M3, unthreaded holes are also allowed.

Figure 3 – Mounting information – panel cut-out outline

Table 3 – Mounting information

Letter	Maximum mm	Minimum mm	Nominal mm
BV14		21,95	
BW14		18,35	
BX14	R 1,25	-	-
BY14	33,1	32,9	33
BZ14	-	-	M3

4 Gauges

4.1 Connectors, IEC 60603-7 interface

Refer to the relevant part of IEC 60603-7.

5 Characteristics

5.1 Climatic category

The lowest and highest temperatures and the duration of the damp heat, steady state test should be selected from the preferred values stated in 2.3 of IEC 61076-1 and shall not exceed the values defined in the relevant part of IEC 60603-7.

The following preferred temperature range and severity of the damp heat steady state test categories have been selected to comply with IEC 61156.

Table 4 – Climatic categories – selected values for environmental performance level A

Climatic category	Lower temperature °C	Upper temperature °C	Damp heat steady state (days)
40/70/21	–40	70	21

5.2 Electrical characteristics

5.2.1 Clearance and creepage distances

The permissible operating voltages depend on the application and on the applicable or specified safety requirements.

Insulation co-ordination 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 5 – Clearance and creepage distances

Distance between contacts and shield		Minimum distance between adjacent contacts	
Creepage	Clearance	Creepage	Clearance
mm	mm	mm	mm
1,40	0,51	0,36	0,36

The electrical characteristics are specified in the relevant part of IEC 60603-7.

5.2.2 Voltage proof

Conditions:

IEC 60512, Test 4a, Method A.

Standard atmospheric conditions.

Mated connectors.

All variants: 1 000 V d.c. or a.c. peak, contact-to-contact

1 500 V d.c. or a.c. peak, contact to shield.

5.2.3 Current-carrying capacity

Refer to the relevant part of IEC 60603-7.

5.2.4 Mating cycles with power applied

Any performance requirements as to the number of mating cycles under electric load shall be agreed between the manufacturer and customer.

NOTE For guidance and support when applying un-mating under load, see also IEC 60512-9-3.

5.2.5 Initial contact resistance

Conditions: IEC 60512, Test 2a.

Mated connectors.

Measurement points: as specified in the relevant clause of IEC 60603-7.

Signal contacts: 20 mΩ max.

Shield contact (if any): 20 mΩ max.

5.2.6 Input to output resistance

Conditions: IEC 60512, Test 2a.

Mated connectors.

Signal contacts: 200 mΩ maximum.

Shield (if any): 100 mΩ maximum.

5.2.7 Resistance unbalance

Conditions: IEC 60512, Test 2a.

Mated connectors.

Among all conductor, difference between maximum and minimum:

100 mΩ max.