IEC 61076-3-119

Edition 1.0 2017-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Connectors for electrical and electronic equipment – Product requirements – Part 3-119: Rectangular connectors – Detail specification for shielded and unshielded, free and fixed 10-way connectors with push-pull coupling for industrial environments for data transmission with frequencies up to 100 MHz

Connecteurs pour équipements électriques et électroniques – Exigences de produit – Partie 3-119: Connecteurs rectangulaires – Spécification particulière pour les fiches et les embases rectangulaires écrantées et non écrantées à 10 pôles, à accouplement pousser-tirer, destinées à être utilisées dans des environnements industriels, pour les transmissions de données avec des fréquences allant jusqu'à 100 MHz

IEC 61076-3-119:2017-12(en-fr)

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International Standard IEC 61076-3-119 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

This first edition cancels and replaces IEC PAS 61076-3-119 published in 2013. This edition constitutes a technical revision.

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

FDIS	Report on voting
48B/2602/FDIS	48B/2617/RVD

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

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

A list of all parts in the IEC 61076 series, published 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 document will remain unchanged until the stability date indicated on the IEC website under "http://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- withdrawn,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.

INTRODUCTION

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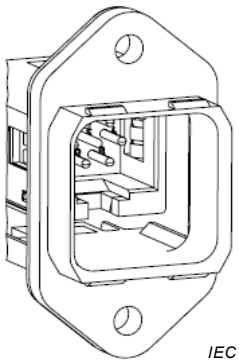
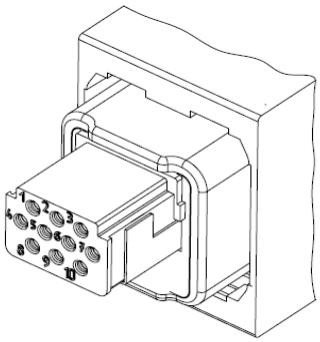
<table>
<tr><td colspan="2">IEC SC 48B – Connector specifications available from:
IEC General secretariat
or from the addresses shown on the inside cover.</td><td>IEC 61076-3-119 Ed. 1.0</td></tr>
<tr><td colspan="2">ELECTRONIC COMPONENTS
DETAIL SPECIFICATION in accordance with
IEC 61076-1</td><td></td></tr>
<tr><td>Outline drawing
 
IEC</td><td> 
IEC</td><td>10-way rectangular connector
round contacts Ø 1 mm
screw or crimp terminations, solder or printed board connections upon agreement between manufacturer and user
shielded and unshielded, free and fixed
for data transmission with frequencies up to 100 MHz
with push-pull coupling</td></tr>
<tr><td colspan="2"></td><td>Fixed and free connectors, for industrial environments</td></tr>
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CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 3-119: Rectangular connectors – Detail specification for shielded and unshielded, free and fixed 10-way connectors with push-pull coupling for industrial environments for data transmission with frequencies up to 100 MHz

1 Scope

This part of IEC 61076-3 establishes specifications and test requirements for 10-way shielded and unshielded rectangular, free and fixed connectors, with push-pull coupling, for data transmission with frequencies up to 100 MHz and for use in industrial environments.

This document specifies free and fixed connectors with round contacts, suitable for screw or crimp terminations. Other terminations techniques, such as solder or printed board connections are upon agreement between manufacturer and user. The free and fixed connectors have a push-pull locking mechanism for IP65 and IP67 protection according to IEC 60529.

Connectors according this document are without breaking capacity COC according to 3.9 of IEC 61984:2008, therefore they are not intended to be engaged or disengaged in normal use when live or under load, if not otherwise specified by the manufacturer.

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 60050-581:2008, *International Electrotechnical Vocabulary – Part 581: Electromechanical components for electronic equipment*

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

IEC 60068-2-20:2008, *Environmental testing – Part 2-20: Tests – Test T: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60352-2, *Solderless connections – Part 2: Crimped 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 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, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

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

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

IEC 60512-5-1, *Connectors for electronic equipment – Tests and measurements – Part 5-1: Current-carrying capacity tests – Test 5a: Temperature rise*

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

IEC 60512-11-1, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 11: Climatic tests – Section 1: Test 11a – Climatic sequence*

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 60512-11-7, *Connectors for electronic equipment – Tests and measurements – Part 11-7: Climatic tests – Test 11g: Flowing mixed gas corrosion test*

IEC 60512-11-9, *Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat*

IEC 60512-11-10, *Connectors for electronic equipment – Tests and measurements – Part 11-10: Climatic tests – Test 11j: Cold*

IEC 60512-11-12, *Connectors for electronic equipment – Tests and measurements – Part 11-12: Climatic tests – Test 11m: Damp heat, cyclic*

IEC 60512-13-2, *Connectors for electronic equipment – Tests and measurements – Part 13-2: Mechanical operation tests – Test 13b: Insertion and withdrawal 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 60512-15-1, *Connectors for electronic equipment – Tests and measurements – Part 15-1: Connector tests (mechanical) – Test 15a: Contact retention in insert*

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

IEC 60512-15-7, *Connectors for electronic equipment – Tests and measurements – Part 15-7: Connector tests (mechanical) – Test 15g: Robustness of protective cover attachment*

IEC 60512-16-5, *Connectors for electronic equipment – Tests and measurements – Part 16-5: Mechanical tests on contacts and terminations – Test 16e: Gauge retention force (resilient contacts)*

IEC 60512-26-100, *Connectors for electronic equipment – Tests and measurements – Part 26-100: Measurement setup, test and reference arrangements and measurements for connectors according to IEC 60603-7 – Tests 26a to 26g*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60999-1:1999, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included)*

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

IEC 61984:2008, *Connectors – Safety requirements and tests*

IEC 62197-1:2006, *Connectors for electronic equipment – Quality assessment requirements – Part 1: Generic specification*

IEC 62430:2009, *Environmentally conscious design for electrical and electronic products*

IEC Guide 109, *Environmental aspects – Inclusion in electrotechnical product standards*

ISO 128 (all parts), *Technical drawings – General principles of presentation*

ISO 1101:2017, *Geometrical product specifications (GPS) – Geometrical tolerancing – Tolerances of form, orientation, location and run-out*

ISO 1302:2002, *Geometrical Product Specifications (GPS) – Indication of surface texture in technical product documentation*

ISO 11469:2016, *Plastics – Generic identification and marking of plastic products*

3 Terms and definitions

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

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 Technical information

4.1 Ratings and characteristics

4.1.1 Rated current

The minimum value is 3 A at an ambient temperature of 40 °C for 0,5 mm^2 (AWG 20), all contacts. The upper limiting temperature (ULT) is 70 °C.

4.1.2 Rated voltage

50 V a.c. / 60 V d.c. for assembled connectors.

4.1.3 Insulation resistance

The minimum value is 100 MΩ.

4.1.4 Voltage proof

The minimum value is 1 500 V a.c. r.m.s., contact-to-contact and contact-to-shield, if applicable.

4.2 Performance levels

To be specified by the manufacturer.

4.3 Compatibility levels

Connectors according to this document shall be intermateable in accordance with IEC 61076-1:2006.

4.4 Climatic categories

Conditions: according to IEC 60068-1 and Table 1.

Table 1 – Climatic category

Climatic category	Lower temperature °C	Upper temperature °C	Damp heat steady state (days)
40/070/21	-40	70	21

4.5 Clearance and creepage distances

Clearance and creepage distances shall be measured according to IEC 60512-1-2 with the following additional requirement.

For these connectors clearance and creepage distances shall be measured only in mated position.

Minimum clearance: 0,8 mm.

Minimum creepage distance: 1,0 mm.

4.6 Marking

The marking of the connector and the package shall be in accordance with 2.7 of IEC 61076-1:2006. The position of the contacts shall be identified by a suitable marking according to Figures 2 and 3.

5 Dimensional information

5.1 General

Drawings shall comply with the relevant parts of ISO 128 and geometrical tolerances are given in accordance with ISO 1101. Dimensions are given in millimetres; drawings are shown in first angle projection. The shape of the connectors may deviate from those given in Figure 1 and in the following drawings as long as the specified dimensions are not influenced.

The following requirements shall apply to the complete connector consisting of both the free and fixed connectors.

For safety aspects IEC 61984 is applicable.

Missing dimensions shall be chosen according to the common characteristics and intended use. The interface dimensions of the female style shall be chosen according to the common characteristics of the male styles.

5.2 Isometric view and common features

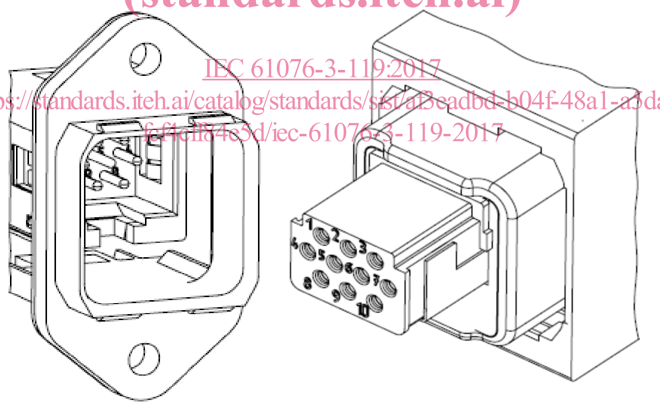

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Figure 1 – Fixed (male) and free (female) connector

5.3 Engagement (mating) information – Contact levels and sequencing

All contacts shall have the same contact level (no first-make last-break contact).