

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Connectors for electrical and electronic equipment – Product requirements –
Part 2-101: Circular connectors – Detail specification for M12 connectors with
screw-locking**

**Connecteurs pour équipements électriques et électroniques – Exigences de
produit –**

**Partie 2-101: Connecteurs circulaires – Spécification particulière pour les
connecteurs M12 à vis**





THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2024 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC -

webstore.iec.ch/advsearchform

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, ...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications, symboles graphiques et le glossaire. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org

Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 500 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 25 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.



INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Connectors for electrical and electronic equipment – Product requirements –
Part 2-101: Circular connectors – Detail specification for M12 connectors with
screw-locking**

**Connecteurs pour équipements électriques et électroniques – Exigences de
produit –**

**Partie 2-101: Connecteurs circulaires – Spécification particulière pour les
connecteurs M12 à vis**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 31.220.10

ISBN 978-2-8322-4491-3

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	7
1 Scope.....	10
2 Normative references	10
3 Terms and definitions	13
4 Technical information	13
4.1 Recommended method of termination for rewirable connectors.....	13
4.2 Connector coding, number of contacts, ratings and characteristics	13
4.3 Systems of levels.....	14
4.3.1 Performance level.....	14
4.3.2 Compatibility levels, according to IEC 61076-1	14
4.4 Classification into climatic categories.....	14
4.5 Creepage and clearance distances	14
4.6 Current-carrying capacity	14
4.7 Marking.....	14
4.8 Safety aspects	14
5 Dimensional information	15
5.1 General.....	15
5.2 Fixed connectors	15
5.2.1 General	15
5.2.2 Style DM.....	16
5.2.3 Style EM.....	17
5.2.4 Style FM.....	18
5.2.5 Style GM	18
5.2.6 Style HM.....	19
5.2.7 Style EF	19
5.2.8 Style FF.....	20
5.2.9 Style GF	21
5.2.10 Style HF	21
5.3 Free connectors	22
5.3.1 General	22
5.3.2 Style JM	23
5.3.3 Style KM.....	23
5.3.4 Style LM	24
5.3.5 Style MM and NM	25
5.3.6 Style JF	26
5.3.7 Style KF	26
5.3.8 Style LF	27
5.3.9 Style MF and NF.....	28
5.4 Interface dimensions.....	29
5.4.1 Pin front and side view A-coding up to 5-way.....	29
5.4.2 Pin front and side view A-coding up to 8-way.....	30
5.4.3 Pin front and side view A-coding up to 12-way.....	32
5.4.4 Pin front and side view A-coding up to 17-way.....	34
5.4.5 Pin front and side view up to B-coding.....	37
5.4.6 Pin front and side view C-coding 3-way	38
5.4.7 Pin front and side view C-coding 4-way	39
5.4.8 Pin front and side view C-coding 5-way	41

5.4.9	Pin front and side view C-coding 6-way	42
5.4.10	Pin front and side view D-coding.....	44
5.5	Engagement (mating) information	46
5.6	Gauges – Sizing gauges and retention force gauges.....	49
6	Characteristics	50
6.1	General.....	50
6.2	Pin assignment and other definitions.....	50
6.3	Classification into climatic categories.....	50
6.4	Electrical characteristics	51
6.4.1	Rated insulation voltage – Rated impulse voltage – Pollution degree.....	51
6.4.2	Voltage proof.....	51
6.4.3	Current-carrying capacity.....	52
6.4.4	Contact resistance.....	53
6.4.5	Insulation resistance.....	53
6.5	Mechanical characteristics	53
6.5.1	Mechanical operation.....	53
6.5.2	Insertion and withdrawal forces	54
6.5.3	Contact retention in insert.....	54
6.5.4	Polarizing and coding method.....	54
6.6	Other characteristics	54
6.6.1	Vibration (sinusoidal).....	54
6.6.2	Shock	55
6.6.3	Degree of protection provided by enclosures (IP code).....	55
6.6.4	Shielding properties.....	55
6.7	Environmental aspects – Marking of insulation material (plastics)	55
7	Test schedule	55
7.1	General.....	55
7.1.1	Overview	55
7.1.2	Climatic category.....	55
7.1.3	Creepage and clearance distances	55
7.1.4	Arrangement for contact resistance measurement	56
7.1.5	Arrangement for dynamic stress tests	56
7.1.6	Wiring of specimens	58
7.2	Test schedules.....	58
7.2.1	Basic (minimum) test schedule	58
7.2.2	Full test schedule	58
Annex A (informative)	Diameter of the female connector body	67
Annex B (informative)	Orientation of cable outlet in relation to coding.....	68
Annex C (normative)	Dimensions of connector insert	69
C.1	General.....	69
C.2	Connector insert, male contacts, without locking thread	69
C.3	Connector insert, male contacts, with M12 locking thread	69
Bibliography	71
Figure 1	– Fixed connector, male contacts, square flange front mounting	16
Figure 2	– Fixed connector, male contacts, with wire / cable, single hole mounting thread M16 × 1,5	17

Figure 3 – Fixed connector, male contacts, with wire / cable, single hole mounting thread M20 × 1,5	18
Figure 4 – Fixed connector, male contacts, with wire / cable, single hole mounting thread M16 × 1,5, mounting orientation	18
Figure 5 – Fixed connector, male contacts, with wire / cable, single hole mounting thread M20 × 1,5, mounting orientation	19
Figure 6 – Fixed connector, female contacts, with wire / cable, single hole mounting thread M16 × 1,5	20
Figure 7 – Fixed connector, female contacts, with wire / cable, single hole mounting thread M20 × 1,5	20
Figure 8 – Fixed connector, female contacts, with wire / cable, single hole mounting thread M16 × 1,5, mounting orientation	21
Figure 9 – Fixed connector, female contacts, with wire / cable, single hole mounting thread M20 × 1,5, mounting orientation	22
Figure 10 – Rewirable connector, male contacts, straight version, with locking nut	23
Figure 11 – Rewirable connector, male contacts, right angled version, with locking nut	24
Figure 12 – Non-rewirable connector, male contacts, straight version, with locking nut	24
Figure 13 – Non-rewirable connector, male contacts, right angled version, with locking nut	25
Figure 14 – Rewirable connector, female contacts, straight version, with locking nut	26
Figure 15 – Rewirable connector, female contacts, right angled version, with locking nut	27
Figure 16 – Non-rewirable connector, female contacts, straight version, with locking nut	27
Figure 17 – Non-rewirable connector, female contacts, right angled version, with locking nut	28
Figure 18 – Pin front and side view A-coding, up to 5-way	29
Figure 19 – Contact position A-coding up to 5-way, front view	30
Figure 20 – Pin front and side view A-coding, up to 8-way	31
Figure 21 – Contact position A-coding up to 8-way, front view	32
Figure 22 – Pin front and side view A-coding, up to 12-way	33
Figure 23 – Contact position A-coding up to 12-way, front view	34
Figure 24 – Pin front and side view A-coding, up to 17-way	35
Figure 25 – Contact position A-coding up to 17-way, front view	36
Figure 26 – Pin front and side view B-coding, up to 5-way	37
Figure 27 – Contact position B-coding up to 5-way, front view	38
Figure 28 – Pin front and side view C-coding, 3-way	38
Figure 29 – Contact position C-coding 3-way, front view	39
Figure 30 – Pin front and side view C-coding, 4-way	40
Figure 31 – Contact position C-coding 4-way, front view	41
Figure 32 – Pin front and side view C-coding, 5-way	41
Figure 33 – Contact position C-coding 5-way, front view	42
Figure 34 – Pin front and side view C-coding, 6-way	43
Figure 35 – Contact position C-coding 6-way, front view	44
Figure 36 – Pin front and side view D-coding	44
Figure 37 – Contact position D-coding, front view	45

Figure 38 – Engagement (mating) information.....	46
Figure 39 – Gauge dimensions	49
Figure 40 – Contact resistance arrangement.....	56
Figure 41 – Dynamic stress test arrangement	57
Figure A.1 – Diameter of the female connector body.....	67
Figure B.1 – Orientation of cable outlet in relation to the coding – Free male connectors according to Table 12	68
Figure C.1 – Connector insert, male contacts, without locking thread.....	69
Figure C.2 – Connector insert, male contacts.....	70
Table 1 – Ratings of connectors.....	13
Table 2 – Styles of fixed connectors	15
Table 3 – Dimensions of style DM, Figure 1	17
Table 4 – Dimensions of style EM, Figure 2	17
Table 5 – Dimensions of style FM, Figure 3	18
Table 6 – Dimensions of style GM, Figure 4.....	19
Table 7 – Dimensions of style HM, Figure 5.....	19
Table 8 – Dimensions of style EF, Figure 6.....	20
Table 9 – Dimensions of style FF, Figure 7.....	21
Table 10 – Dimensions of style GF, Figure 8.....	21
Table 11 – Dimensions of style HF, Figure 9.....	22
Table 12 – Styles of free connectors	22
Table 13 – Dimensions of style JM, Figure 10.....	23
Table 14 – Dimensions of style KM, Figure 11	24
Table 15 – Dimensions of style LM, Figure 12.....	25
Table 16 – Dimensions of style MM and NM, Figure 13.....	25
Table 17 – Dimensions of style JF, Figure 14.....	26
Table 18 – Dimensions of style KF, Figure 15.....	27
Table 19 – Dimensions of style LF, Figure 16	28
Table 20 – Dimensions of style MF and NF, Figure 17	28
Table 21 – Dimensions for Figure 18.....	29
Table 22 – Dimensions for Figure 20.....	31
Table 23 – Dimensions for Figure 22.....	33
Table 24 – Dimensions for Figure 24.....	35
Table 25 – Dimensions for Figure 26.....	37
Table 26 – Dimensions for Figure 28.....	39
Table 27 – Dimensions for Figure 30.....	40
Table 28 – Dimensions for Figure 32.....	42
Table 29 – Dimensions for Figure 34.....	43
Table 30 – Dimensions for Figure 36.....	45
Table 31 – Connectors dimensions in mated and locked position	47
Table 32 – Gauges	50
Table 33 – Climatic category.....	50

Table 34 – Rated insulation voltage – Rated impulse voltage – Pollution degree.....	51
Table 35 – Voltage proof.....	52
Table 36 – Current-carrying capacity	53
Table 37 – Number of mechanical operations	54
Table 38 – Insertion and withdrawal forces	54
Table 39 – Number of test specimens	58
Table 40 – Test group P	59
Table 41 – Test group AP	60
Table 42 – Test group BP	62
Table 43 – Test group CP	63
Table 44 – Test group DP	64
Table 45 – Test group EP	65
Table 46 – Test group FP	65
Table 47 – Test group NP	66
Table A.1 – Diameter of the female connector body, dimension x	67
Table C.1 – Dimensions of connector insert, Figure C.1.....	69
Table C.2 – Dimensions of connector insert, Figure C.2.....	70

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[IEC 61076-2-101:2024](#)

<https://standards.itih.ai/catalog/standards/iec/0390bef0-4096-4156-84ca-360a71a3cf0c/iec-61076-2-101-2024>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT –
PRODUCT REQUIREMENTS –****Part 2-101: Circular connectors –
Detail specification for M12 connectors with screw-locking**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 61076-2-101 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 fourth edition cancels and replaces the third edition published in 2012. This edition constitutes a technical revision.

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

- a) Technical specifications regarding dimensional information (Clause 5) and characteristics (Clause 6) have been updated, and new subclauses have been added.
- b) New style NF (free connectors) has been added.

- c) Fixed connectors with glass to metal seals (former styles WM, XM, YM, ZM and WF, XF, TF and ZF) are no longer covered by this document: relevant definitions and requirements have been removed.
- d) The P-coding has been eliminated.
- e) Annex B (informative) Steel conduit thread, sizes has been deleted and a new Annex B (informative) Orientation of cable outlet in relation to coding has been added.
- f) The dimension specification of former styles AM and BM have been moved into a new Annex C (normative).

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

Draft	Report on voting
48B/3111/FDIS	48B/3129/RVD

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

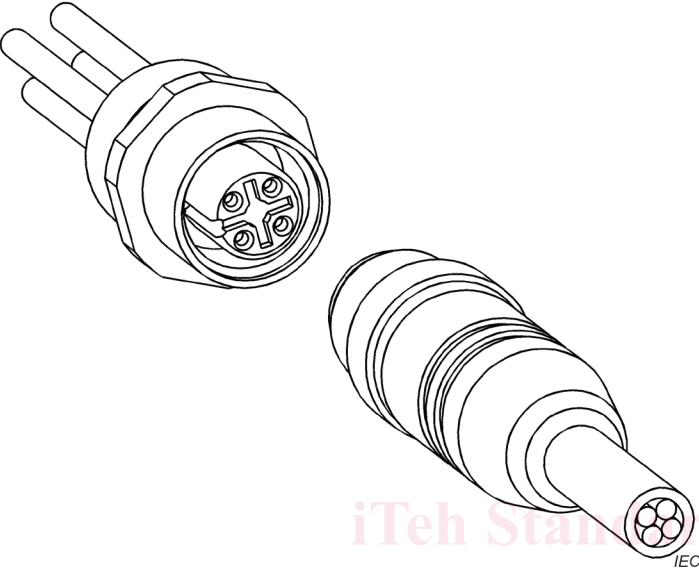
The language used for the development of this International Standard is English.

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 of IEC 61076 series, under the general title *Connectors for electrical and 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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

<p>IEC SC 48B – Electrical connectors Specification available from: IEC General secretariat or from the addresses shown on the inside cover.</p>	<p>IEC 61076-2-101 Ed 4</p>
<p>DETAIL SPECIFICATION in accordance with IEC 61076-1</p>	
<p style="text-align: center;">Outline drawing</p>  <p style="text-align: center;">iTech Standards (https://standards.iteh.ai) Document Preview IEC 61076-2-101:2024 https://standards.iteh.ai/catalog/standards/iec/0390bef0-4096-4156-81ca-360a71a3cf0c/iec-61076-2-101-2024</p>	<p style="text-align: center;">Product description</p> <p>Circular connectors M12 2- to 17-way Male and female contacts Male and female connectors Rewirable – Non-rewirable</p> <hr/> <p>Free cable connectors Straight and right angle connectors Fixed connectors Flange mounting Single hole mounting Connector insert</p>

CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 2-101: Circular connectors – Detail specification for M12 connectors with screw-locking

1 Scope

This part of IEC 61076 describes M12 screw-locking circular connectors with 2-way up to 17-way, for data transmission with frequencies up to 100 MHz and signal and power transmission at up to 250 V rated voltage and up to 4 A rated current per contact.

These connectors consist of fixed and free connectors, either rewirable or non-rewirable.

Male connectors have round contacts, \varnothing 0,6 mm, \varnothing 0,76 mm, \varnothing 0,8 mm or \varnothing 1,0 mm according to number of ways and coding, all contacts with the same size.

The different codings prevent the mating of differently coded male and female connectors.

NOTE 1 M12 is the dimension of the thread of the screw-locking mechanism of these circular connectors.

NOTE 2 These connectors are typically used for connecting industrial automation devices for process measurement and control.

NOTE 3 Several other IEC standards are available covering additional styles of circular connectors with M12 × 1 screw-locking, see Bibliography.

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

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

IEC 60352 (all parts), *Solderless connections*

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

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

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 60512-2-2, *Connectors for electronic equipment – Tests and measurements – Part 2-2: Electrical continuity and contact resistance tests – Test 2b: Contact resistance – Specified test current 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, *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 60512-9-2, *Connectors for electronic equipment – Tests and measurements – Part 9-2: Endurance tests – Test 9b: Electrical load and temperature*

IEC 60512-11-1, *Connectors for electrical and electronic equipment – Tests and measurements – 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 60512-14-7, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 14: Sealing tests – Section 7: Test 14g: Impacting water*

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 60512-19-3, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 19: Chemical resistance tests – Section 3: Test 19c – Fluid resistance*

IEC 60512-23-3, *Connectors for electrical and electronic equipment – Tests and measurements – Part 23-3: Screening and filtering tests – Test 23c: Shielding effectiveness of connectors and accessories – Line injection method*

IEC 60512-29-100, *Connectors for electronic equipment – Tests and measurements – Part 29-100: Signal integrity tests up to 500 MHz on M12 style connectors – Tests 29a to 29g*

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

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60998-2-1, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-1: Particular requirements for connecting devices as separate entities with screw-type clamping units*

IEC 60999-1, *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 mm² up to 35 mm² (included)*

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

IEC 61076-1:2006/AMD1:2019

IEC 61076-2-010:2021, *Connectors for electrical and electronic equipment – Product requirements – Part 2-010: Circular connectors – Detail specification for connectors with outer or inner push-pull locking mechanism, based on mating interfaces according to IEC 61076-2-101, IEC 61076-2-109, IEC 61076-2-111 and IEC 61076-2-113*

IEC 61076-2-012:2020, *Connectors for electrical and electronic equipment – Product Requirements – Part 2-012: Circular connectors – Detail specification for connectors with inner push-pull locking based on M12 connector interfaces according to IEC 61076-2-101, IEC 61076-2-109, IEC 61076-2-111 and IEC 61076-2-113*

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

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

IEC TR 63040:2016, *Guidance on clearances and creepage distances in particular for distances equal to or less than 2 mm – Test results of research on influencing parameters*

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