IEC 61076-2-111

Edition 2.0 2025-12

INTERNATIONAL STANDARD

Connectors for electrical and electronic equipment - Product requirements - Part 2-111: Circular connectors - Detail specification for power connectors with M12 screw-locking

ICS 31.220.10

ISBN 978-2-8327-0766-1

IEC 61076-2-111:2025-12(en)

THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2025 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.

IEC Secretariat
3, rue de Varembé
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 It also gives information on projects, replaced and withdrawn publications.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.

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Connectors for electrical and electronic equipment - Product requirements - Part 2-111: Circular connectors - Detail specification for power connectors with M12 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 61076-2-111 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 2017. This edition constitutes a technical revision.

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

a) The structure of this document has been adapted to the new IEC template for standards. New subclauses have been added. In Clause 5 and Clause 6, technical specifications have been updated.
b) This document no longer includes the mating faces for M12 E-coded connectors.

c) Annex B (informative) Orientation of cable outlet in relation to coding has been added.

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

Draft	Report on voting
48B/3169/FDIS	48B/3180/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.

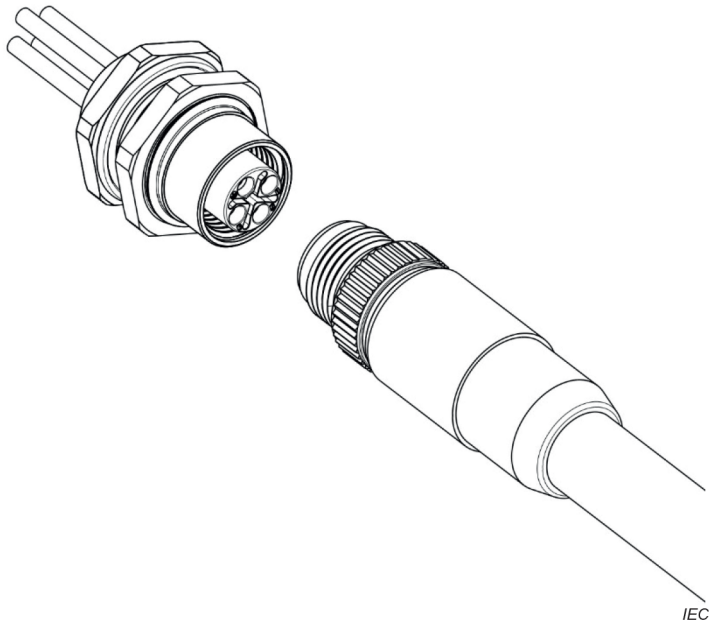
This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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.

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.

<table>
<tr><td>IEC SC 48B – Electrical connectors

Specification available from: IEC General secretariat or from the addresses shown on the inside cover.</td><td>IEC 61076-2-111 Ed 2</td></tr>
<tr><td>DETAIL SPECIFICATION in accordance with IEC 61076-1</td><td></td></tr>
<tr><td rowspan="2"> 
</td><td>Circular connectors

Power connectors with M12 screw-locking

Male and female connectors

Male and female contacts

Rewirable – Non-rewirable</td></tr>
<tr><td>Free cable connectors

Straight and right-angled connectors

Fixed connectors

Flange mounting

Single hole mounting</td></tr>
</table>

1 Scope

This part of IEC 61076-2 describes 4- to 6-way circular connectors with M12 screw-locking with current ratings 8, 12 or 16 A per contact and voltage ratings of 50 V AC / 60 V DC or 630 V according to their coding, that are typically used for power supply and power applications in industrial premises.

These connectors consist of both fixed and free connectors, either rewirable or non-rewirable. Male connectors have round contacts Ø1,0 mm and Ø1,5 mm.

The different codings provided by this document prevent the mating of differently coded male or female connectors to any other similarly sized interfaces, covered by other standards and the cross-mating between the different codings provided by this document.

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

NOTE 2 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, *Advance edition of the International Electrotechnical Vocabulary - Chapter 581: Electromechanical components for electronic equipment*

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

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

IEC 60068-2-60, *Environmental testing - Part 2: Tests - Test Ke: Flowing mixed gas corrosion test*

IEC 60352-2, *Solderless connections - Part 2: Crimped connections - General requirements, test methods and practical guidance*

IEC 60352-3, *Solderless connections - Part 3: Accessible insulation displacement (ID) connections - General requirements, test methods and practical guidance*

IEC 60352-4, *Solderless connections - Part 4: Non-accessible insulation displacement (ID) 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 60352-6, *Solderless connections - Part 6: Insulation piercing connections - General requirements, test methods and practical guidance*

IEC 60352-7, *Solderless connections - Part 7: Spring clamp connections - General requirements, test methods and practical guidance*

IEC 60352-9, *Solderless connections - Part 9: Ultrasonically welded connections - General requirements, test methods and practical guidance*

IEC 60512-1, *Connectors for electrical and electronic equipment - Tests and measurements - Part 1: Generic specification*

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 60512-9-2, *Connectors for electronic equipment - Tests and measurements - Part 9-2: Endurance tests - Test 9b: Electrical load and temperature*

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 60512-12-1, *Connectors for electronic equipment - Tests and measurements - Part 12-1: Soldering tests - Test 12a: Solderability, wetting, solder bath method*

IEC 60512-12-2, *Connectors for electronic equipment - Tests and measurements - Part 12-2: Soldering tests - Test 12b: Solderability, wetting, soldering iron method*

IEC 60512-12-3, *Connectors for electronic equipment – Tests and measurements – Part 12-3: Soldering tests – Test 12c: Solderability, de-wetting*

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 60529, *Degrees of protection provided by enclosures (IP code)*

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

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 mm^2 up 35 mm^2 (included)*

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

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, *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 21920-1, *Geometrical product specifications (GPS) - Surface texture: Profile - Part 1: Indication of surface texture*

Bibliography

IEC 60050-195:2021, *International Electrotechnical Vocabulary (IEV) - Part 195: Earthing and protection against electric shock*

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 61076-2, *Connectors for electronic equipment - Product requirements – Part 2: Sectional specification for circular connectors*

IEC 61076-2-010, *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, *Connectors for electrical and electronic equipment - Product requirements - Part 2-010: Circular connectors - Detail specification for connectors with inner push-pull locking mechanism, 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 61076-2-101, *Connectors for electrical and electronic equipment - Product requirements - Part 2-101: Circular connectors - Detail specification for M12 connectors with screw-locking*

IEC 61076-2-107, *Connectors for electronic equipment - Product requirements - Part 2-107: Detail specification for circular hybrid connectors M12 with electrical and fibre-optic contacts with screw-locking*

IEC 61076-2-109, *Connectors for electronic equipment - Product requirements - Part 2-109: Circular connectors - Detail specification for connectors with M12 × 1 screw-locking, for data transmission frequencies up 500 MHz*

IEC 61076-2-113, *Connectors for electronic equipment - Product requirements - Part 2-113: Circular connectors - Detail specification for connectors with M12 screw-locking with power and signal contacts for data transmission with frequency up 100 MHz*

ISO 11469, *Plastics - Generic identification and marking of plastic products*

_____