

# PUBLICLY AVAILABLE SPECIFICATION

## PRE-STANDARD

Connectors for electrical and electronic equipment – Product requirements –  
Part 2-010: Circular connectors – Detail specification for push-pull connectors  
with 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



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### **CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –**

#### **Part 2-010: Circular connectors – Detail specification for push-pull connectors with 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**

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The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document

Draft PAS	Report on voting
48B/2796/DPAS	48B/2817/RVDPAS

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

An International Standard is under preparation by IEC SC48B, to be published as IEC 61076-2-010 (if approved). This PAS will be withdrawn upon publication of the International Standard.

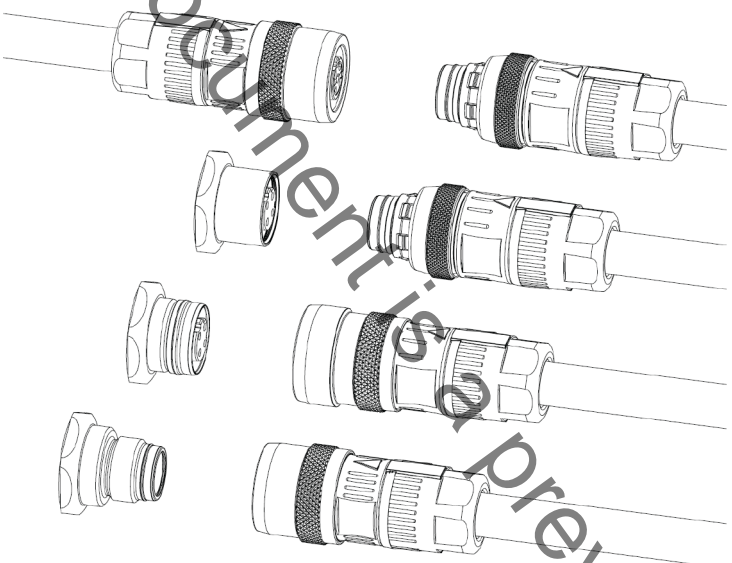
A list of all parts in the IEC 61076 series, published under the general title *Connectors for electrical and electronic equipment – Product requirements*, can be found on the IEC website.

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.

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## INTRODUCTION

<p>IEC SC 48B – Electrical connectors</p> <p>Specification available from:</p> <p>IEC General secretariat</p> <p>or from the addresses shown on the inside cover.</p>	IEC PAS 61076-2-010 Ed. 1
<p>ELECTRONIC COMPONENTS</p> <p>DETAIL SPECIFICATION in accordance with IEC 61076-1</p>	
 <p>IEC</p>	<p>Circular M12 connectors with push-pull locking for power, signal and data transmission</p> <p>Fixed connectors with male and female contacts, mateable with M12 screw or push-pull plugs</p> <p>Free cable connectors with male or female contacts with push-pull or screw locking</p> <p>Rewireable – Non-rewireable</p> <p>Fixed connectors, with front, rear or single hole mounting</p> <p>Straight and right-angled free cable connectors</p>

## INTRODUCTION

## CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

### Part 2-010: Circular connectors – Detail specification for push-pull connectors with 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

## 1 Scope

This part of IEC 61076 specifies circular connectors with a push-pull locking mechanism of a size derived from and thus being compatible with M12 screw-locking connectors (free connectors with screw-locking according to IEC 61076-2-101, IEC 61076-2-109, IEC 61076-2-111 or IEC 61076-2-113 are compatible to push-pull fixed interfaces according to this document) and with mating interfaces according to IEC 61076-2-101, IEC 61076-2-109, IEC 61076-2-111 or IEC 61076-2-113.

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

This document covers both

- 1) power connectors with current ratings up to 16 A and voltage ratings up to 630 V, typically used for power supply and power applications in industrial premises, and
- 2) connectors for data and signal transmission with frequencies up to 500 MHz.

These connectors consist of both, fixed and free connectors, either rewirable or non-rewirable, with M12 push-pull locking as explained above. Male connectors have round contacts from Ø0,6 mm up to Ø1,5 mm. In addition, the push-pull mechanisms consist of two different push-pull designs:

- a) An outer push-pull for male and female fixed connector, where the locking groove is placed onto the outer cylindric surface of the housing. The outer push-pull for female fixed connectors is made for two different types of male connectors. It has locking means for both types on its outer surface.

NOTE 2 For design and dimensions, see 5.3.1 and 5.3.2.

- b) An inner push-pull for female fixed connectors, where the locking means are placed onto the inner cylindric surface of the housing.

NOTE 3 For design and dimensions, see 5.3.3.

The different codings provided by IEC 61076-2 and mentioned within this document, prevent the mating of accordingly 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 IEC 61076-2.

## 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 (IEV) – Part 581: Electromechanical components for electronic equipment* (available at <http://www.electropedia.org>)

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

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

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

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

IEC 60603-7:2008, *Connectors for electronic equipment – Part 7: Detail specification for 8-way, unshielded, free and fixed connectors*

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

IEC 60998-2-1:2002, *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 61076-1:2006, *Connectors for electronic equipment – Product requirements – Part 1: Generic specification*

IEC 61076-2-101, *Connectors for electronic equipment – Product requirements – Part 2-101: Circular connectors – Detail specification for M12 connectors with screw-locking*

IEC 61076-2-109, *Connectors for electronic equipment – Product requirements – Part 2-109: Circular connectors – Detail specification for connectors with M12x1 screw-locking, for data transmission frequencies up to 500 MHz*

IEC 61076-2-111, *Connectors for electrical and electronic equipment – Product requirements – Part 2-111: Circular connectors – Detail specification for power connectors with M12 screw-locking*

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 frequencies up to 100 MHz*

IEC 61984, *Connectors – Safety requirements and tests*

### 3 Terms and definitions

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

#### 3.1

##### **mounting orientation**

circular mounting position of the connector in relation to the polarization of the mating interface.

Note 1 to entry: Where the free connector has an angled cable entry (as opposed to a straight cable entry), the angle between the entry direction and the polarization keyway should be specified.

### 4 Technical information

#### 4.1 System of levels

##### 4.1.1 Performance levels

Performance levels for these connectors (mating cycles for the mating interface only) are specified in the applicable standard, either IEC 61076-2-101, IEC 61076-2-109, IEC 61076-2-111 or IEC 61076-2-113. The same performance level (number of cycles of mechanical operations, i.e. one locking and one unlocking operation) shall apply to the specific complete connector with the push-pull locking described herein.

A qualification of the push-pull locking mechanism for the highest performance level shall cover the qualifications for all lower performance levels required by the various mating interfaces, which are not subject to re-qualification for all those aspects already covered in the relevant IEC standards mentioned above.

##### 4.1.2 Compatibility levels, according to IEC 61076-1

The connectors according to this document are intermateable according to IEC 61076-1.