

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**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 to 100 MHz**

[IEC 61076-2-113:2017](#)

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**Connecteurs pour équipements électroniques – Exigences de produit –  
Partie 2-113: Connecteurs circulaires – Spécification particulière relative aux  
connecteurs à contacts de puissance et de signalisation, avec verrouillage à vis  
M12 pour les transmissions de données à des fréquences allant jusqu'à 100 MHz**



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**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 to 100 MHz**

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International Standard IEC 61076-2-113 has been prepared by subcommittee 48B: Electrical connectors, of IEC technical committee 48: Electrical connectors and mechanical structures for electrical and electronic equipment.

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

FDIS	Report on voting
48B/2539/FDIS	48B/2547/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, 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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## INTRODUCTION

The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed that compliance with this document may involve the use of a patent concerning connectors given in this specification.

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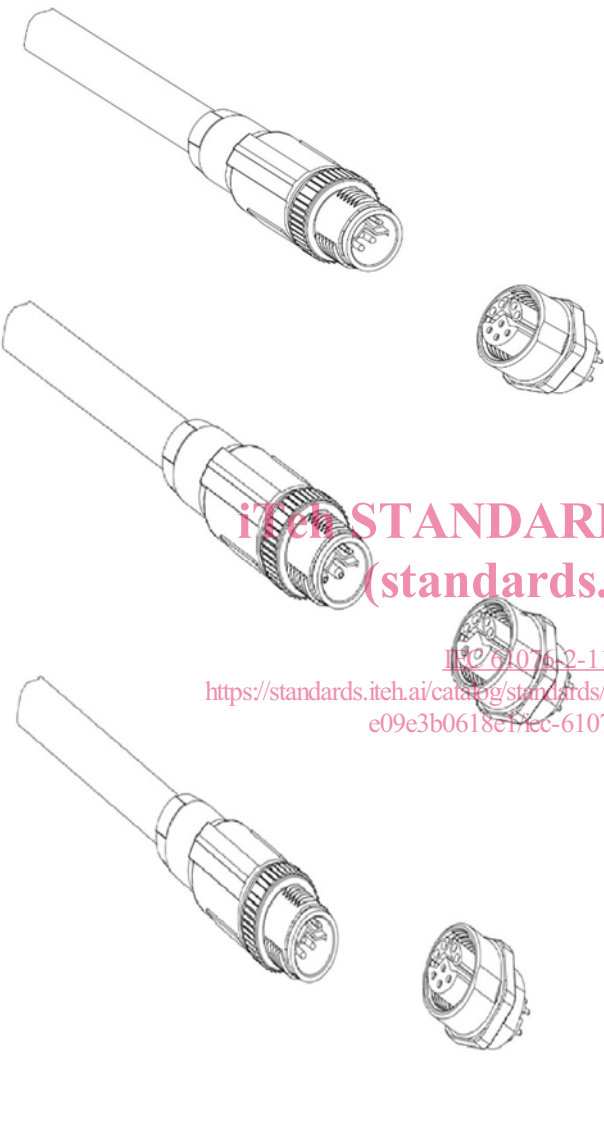
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<p>IEC SC 48B – Electrical connectors                  Specification available from:                  IEC General secretariat                  Or from the addresses shown on the inside cover.</p>	<p>IEC 61076-2-113Ed1</p>
<p>ELECTRONIC COMPONENTS                  DETAIL SPECIFICATION in accordance with IEC 61076-1</p>	
 <p style="text-align: right;">EC</p>	<p>Circular connectors                  M12 6 and 8 way                  Male and female connectors                  Rewireable – Non-rewireable</p> <p>Free cable connectors                  Straight and right angle connectors                  Fixed connectors                  Single hole mounting</p>

## 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 to 100 MHz

#### 1 Scope

This part of IEC 61076 describes M12 circular connectors with two data pairs and power contacts with current ratings up to 12 A, that are typically used for data and power applications in industrial premises. These connectors consist of both fixed and free connectors either rewirable or non rewirable, with screw-locking. Male connectors have round contacts diameters of 1,50 mm, 1,00 mm and 0,60 mm.

The different codings provided by 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 this document.

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

#### 2 Normative references (standards.iteh.ai)

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

IEC 60352 (all parts), *Solderless connectors*

IEC 60512 (all parts), *Connectors for electronic equipment – Tests and measurements*

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

IEC 60664-1, *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 (all parts), *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units*

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

IEC 61984, *Connectors – Safety requirements and tests*

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

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

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581 as well as the following 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 an in-line cable entry), the angle between the cable entry direction and the polarization keyway should be specified.

### 4 Technical information

#### 4.1 Systems of levels

##### 4.1.1 Performance levels

Performance level for this connector is 1.

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

Connectors according to this document are supposed to be intermateable.

#### 4.2 Classification into climatic categories

Classification into climatic categories is specified in 6.3.

#### 4.3 Creepage and clearance distances

See 6.4.1 in this document.

#### 4.4 Current-carrying capacity

Current carrying capacity is as specified in Table 1 and 6.4.3.

**Table 1 – Ratings of connectors**

Type	Style	No. of signal contacts and their function	Signal pin diameter mm	No. of power contacts	Power pin diameter mm	Rated voltage a.c. or d.c. V	Rated current (power contacts) A
1	6 way	4(2 data pairs)	0,6 ±0,03	2	1,5 ±0,03	50	10
2	8 way	4(2 data pairs)	0,6 ±0,03	4	1,0 ±0,03	50	6
3	6 way	4(2 data pairs)	0,6 ±0,03	2	1,5 ±0,03	50	12
4	8 way	4(2 data pairs)	0,6 ±0,03	4	1,0 ±0,03	50	6

#### 4.5 Marking

The marking of the connector and the package shall be in accordance with 2.7 of IEC 61076-1:2006.

#### 4.6 Safety aspects

The connectors covered by this document are extra-low voltage (SELV) connectors, thus IEC 61984 dealing with safety aspects of connectors is applicable to them as a guidance.

### 5 Dimensional information [IEC 61076-2-113:2017](https://standards.iteh.ai/catalog/standards/sist/4536247a-f9b6-43c2-8feb-e09e3b0618e1/iec-61076-2-113-2017)

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#### 5.1 General

Throughout this document dimensions are in mm. Drawings are shown in the first angle projection. The shape of the connectors may deviate from those given in the following drawings as long as the specified dimensions are not influenced.

Missing dimensions shall be chosen according to common characteristics and intended use.

#### 5.2 Survey of styles and variants

##### 5.2.1 General

For all connector styles with cables, the length  $L$  of the cable shall be agreed between manufacturer and user. For interface dimensions see 5.3.

The interface dimensions of the female styles shall be chosen according to the common characteristics of the male styles.

##### 5.2.2 Contact terminations

The contact terminations shall be alternatively of the following types: screw, crimp, piercing, insulation displacement, press-in or solder.

##### 5.2.3 Fixed connectors

###### 5.2.3.1 General

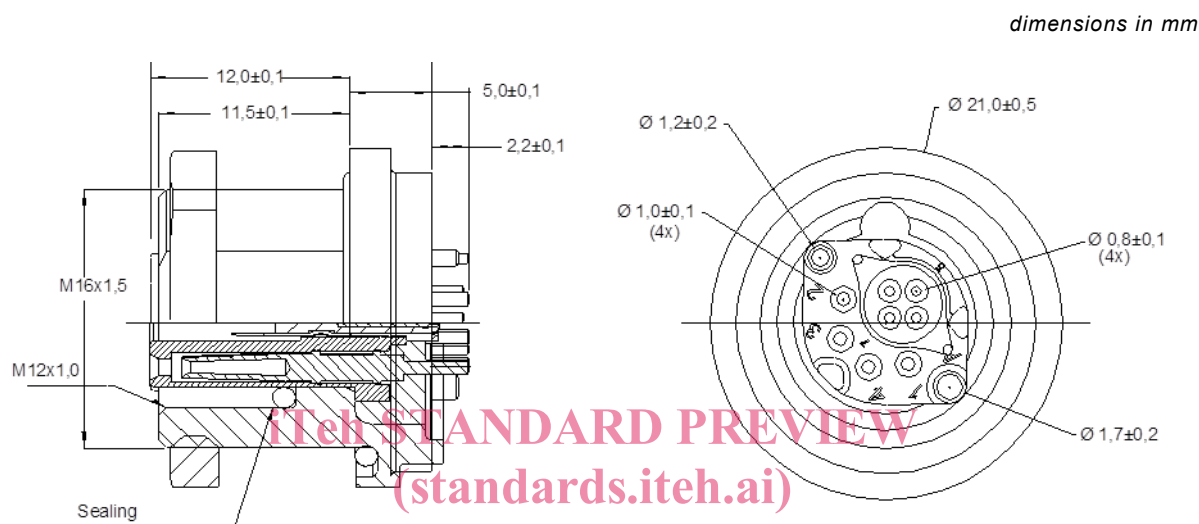
Table 2 shows styles of fixed connectors.

**Table 2 – Styles of fixed connectors**

Style	Description
EF	Fixed connector, female contacts, with contact pcb tails, single hole mounting M16 × 1,5

**5.2.3.2 Style EF**

Figure 1 shows a fixed connector, with female contacts, a mounting with thread M12 × 1, with wire ends and a single hole mounting thread M16 × 1,5.



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**Figure 1 – Fixed connector, with female contacts, with contact pcb tails, female coupling**

NOTE Figures 1 to 5 as well as Table 3 styles are mere examples and do not imply a limitation in the connection technology as connectors covered by this document may also be rewirable.

**5.2.4 Free connectors**

**5.2.4.1 General**

Table 3 shows styles of free connectors.

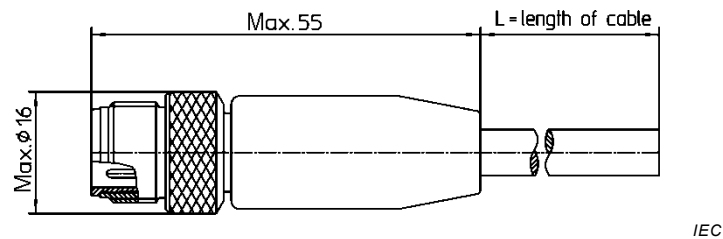
**Table 3 – Styles of free connectors**

Style	Description
LM	Non-rewireable connector, male contacts, straight version, with locking nut <sup>a</sup>
MM	Non-rewireable connector, male contacts, right angled version, with locking nut
LF	Non-rewireable connector, female contacts, straight version, with locking nut
MF	Non-rewireable connector, female contacts, right angled version, with locking nut
<sup>a</sup> Knurled ring or hexagonal ring upon agreement.	

**5.2.4.2 Style LM**

Figure 2 shows a non-rewireable connector, with male contacts and a straight version with locking nut.

dimensions in mm

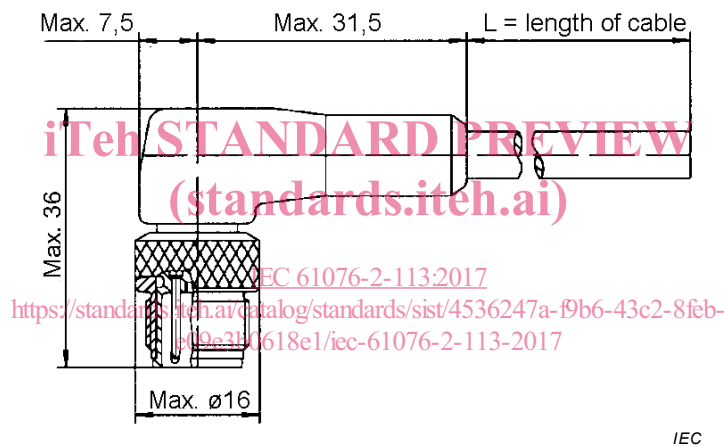


**Figure 2 – Non-rewireable connector, with male contacts, straight version, with locking nut**

#### 5.2.4.3 Style MM

Figure 3 shows a non-rewireable connector, with male contacts, a right angled version with locking nut.

dimensions in mm

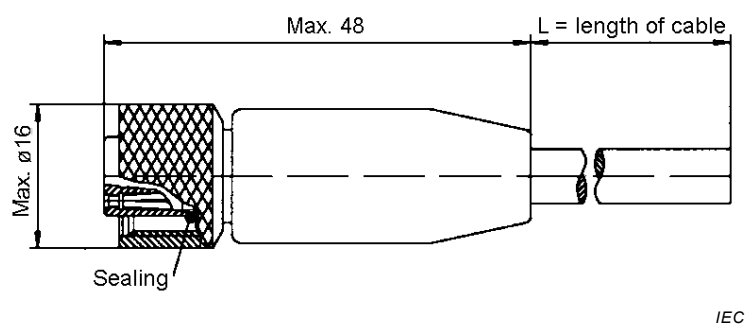


**Figure 3 – Non-rewireable connector, with male contacts, angled version, with locking nut**

#### 5.2.4.4 Style LF

Figure 4 shows a non-rewireable connector, with female contacts and a straight version with locking nut.

dimensions in mm



**Figure 4 – Non-rewireable connector, with female contacts, straight version, with locking nut**