

**BS EN 61076-2-104:2014**



**BSI Standards Publication**

# **Connectors for electronic equipment — Product requirements**

Part 2-104: Circular connectors —  
Detail specification for circular connectors  
with M8 screw-locking or snap-locking

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The UK participation in its preparation was entrusted to Technical Committee EPL/48, Electromechanical components and mechanical structures for electronic equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

**Connectors for electronic equipment - Product requirements -  
Part 2-104: Circular connectors - Detail specification for circular  
connectors with M8 screw-locking or snap-locking  
(IEC 61076-2-104:2014)**

Connecteurs pour équipements électroniques - Exigences  
de produit - Partie 2-104: Connecteurs circulaires -  
Spécification particulière pour les connecteurs circulaires  
M8 à vis ou à encliquetage  
(CEI 61076-2-104:2014)

Steckverbinder für elektronische Einrichtungen -  
Produktanforderungen - Teil 2-104: Rundsteckverbinder -  
Bauartspezifikation für Rundsteckverbinder M8 mit  
Schraub- oder Rastverriegelung  
(IEC 61076-2-104:2014)

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

## Foreword

The text of document 48B/2384/FDIS, future edition 2 of IEC 61076-2-104, prepared by SC 48B "Connectors" of IEC/TC 48 "Electromechanical components and mechanical structures for electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61076-2-104:2014.

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- latest date by which the national (dow) 2017-10-14  
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document have to be withdrawn

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## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu)

| <u>Publication</u> | <u>Year</u> | <u>Title</u>                                                                                                                                                                                                 | <u>EN/HD</u>          | <u>Year</u>  |
|--------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------|
| IEC 60050          | Series      | International Electrotechnical Vocabulary                                                                                                                                                                    | -                     | -            |
| IEC 60068-1        | 2013        | Environmental testing -<br>Part 1: General and guidance                                                                                                                                                      | EN 60068-1            | 2014         |
| IEC 60068-2-60     | -           | Environmental testing -<br>Part 2: Tests - Test Ke: Flowing mixed<br>gas corrosion test                                                                                                                      | EN 60068-2-60         | -            |
| IEC 60352          | Series      | Solderless connections                                                                                                                                                                                       | EN 60352              | Series       |
| IEC 60512          | Series      | Connectors for electronic equipment -<br>Tests and measurements                                                                                                                                              | EN 60512              | Series       |
| IEC 60529          | 1989        | Degrees of protection provided by<br>enclosures (IP Code)                                                                                                                                                    | EN 60529<br>corr. May | 1991<br>1993 |
| + A1               | 1999        |                                                                                                                                                                                                              | + A1                  | 2000         |
| + A2               | 2013        |                                                                                                                                                                                                              | + A2                  | 2013         |
| IEC 60664-1        | 2007        | Insulation coordination for equipment<br>within low-voltage systems -<br>Part 1: Principles, requirements and tests                                                                                          | EN 60664-1            | 2007         |
| IEC 60998-2-1      | -           | Connecting devices for low-voltage<br>circuits for household<br>and similar purposes -<br>Part 2-1: Particular requirements for<br>connecting devices as separate entities<br>with screw-type clamping units | EN 60998-2-1          | -            |
| IEC 60999          | Series      | Connecting devices - Electrical copper<br>conductors - Safety requirements for<br>screw-type and screwless-type clamping<br>units                                                                            | EN 60999              | Series       |
| IEC 61076-1        | 2006        | Connectors for electronic equipment -<br>Product requirements -<br>Part 1: Generic specification                                                                                                             | EN 61076-1            | 2006         |

| <u>Publication</u> | <u>Year</u> | <u>Title</u>                                                                                                | <u>EN/HD</u> | <u>Year</u> |
|--------------------|-------------|-------------------------------------------------------------------------------------------------------------|--------------|-------------|
| IEC 61984          | -           | Connectors - Safety requirements and tests                                                                  | EN 61984     | -           |
| ISO 1302           | -           | Geometrical Product Specifications (GPS) - Indication of surface texture in technical product documentation | EN ISO 1302  | -           |

## CONTENTS

|       |                                                               |    |
|-------|---------------------------------------------------------------|----|
| 1     | Scope .....                                                   | 8  |
| 2     | Normative references .....                                    | 8  |
| 3     | Technical information .....                                   | 9  |
| 3.1   | Terms and definitions.....                                    | 9  |
| 3.2   | Recommended method of termination .....                       | 9  |
| 3.3   | Number of contacts, ratings and characteristics .....         | 9  |
| 3.4   | Creepage and clearance distances .....                        | 9  |
| 3.5   | Marking.....                                                  | 10 |
| 3.6   | Safety aspects .....                                          | 10 |
| 4     | Dimensional information .....                                 | 10 |
| 4.1   | General.....                                                  | 10 |
| 4.2   | Survey of styles and variants .....                           | 10 |
| 4.2.1 | General .....                                                 | 10 |
| 4.2.2 | Fixed connectors .....                                        | 10 |
| 4.2.3 | Free connectors.....                                          | 12 |
| 4.3   | Interface dimensions .....                                    | 17 |
| 4.3.1 | Pin front and side view A-coding.....                         | 17 |
| 4.3.2 | Pin front view B-coding .....                                 | 19 |
| 4.4   | Engagement (mating) information .....                         | 20 |
| 4.5   | Gauges .....                                                  | 21 |
| 4.5.1 | Sizing gauges and retention force gauges .....                | 21 |
| 5     | Characteristics .....                                         | 22 |
| 5.1   | Climatic category .....                                       | 22 |
| 5.2   | Electrical characteristics .....                              | 22 |
| 5.2.1 | Rated voltage – Rated impulse voltage – Pollution degree..... | 22 |
| 5.2.2 | Voltage proof.....                                            | 23 |
| 5.2.3 | Current-carrying capacity.....                                | 23 |
| 5.2.4 | Contact resistance .....                                      | 23 |
| 5.2.5 | Insulation resistance .....                                   | 23 |
| 5.3   | Mechanical characteristics .....                              | 24 |
| 5.3.1 | Mechanical operation.....                                     | 24 |
| 5.3.2 | Insertion and withdrawal forces .....                         | 24 |
| 5.3.3 | Contact retention in insert.....                              | 24 |
| 5.3.4 | Polarizing method.....                                        | 24 |
| 5.3.5 | Vibration (sinusoidal) .....                                  | 24 |
| 5.4   | Other characteristics .....                                   | 25 |
| 5.4.1 | IP degree of protection .....                                 | 25 |
| 6     | Test schedule .....                                           | 25 |
| 6.1   | General.....                                                  | 25 |
| 6.1.1 | Introductory remarks.....                                     | 25 |
| 6.1.2 | Arrangement for contact resistance measurements.....          | 25 |
| 6.1.3 | Arrangement for dynamic stress tests (vibration) .....        | 26 |
| 6.2   | Test schedule .....                                           | 28 |
| 6.2.1 | Test group P – Preliminary .....                              | 28 |
| 6.2.2 | Test group AP – Dynamic/ Climatic.....                        | 29 |

|                       |                                                                                           |    |
|-----------------------|-------------------------------------------------------------------------------------------|----|
| 6.2.3                 | Test group BP – Mechanical endurance .....                                                | 31 |
| 6.2.4                 | Test group CP – Electrical load .....                                                     | 33 |
| 6.2.5                 | Test group DP – Chemical resistivity .....                                                | 34 |
| 6.2.6                 | Test group EP – Connection method tests .....                                             | 34 |
| Annex A (informative) | Diameter of the female connector body .....                                               | 35 |
| Figure 1              | – Tube insert, male contacts dip solder mounting, long version .....                      | 11 |
| Figure 2              | – Tube insert, male contacts dip solder mounting, short version .....                     | 11 |
| Figure 3              | – Fixed connector with wire ends, male contacts, single hole mounting .....               | 11 |
| Figure 4              | – Fixed connector with wire ends, female contacts, single hole mounting .....             | 12 |
| Figure 5              | – Rewireable connector, male contacts, straight version, with locking nut .....           | 13 |
| Figure 6              | – Rewireable connector, male contacts, right angled version, with locking nut .....       | 13 |
| Figure 7              | – Non-rewireable connector, male contacts, straight version, snap-locking .....           | 14 |
| Figure 8              | – Non-rewireable connector, male contacts, straight version, with locking nut .....       | 14 |
| Figure 9              | – Non-rewireable connector, male contacts, right angled version, with locking nut ..      | 14 |
| Figure 10             | – Rewireable connector, female contacts, straight version, with locking nut .....         | 15 |
| Figure 11             | – Rewireable connector, female contacts, right angled version, with locking nut...        | 15 |
| Figure 12             | – Non-rewireable connector, female contacts, straight version, snap-locking .....         | 15 |
| Figure 13             | – Non-rewireable connector, female contacts, right angled version, snap-locking .....     | 16 |
| Figure 14             | – Non-rewireable connector, female contacts, straight version, with locking nut ....      | 16 |
| Figure 15             | – Non-rewireable connector, female contacts, right angled version, with locking nut ..... | 16 |
| Figure 16             | – Pin front view A-coding .....                                                           | 17 |
| Figure 17             | – Pin side view A-coding .....                                                            | 18 |
| Figure 18             | – Contact position A-coding – Front view .....                                            | 19 |
| Figure 19             | – Pin front view B-coding .....                                                           | 19 |
| Figure 20             | – Contact position – B-coding – Front view .....                                          | 20 |
| Figure 21             | – Engagement (mating) information .....                                                   | 20 |
| Figure 22             | – Gauge dimensions .....                                                                  | 22 |
| Figure 23             | – Contact resistance arrangement .....                                                    | 26 |
| Figure 24             | – Dynamic stress test arrangement .....                                                   | 27 |
| Figure A.1            | – Diameter of the female connector body, coding variant A .....                           | 35 |
| Figure A.2            | – Shape of the female connector body, coding variant B .....                              | 35 |
| Table 1               | – Connector ratings related to coding and number of contacts .....                        | 9  |
| Table 2               | – Creepage and clearance distances .....                                                  | 9  |
| Table 3               | – Styles of fixed connectors .....                                                        | 10 |
| Table 4               | – Styles of free connectors .....                                                         | 12 |
| Table 5               | – Connector dimensions in mated and locked position .....                                 | 21 |
| Table 6               | – Gauges .....                                                                            | 22 |
| Table 7               | – Climatic category .....                                                                 | 22 |
| Table 8               | – Rated voltage – Rated impulse voltage – Voltage proof .....                             | 23 |
| Table 9               | – Voltage proof .....                                                                     | 23 |

|                                                  |    |
|--------------------------------------------------|----|
| Table 10 – Number of mechanical operations ..... | 24 |
| Table 11 – Insertion and withdrawal forces ..... | 24 |
| Table 12 – Number of test specimens .....        | 25 |
| Table 13 – Test group P .....                    | 28 |
| Table 14 – Test group AP .....                   | 29 |
| Table 15 – Test group BP .....                   | 31 |
| Table 16 – Test group CP .....                   | 33 |
| Table 17 – Test group DP .....                   | 34 |
| Table 18 – Test group EP .....                   | 34 |

## CONNECTORS FOR ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

### Part 2-104: Circular connectors – Detail specification for circular connectors with M8 screw-locking or snap-locking

#### 1 Scope

This part of IEC 61076 describes circular connectors M8 screw-locking or with nominal diameter 8 mm snap-locking, typically used for industrial process measurement and control. These connectors consist of fixed and free connectors either rewirable or non-rewirable. Male connectors have round contacts of diameter 0,6 mm, diameter 0,7 mm and diameter 1,0 mm.

Throughout this detail specification, dimensions are in mm.

NOTE M8 is the dimension of the thread of the screw-locking mechanism of these circular connectors.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts): *International Electrotechnical Vocabulary* (available at <http://www.electropedia.org>)

IEC 60068-1:2013, *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 connections*

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

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

Amendment 2:2013

Amendment 1:1999

IEC 60664-1:2007, *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*

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

### 3 Technical information

#### 3.1 Terms and definitions

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

#### 3.2 Recommended method of termination

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

#### 3.3 Number of contacts, ratings and characteristics

**Table 1 – Connector ratings related to coding and number of contacts**

| Coding | Contacts | Rated voltage        | Rated current |
|--------|----------|----------------------|---------------|
| A      | 3        | 50 V a.c./ 60 V d.c. | 3 A           |
| A      | 4        | 50 V a.c./ 60 V d.c. | 3 A           |
| A      | 6        | 30 V a.c./ 30 V d.c. | 1,5 A         |
| A      | 8        | 30 V a.c./ 30 V d.c. | 1,5 A         |
| B      | 5        | 30 V a.c./ 30 V d.c. | 3 A           |

Insulation resistance:  $10^8 \Omega \text{ min.}$

Climatic category: see 5.1, Table 7

Contact spacing: see Clause 4, dimensions

#### 3.4 Creepage and clearance distances

The permissible operating voltages, depends on the application and also on the safety requirements.

The creepage and clearance distances in Table 2 are given as operating characteristics of mated connectors and shall be measured according to IEC 60512-1-2. The minimum values for clearance and creepage can be found in Table 2.

**Table 2 – Creepage and clearance distances**

*Dimensions are in millimeter*

| Connector style and number of contacts | Minimum distance between contacts and earth contact |           | Minimum distance between adjacent contacts |           |
|----------------------------------------|-----------------------------------------------------|-----------|--------------------------------------------|-----------|
|                                        | Creepage                                            | Clearance | Creepage                                   | Clearance |
| A-coding 3+4 contacts                  | 0,6                                                 | 0,6       | 0,6                                        | 0,6       |
| A-coding 6+8 contact and B-coding      | 0,6                                                 | 0,6       | 0,6                                        | 0,6       |

Application information – The permissible rated voltage depends on the application or specified safety requirements. Reductions in creepage or clearance distances may occur due to the printed board or wiring used, and shall duly be taken into account.

### 3.5 Marking

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

### 3.6 Safety aspects

For safety aspects IEC 61984 shall be considered as guidance unless otherwise specified.

## 4 Dimensional information

### 4.1 General

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.

For connector dimensions, see drawings in 4.2.

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

### 4.2 Survey of styles and variants

#### 4.2.1 General

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

For interface dimensions, see 4.3.

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

For reliable intermateability, the dimensions of the female connector body as detailed in Annex A shall be met. Compliance is checked by inspection and measurement.

#### 4.2.2 Fixed connectors

##### 4.2.2.1 General

**Table 3 – Styles of fixed connectors**

| Style | Description                                                           |
|-------|-----------------------------------------------------------------------|
| BM    | Tube insert, male contacts dip solder mounting, long version          |
| CM    | Tube insert, male contacts dip solder mounting, short version         |
| EM    | Fixed connector with wire ends, male contacts, single hole mounting   |
| EF    | Fixed connector with wire ends, female contacts, single hole mounting |