IEC 61076-2-116

Edition 1.0 2022-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Connectors for electrical and electronic equipment – Product requirements – Part 2-116: Detail specification for circular connectors size 15 with up to 3+PE power contacts and auxiliary contacts, with bayonet-locking

Connecteurs pour équipements électriques et électroniques – Exigences de produit –
Partie 2-116: Spécification particulière pour les connecteurs circulaires de taille 15 avec jusqu'à 3+PE contacts de puissance et contacts auxiliaires, avec verrouillage à baïonnette

IEC 61076-2-116:2022-12(en-fr)

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IEC 61076-2-116 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.

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

Draft	Report on voting
48B/3000/FDIS	48B/3010/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.

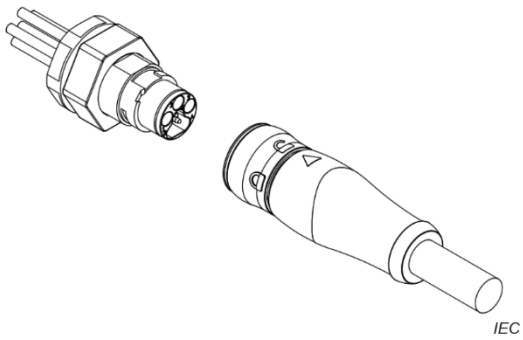
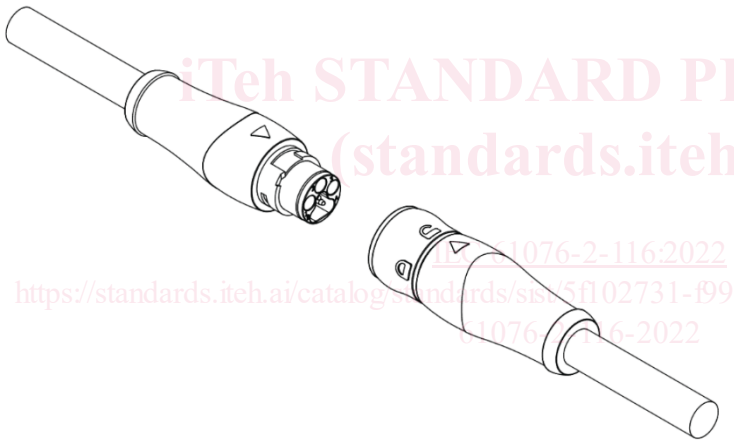
This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

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- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

IEC SC 48B – Electrical connectors Specification available from: IEC General secretariat or from the addresses shown on the inside cover.	IEC 61076-2-116 Ed. 1
DETAIL SPECIFICATION in accordance with IEC 61076-1	
 IEC	Circular connectors for signal and power applications with bayonet-locking Male and female connectors Male and female contacts Rewireable and non-rewireable
 IEC	Free cable connectors Straight and right-angle connectors Fixed connectors Flange mounting Single hole mounting With circular mounting orientation

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CONNECTORS FOR ELECTRICAL AND ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 2-116: Detail specification for circular connectors size 15 with up to 3+PE power contacts and auxiliary contacts, with bayonet-locking

1 Scope

This part of IEC 61076-2 specifies circular connectors size 15 with bayonet-locking, with up to 3 power contacts with rated insulation voltage up to 630 V AC/DC and rated current up to 20 A, plus PE, and up to 3 auxiliary contacts with rated insulation voltage up to 63 V AC/DC and rated current up to 10 A, that are typically used for industrial power supply and power applications, such as the feeding and control of 3-phase asynchronous motors. These connectors consist of both fixed and free connectors either rewireable or non-rewireable, with bayonet-locking. Male connectors have round contacts, either power or signal, Ø1,6 mm.

NOTE 1 Size 15 is the dimension of the inner contact carrier of the male connector interface (dimension AG in Table 18).

NOTE 2 Number of power and auxiliary contacts, voltage and current ratings vary according to the type of connector, see Table 1.

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*

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

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

IEC 60352 (all parts), *Solderless connections*

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

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 60512-2-1, *Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method*

IEC 60512-2-5, *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 60512-5-2, *Connectors for electronic equipment – Tests and measurements – Part 5-2: Current-carrying capacity tests – Test 5b: Current-temperature derating*

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 11-1: Climatic tests – Test 11a – Climatic sequence*

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 60512-16-1, *Connectors for electronic equipment – Tests and measurements – Part 16-1: Mechanical tests on contacts and terminations – Test 16a: Probe damage*

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 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60664-1, *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 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 61984, *Connectors – Safety requirements and tests*

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

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

ISO 21920-1: 2021, *Geometrical product specifications (GPS) – Surface texture: Profile – Part 1: Indication of surface texture*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050-581, IEC 61076-1, IEC 60512-1, IEC 61984, 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
circular 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 cable entry direction and the polarization keyway should be specified.

4 Technical information

4.1 Recommended method of termination

According to IEC 60352 series (solderless connections) and IEC 60999-1 (screw-type and screwless-type connections).

4.2 Electrical ratings and characteristics

The electrical ratings and characteristics shall be as specified in Table 1 and in Table 22 through Table 25.

Table 1 – Ratings of connectors

Type	Style	No. of contacts	Function	Pin Ø mm	Rated insulation voltage	Rated current A
1	6-way (2 +PE +3)	3	2 + PE	1,6	24 V DC	20
		3	A + B + C		24 V DC	4
2	6-way (2 +PE +3)	3	2 + PE	1,6	48 V DC	20
		3	A + B + C		48 V DC	4
3	6-way (3 +PE +2)	4	3 + PE	1,6	630 V AC/DC	16
		2	A + B		63 V AC/DC	10

NOTE 1 The rated currents for connectors type 1 and 2 provided in Table 1 are associated with a min. 2,5 mm^2 wire size for the power contacts and a min. 0,34 mm^2 wire size for the auxiliary contacts.

NOTE 2 The rated currents for connectors type 3 provided in Table 1 are associated with a min. 1,5 mm^2 wire size for the power contacts and a min. 1 mm^2 wire size for the auxiliary contacts.

4.3 Current-carrying capacity

The current-carrying capacity shall be measured according to IEC 60512-5-2, Test 5b and stated by the manufacturer.

It shall be applied to a wiring with conductor cross-sectional area of min. 1,5 mm^2 for 16 A or min. 2,5 mm^2 for 20 A on the power section and min. 0,34 mm^2 for 4 A or 1 mm^2 for 10 A on the signal section, and it shall fulfil the rated currents specified in Table 1.

4.4 Systems of levels – Compatibility levels, according to IEC 61076-1

Connectors according to this document are intermateable according to IEC 61076-1.

4.5 Classification into climatic categories

Classification into climatic categories is specified in 6.3.

4.6 Marking

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

4.7 Safety aspects

For safety aspects IEC 61984 shall be considered.

Connectors according to this document are COC (connectors without breaking capacity) per IEC 61984, unless otherwise specified by the manufacturer.

5 Dimensional information

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 Fixed connectors

5.2.2.1 General

Table 2 shows styles of fixed connectors.

Table 2 – Styles of fixed connectors

Style	Description
DM	Fixed connector, male contacts, square flange front mounting
EM	Fixed connector, male contacts, single hole mounting
FM	Fixed connector, male contacts, single hole mounting, circular mounting orientation
DF	Fixed connector, female contacts, square flange front mounting
EF	Fixed connector, female contacts, single hole mounting
FF	Fixed connector, female contacts, single hole mounting, circular mounting orientation

5.2.2.2 Style DM

Figure 1 and Table 3 show a fixed connector, with male contacts, with a square flange front mounting.

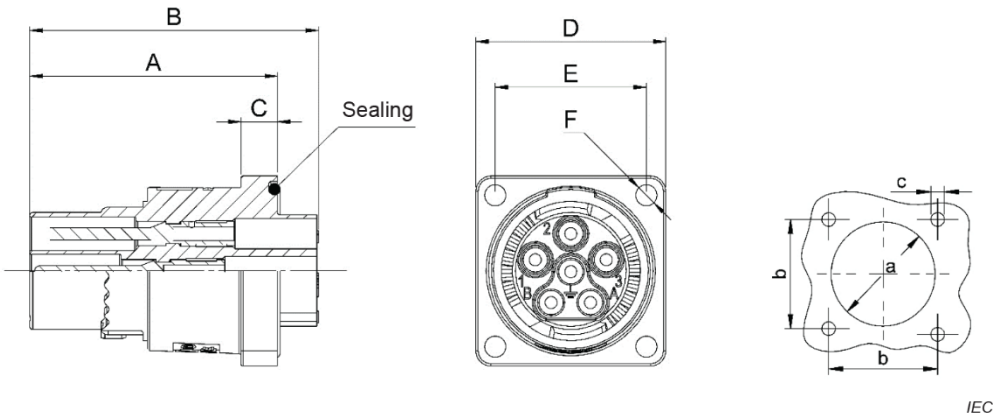

Figure 1 – Fixed connector, male contacts, with a square flange front mounting

Table 3 – Dimensions of style DM, Figure 1

Dimensions in millimetres

A max.	B max.	C max.	D max.	E	ØF	Øa max.	b	c
36	43	5	25	19,9	2,8±0,1	21	19,9	4×M2,5

5.2.2.3 Style EM

Figure 2 and Table 4 show a fixed connector, with male contacts, single hole mounting.

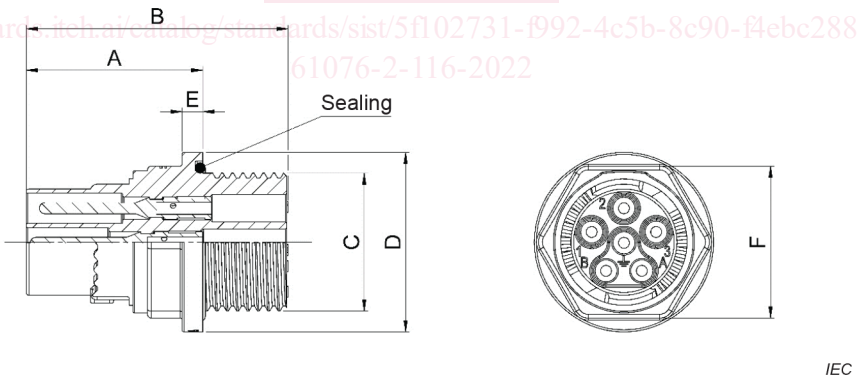

Figure 2 – Fixed connector, male contacts, single hole mounting

Table 4 – Dimensions of style EM, Figure 2

Dimensions in millimetres

A max.	B max.	C	ØD max.	E max.	F
28	39	M20×1,5	30	5	22

5.2.2.4 Style FM

Figure 3 and Table 5 show a fixed connector, with male contacts, single hole mounting and a circular mounting orientation.