

BS EN 61076-2-101:2008

Incorporating corrigendum March 2010



BSI Standards Publication

Connectors for electronic equipment — Product requirements —

Part 2-101: Circular connectors — Detail specification for M12 connectors with screw-locking

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National foreword

This British Standard is the UK implementation of EN 61076-2-101:2008. It is identical to IEC 61076-2-101:2008, incorporating corrigendum March 2010. Together with BS EN 61076-2-104:2008, it supersedes BS EN 61076-2-101:2003 which is withdrawn.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by IEC corrigendum March 2010 is indicated in the text by AC1 AC1.

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.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Date	Text affected
31 July 2010	Implementation of IEC corrigendum March 2010

**Connectors for electronic equipment -
Product requirements -
Part 2-101: Circular connectors -
Detail specification for M12 connectors with screw-locking
(IEC 61076-2-101:2008)**

Connecteurs pour équipements
électroniques -
Exigences de produit -
Partie 2-101: Connecteurs circulaires -
Spécification particulière
pour les connecteurs M12 à vis
(CEI 61076-2-101:2008)

Steckverbinder für elektronische
Einrichtungen -
Produktanforderungen -
Teil 2-101: Rundsteckverbinder -
Bauartspezifikation für Steckverbinder
M12 mit Schraubverriegelung
(IEC 61076-2-101:2008)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 48B/1893/FDIS, future edition 2 of IEC 61076-2-101, 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 was approved by CENELEC as EN 61076-2-101 on 2008-08-01.

This European Standard, together with EN 61076-2-104:2008, supersedes EN 61076-2-101:2003 + A1:2006.

EN 61076-2-101:2008 includes the following significant technical changes with respect to EN 61076-2-101:2003:

- the connector type M8 has been removed from EN 61076-2-101 and has been published in a separate European Standard under reference EN 61076-2-104;
- the content of Amendment 1 is included in this European Standard;
- mounting thread changed from Pg to metric.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2009-05-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2011-08-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61076-2-101:2008 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60423	NOTE Harmonized as EN 60423:2007 (not modified).
IEC 61076-2-001	NOTE Harmonized as EN 61076-2-001:2001 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

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

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
-	-	Communication cables - Specifications for test methods - Part 1-14: Electrical test methods - Coupling attenuation or screening attenuation of connecting hardware	EN 50289-1-14	- ¹⁾
IEC 60050-581	- ¹⁾	International Electrotechnical Vocabulary (IEV) - Chapter 581: Electromechanical components for electronic equipment	-	-
IEC 60068-1	- ¹⁾	Environmental testing - Part 1: General and guidance	EN 60068-1	1994 ²⁾
IEC 60068-2-60	- ¹⁾	Environmental testing - Part 2: Tests - Test Ke: Flowing mixed gas corrosion test	EN 60068-2-60	1996 ²⁾
IEC 60352	Series	Solderless connections	EN 60352	Series
IEC 60512	Series	Connectors for electronic equipment - Tests and measurements	EN 60512	Series
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May	1991 1993
IEC 60664-1	- ¹⁾	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007 ²⁾
IEC 60998-2-1 (mod)	- 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	EN 60998-2-1	2004 ²⁾
IEC 60999	Series	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units	EN 60999	Series
IEC 61076-1	2006	Connectors for electronic equipment - Product requirements - Part 1: Generic specification	EN 61076-1	2006
IEC 61984	- ¹⁾	Connectors - Safety requirements and tests	EN 61984	2001 ²⁾
ISO 1302	- ¹⁾	Geometrical Product Specifications (GPS) - Indication of surface texture in technical product documentation	-	-

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

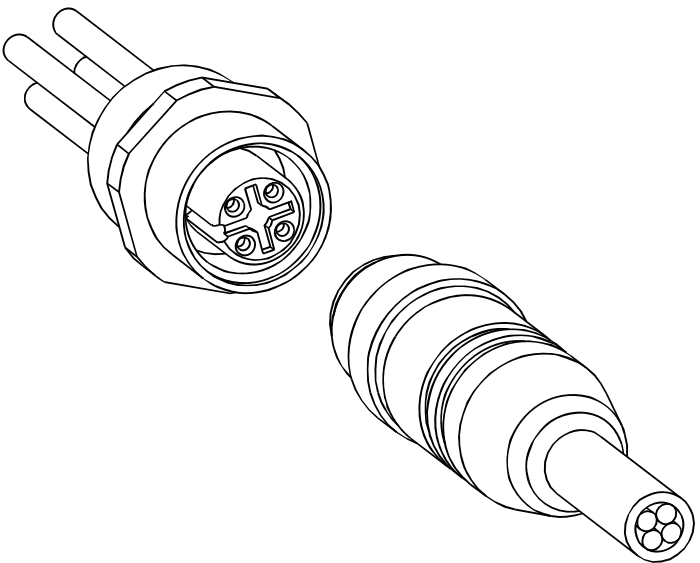
<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
DIN 46320	- ¹⁾	Screwed glands for cables: general application, dimensions, mounting instructions	-	-

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IEC SC 48B – Connectors Specification available from: IEC General secretariat or from the addresses shown on the inside cover.	IEC 61076-2-101/Ed. 2.0
ELECTRONIC COMPONENTS DETAIL SPECIFICATION in accordance with IEC 61076-1	
 IEC 2336/03	Circular connectors M12 2 to 12 way Male and female contacts Male and female connectors Rewireable – Non-rewireable
	Free cable connectors Straight and right angle connectors Fixed connectors Flange mounting Single hole mounting Pin sockets

CONNECTORS FOR ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

Part 2-101: Circular connectors – Detail specification for M12 connectors with screw-locking

1 General information

Throughout this standard dimensions are in mm.

1.1 Scope

This International Standard describes circular connectors M12 typically used for industrial process measurement and control. These connectors consist of fixed and free connectors either rewirable or non-rewirable, with screw-locking. Male connectors have round contacts $\varnothing$ 0,6 mm, $\varnothing$ 0,76 mm, $\varnothing$ 0,8 mm and $\varnothing$ 1,0 mm.

The different codings prevent the mating of these coded male or female connectors to any other interfaces and cross mating between the different codings.

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

1.2 Recommended method of termination

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

1.2.1 Number of contacts or contact cavities

A-coding	2 to 12 contacts
B-coding	5 contacts
C-coding	3 to 6 contacts
D-coding	4 contacts
P-coding	5 contacts (4+PE)

1.3 Ratings and characteristics

Rated Voltage	A-coding	2 to 4 contacts	250 V d.c. or a.c.
		5 contacts	60 V d.c. or a.c.
		6 to 12 contacts	30 V d.c. or a.c.
	B-coding	5 contacts	60 V d.c. or a.c.
		3 and 4 contacts	250 V d.c. or a.c.
	C-coding	 5 contacts	60 V d.c. or a.c.
		6 contacts	30 V d.c. or a.c. 
	D-coding	4 contacts	250 V d.c. or a.c.
	P-coding (4+PE)	5 contacts (4+PE)	60 V d.c. or a.c.

Rated Current	A-coding	2 to 5 contacts	4 A
		6 to 8 contacts	2 A
		9 to 12 contacts	1,5 A
	B-coding	5 contacts	4 A
		3 contacts (2+PE)	4 A
		4 contacts (3+PE)	4 A
		5 contacts (4+PE)	2 A
	C-coding	6 contacts (5+PE)	2 A
	D-coding	4 contacts	4 A
	P-coding	5 contacts (4+PE)	4 A



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

Climatic category : see 4.1 Table 5

Contact spacing : see 3

1.4 Normative references

The following referenced documents are indispensable for the application 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 60068-2-60, *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)*

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*

ISO 1302: *Technical drawings – Methods of indicating surface texture*

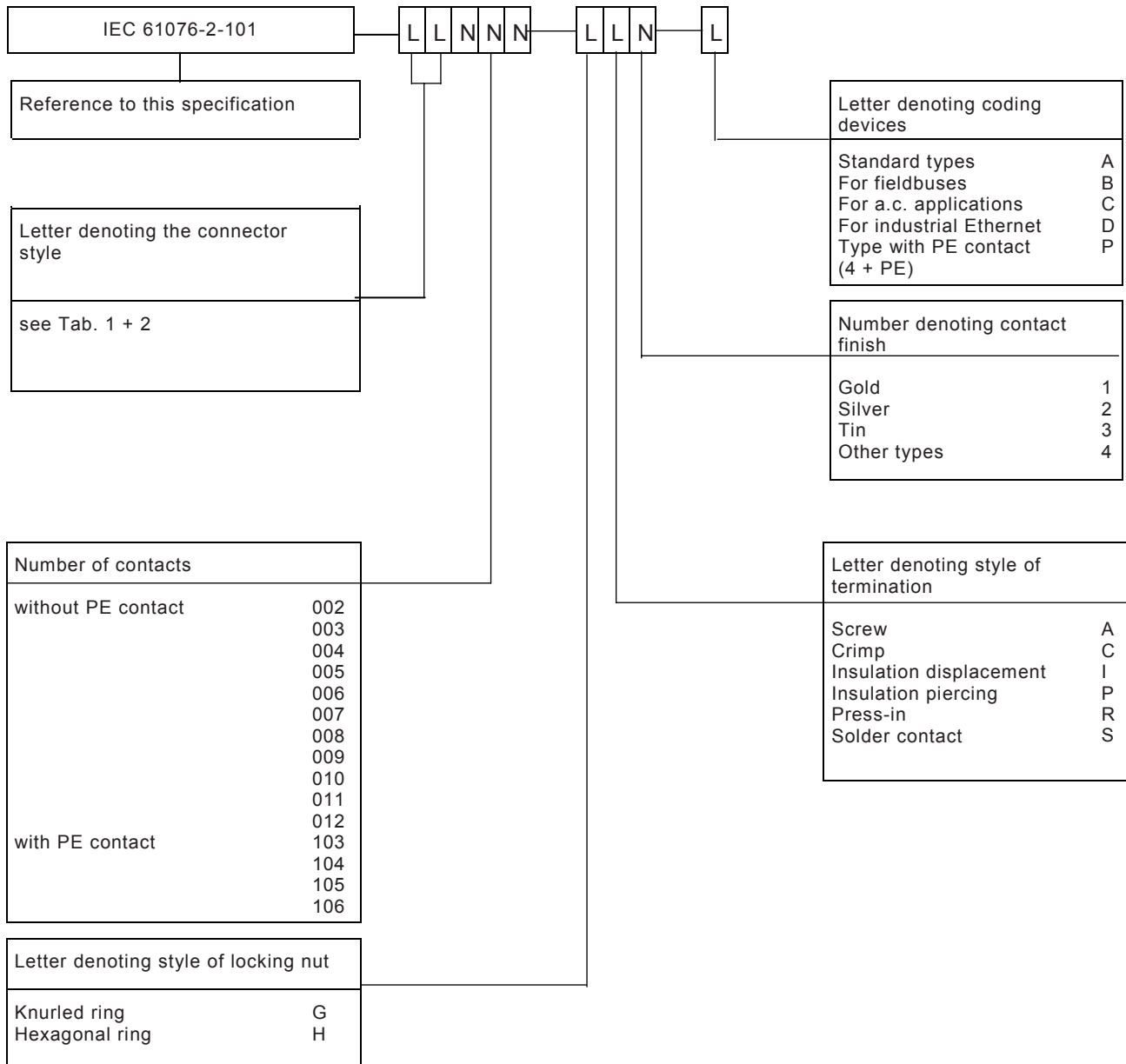
EN 50289-1-14, *Communication cables – Specifications for test methods – Part 1-14: Electrical test methods – Coupling attenuation or screening attenuation of connecting hardware (only available in English)*

DIN 46320, *Screwed glands for cables: general application, dimensions, mounting instructions*

1.5 Marking

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

1.6 IEC Type designation



NOTE "L" stands for letter, "N" stands for number

1.7 Ordering information

For ordering connectors to this standard, the type designation described in 1.6 shall be used.

Example 1: Non-rewireable free connector

MF 004 – GI1-A

Free connector style MF, non-rewireable, right angled version with female insulation displacement contacts, 4 ways, with knurled ring, gold contact finish, coding A, standard type

Example 2: Rewireable free connector

KM 004 – HC3-D

Free connector style KM, rewireable, right angled version with male contacts, 4 ways, with

knurled ring, crimp terminals, tin contact finish, coding D for Ethernet in industrial environment
e. g. ISO/IEC 24702.

1.8 Safety aspects

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

2 Technical information

Dimensions in mm.

2.1 Terms and definitions

For the purposes of this International Standard, terms and definitions from IEC 60050-581 apply.

2.1.1 Mounting orientation

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

NOTE 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.

2.2 Survey of styles and variants

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

For interface dimensions see 3.2.

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 have to be met.

2.2.1 Fixed connectors

Table 1 shows styles of fixed connectors.

Table 1 – Styles of fixed connectors

Style	Description
AM	Tube insert, male contacts, mounting without thread
BM	Tube insert, male contacts, mounting with thread M12 × 1
DM	Fixed connector, male contacts, mounting with thread M12 × 1, square flange front mounting
EM	Fixed connector, male contacts, mounting with thread M12 × 1, with wire ends, single hole mounting M16 × 1,5
FM	Fixed connector, male contacts, mounting with thread M12 × 1, with wire ends, single hole mounting M20 × 1,5
GM	Fixed connector, male contacts, mounting with thread M12 × 1, with wire ends, single hole mounting M16 × 1,5, mounting orientation
HM	Fixed connector, male contacts, mounting with thread M12 × 1, with wire ends, single hole mounting M20 × 1,5, mounting orientation
EF	Fixed connector, female contacts, with wire ends, single hole mounting M16 × 1,5
FF	Fixed connector, female contacts, with wire ends, single hole mounting M20 × 1,5
GF	Fixed connector, female contacts, with wire ends, single hole mounting M16 × 1,5, mounting orientation
HF	Fixed connector, female contacts, with wire ends, single hole mounting M20 × 1,5, mounting orientation

NOTE For new connectors according to this International Standard, Pg screw threads according to DIN 46320 (withdrawn) should not be applicable. For information on Pg threads, see Annex B.

2.2.1.1 Style AM

Figure 1 shows a tube insert, with male contacts and a mounting with thread (thread on tube).

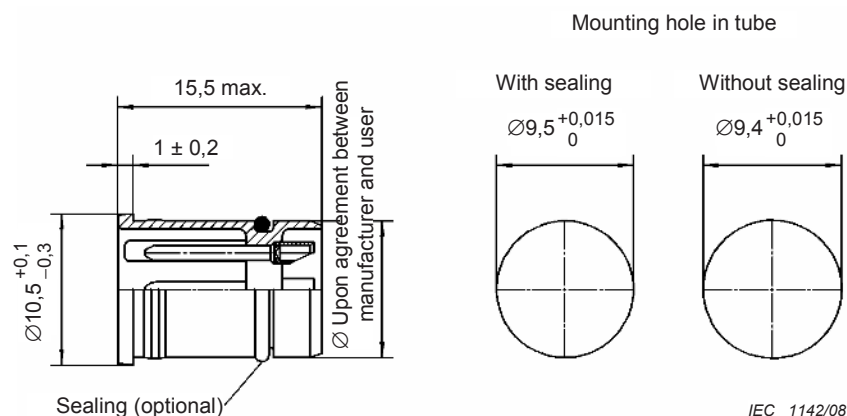


Figure 1 – Tube insert, male contacts, mounting without thread (thread on tube)

2.2.1.2 Style BM

Figure 2 shows a tube insert, with male contacts and a mounting with thread M12 × 1.

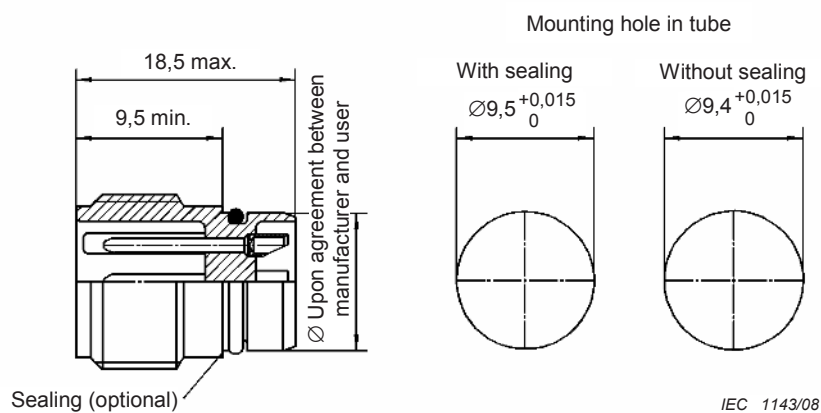


Figure 2 – Tube insert, male contacts, mounting with thread M12 × 1

2.2.1.3 Style DM

Figure 3 shows a fixed connector, with male contacts, mounting with thread M12 × 1 and a square flange front mounting.

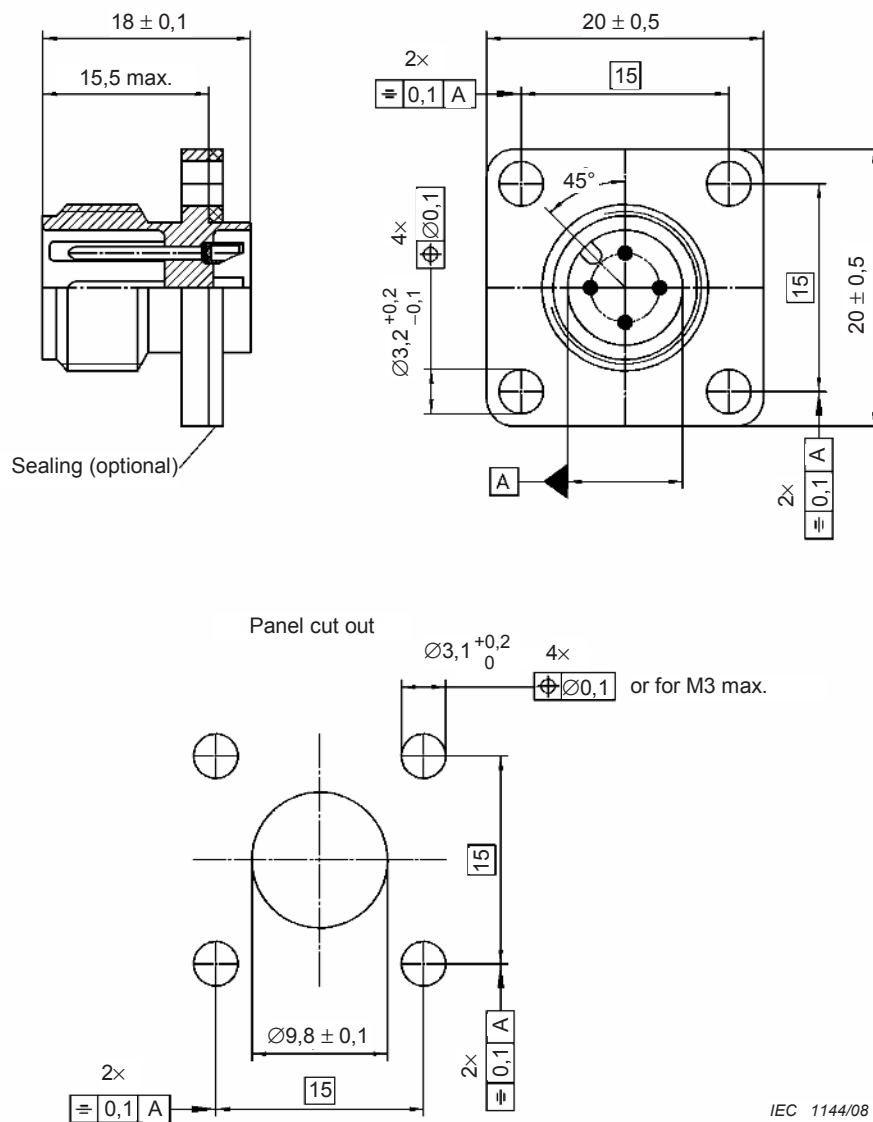


Figure 3 – Fixed connector, male contacts, mounting with thread M12 × 1, square flange front mounting

2.2.1.4 Style EM

Figure 4 shows a fixed connector, with male contacts, mounting with thread $M12 \times 1$, with wire ends and a single hole mounting thread $M16 \times 1,5$.

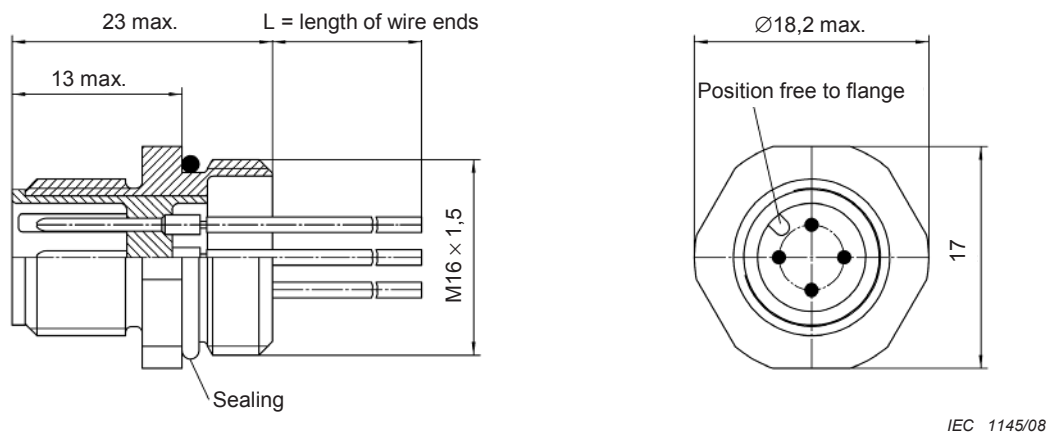


Figure 4 – Fixed connector, male contacts, mounting with thread $M12 \times 1$, with wire ends, single hole mounting thread $M16 \times 1,5$

2.2.1.5 Style FM

Figure 5 shows fixed connectors, with male contacts, mounting with thread $M12 \times 1$, with wire ends and a single hole mounting thread $M20 \times 1,5$.

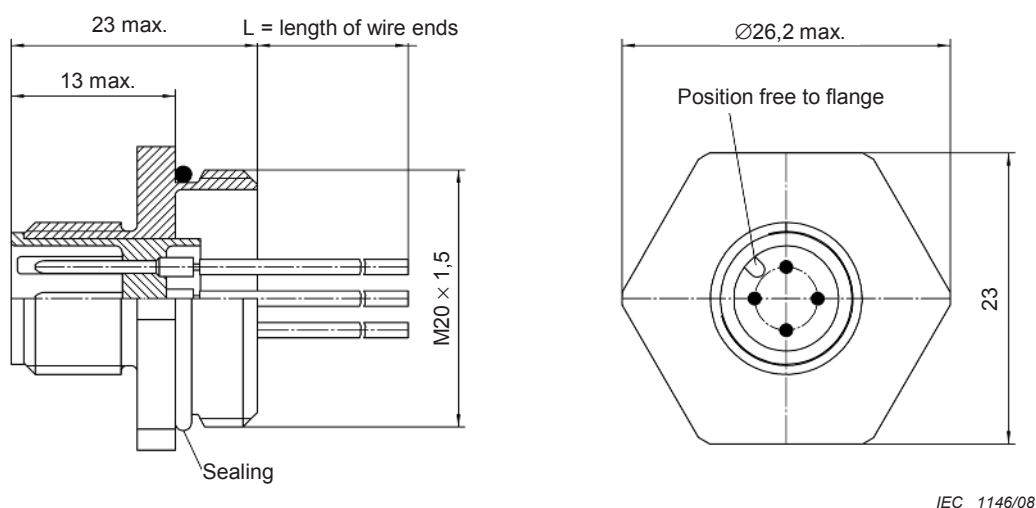


Figure 5 – Fixed connector, male contacts, mounting with thread $M12 \times 1$, with wire ends, single hole mounting thread $M20 \times 1,5$