

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Connecteurs pour équipements électroniques – Exigences de produit –
Partie 2-101: Connecteurs circulaires – Spécification particulière pour les
connecteurs M12 à vis**



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2012 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester.

If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de la CEI ou du Comité national de la CEI du pays du demandeur.

Si vous avez des questions sur le copyright de la CEI ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de la CEI de votre pays de résidence.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

Useful links:

IEC publications search - www.iec.ch/searchpub

The advanced search enables you to find IEC publications by a variety of criteria (reference number, text, technical committee,...).

It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available on-line and also once a month by email.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing more than 30 000 terms and definitions in English and French, with equivalent terms in additional languages. Also known as the International Electrotechnical Vocabulary (IEV) on-line.

Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

A propos de la CEI

La Commission Electrotechnique Internationale (CEI) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications CEI

Le contenu technique des publications de la CEI est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Liens utiles:

Recherche de publications CEI - www.iec.ch/searchpub

La recherche avancée vous permet de trouver des publications CEI en utilisant différents critères (numéro de référence, texte, comité d'études,...).

Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

Just Published CEI - webstore.iec.ch/justpublished

Restez informé sur les nouvelles publications de la CEI. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

Electropedia - www.electropedia.org

Le premier dictionnaire en ligne au monde de termes électroniques et électriques. Il contient plus de 30 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans les langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (VEI) en ligne.

Service Clients - webstore.iec.ch/csc

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: csc@iec.ch.



IEC 61076-2-101

Edition 3.0 2012-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

**Connecteurs pour équipements électroniques – Exigences de produit –
Partie 2-101: Connecteurs circulaires – Spécification particulière pour les
connecteurs M12 à vis**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX

XA

ICS 31.220.10

ISBN 978-2-8322-0058-2

**Warning! Make sure that you obtained this publication from an authorized distributor.
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

CONTENTS

FOREWORD.....	5
1 Scope.....	8
2 Normative references	8
3 Technical information	9
3.1 Terms and definitions	9
3.2 Recommended method of termination	9
3.2.1 General	9
3.2.2 Number of contacts or contact cavities	10
3.3 Ratings and characteristics	10
3.4 Marking	10
3.5 Safety aspects.....	10
4 Dimensional information	11
4.1 General.....	11
4.2 Survey of styles and variants.....	11
4.2.1 Fixed connectors	11
4.2.2 Free connectors	22
4.3 Interface dimensions	27
4.3.1 Pin front view A-coding	27
4.3.2 Pin front view B-coding	32
4.3.3 Pin front view C-coding.....	33
4.3.4 Pin front view D-coding	36
4.3.5 Pin front view P-coding	37
4.4 Engagement (mating) information	38
4.5 Gauges	40
5 Characteristics	41
5.1 Climatic category.....	41
5.2 Electrical characteristics.....	41
5.2.1 Rated voltage – Rated impulse voltage – Pollution degree.....	41
5.2.2 Voltage proof.....	42
5.2.3 Current-carrying capacity.....	43
5.2.4 Contact resistance.....	43
5.2.5 Insulation resistance.....	44
5.3 Mechanical characteristics	44
5.3.1 IP degree of protection	44
5.3.2 Mechanical operation	44
5.3.3 Insertion and withdrawal forces	44
5.3.4 Contact retention in insert.....	44
5.3.5 Polarizing method.....	45
5.3.6 Vibration (sinusoidal).....	45
5.3.7 Pressure differential	45
6 Test schedule.....	45
6.1 General.....	45
6.2 Arrangement for contact resistance measurements	46
6.3 Arrangement for dynamic stress tests (vibration)	46
6.4 Test schedule.....	48

6.4.1	Test group P – Preliminary	48
6.4.2	Test group AP – Dynamic/ Climatic.....	49
6.4.3	Test group BP – Mechanical endurance.....	52
6.4.4	Test group CP – Electrical load	54
6.4.5	Test group DP – Chemical resistivity	55
6.4.6	Test group EP – Connection method tests	55
6.4.7	Test group FP – Electrical transmission requirements	56
Annex A (informative)	Diameter of the female connector body	57
Annex B (informative)	Steel conduit thread, sizes	58
Figure 1	– Tube insert, male contacts, mounting without thread (thread on tube)	12
Figure 2	– Tube insert, male contacts, mounting with thread M12 × 1	12
Figure 3	– Fixed connector, male contacts, mounting with thread M12 × 1, square flange front mounting	13
Figure 4	– Fixed connector, male contacts, mounting with thread M12 × 1, with wire ends, single hole mounting thread M16 × 1,5	14
Figure 5	– Fixed connector, male contacts, mounting with thread M12 × 1, with wire ends, single hole mounting thread M20 × 1,5	14
Figure 6	– Fixed connector, male contacts, mounting with thread M12 × 1 with wire ends, single hole mounting thread M16 × 1,5, mounting orientation	15
Figure 7	– Fixed connector, male contacts, mounting with thread M12 × 1, with wire ends, single hole mounting thread M20 × 1,5, mounting orientation	15
Figure 8	– Fixed connector, glass to metal seal, square flange front mounting, male contacts	16
Figure 9	– Fixed connector, glass to metal seal, single hole front mounting, male contacts	17
Figure 10	– Fixed connector, glass to metal seal, jam nut rear mounting, male contacts	18
Figure 11	– Fixed connector, glass to metal seal, through flange mounting, male contacts	19
Figure 12	– Fixed connector, female contacts, mounting with thread M12 × 1, with wire ends, single hole mounting thread M16 × 1,5	19
Figure 13	– Fixed connector, female contacts, mounting with thread M12 × 1, with wire ends, single hole mounting thread M20 × 1,5	20
Figure 14	– Fixed connector, female contacts, mounting with thread M12 × 1, with wire ends, single hole mounting thread M16 × 1,5, mounting orientation.....	21
Figure 15	– Fixed connector, female contacts, mounting with thread M12 × 1, with wire ends, single hole mounting thread M20 × 1,5, mounting orientation.....	21
Figure 16	– Rewireable connector, male contacts, straight version, with locking nut	22
Figure 17	– Rewireable connector, male contacts, right angled version, with locking nut.....	23
Figure 18	– Non-rewireable connector, male contacts, straight version, with locking nut	23
Figure 19	– Non-rewireable connector, male contacts, right angled version, with locking nut	24
Figure 20	– Non-rewireable connector, male contacts, right angled higher version, with locking nut	24
Figure 21	– Rewireable connector, female contacts, straight version, with locking nut	25
Figure 22	– Rewireable connector, female contacts, right angled version, with locking nut....	25
Figure 23	– Non-rewireable connector, female contacts, straight version, with locking nut	26

Figure 24 – Non-rewireable connector, female contacts, right angled version, with locking nut	26
Figure 25 – Pin front view A-coding, up to 12 ways	27
Figure 26 – Pin front view A-coding, 13 up to 17 ways	28
Figure 27 – Contact position A-coding front view	30
Figure 28 – Pin front view B-coding	32
Figure 29 – Contact position B-coding front view	32
Figure 30 – Pin front view 3 way with C-coding	33
Figure 31 – Pin front view 4 way with C-coding	33
Figure 32 – Pin front view 5 way with C-coding	34
Figure 33 – Pin front view 6 way with C-coding	34
Figure 34 – Contact position C-coding front view	35
Figure 35 – Pin front view D-coding	36
Figure 36 – Contact position D-coding front view	36
Figure 37 – Pin front view P-coding	37
Figure 38 – Contact position P-coding front view	37
Figure 39 – Engagement (mating) information.....	38
Figure 40 – Gauge dimensions	41
Figure 41 – Contact resistance arrangement.....	46
Figure 42 – Dynamic stress test arrangement.....	47
Figure A.1 – Diameter of the female connector body.....	57
Figure B.1 – Dimensions Pg thread.....	58
Table 1 – Ratings of connectors.....	10
Table 2 – Styles of fixed connectors	11
Table 3 – Styles of free connectors.....	22
Table 4 – Connectors dimensions in mated and locked position	39
Table 5 – Gauges	41
Table 6 – Climatic category	41
Table 7 – Rated voltage – Rated impulse voltage – Pollution degree	42
Table 8 – Voltage proof.....	43
Table 9 – Number of mechanical operations	44
Table 10 – Insertion and withdrawal forces	44
Table 11 – Number of test specimens	46
Table 12 – Test group P	48
Table 13 – Test group AP	49
Table 14 – Test group BP	52
Table 15 – Test group CP	54
Table 16 – Test group DP	55
Table 17 – Test group EP	55
Table 18 – Test group FP	56
Table A.1 – Diameter of the female connector body, dimension x	57
Table B.1 – Dimensions	59

STANDARD PREVIEW
(standards.iteh.ai)
IEC 61076-2-101:2012
<https://standards.iteh.ai/catalog/standards/sist/7c7aad72-91d0-4dd1-b580-129a1f0d0a36/iec-61076-2-101-2012>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**CONNECTORS FOR ELECTRONIC EQUIPMENT –
PRODUCT REQUIREMENTS –****Part 2-101: Circular connectors –
Detail specification for M12 connectors with screw-locking**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61076-2-101 has been prepared by sub-committee 48B: Connectors, of Technical Committee 48: Electromechanical components and mechanical structures for electronic equipment.

This third edition cancels and replaces the second edition published in 2008 and its corrigendum published in 2010. It constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- The drawings of some styles have been corrected.
- A new style with maximum 17 poles, with A-coding, has been added, as new applications for the industrial process measurement and control require a high number of poles in M12 circular connectors. The existing styles and dimensions which were

specified in IEC 61076-2-101 Ed. 2 are further applicable for the added interface dimension of the 17 poles versions.

- Removal of the type designation and ordering information, former Tables 6 and 7 have been updated accordingly.
- Inclusion of the technical content of IEC PAS 61076-2-108, which will be withdrawn after publication of this International Standard. The drawings have been updated and correction to the title of Figure 9 was made.

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

FDIS	Report on voting
48B/2279/FDIS	48B/2288/RVD

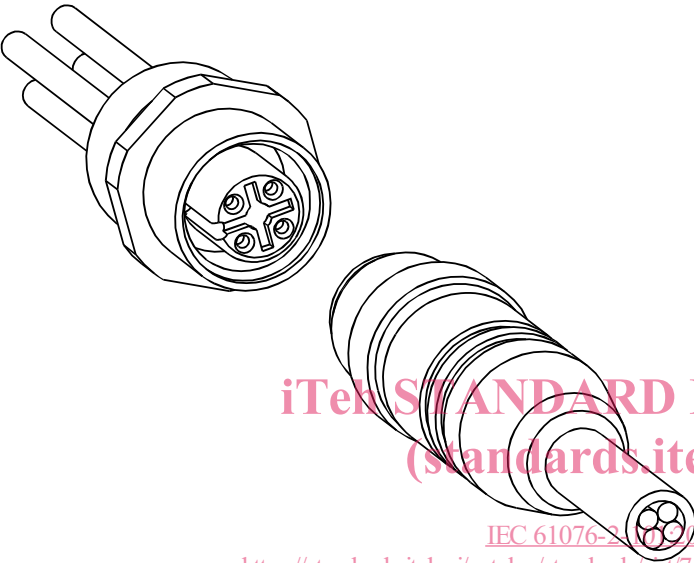
Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or [IEC 61076-2-101:2012](https://standards.iteh.ai/catalog/standards/sist/7c7aad72-91d0-4dd1-b580-129a1f0d0a36/iec-61076-2-101-2012)
- amended.

<p>IEC SC 48B – Connectors</p> <p>Specification available from: IEC General secretariat or from the addresses shown on the inside cover.</p>	IEC 61076-2-101 Ed. 3.0
<p>ELECTRONIC COMPONENTS</p> <p>DETAIL SPECIFICATION in accordance with IEC 61076-1</p>	
 <p>https://standards.itech.ai/catalog/standards/sist/7c7aad72-91d0-4dd1-b580-129a1f0d0a36/iec-61076-2-101-2012</p> <p>IEC 61076-2-101:2012 IEC 2336/03</p>	<p>Circular connectors M12 2 to 17 way Male and female contacts Male and female connectors Rewireable – Non-rewireable</p>
	<p>Free cable connectors Straight and right angle connectors Fixed connectors Fixed connectors with glass to metal seals (pin contacts only)</p> <p>Flange mounting Single hole mounting</p> <p>Pin sockets</p>

CONNECTORS FOR ELECTRONIC EQUIPMENT – PRODUCT REQUIREMENTS –

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

1 Scope

This part of IEC 61076 describes M12 circular connectors typically used for industrial process measurement and control. These connectors consist of fixed and free connectors either rewirable or non-rewirable, with screw-locking. The connectors with glass to metal seal are fixed connectors only which consist of fixed glass to metal sealed styles with rewirable male contacts and are intermateable with corresponding free connectors according to this International Standard. 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.

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 60050-581: 2008, *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: Tests – Test Ke: Flowing mixed gas corrosion test*

IEC 60352 (all parts), *Solderless connections*

IEC 60423:2007, *Conduit systems for cable management – Outside diameters of conduits for electrical installations and threads for conduits and fittings*

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

IEC 60512-1-100, *Connectors for electronic equipment – Tests and measurements – Part 1-100: General – Applicable publications*

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*

3 Technical information

3.1 Terms and definitions

For the purposes of this document, terms and definitions from IEC 60050-581 as well as the following apply.

3.1.1

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.

3.1.2

glass to metal seal

a form of construction whereby the connector contacts are housed in a glass insert which is inside a metal connector shell so as to form a connector with a hermetic seal which may be used to isolate differing environments

3.1.3

matched glass to metal seal

a form of construction whereby the thermal expansion characteristics of the glass, the metallic contacts, and the connector shell are similar and the seal between the glass and the metal is formed by a chemical bond

3.1.4

compression glass to metal seal

a form of construction whereby due to the its higher coefficient of expansion the shell contracts around the glass during the solidification phase of manufacture applying a compression force to the glass insert so as to form a seal

3.2 Recommended method of termination

3.2.1 General

The contact terminations shall be of the following types: screw, crimp, insulation piercing, insulation displacement, press-in or solder. For the male connectors having a glass to metal seal the recommended contact terminations are crimp, eyelet, solder, PCB and rounded.

NOTE 1 eyelet – the termination end is flattened and pierced with a hole to provide both mechanical retention of the wire as well as solder attachment.

NOTE 2 rounded – terminal post with rounded (domed) end.

NOTE 3 PCB – termination spills suitable for insertion into printed circuits.

3.2.2 Number of contacts or contact cavities

A-coding	2 to 17 contacts
B-coding	5 contacts
C-coding	3 to 6 contacts
D-coding	4 contacts
P-coding	5 contacts (4+PE)

3.3 Ratings and characteristics

For the ratings, see Table 1.

Table 1 – Ratings of connectors

Coding	Style	Contacts	Rated voltage a.c. or d.c. V	Rated current A
A-coding	5 way	2 to 4	250	4
		5	60	
	8 way	6 to 8	30	2
	12 way	9 to 12	30	1,5
	17 way	13 to 17	30	1,5
B-coding	5 way	5	60	4
C-coding	3 way (2 + PE)	3 (2 + PE)	250	4
	4 way (3 + PE)	4 (3 + PE)	250	4
	5 way (4 + PE)	5 (4 + PE)	60	2
	6 way (5 + PE)	6 (5 + PE)	30	2
D-coding	4 way	4	250	4 ^a
P-coding	5 way (4 + PE)	5 (4 + PE)	60	4

^aThe M12 connectors with D-coding (4 way) are tested for use with frequencies up to 100 MHz.

Insulation resistance : 10⁸ Ω min.
 Climatic category : see Table 6
 Contact spacing : see Clause 5

3.4 Marking

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

3.5 Safety aspects

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

4 Dimensional information

4.1 General

Throughout this standard 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.

4.2 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 connector styles with glass to metal seal the length E of the contacts shall be agreed 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 have to be met.

4.2.1 Fixed connectors

Table 2 shows styles of fixed connectors.

Table 2 – 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
WM	Fixed connector, glass to metal seal, square flange front mounting, male contacts
XM	Fixed connector, glass to metal seal, single hole front mounting, male contacts
YM	Fixed connector, glass to metal seal, jam nut rear mounting, male contacts
ZM	Fixed connector, glass to metal seal, through flange mounting, male contacts
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.

4.2.1.1 Style AM

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

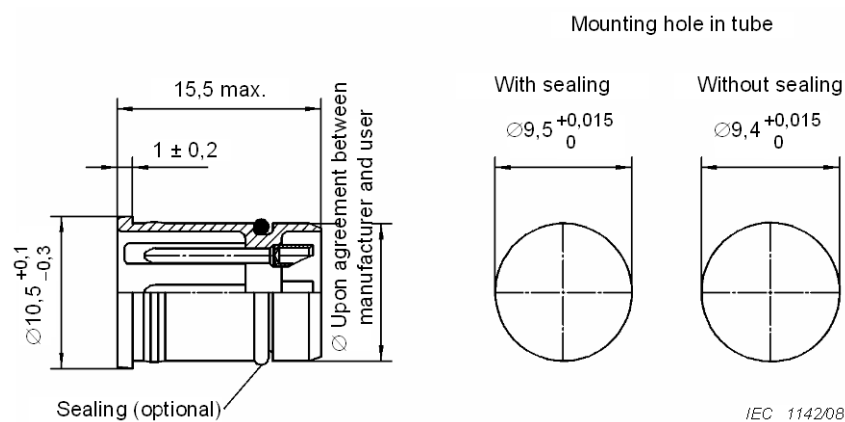


Figure 1 – Tube insert, male contacts, mounting without thread (thread on tube)

4.2.1.2 Style BM

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

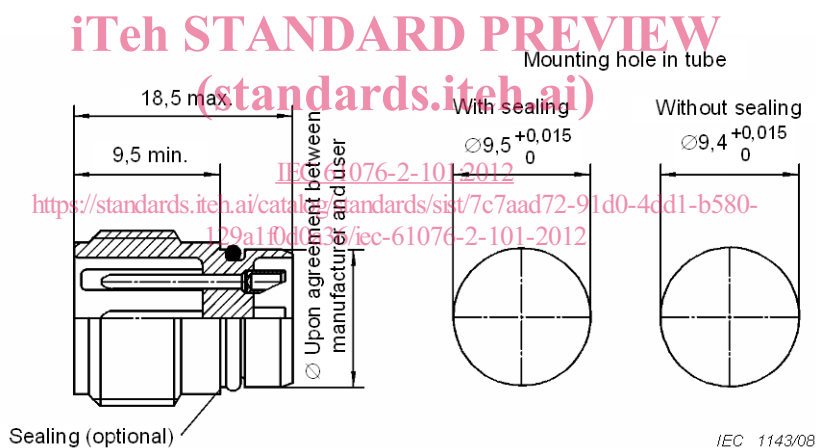


Figure 2 – Tube insert, male contacts, mounting with thread M12 × 1

4.2.1.3 Style DM

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

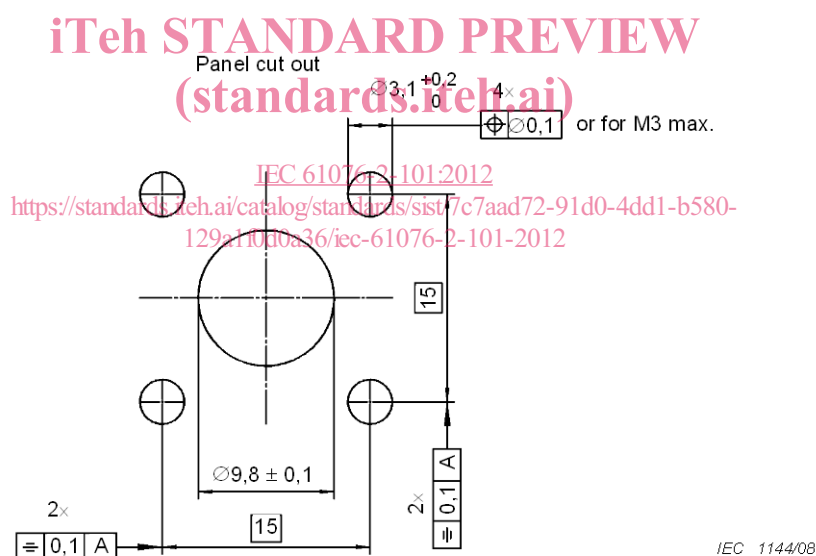
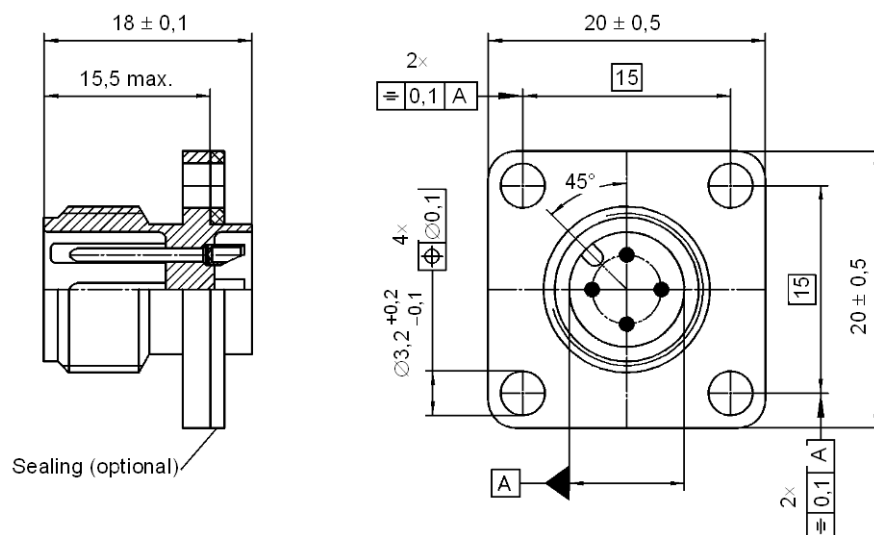


Figure 3 – Fixed connector, male contacts, mounting with thread M12 × 1, square flange front mounting