

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

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



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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IEC 61076-2-101 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.

This fourth edition cancels and replaces the third edition published in 2012. This edition constitutes a technical revision.

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

- a) Technical specifications regarding dimensional information (Clause 5) and characteristics (Clause 6) have been updated, and new subclauses have been added.
- b) New style NF (free connectors) has been added.

- c) Fixed connectors with glass to metal seals (former styles WM, XM, YM, ZM and WF, XF, TF and ZF) are no longer covered by this document: relevant definitions and requirements have been removed.
- d) The P-coding has been eliminated.
- e) Annex B (informative) Steel conduit thread, sizes has been deleted and a new Annex B (informative) Orientation of cable outlet in relation to coding has been added.
- f) The dimension specification of former styles AM and BM have been moved into a new Annex C (normative).

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

Draft	Report on voting
48B/3111/FDIS	48B/3129/RVD

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

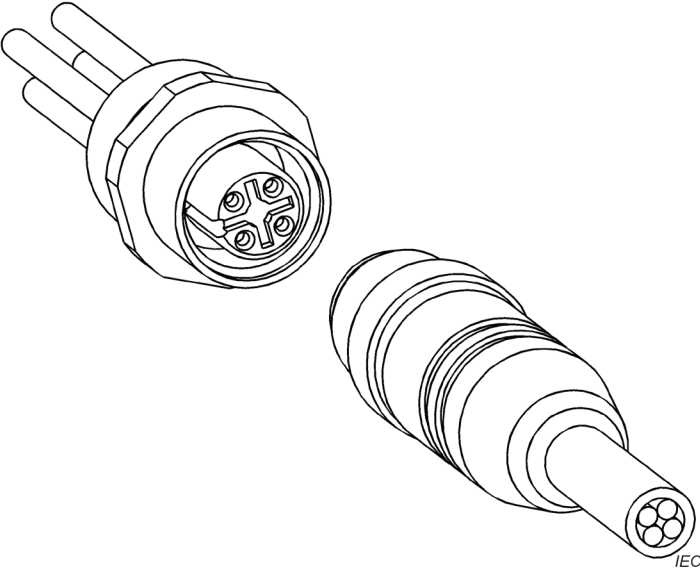
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This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed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

A list of all parts of IEC 61076 series, 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

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IEC SC 48B – Electrical connectors Specification available from: IEC General secretariat or from the addresses shown on the inside cover.	IEC 61076-2-101 Ed 4
DETAIL SPECIFICATION in accordance with IEC 61076-1	
Outline drawing 	Product description Circular connectors M12 2- to 17-way Male and female contacts Male and female connectors Rewirable – Non-rewirable
	Free cable connectors Straight and right angle connectors Fixed connectors Flange mounting Single hole mounting Connector insert

CONNECTORS FOR ELECTRICAL AND 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 screw-locking circular connectors with 2-way up to 17-way, for data transmission with frequencies up to 100 MHz and signal and power transmission at up to 250 V rated voltage and up to 4 A rated current per contact.

These connectors consist of fixed and free connectors, either rewirable or non-rewirable.

Male connectors have round contacts, Ø 0,6 mm, Ø 0,76 mm, Ø 0,8 mm or Ø 1,0 mm according to number of ways and coding, all contacts with the same size.

The different codings prevent the mating of differently coded male and female connectors.

NOTE 1 M12 is the dimension of the thread of the screw-locking mechanism of these circular connectors.

NOTE 2 These connectors are typically used for connecting industrial automation devices for process measurement and control.

NOTE 3 Several other IEC standards are available covering additional styles of circular connectors with M12 × 1 screw-locking, see Bibliography.

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 – Part 581: Electromechanical components for electronic equipment*

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

IEC 60352 (all parts), *Solderless connections*

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

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

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 60512-2-2, *Connectors for electronic equipment – Tests and measurements – Part 2-2: Electrical continuity and contact resistance tests – Test 2b: Contact resistance – Specified test current 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 60512-6-3, *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: Climatic tests – Section 1: Test 11a – Climatic sequence*

IEC 60512-11-3, *Connectors for electronic equipment – Tests and measurements – Part 11-3: Climatic tests – Test 11c: Damp heat, steady state*

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 60512-14-7, *Electromechanical components for electronic equipment – Basic testing procedures and measuring methods – Part 14: Sealing tests – Section 7: Test 14g: Impacting water*

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 60512-23-3, *Connectors for electrical and electronic equipment – Tests and measurements – Part 23-3: Screening and filtering tests – Test 23c: Shielding effectiveness of connectors and accessories – Line injection method*

IEC 60512-29-100, *Connectors for electronic equipment – Tests and measurements – Part 29-100: Signal integrity tests up to 500 MHz on M12 style connectors – Tests 29a to 29g*

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

IEC 60529:1989/AMD1:1999

IEC 60529:1989/AMD2:2013

IEC 60664-1:2020, *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 60999-1, *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 61076-2-010:2021, *Connectors for electrical and electronic equipment – Product requirements – Part 2-010: Circular connectors – Detail specification for connectors with outer or inner push-pull locking mechanism, based on mating interfaces according to IEC 61076-2-101, IEC 61076-2-109, IEC 61076-2-111 and IEC 61076-2-113*

IEC 61076-2-012:2020, *Connectors for electrical and electronic equipment – Product Requirements – Part 2-012: Circular connectors – Detail specification for connectors with inner push-pull locking based on M12 connector interfaces according to IEC 61076-2-101, IEC 61076-2-109, IEC 61076-2-111 and IEC 61076-2-113*

IEC 61984:2008, *Connectors – Safety requirements and tests*

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

IEC TR 63040:2016, *Guidance on clearances and creepage distances in particular for distances equal to or less than 2 mm – Test results of research on influencing parameters*

ISO 11469:2016, *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 and IEC 61984, as well as the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

mounting orientation

circular mounting position of the connector in relation to the polarization of the mating interface

4 Technical information

4.1 Recommended method of termination for rewirable connectors

The contact terminations for rewirable connectors shall be of the following types: screw, crimp, spring clamp, insulation piercing, insulation displacement, press-in connections according to the respective part of the IEC 60352 series and to IEC 60999-1, as applicable, or solder.

4.2 Connector coding, number of contacts, ratings and characteristics

Table 1 provides the codings of these connectors as a function of their variants, number of contacts, rated voltage and rated current.

Table 1 – Ratings of connectors

Coding	Variants	Number of contacts	Rated voltage AC or DC	Rated current A
A-coding	5-way	2 to 4 ^b	250 V	4
		2 to 5 ^c	50 V AC / 63 V DC	
	8-way	6 to 8	32 V	2
	12-way	9 to 12	32 V	1,5
	17-way	13 to 17	32 V	1,5
B-coding	5-way	5	50 V AC / 63 V DC	4
C-coding	3-way (2 + PE)	3 (2 + PE)	250 V	4
	4-way (3 + PE)	4 (3 + PE)	250 V	4
	5-way (4 + FE)	5 (4 + FE)	50 V AC / 63 V DC	2
	6-way (5 + FE)	6 (5 + FE)	32 V	2
D-coding	4-way	4	60 V DC ^a	4
^a The M12 connectors with D-coding (4-way) are used as data connectors for transmission at frequencies up to 100 MHz and operating voltage up to 60 V DC. Tests: see test group FP. ^b Any configuration excludes contact 5. ^c Any configuration includes contact 5.				

Insulation resistance: 10⁸ Ω min.

Contact spacing: see interface dimensions in 5.4.

4.3 Systems of levels

4.3.1 Performance level

Connectors according to this document are classified by mating performance level (MPL). See 6.5.1 for details.

4.3.2 Compatibility levels, according to IEC 61076-1

Connectors according to this document are intermateable and interoperable according to IEC 61076-1 (level 3).

Interoperability is granted provided that the same performance level as defined in 4.3.1 and the same surface of the contacts as defined in 6.2 is considered.

4.4 Classification into climatic categories

See 6.3.

4.5 Creepage and clearance distances

The creepage and clearance distances shall be dimensioned according to the rated insulation voltage values specified in Table 34 (see 6.4.1), in accordance with IEC 60664-1 and shall be measured only in mated position (see 4.8, COC unless otherwise specified by the manufacturer) according to IEC 60512-1-2.

NOTE 1 Creepage distances can be dimensioned for pollution degree 2 for connectors IP54 or higher such as these (see 6.6.3), see IEC 61984:2008, 6.19.3.

The creepage and clearance distances that cover performance requirements in IEC 60664-1 may be reduced, based on IEC TR 63040.

NOTE 2 As indicated in IEC 60664-1, IEC TR 63040 provides an alternative and more precise dimensioning procedure for clearances and creepage distances equal to or less than 2 mm.

In practice, reductions in creepage or clearance distances can occur due to the conductive pattern of the printed board or the wiring used and should in such case duly be taken into account.

NOTE 3 The permissible rated voltage depends on the application and the relevant specified safety requirements.

4.6 Current-carrying capacity

See 6.4.3.

4.7 Marking

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

4.8 Safety aspects

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

Connectors according to this standard 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.

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

Alternative installation situations are possible and shall be defined and agreed upon between manufacturer and user.

For interface dimensions see 5.4.

All dimensions are related to operating conditions.

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 should be met.

For free connectors with right angled cable outlets, the direction of the cable outlet in relation to the coding should be specified to assure that the cable leaves the housing in the specified direction and ensure the correct mounting orientation. This is indicated in the figures of styles by an arrow and described in Annex B.

Dimensions of connector inserts, male contacts, with and without locking thread, are specified in Annex C.

5.2 Fixed connectors

5.2.1 General

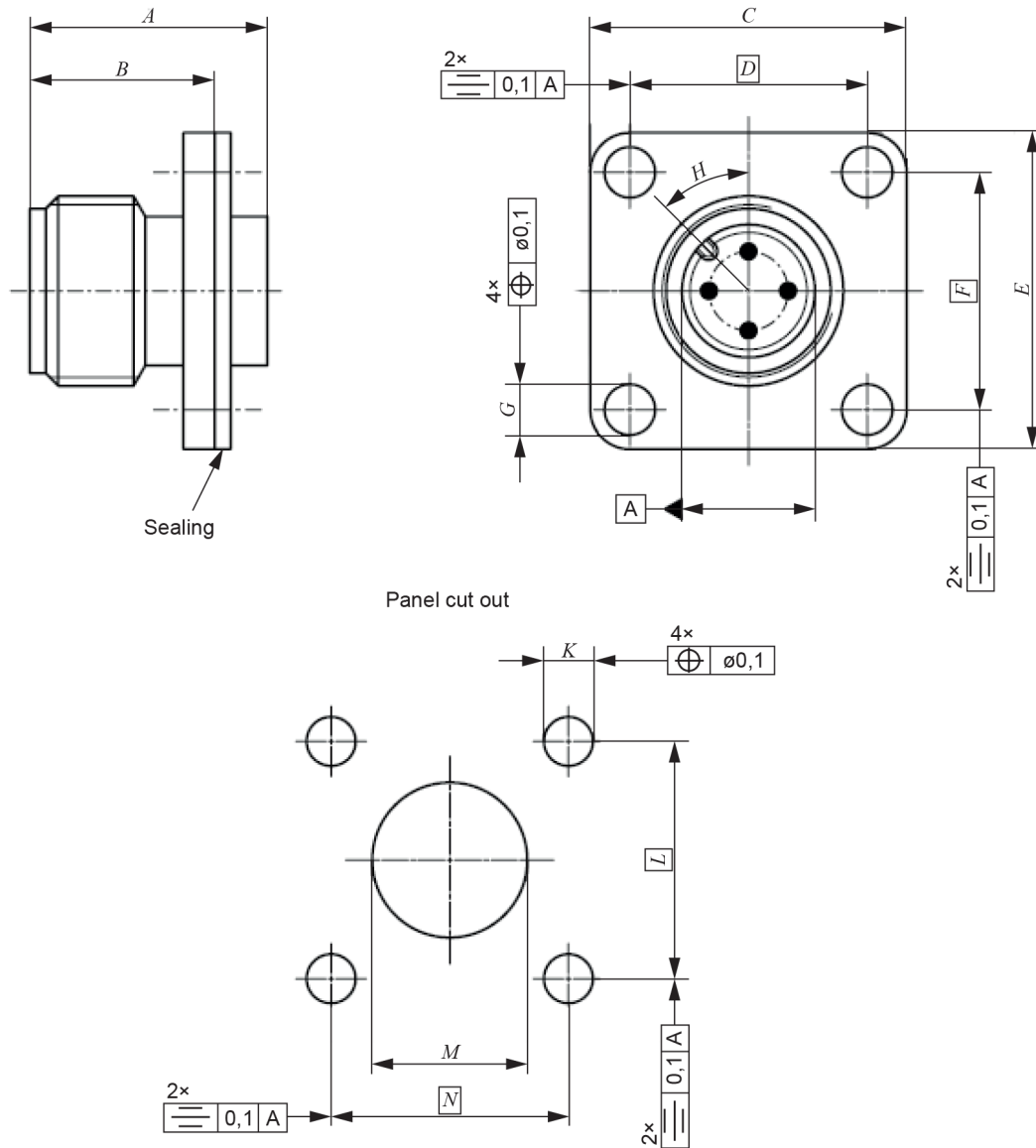
Table 2 shows styles of fixed connectors.

Table 2 – Styles of fixed connectors

Style	Description
DM	Fixed connector, male contacts, square flange front mounting
EM	Fixed connector, male contacts, with wire / cable, single hole mounting M16 × 1,5
FM	Fixed connector, male contacts, with wire / cable, single hole mounting M20 × 1,5
GM	Fixed connector, male contacts, with wire / cable, single hole mounting M16 × 1,5, mounting orientation ^a
HM	Fixed connector, male contacts, with wire / cable, single hole mounting M20 × 1,5, mounting orientation ^a
EF	Fixed connector, female contacts, with wire / cable, single hole mounting M16 × 1,5
FF	Fixed connector, female contacts, with wire / cable, single hole mounting M20 × 1,5
GF	Fixed connector, female contacts, with wire / cable, single hole mounting M16 × 1,5, mounting orientation ^a
HF	Fixed connector, female contacts, with wire / cable, single hole mounting M20 × 1,5, mounting orientation ^a
^a Styles of fixed connectors providing mounting orientation (see 3.1) allow orientation at will of the connector once mounted, to match the intended cable direction of a mated right-angled-style free connector.	

5.2.2 Style DM

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



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

Table 3 shows dimensions of style DM.

Table 3 – Dimensions of style DM, Figure 1

<i>Dimensions in millimetres</i>			
Letter	Minimum	Nominal	Maximum
A	17,9	18	18,1
B	-	-	15,5
C	19,5	20	20,5
D	-	15	-
E	19,5	20	20,5
F	-	15	-
G	Ø 3,1	Ø 3,2	Ø 3,4
H	-	45°	-
K	-	Ø 3,1	Ø 3,3
L	-	15	-
M	Ø 9,7	Ø 9,8	Ø 9,9
N	-	15	-

5.2.3 Style EM

Figure 2 shows a fixed connector, with male contacts, with wire / cable and a single hole mounting thread M16 × 1,5.

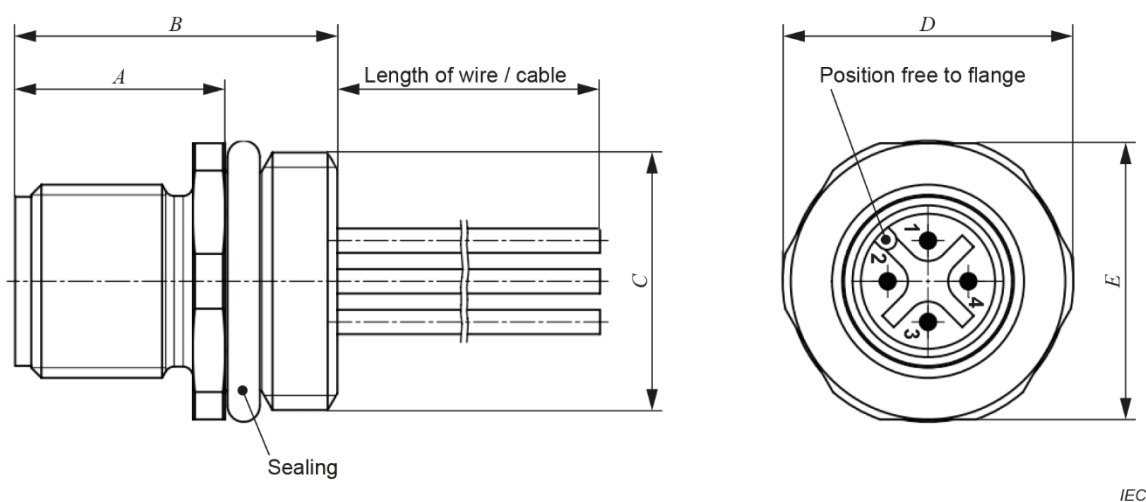


Figure 2 – Fixed connector, male contacts, with wire / cable, single hole mounting thread M16 × 1,5

Table 4 shows dimensions of style EM.

Table 4 – Dimensions of style EM, Figure 2

<i>Dimensions in millimetres</i>				
A max.	B max.	C	D max.	E
13	23	M16 × 1,5	Ø 18,2	17

5.2.4 Style FM

Figure 3 shows fixed connectors, with male contacts, with wire / cable and a single hole mounting thread M20 × 1,5.

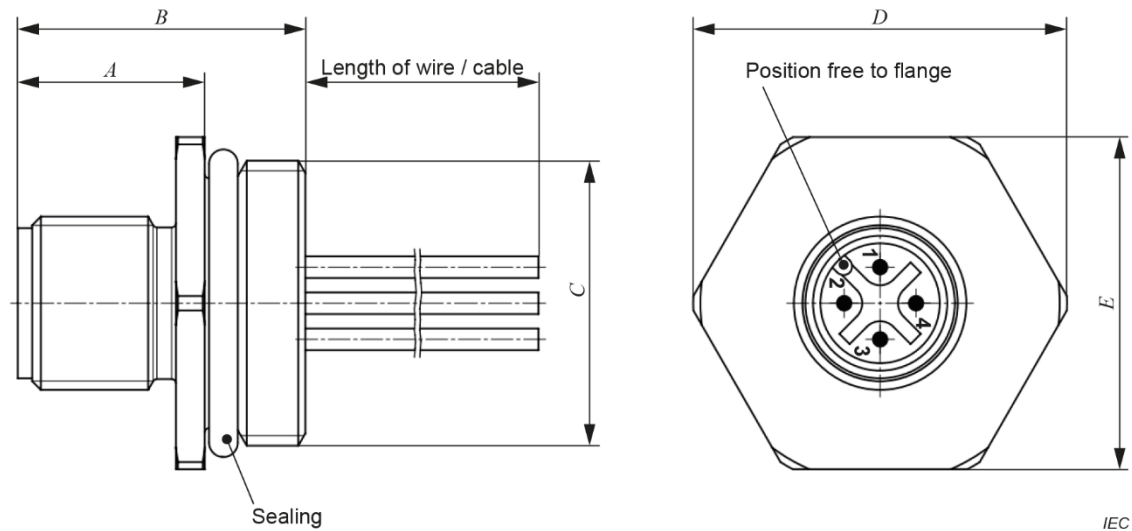


Figure 3 – Fixed connector, male contacts, with wire / cable, single hole mounting thread M20 × 1,5

Table 5 shows dimensions of style FM.

Table 5 – Dimensions of style FM, Figure 3

<i>Dimensions in millimetres</i>				
A max.	B max.	C	D max.	E
13	23	M20 × 1,5	Ø 26,2	23

5.2.5 Style GM

Figure 4 shows fixed connector, male contacts, with wire / cable, a single hole mounting thread M16 × 1,5 and a mounting orientation.

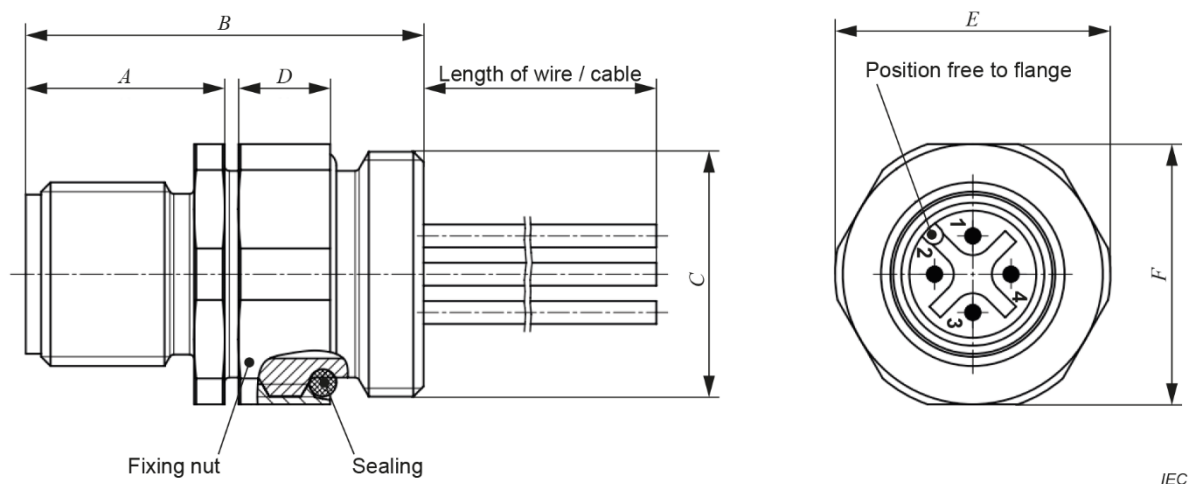


Figure 4 – Fixed connector, male contacts, with wire / cable, single hole mounting thread M16 × 1,5, mounting orientation

Table 6 shows dimensions of style GM.

Table 6 – Dimensions of style GM, Figure 4

Dimensions in millimetres

A max.	B max.	C	D	E max.	F
13	26,5	M16 × 1,5	6±0,3	Ø 18,2	17

5.2.6 Style HM

Figure 5 shows a fixed connector, with male contacts, with wire / cable, a single hole mounting thread M20 × 1,5 and a mounting orientation.

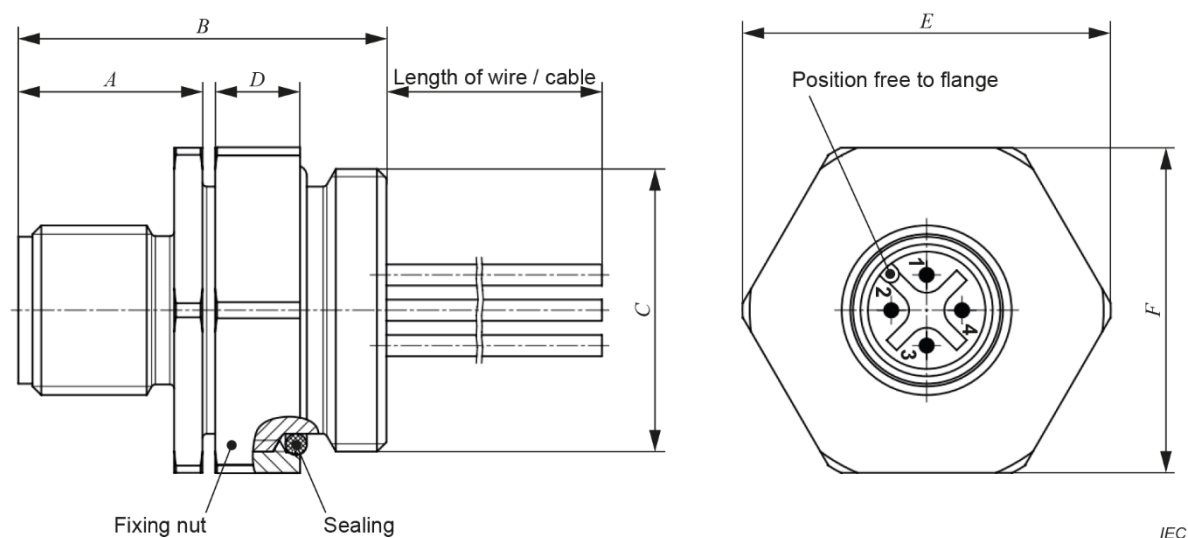


Figure 5 – Fixed connector, male contacts, with wire / cable, single hole mounting thread M20 × 1,5, mounting orientation

Table 7 shows dimensions of style HM.

Table 7 – Dimensions of style HM, Figure 5

Dimensions in millimetres

A max.	B max.	C	D	E max.	F
13	26,5	M20 × 1,5	6±0,3	Ø 26,2	23

5.2.7 Style EF

Figure 6 shows a fixed connector, female contacts, with wire / cable and a single hole mounting thread M16 × 1,5.

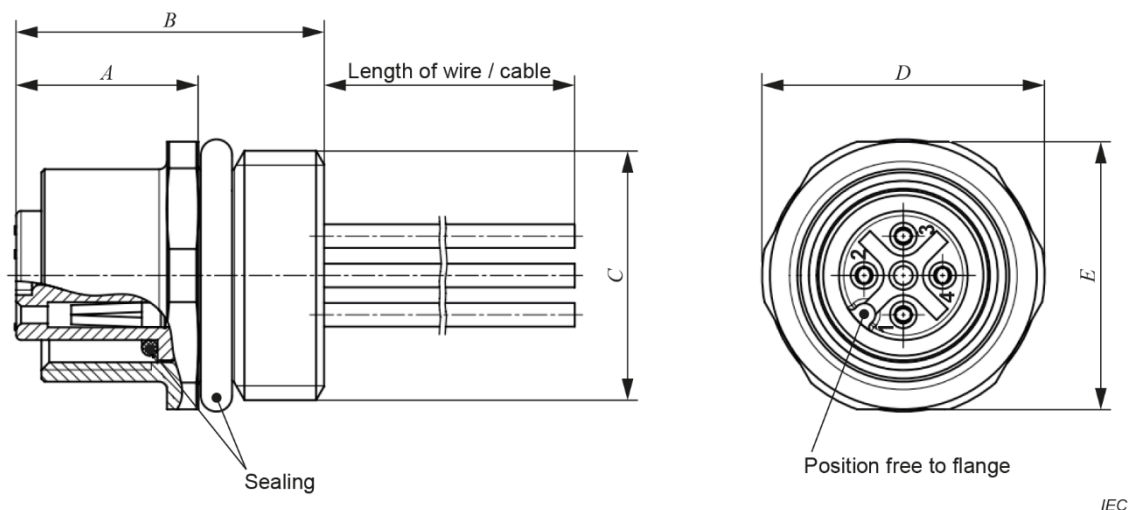


Figure 6 – Fixed connector, female contacts, with wire / cable, single hole mounting thread M16 × 1,5

Table 8 shows dimensions of style EF.

Table 8 – Dimensions of style EF, Figure 6

<i>Dimensions in millimetres</i>				
A max.	B max.	C	D max.	E
13	22,5	M16 × 1,5	Ø 18,2	17

5.2.8 Style FF

Figure 7 shows a fixed connector, with female contacts, with wire / cable and a single hole mounting thread M20 × 1,5.

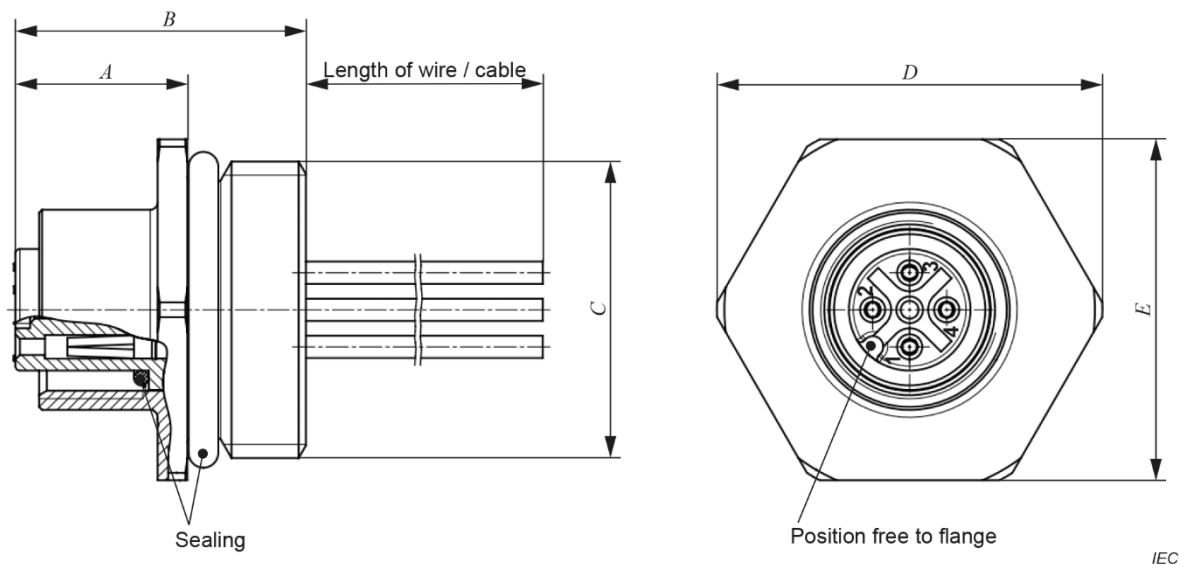


Figure 7 – Fixed connector, female contacts, with wire / cable, single hole mounting thread M20 × 1,5

Table 9 shows dimensions of style FF.

Table 9 – Dimensions of style FF, Figure 7

<i>Dimensions in millimetres</i>				
A max.	B max.	C	D max.	E
13	22,5	M20 × 1,5	Ø 26,2	23

5.2.9 Style GF

Figure 8 shows a fixed connector, with female contacts, with wire / cable, a single hole mounting thread M16 × 1,5 and a mounting orientation.

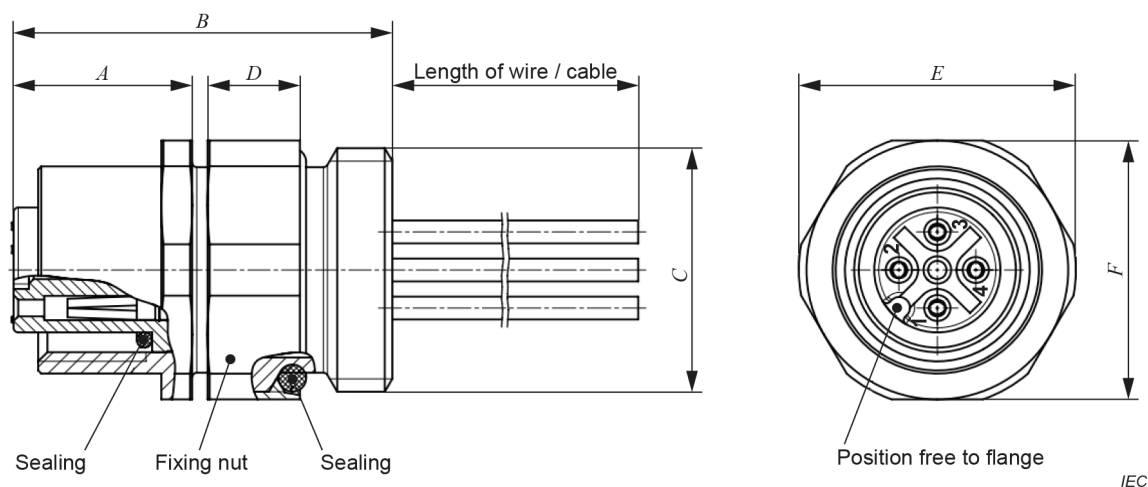


Figure 8 – Fixed connector, female contacts, with wire / cable, single hole mounting thread M16 × 1,5, mounting orientation

Table 10 shows dimensions of style GF.

Table 10 – Dimensions of style GF, Figure 8

<i>Dimensions in millimetres</i>					
A max.	B max.	C	D	E max.	F
13	25	M16 × 1,5	6±0,3	Ø 18,2	17

5.2.10 Style HF

Figure 9 shows a fixed connector, with female contacts, with wire / cable, a single hole mounting thread M20 × 1,5 and a mounting orientation.

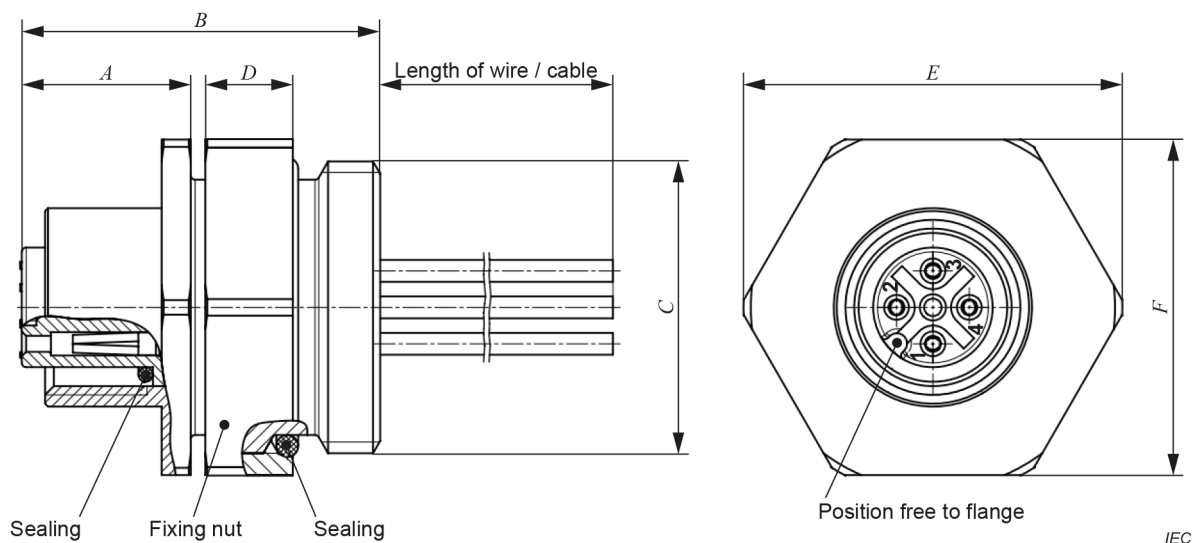


Figure 9 – Fixed connector, female contacts, with wire / cable, single hole mounting thread M20 × 1,5, mounting orientation

Table 11 shows dimensions of style HF.

Table 11 – Dimensions of style HF, Figure 9

Dimensions in millimetres

A max.	B max.	C	D	E max.	F
13	25	M20 × 1,5	6±0,3	Ø 26,2	23

5.3 Free connectors

5.3.1 General

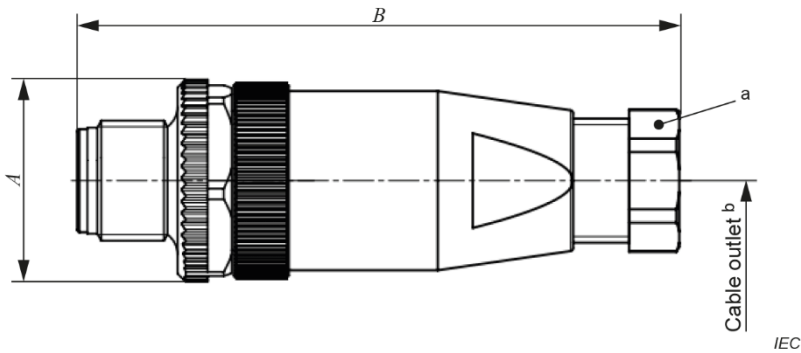
Table 12 shows styles of free connectors.

Table 12 – Styles of free connectors

Style	Description
JM	Rewirable connector, male contacts, straight version, with locking nut ^a
KM	Rewirable connector, male contacts, right angled version, with locking nut ^a
LM	Non-rewirable connector, male contacts, straight version, with locking nut ^a
MM	Non-rewirable connector, male contacts, right angled version, with locking nut
NM	Non-rewirable connector, male contacts, right angled higher version, with locking nut
JF	Rewirable connector, female contacts, straight version, with locking nut
KF	Rewirable connector, female contacts, right angled version, with locking nut
LF	Non-rewirable connector, female contacts, straight version, with locking nut
MF	Non-rewirable connector, female contacts, right angled version, with locking nut
NF	Non-rewirable connector, female contacts, right angled higher version, with locking nut
^a Knurled ring or hexagonal ring upon agreement.	

5.3.2 **Style JM**

Figure 10 shows a rewirable connector, with male contacts and a straight version with locking nut.



- NOTE 1 Cable outlet alternatively inside.
- NOTE 2 Cable outlet diameter range upon agreement.

Figure 10 – Rewirable connector, male contacts, straight version, with locking nut

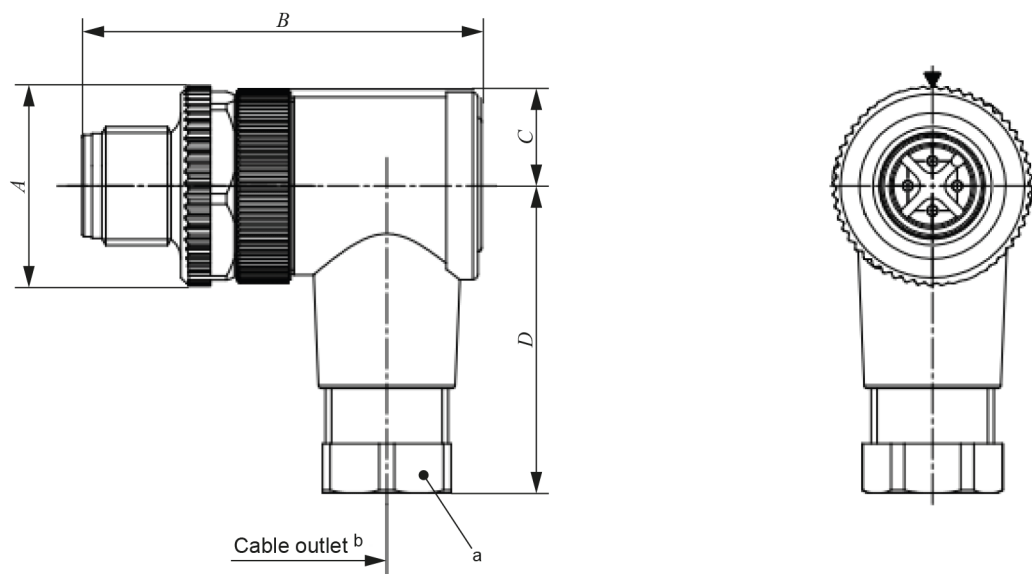
Table 13 shows dimensions of style JM.

Table 13 – Dimensions of style JM, Figure 10

Dimensions in millimetres	
ØA max.	B max.
21	65

5.3.3 **Style KM**

Figure 11 shows a rewirable connector, with male contacts and a right angled version with locking nut.



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NOTE 1 Cable outlet alternatively inside.

NOTE 2 Cable outlet diameter range upon agreement.

Figure 11 – Rewirable connector, male contacts, right angled version, with locking nut

Table 14 shows dimensions of style KM.

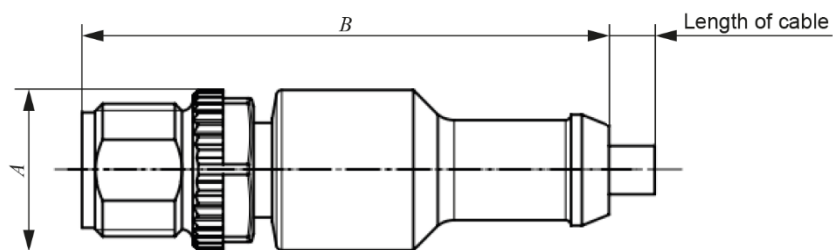
Table 14 – Dimensions of style KM, Figure 11

Dimensions in millimetres

$\varnothing A$ max.	B max.	C max.	D max.
21	60,5	10,5	33

5.3.4 Style LM

Figure 12 shows a non-rewirable connector, with male contacts and a straight version with locking nut.



IEC

Figure 12 – Non-rewirable connector, male contacts, straight version, with locking nut

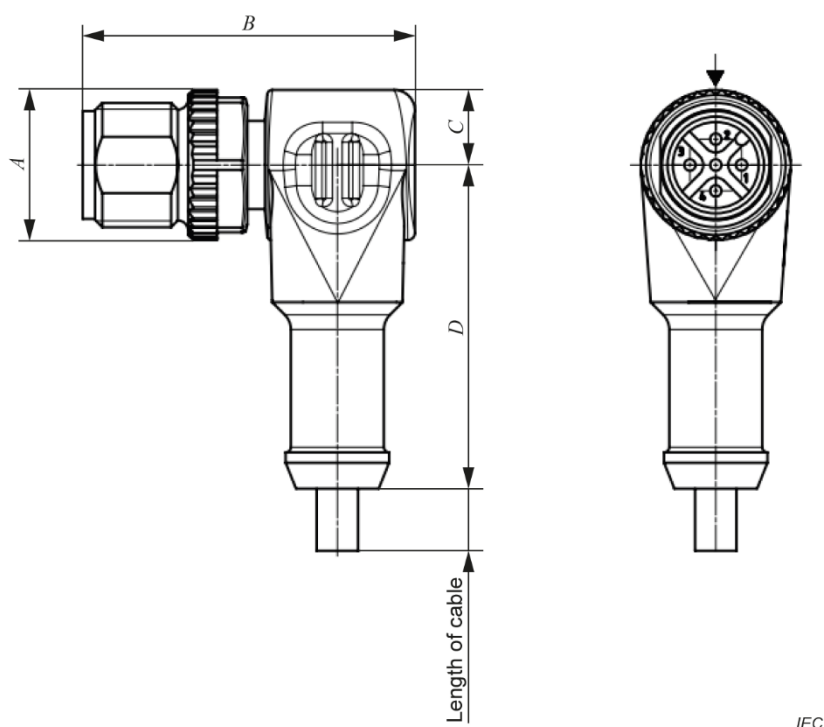
Table 15 shows dimensions of style LM.

Table 15 – Dimensions of style LM, Figure 12

<i>Dimensions in millimetres</i>		
Style	ØA max.	B max.
LM1	16	55
LM2	18	65

5.3.5 Style MM and NM

Figure 13 shows a non-rewirable connector, with male contacts and two right angled versions with locking nut.



IEC

Figure 13 – Non-rewirable connector, male contacts, right angled version, with locking nut

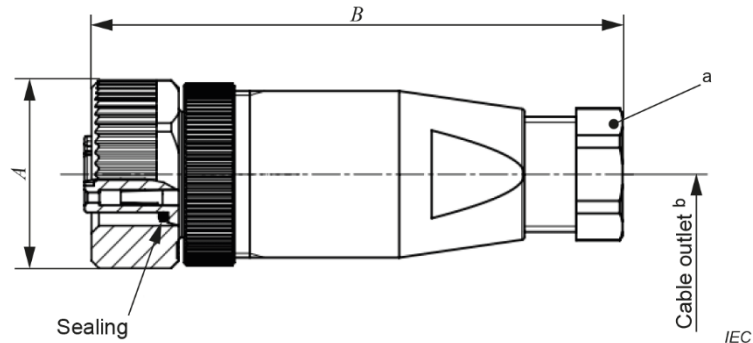
Table 16 shows dimensions of style MM and NM.

Table 16 – Dimensions of style MM and NM, Figure 13

<i>Dimensions in millimetres</i>				
Style	ØA max.	B max.	C max.	D max.
MM1	16	36	7,5	31,5
MM2	18	41	9	40
NM	16	43	7,5	31,5

5.3.6 Style JF

Figure 14 shows a rewirable connector, with female contacts and a straight version with locking nut.



NOTE 1 Cable outlet alternatively inside.

NOTE 2 Cable outlet diameter upon agreement.

Figure 14 – Rewirable connector, female contacts, straight version, with locking nut

Table 17 shows dimensions of style JF.

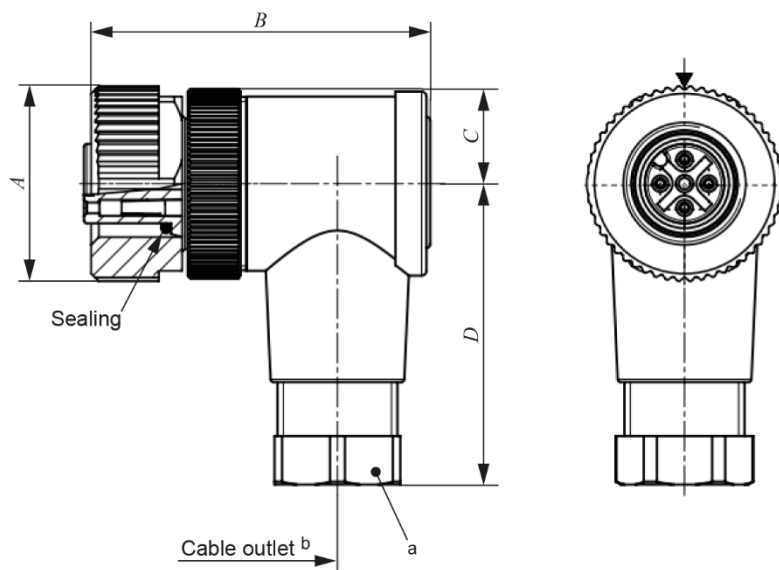
Table 17 – Dimensions of style JF, Figure 14

Dimensions in millimetres

ØA max.	B max.
21	65

5.3.7 Style KF

Figure 15 shows a rewirable connector, with female contacts and a right angled version with locking nut.



IEC

NOTE 1 Cable outlet alternatively inside.

NOTE 2 Cable outlet diameter upon agreement.

Figure 15 – Rewirable connector, female contacts, right angled version, with locking nut

Table 18 shows dimensions of style KF.

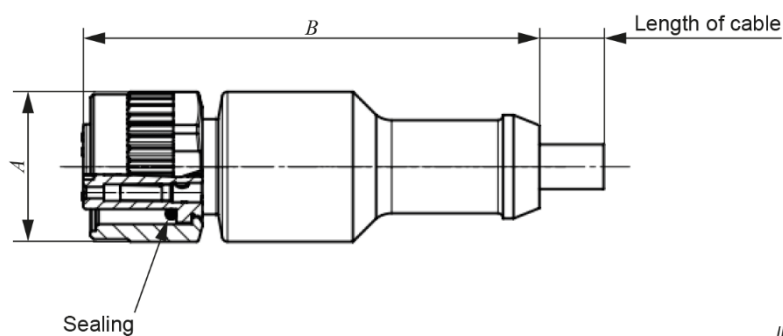
Table 18 – Dimensions of style KF, Figure 15

Dimensions in millimetres

ØA max.	B max.	C max.	D max.
21	60,5	10,5	33

5.3.8 Style LF

Figure 16 shows a non-rewirable connector, with female contacts and a straight version with locking nut.



IEC

Figure 16 – Non-rewirable connector, female contacts, straight version, with locking nut

Table 19 shows dimensions of style LF.

Table 19 – Dimensions of style LF, Figure 16

<i>Dimensions in millimetres</i>		
Style	ØA max.	B max.
LF1	16	48
LF2	18	63

5.3.9 Style MF and NF

Figure 17 shows a non-rewirable connector, with female contacts and two right angled versions with locking nut.

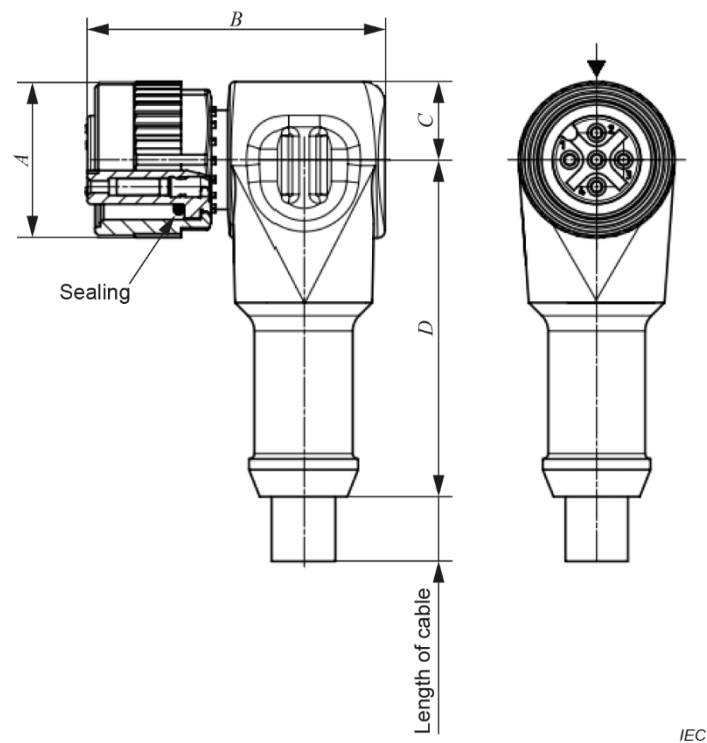


Figure 17 – Non-rewirable connector, female contacts, right angled version, with locking nut

Table 20 shows dimensions of style MF and NF.

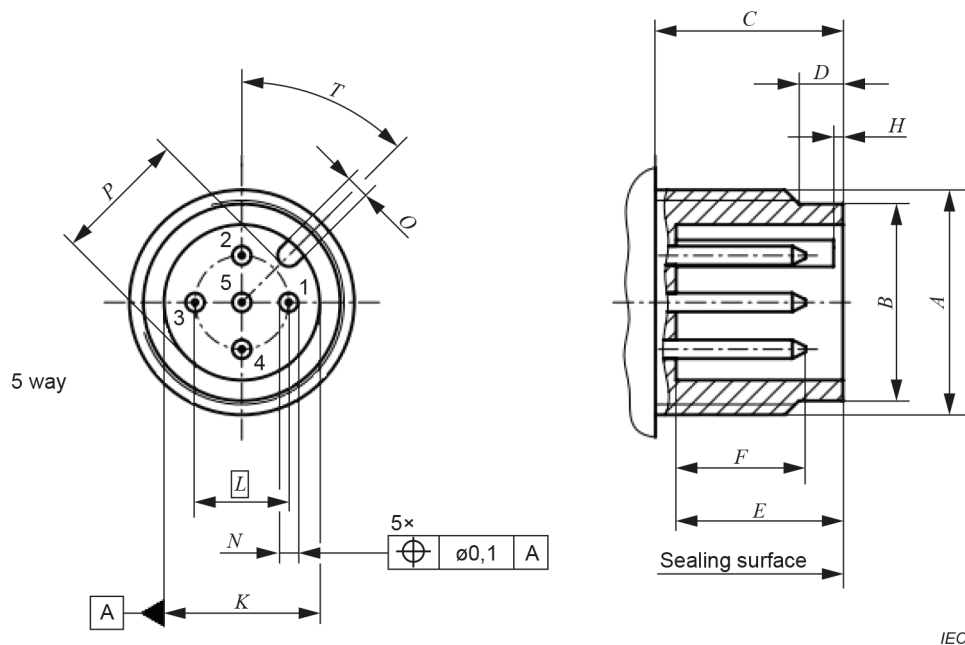
Table 20 – Dimensions of style MF and NF, Figure 17

<i>Dimensions in millimetres</i>				
Style	ØA max.	B max.	C max.	D max.
MF1	16	33	7,5	31,5
MF2	18	40	9	40
NF	16	40	7,5	31,5

5.4 Interface dimensions

5.4.1 Pin front and side view A-coding up to 5-way

Figure 18 shows the pin front and side view A-coding up to 5-way.



IEC

To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension D should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension D) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

NOTE Width of coding pin and pin orientation equal for all styles with the same coding.

Figure 18 – Pin front and side view A-coding, up to 5-way

Table 21 shows dimensions for Figure 18.

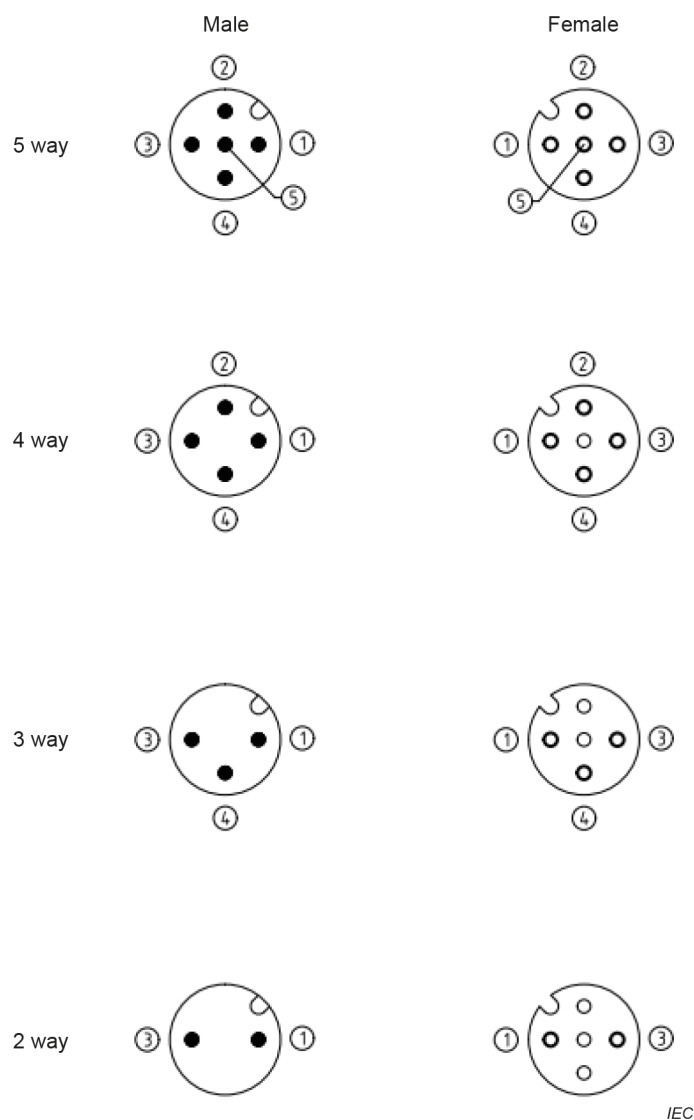
Table 21 – Dimensions for Figure 18

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C	10	-	-
D ^a	-	-	3
E	8,7	8,9	-
F	6,7	6,9	7,1
H	0	0,5	-
K	-	Ø 8,3	Ø 8,45
L	-	Ø 5	-
N	Ø 0,97	Ø 1	Ø 1,03
O	1,1	1,2	-
P	-	7,1	7,25
T	44,5°	45°	45,5°

^a See Note 2 of Figure 18.

Figure 19 shows the contact position A-coding up to 5-way, front view.



Unloaded cavities of the female connector shall be open.

NOTE 1 The 2-, 3- and 4-way connectors are partially loaded variants of the 5-way connector.

NOTE 2 Other partially loaded variants possible upon agreement between manufacturer and user and conform to this document.

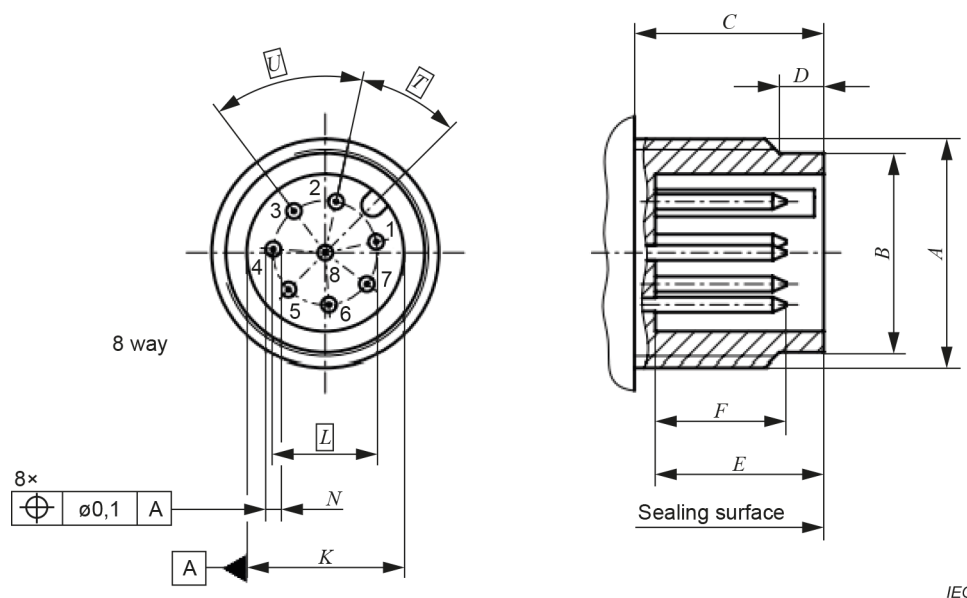
NOTE 3 Unconnected contacts of the male connector are possible at partially loaded variants.

Figure 19 – Contact position A-coding up to 5-way, front view

The contact marking shall be on the termination side of the connector insert as long as the size of the component allows the placement there.

5.4.2 Pin front and side view A-coding up to 8-way

Figure 20 shows the pin front and side view A-coding up to 8-way.



To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension D should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension D) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

NOTE Width of coding pin and pin orientation equal for all styles with the same coding.

Figure 20 – Pin front and side view A-coding, up to 8-way

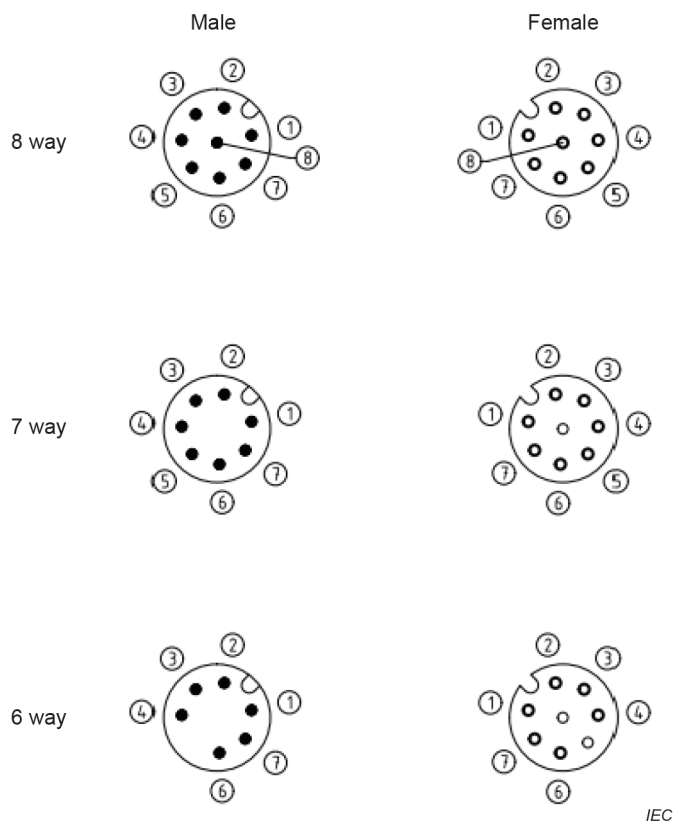
Table 22 shows dimensions for Figure 20.

Table 22 – Dimensions for Figure 20

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C	10	-	-
D ^a	-	-	3
E	8,7	8,9	-
F	6,7	6,9	7,1
K	-	Ø 8,3	Ø 8,45
L	-	Ø 5,5	-
N	Ø 0,77	Ø 0,8	Ø 0,83
T	-	33°	-
U	-	6 × 49°	-
^a See Note 2 of Figure 20.			

Figure 21 shows the contact position A-coding up to 8-way, front view.



Unloaded cavities of the female connector shall be open.

NOTE 1 The 6-, and 7-way connectors are partially loaded variants of the 8-way connector.

NOTE 2 Other partially loaded variants possible upon agreement between manufacturer and user and conform to this document.

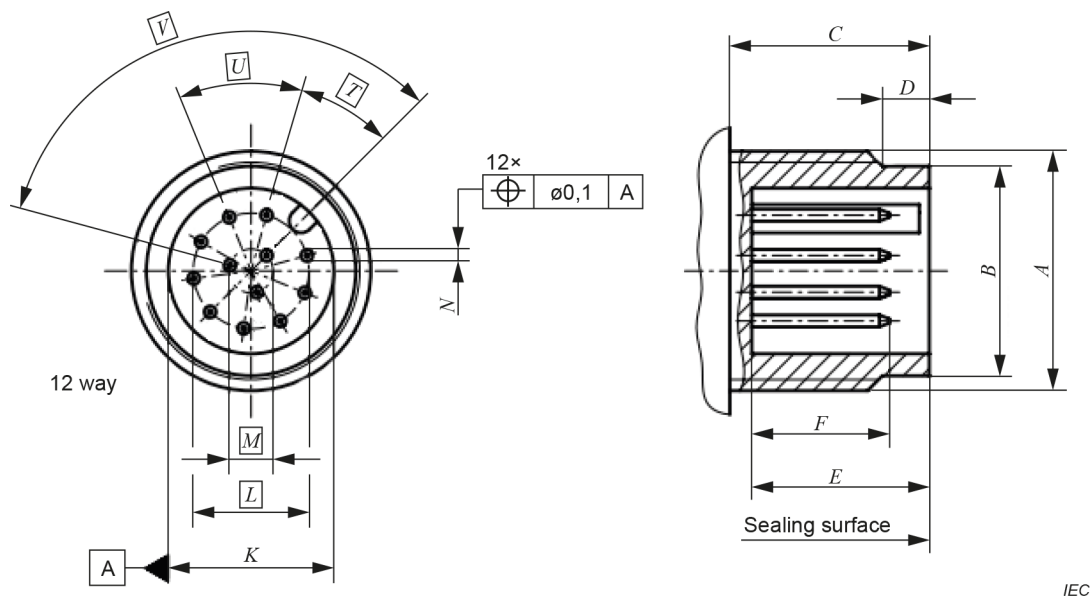
NOTE 3 Unconnected contacts of the male connector are possible at partially loaded variants.

Figure 21 – Contact position A-coding up to 8-way, front view

The contact marking shall be on the termination side of the connector insert as long as the size of the component allows the placement there.

5.4.3 Pin front and side view A-coding up to 12-way

Figure 22 shows the pin front and side view A-coding up to 12-way.



IEC

To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension D should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension D) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

NOTE Width of coding pin and pin orientation equal for all styles with the same coding.

Figure 22 – Pin front and side view A-coding, up to 12-way

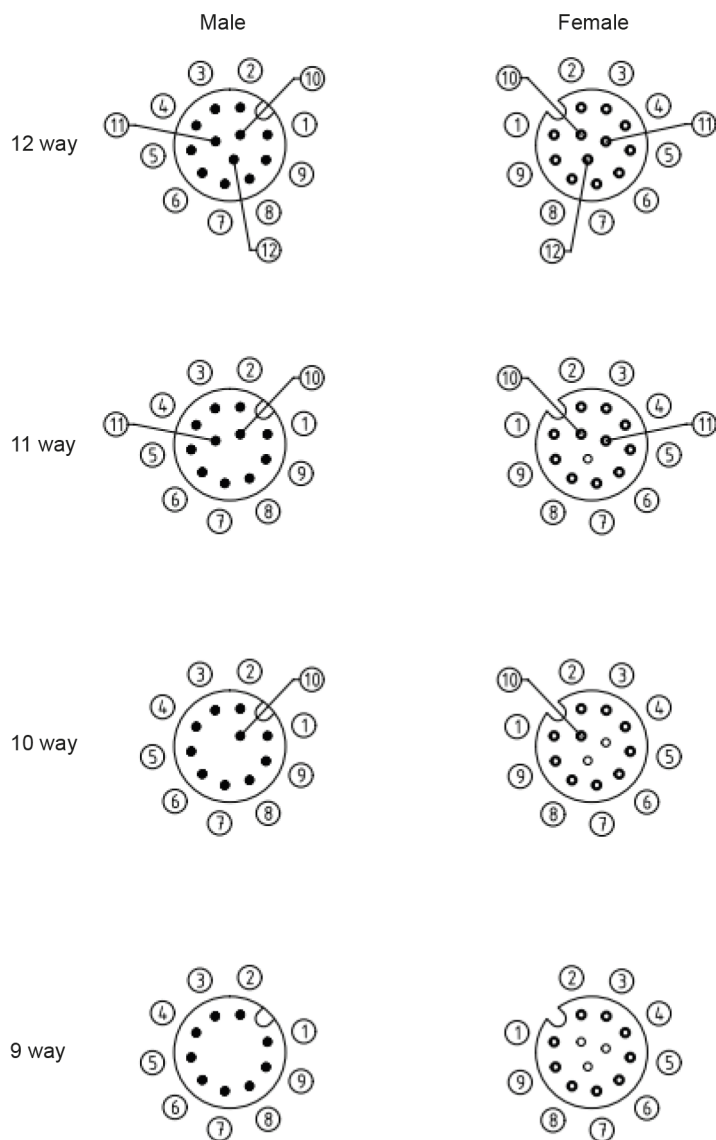
Table 23 shows dimensions for Figure 22.

Table 23 – Dimensions for Figure 22

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C	10	-	-
D ^a	-	-	3
E	8,7	8,9	-
F	6,7	6,9	7,1
K	-	Ø 8,3	Ø 8,45
L	-	Ø 5,8	-
M	-	Ø 2,2	-
N	Ø 0,57	Ø 0,6	Ø 0,63
T	-	29,5°	-
U	-	8 × 37,625°	-
V	-	2 × 120°	-
^a See Note 2 of Figure 22.			

Figure 23 shows the contact position A-coding up to 12-way, front view.



IFC

Unloaded cavities of the female connector shall be open.

NOTE 1 The 9-, 10- and 11-way connectors are partially loaded variants of the 12-way connector.

NOTE 2 Other partially loaded variants possible upon agreement between manufacturer and user and conform to this document.

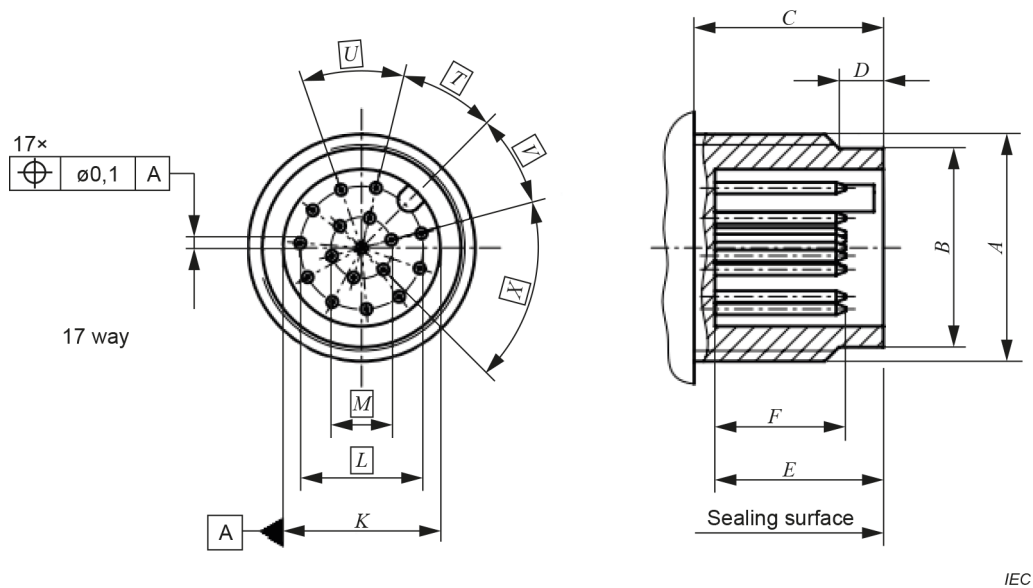
NOTE 3 Unconnected contacts of the male connector are possible at partially loaded variants.

Figure 23 – Contact position A-coding up to 12-way, front view

The contact marking shall be on the termination side of the connector insert as long as the size of the component allows the placement there.

5.4.4 Pin front and side view A-coding up to 17-way

Figure 24 shows the pin front and side view A-coding up to 17-way.



To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension *D* should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension *D*) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

NOTE Width of coding pin and pin orientation equal for all styles with the same coding.

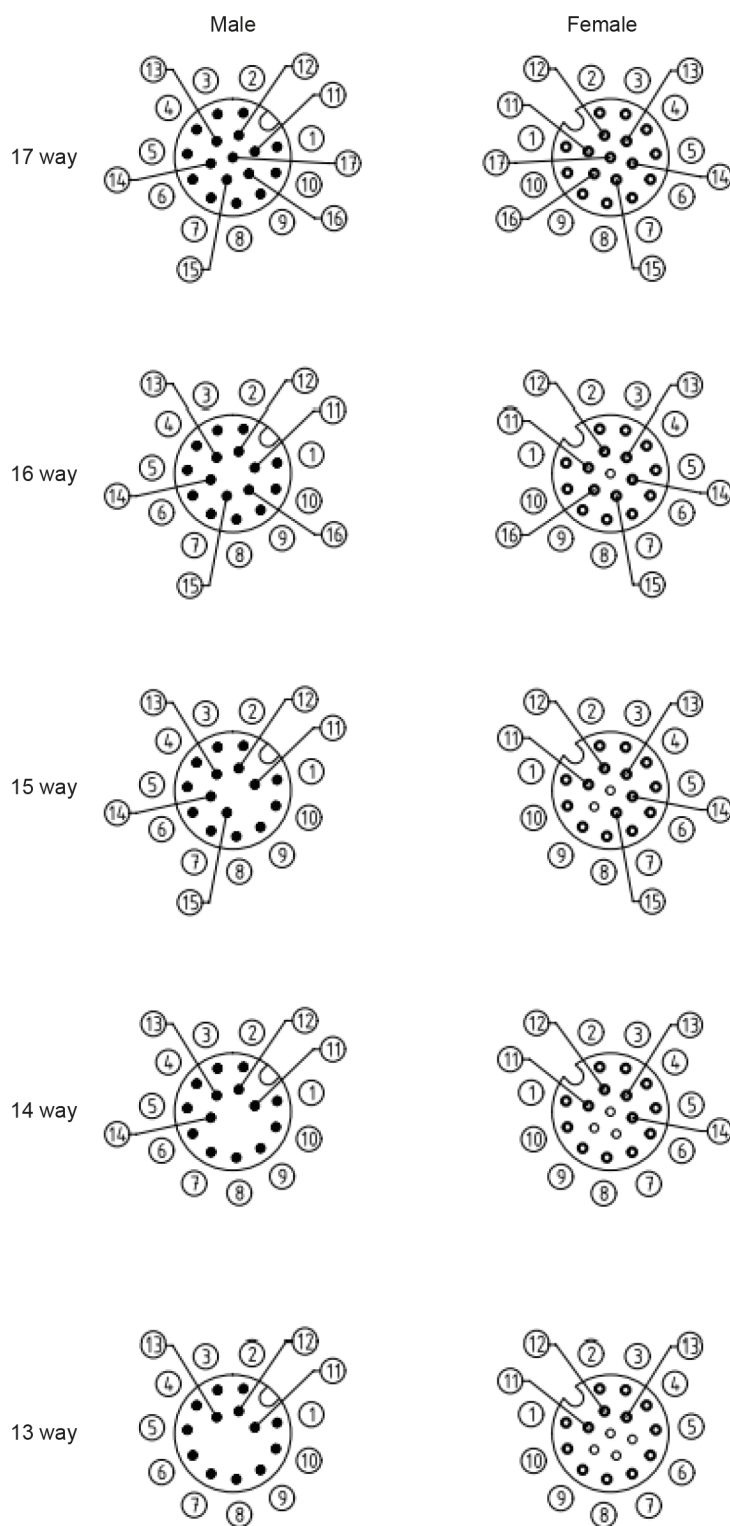
Figure 24 – Pin front and side view A-coding, up to 17-way

Table 24 shows dimensions for Figure 24.

Table 24 – Dimensions for Figure 24

Dimensions in millimetres			
Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C	10	-	-
D ^a	-	-	3
E	8,7	8,9	-
F	6,7	6,9	7,1
K	-	Ø 8,3	Ø 8,45
L	-	Ø 6,5	-
M	-	Ø 3,25	-
N	Ø 0,57	Ø 0,6	Ø 0,63
T	-	31,5°	-
U	-	9 × 33°	-
V	-	30°	-
X	-	5 × 60°	-
^a See Note 2 of Figure 24.			

Figure 25 shows the contact position A-coding up to 17-way, front view.



IEC

Unloaded cavities of the female connector shall be open.

NOTE 1 The 13-, 14-, 15- and 16-way connectors are partially loaded variants of the 17-way connector.

NOTE 2 Other partially loaded variants possible upon agreement between manufacturer and user and conform to this document.

NOTE 3 Unconnected contacts of the male connector are possible at partially loaded variants.

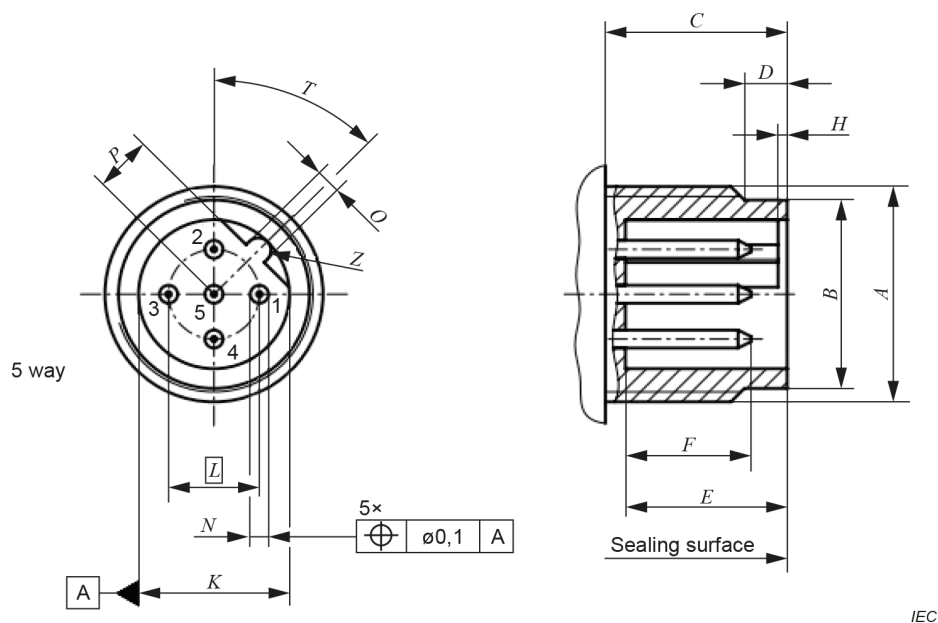
Figure 25 – Contact position A-coding up to 17-way, front view



The contact marking shall be on the termination side of the connector insert as long as the size of the component allows the placement there.

5.4.5 Pin front and side view up to B-coding

Figure 26 shows the pin front and side view B-coding up to 5-way.



IEC

To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension *D* should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension *D*) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

Figure 26 – Pin front and side view B-coding, up to 5-way

Table 25 shows dimensions for Figure 26.

Table 25 – Dimensions for Figure 26

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C	10	-	-
D ^a	-	-	3
E	8,7	8,9	-
F	6,7	6,9	7,1
H	0	0,5	-
K	-	Ø 8,3	Ø 8,45
L	-	Ø 5,0	-
N	Ø 0,97	Ø 1	Ø 1,03
O	-	1,4	1,5
P	-	3,2	3,3
T	44,5°	45°	45,5°
Z	-	R0,7	-

^a See Note 1 of Figure 26.

Figure 27 shows the contact position B-coding front view.



Unloaded cavities of the female connector shall be open.

NOTE 1 Other partially loaded variants possible upon agreement between manufacturer and user and conform to this document.

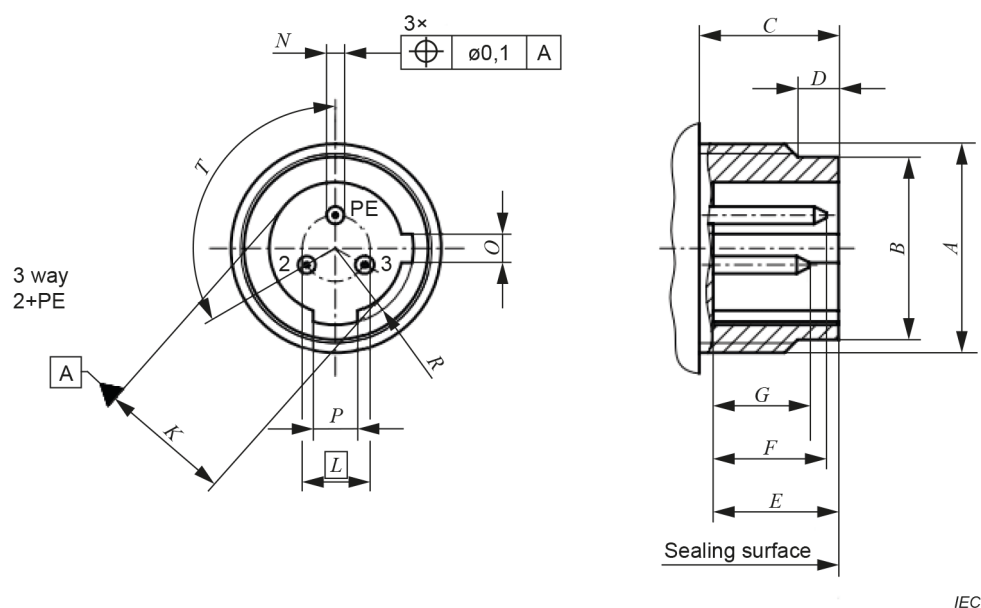
NOTE 2 Unconnected contacts of the male connector are possible at partially loaded variants.

Figure 27 – Contact position B-coding up to 5-way, front view

The contact marking shall be on the termination side of the connector insert as long as the size of the component allows the placement there.

5.4.6 Pin front and side view C-coding 3-way

Figure 28 shows the pin front and side view C-coding 3-way.



To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension D should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension D) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following dimensions: measure C min. 10 mm.

NOTE Width of coding and orientation equal for all styles with the same coding.

Figure 28 – Pin front and side view C-coding, 3-way

Table 26 shows dimensions for Figure 28.

Table 26 – Dimensions for Figure 28

Dimensions in millimetres			
Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C ^a	8	-	-
D ^b	-	-	3
E	7,0	7,2	-
F	-	6,5	6,7
G	5,3	5,5	-
K	-	Ø 7,6	Ø 7,75
L	-	Ø 3,8	-
N	Ø 0,97	Ø 1	Ø 1,03
O	-	1,65	1,75
P	-	2,55	2,65
R	-	R4,4	R4,5
T	-	2 × 120°	-
^a See Note 3 of Figure 28.			
^b See Note 2 of Figure 28.			

Figure 29 shows the contact position C-coding 3-way, front view.

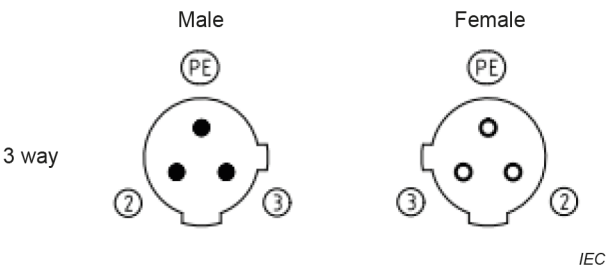
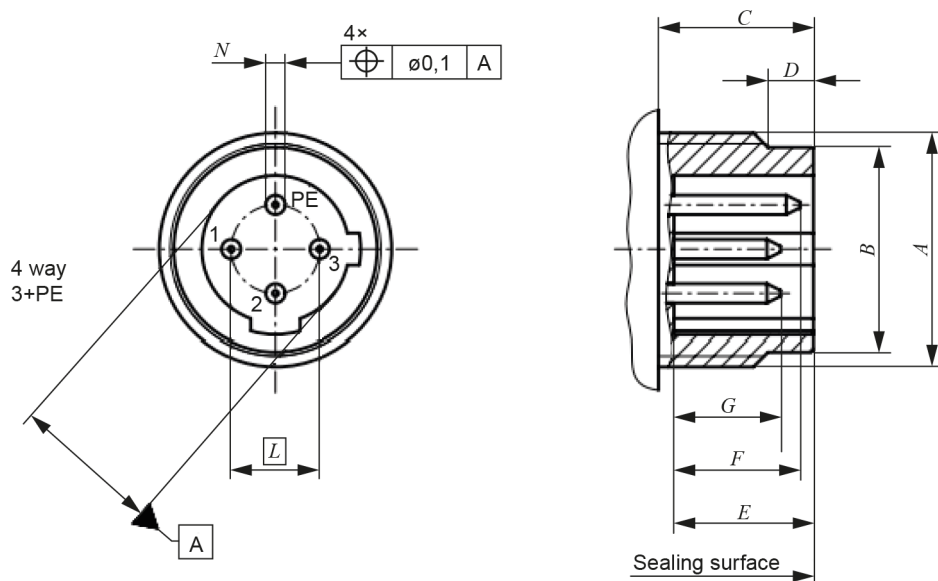


Figure 29 – Contact position C-coding 3-way, front view

The contact marking shall be on the termination side of the connector insert as long as the size of the component allows the placement there.

5.4.7 Pin front and side view C-coding 4-way

Figure 30 shows the pin front and side view C-coding 4-way.



IEC

To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension D should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension D) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following dimensions: measure C 10 mm min.

NOTE Width of coding and orientation equal for all styles with the same coding.

Figure 30 – Pin front and side view C-coding, 4-way

Table 27 shows dimensions for Figure 30.

Table 27 – Dimensions for Figure 30

Dimensions in millimetres			
Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C ^a	8	-	-
D ^b	-	-	3
E	7,0	7,2	-
F	-	6,5	6,7
G	5,3	5,5	-
K	-	Ø 7,6	Ø 7,75
L	-	Ø 4,57	-
N	Ø 0,97	Ø 1	Ø 1,03
^a See Note of Figure 30.			
^b See Note of Figure 30.			

Figure 31 shows the contact position C-coding 4-way, front view.

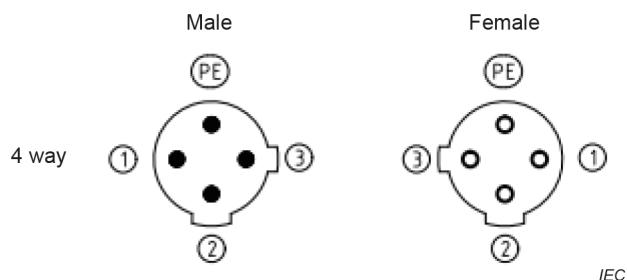
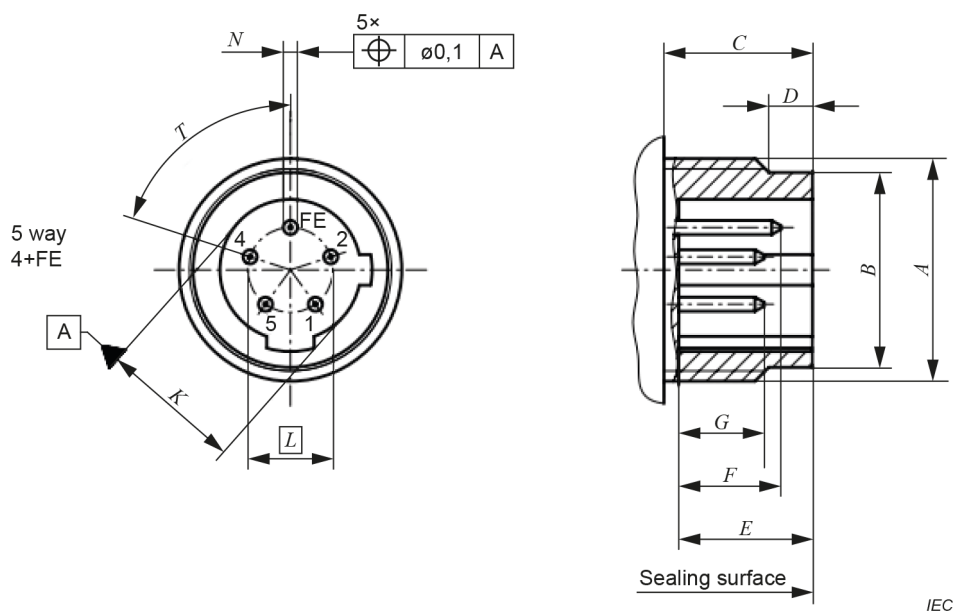


Figure 31 – Contact position C-coding 4-way, front view

The contact marking shall be on the termination side of the connector insert as long as the size of the component allows the placement there.

5.4.8 Pin front and side view C-coding 5-way

Figure 32 shows the pin front and side view C-coding 5-way.



To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension D should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension D) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following dimensions: measure C 10 mm min.

NOTE Width of coding and orientation equal for all styles with the same coding.

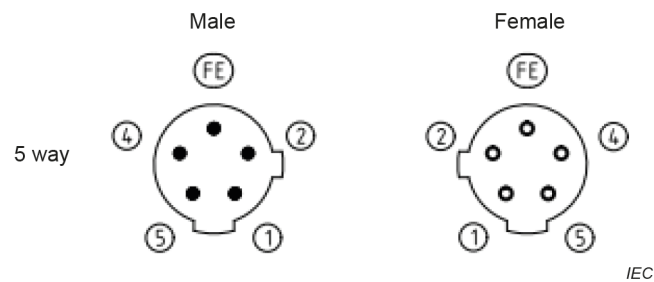
Figure 32 – Pin front and side view C-coding, 5-way

Table 28 shows dimensions for Figure 32.

Table 28 – Dimensions for Figure 32

<i>Dimensions in millimetres</i>			
Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C ^a	8	-	-
D ^b	-	-	3
E	7,0	7,2	-
F	-	5,5	5,7
G	4,4	4,6	-
K	-	Ø 7,6	Ø 7,75
L	-	Ø 4,57	-
N	Ø 0,73	Ø 0,76	Ø 0,79
T	-	4 × 72°	-
^a See Note of Figure 32.			
^b See Note of Figure 32.			

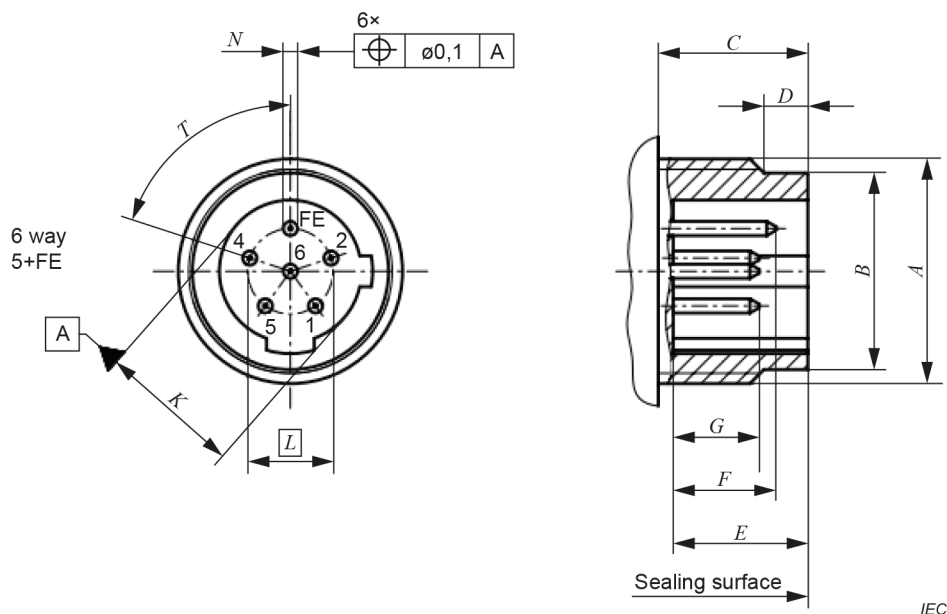
Figure 33 shows the contact position C-coding 5-way, front view.

**Figure 33 – Contact position C-coding 5-way, front view**

The contact marking shall be on the termination side of the connector insert as long as the size of the component allows the placement there.

5.4.9 Pin front and side view C-coding 6-way

Figure 34 shows the pin front and side view C-coding 6-way.



To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following advice:

- Dimension *D* should be 1,5 mm min.
- For male fixed connectors the start of the thread (dimension *D*) could be up to 3,6 mm. This should be respected for the design of screw for styles JF, KF, LF, MF and NF.

To ensure compatibility with IEC 61076-2-010 and IEC 61076-2-012 it is recommended that future developments use the following dimensions: measure *C* 10 mm min.

NOTE Width of coding and orientation equal for all styles with the same coding.

Figure 34 – Pin front and side view C-coding, 6-way

Table 29 shows dimensions for Figure 34.

Table 29 – Dimensions for Figure 34

Dimensions in millimetres

Letter	Minimum	Nominal	Maximum
A	-	M12 × 1	-
B	Ø 10,2	Ø 10,5	-
C ^a	8	-	-
D ^b	-	-	3
E	7,0	7,2	-
F	-	5,5	5,7
G	4,4	4,6	-
K	-	Ø 7,6	Ø 7,75
L	-	Ø 4,57	-
N	Ø 0,73	Ø 0,76	Ø 0,79
T	-	4 × 72°	-
^a See Note of Figure 34.			
^b See Note of Figure 34.			