INTERNATIONAL STANDARD

ISO/IEC 10173

Second edition
1998-12-15

Information technology — Telecommunications and information exchange between systems — Interface connector and contact assignments for ISDN primary rate access connector located at reference points S and T

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Connecteur d'interface et attributions de contact pour connecteur d'accès à vitesse primaire ISDN situé aux points de référence S et T

Reference number
ISO/IEC 10173:1998(E)

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Foreword

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In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 10173 was prepared by Joint Technical Committee, ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

This second edition cancels and replaces the first edition (ISO/IEC 10173:1991), which has been technically revised.

Annexes A to D of this International Standard are for information only.

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Information technology — Telecommunications and information exchange between systems — Interface connector and contact assignments for ISDN primary rate access connector located at reference points S and T

1 Scope

This International Standard specifies the 8-contact connector (plug and jack) and the assignments of its contact numbers for use in the physical interfaces of Integrated Services Digital Network (ISDN) primary rate access services conforming to ITU-T Recommendation I.431.

In this International Standard, as in ITU-T Recommendation I.431, the term “NT” is used to indicate the network terminating layer 1 aspects of NT1s and NT2s, and the term “TE” is used to indicate terminal layer 1 aspects of TE1s, TAs and NT2s.

NOTES

1 This International Standard specifies only those connector dimensions required to ensure intermatability of plug and jack. Complete detailed specifications of the connector are the subject of IEC 603-7, see annex C.

2 ITU-T recognizes an alternative connection system which is not covered by this International Standard. It uses coaxial connectors as specified in IEC 169-8 (see annex C), and is illustrated in annex B.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 8877:1992, *Information technology – Telecommunications and information exchange between systems – Interface connector and contact assignments for ISDN Basic Access Interface located at reference points S and T.*

ITU-T Recommendation I.431:1993, *Primary rate user-network interface – Layer 1 specification.*

3 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1
contact
the conductive element in a component which mates with the corresponding element to provide an electrical path

3.2
plug
free male connector

3.3
jack
fixed or free female connector

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4 Connector

Plugs and jacks with up to eight contacts are specified for the interconnection of TEs and NTs (see 4.1). Options for the use of keying features are specified in 4.2.

4.1 General requirements

Unless the TE is directly connected to the interface cable, one plug and jack pair shall be used to connect the TE connecting cord to the interface cable at the interface point I_a as specified in ITU-T Recommendation I.431 (see figures A.1 and B.1). Unless the NT is directly connected to the interface cable, a plug and jack pair shall be used to connect the NT connecting cord at interface point I_b. In some countries, where the NT is a multi-port device such as a PABX, a different connector (such as one that accommodates multiple interfaces) may be used at interface point I_b. A typical arrangement of connecting cords and an interface cable is shown in figure A.1 of this International Standard.

TE and NT connecting cords shall be terminated in plugs as specified below. The cord-terminating plug may have four, six or eight contacts. The number of physical contacts required is dependent on the use by the associated equipment, TE or NT, of optional powering provisions across the interface, and of optional provisions for shield continuity. The optional powering capabilities are described in ITU-T Recommendation I.431, Section 8, and both the powering and shield continuity options are summarized in annex A of this International Standard.

Unless intended for direct connection to the TE or NT, interface cables shall be terminated in jacks as specified below. The jack may have four, six or eight contacts. As with the plug, the number of contacts required is dependent on the use of powering and shield continuity options.

Plugs for use in ISDN primary rate applications shall conform to the dimensions specified in 4.2. Physical contacts 3, 6, 7 and 8 are shown for illustrative purposes in the referenced figures and may be omitted from the connector assembly if not required.

4.2 Keying requirements

The specified 8-contact connectors may be equipped with keying features in accordance with national requirements as specified in 4.2.2. Otherwise, the requirements specified in 4.2.1 apply.

When procuring equipment internationally that will use the 8-contact connectors, the user shall specify the keying features in accordance with national requirements.

4.2.1 Non-keyed connector

The connector specified in this option has the dimensions of the connector specified in ISO/IEC 8877 (ISDN basic access), with no additional provisions for keying.

The connector dimensions necessary to ensure mating of the plugs with jacks (see note 1) are specified in clause 4 of ISO/IEC 8877.

NOTE Recommendations for the avoidance of risks of damage through inadvertent cross-connection to basic access TEs or NTs are given in annex D.

4.2.2 Keyed connector

The connector specified in this option has the same basic dimensions as the connector specified in ISO/IEC 8877, but contains additional keying features to prevent inadvertent connection to services using that connector.

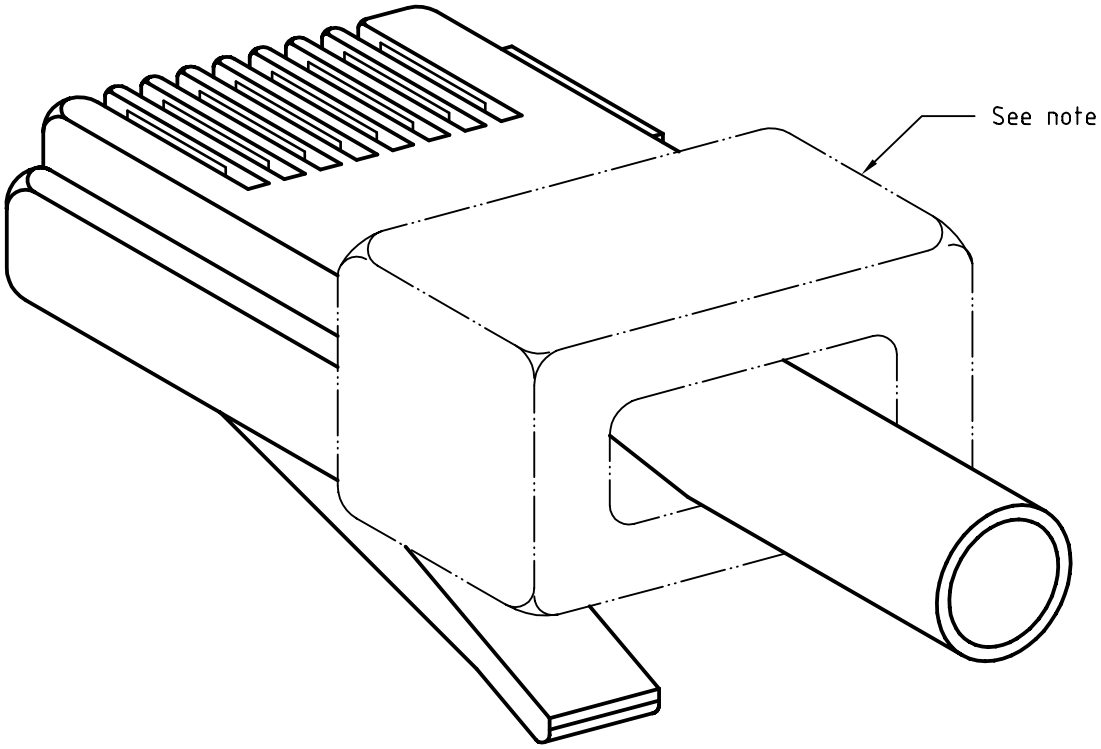
Figure 1 illustrates the cord-terminating plug, and figure 2 illustrates the jack.

Connector dimensions necessary to ensure mating of the plugs with jacks (see note 1) are specified in figures 3 to 5. Figure 3 gives the mechanical specifications of the 8-contact plug, and figure 5 that of the jack. Figure 4 gives the plug/jack specification for mating.

Jacks for use in ISDN primary rate access applications in accordance with this option shall conform to the dimensions specified in figures 4 and 5. However, as an option, the provision for keying the jack may be modified to permit the insertion of either the plug specified in ISO/IEC 8877 (ISDN basic access) or the plug specified in this International Standard.

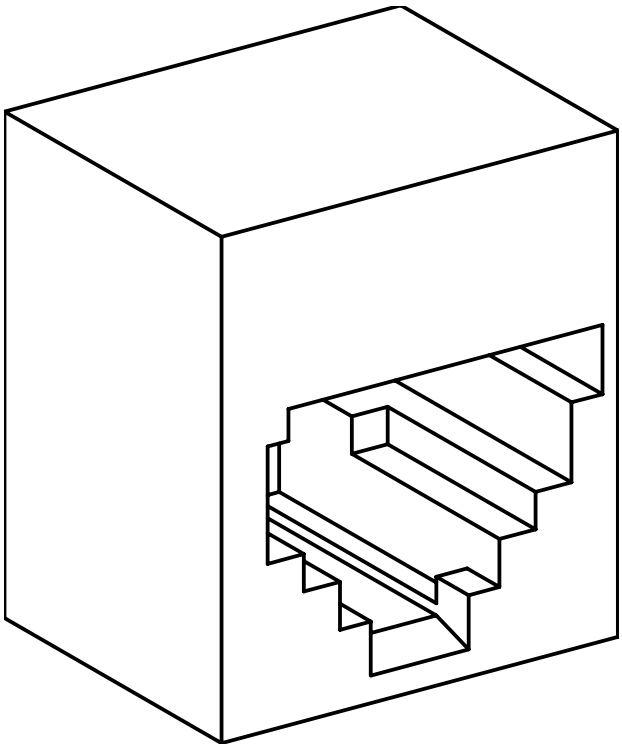
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NOTE The connector dimensions specified in figures 3 to 5 and implicit in figures 1 and 2 are not the same as those specified for the keyed option in IEC 603-7.



NOTE This portion of the plug illustrates a structure necessary for securing the cordage and is not pertinent to proper mating with the jack.

Figure 1 — Plug, 8-pole

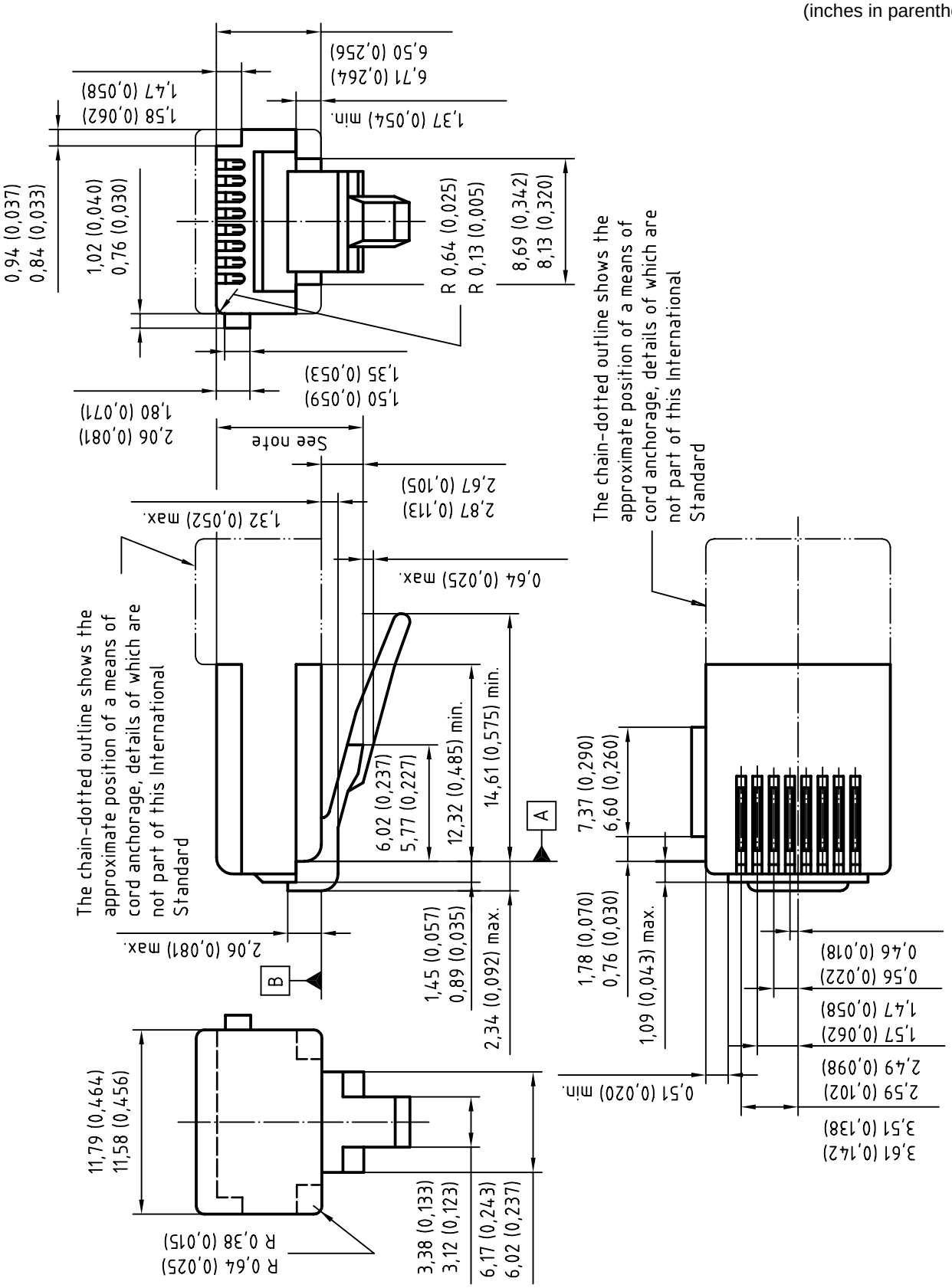


NOTE Jack contacts not shown for clarity.

Figure 2 — Jack, 8-pole

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Dimensions in millimetres
(inches in parentheses)



NOTES

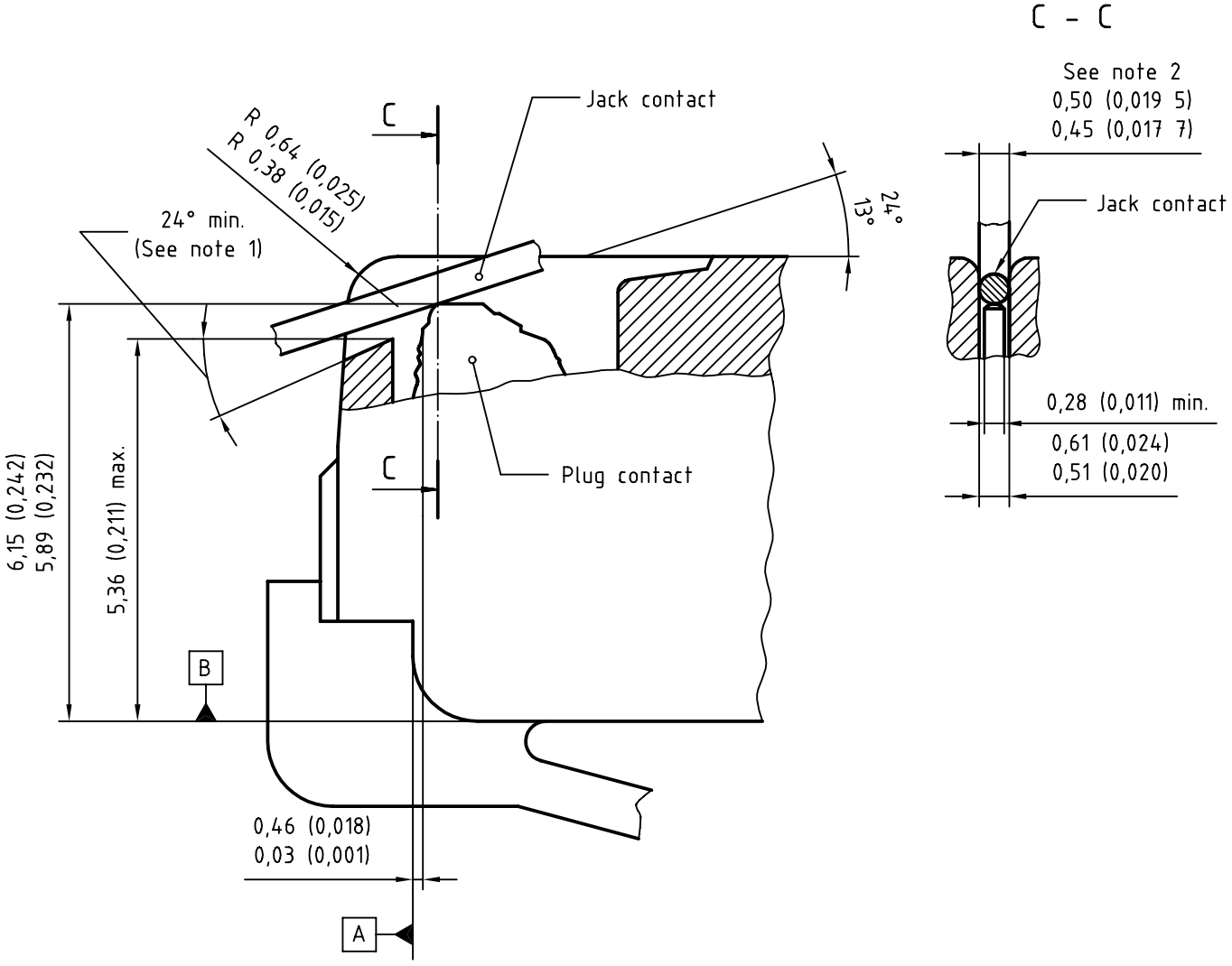
1 With the latch depressed, this dimension shall be 8,36 (0,329) max.

2 Dimensions to be centrally located about the centreline within ± 0,08 (± 0,003).

Figure 3 — Plug mechanical specification

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Dimensions in millimetres
(inches in parentheses)



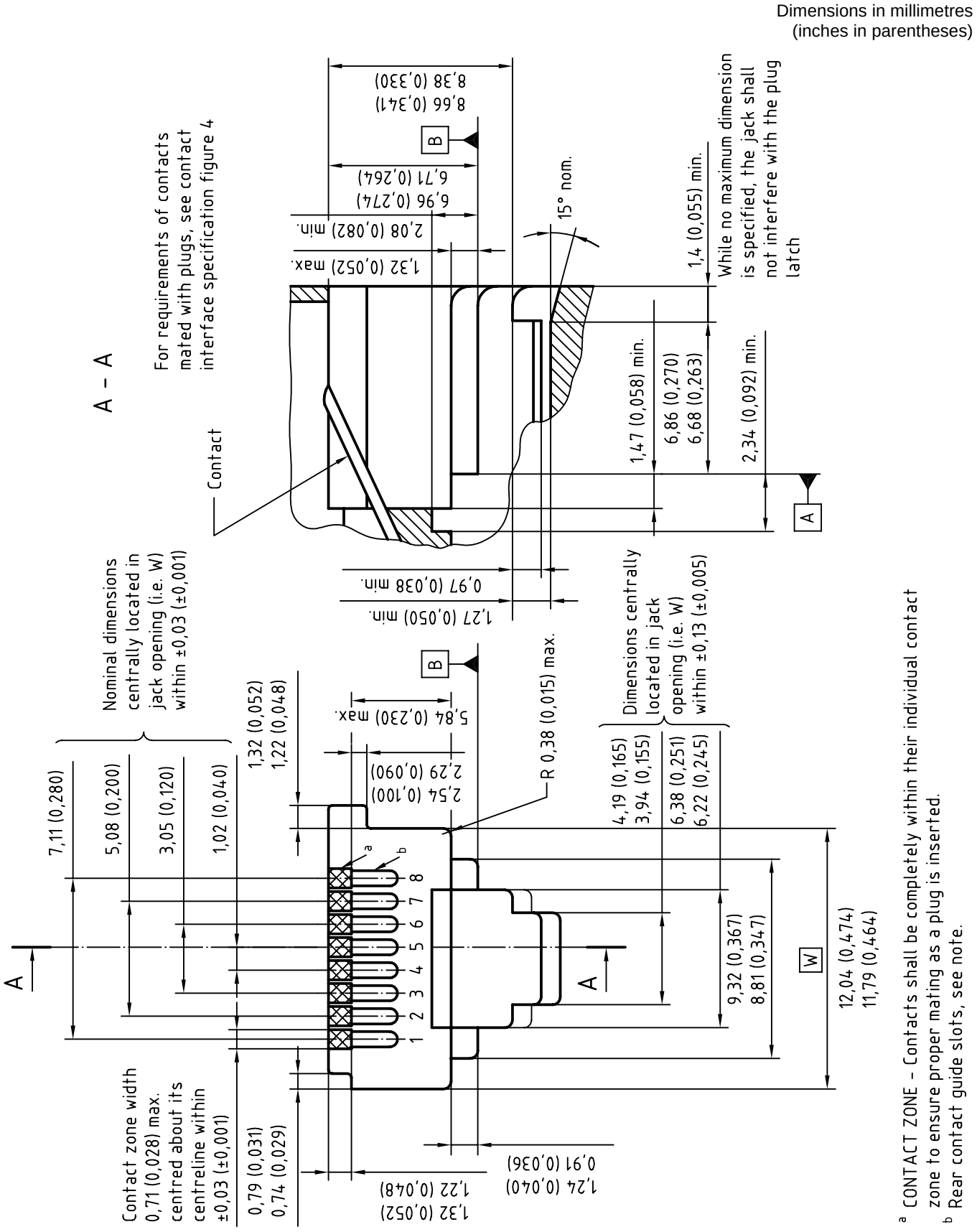
NOTES

1 The 24° min. angle applies only to plugs with front plastic walls higher than 4,83 (0,190).

2 Jack contacts may be rectangular with a width of 0,5 (0,019 5) max. and 0,36 (0,014) min.

Figure 4 — Plug/jack contact specification

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NOTE Guide slots shall prevent any individual contact from being displaced from its associated slot while permitting movement within individual slots.

Figure 5 — Jack mechanical specification

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5 Assignment of contacts

Four contacts are assigned for the two conductor pairs for signal transmission NT to TE and TE to NT, two contacts each for TRANSMIT and RECEIVE. Contacts are also assigned for an optional pair used for powering, and for continuity of shields for individual pairs. The contact assignments applicable to the interface on the NT1 side of an NT2 shall be the same as for the interface at a TE. Where a shield to both pairs is provided, the two contacts may be used in parallel to provide continuity.

NOTE This International Standard does not specify where shielding is required, but some information is given in A.3.

The use of twisted pairs for TRANSMIT and RECEIVE circuits shall conform to the applicable requirements of ITU-T Recommendation I.431.

Table 1 — Contact assignments

Contact	TE	NT	Polarity
1	Receive	Transmit	
2	Receive	Transmit	
3	Shield (R)[1)]	Shield (T)[1)]	
4	Transmit	Receive	
5	Transmit	Receive	
6	Shield (T)[1)]	Shield (R)[1)]	
7	Power source[1)]	Power sink[1)]	–
8	Power source[1)]	Power sink[1)]	+
1) Optional, see A.2.			

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Annex A
(informative)

Interface cables and connecting cords, powering and shielding

A.1 Interface cables and connecting cords

The interface cabling arrangement implied by ITU-T Recommendation I.431 is illustrated in figure A.1.

In many applications the interface cable will be the user's premises wiring, and a jack in a form suitable for wall mounting is required. In other applications the interface cable will be wired directly to the NT or the TE without connectors. However, where connectors are used they shall conform to this International Standard.

A.2 Powering arrangements

The provision of power to the NT via the interface using a separate pair of wires from those used for transmission is optional. The voltage and power requirements are specified in ITU-T Recommendation I.431, Section 8. The location of the source of power (i.e. whether in the TE or in a separate unit) is not specified.

A.3 Shielding

Contacts 3 and 6 are provided for shield continuity where this is required. ITU-T Recommendation I.431 specifies that the need for shielded cables and the further need for shield continuity are application dependent. In some applications, cords and cables may have a single shield that encloses all conductors; in other applications, shields may be provided for individual TRANSMIT and RECEIVE pairs.

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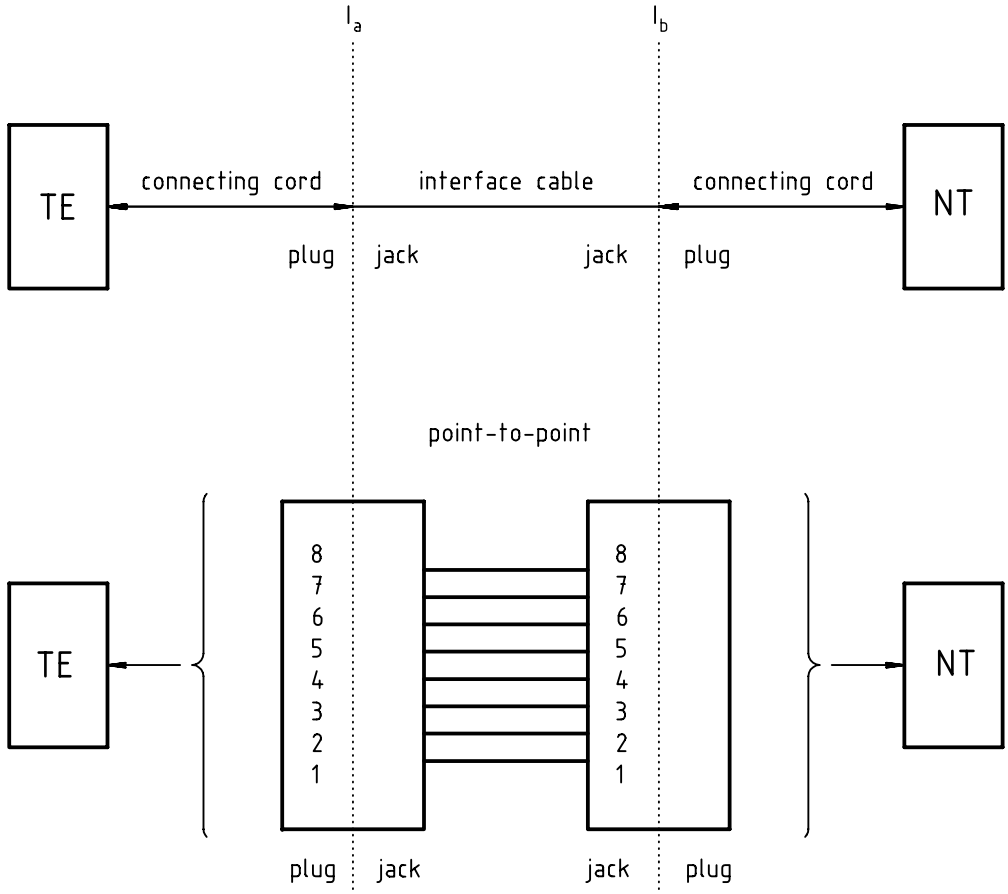


Figure A.1 — Cabling and connector arrangements

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Annex B
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Coaxial connectors for ISDN primary rate access

For the alternative connector system, except when the TE is directly connected to the interface cable, two 75 ohm BNC connector pairs (plug and jack) are specified for use at the interface I_a, and except when the NT is directly connected to the interface cable, two 75 ohm BNC connector pairs (plug and jack) are specified for use at the interface I_b. In each case, one of the two pairs is for the TRANSMIT direction and the other for the RECEIVE direction. The connector and cabling arrangements are shown in figure B.1. The connectors are specified in IEC 169-8, with mating dimensions as shown in figures B.2 and B.3.

NOTES

1 The means of identification of each pair (TRANSMIT and RECEIVE) is not specified.

2 The provision of a connector for the power feeding option is not specified.

3 In IEC 169-8, the pin (male) connector corresponds to the plug, and the socket (female) connector corresponds to the jack as defined in this International Standard.

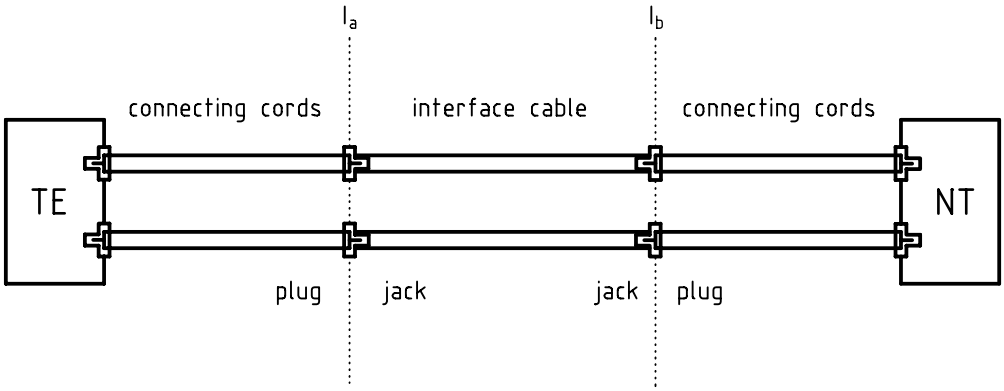
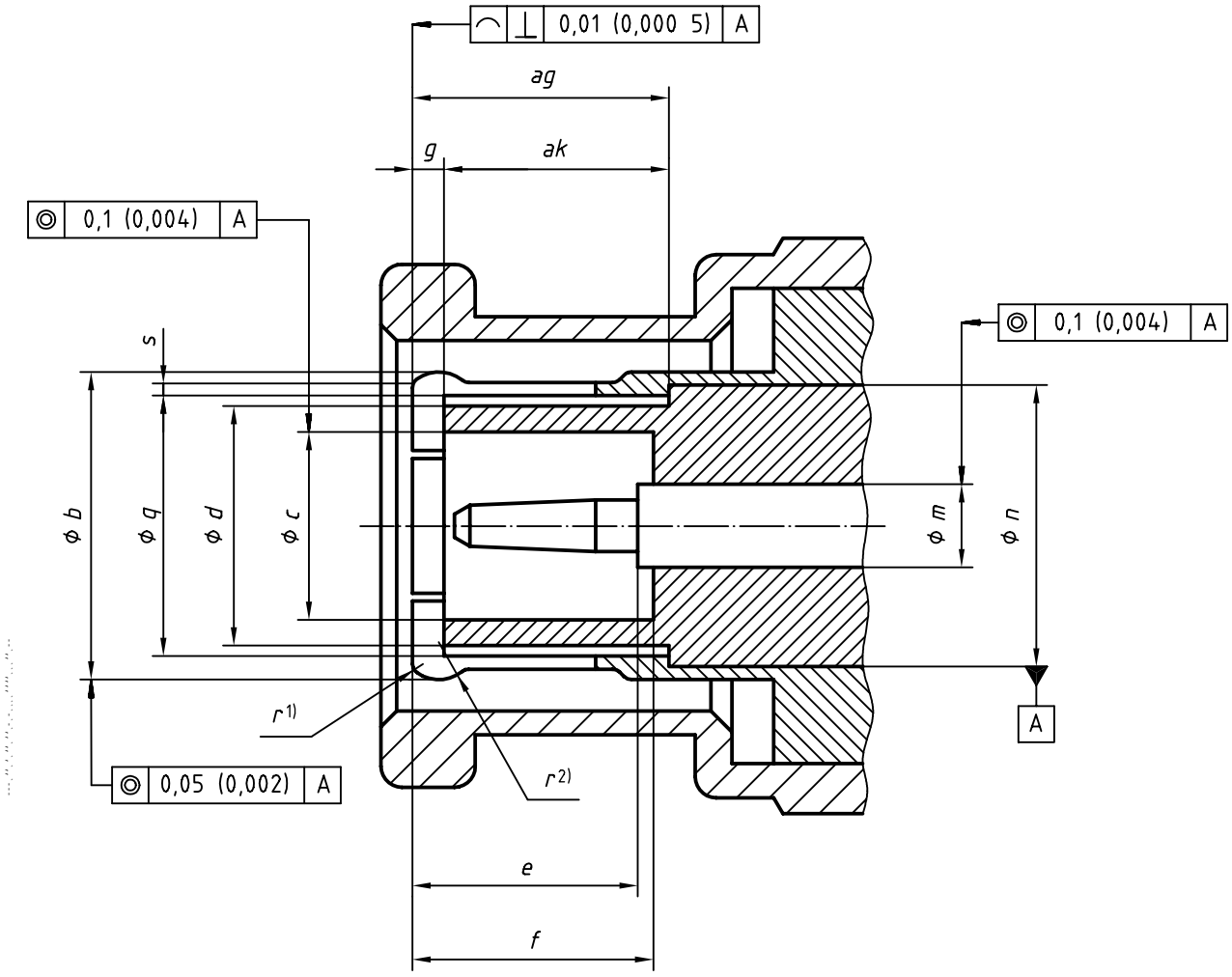


Figure B.1 — Cabling and connector arrangements

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Dimensions in millimetres
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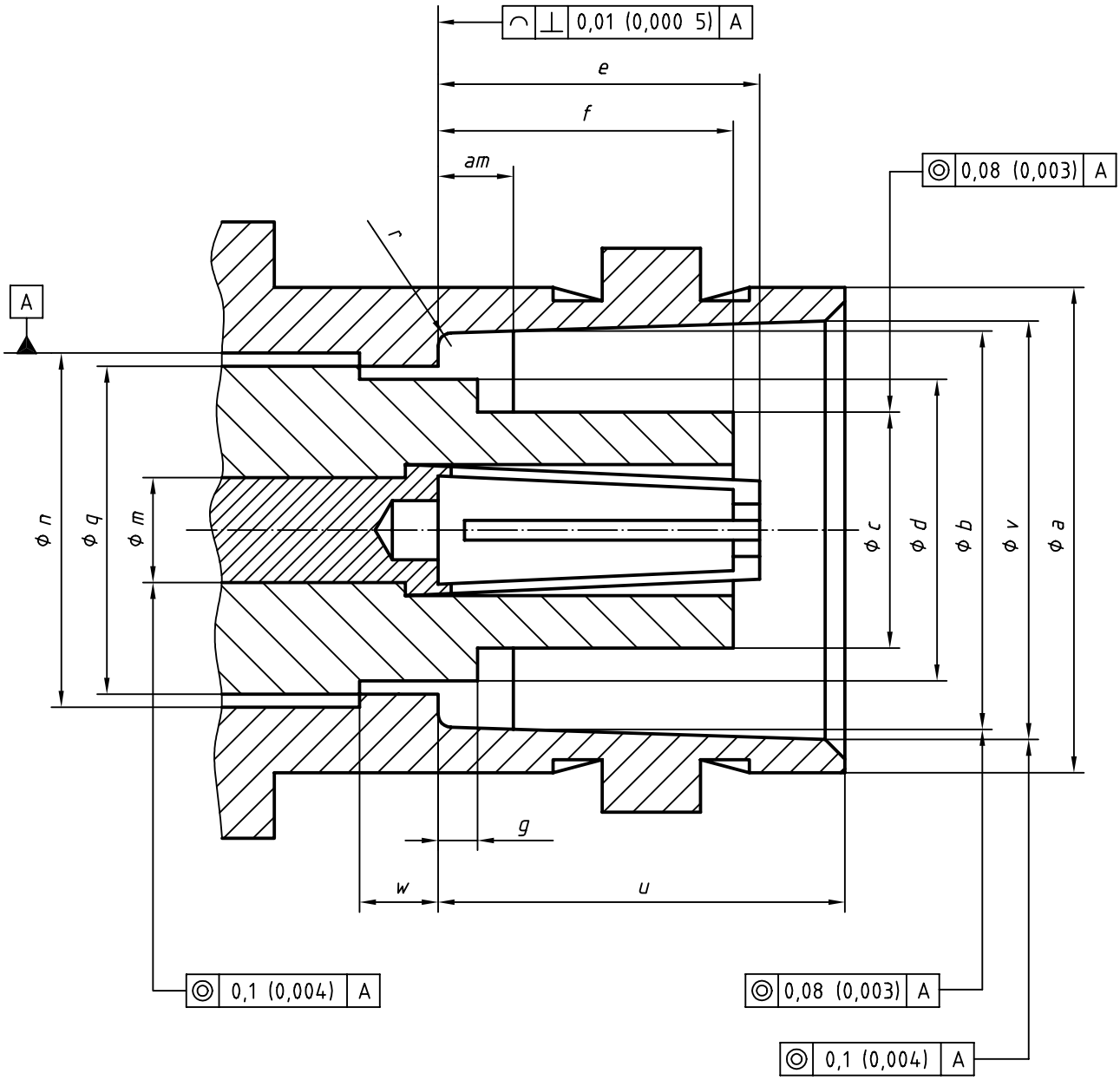


Ref.	mm		in	
	min.	max.	min.	max.
b	8,10	8,15	0,319	0,321
c	4,88	4,93	0,192	0,194
e	5,31	5,38	0,209	0,212
f	5,38	5,54	0,212	0,218
g	0,15	0,30	0,006	0,012
m	2,13	2,15	0,083 7	0,084 7
n	6,99	7,01	0,275 2	0,276 9
q	6,72	6,74	0,264 5	0,265 5
$r^{1)}$	0,13	0,20	0,005	0,008
$r^{2)}$	—	0,89	—	0,035
s	0,30	—	0,012	—
ag	5,31	5,36	0,209	0,211
ak	5,16 nom.	5,16 nom.	0,203 nom.	0,203 nom.

Figure B.2 — Male connector

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Dimensions in millimetres
(inches in parentheses)



Ref.	mm		in	
	min.	max.	min.	max.
a	9,60	9,68	0,378	0,381
b	8,10	8,15	0,319	0,321
c	4,67	4,72	0,184	0,186
d	6,58	6,68	0,259	0,263
e	5,21	5,28	9,205	0,208
f	5,08	5,23	0,200	0,206
g	0,0	0,15	0,00	0,006
m	2,13	2,15	0,0837	0,0847
n	6,99	7,01	0,2752	0,2760
q	6,71	6,76	0,264	0,266

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r	—	0,1	—	0,004
u	8,36	8,46	0,329	0,333
v	8,31	8,46	0,327	0,333
w	0,79	0,84	0,031	0,333
am	0,51	1,02	0,020	0,040

Figure B.3 — Female connector

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Annex C
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Bibliography

[1] IEC 169-8:1978, *Radio-frequency connectors – Part 8: R.F. coaxial connectors with inner diameter of outer conductor 6.5 mm (0.256 in) with bayonet lock – Characteristic impedance 50 ohms (Type BNC).*

[2] IEC 603-7:1996, *Connectors for frequencies below 3 MHz for use with printed boards – Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality.*

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Annex D
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Recommendations regarding inadvertent cross-connection between basic and primary rate access

If jacks conforming to the non-keyed option (see 4.2.1) are used in close proximity to jacks provided for ISDN basic access, the risks of damage through inadvertent cross-connection of basic access TEs to primary rate access NTs, and of primary rate access TEs to basic access NTs, can be minimized by:

1 proper labelling of all plugs and jacks.

2 not implementing power source 3 in basic access TEs (which potentially could damage primary rate TEs or NTs using contacts 1 and 2).

3 not implementing transformerless coupling on transmit and receive pairs (to prevent basic access phantom power feeding to the primary rate pair connections on contacts 4 and 5).

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