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## **Information processing systems — Interface connector and contact assignments for ISDN basic access interface located at reference points S and T**

*Systemes de traitement de l'information — Connecteur d'interface et affectation des contacts pour l'interface d'accès de base au RNIS située aux points de référence S et T*

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## Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8877 was prepared by Technical Committee ISO/TC 97, *Information processing systems*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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# Information processing systems — Interface connector and contact assignments for ISDN basic access interface located at reference points S and T

## 1 Scope and field of application

This International Standard specifies the 8-pole connector (plug and jack) and the assignments of poles/contacts for use in physical interfaces of Integrated Services Digital Network (ISDN) basic access arrangements. These physical interfaces, where they exist, will be located at reference points S and T between TEs and NTs and between NT1s and NT2s and shall conform to CCITT Recommendation I.430.

CCITT Recommendation I.430 requires plugs and jacks on equipment connecting cords and interface cables as shown in figure 2/I.430 of that Recommendation (see also annex A).

For the purpose of this International Standard, when viewed from an NT1, an NT2 may be considered to be a TE.

NOTE — This International Standard specifies connector dimensions but only those to ensure intermatibility, complete detailed specifications of the plugs and jacks and all other dimensions will be the subject of a future IEC standard.

## 2 References

CCITT Recommendation I.411-1985, *ISDN user-network interface — Reference configurations*.

CCITT Recommendation I.420-1985, *Basic user-network interface*.

CCITT Recommendation I.430-1985, *Basic user-network interface — Layer 1 specification*.<sup>1)</sup>

## 3 Definitions

For the purpose of this International Standard the following definitions apply.

**3.1 pole:** A position for a contact.

**3.2 contact:** The electrical contact element which, for many connectors, is referred to as a "pin".

**3.3 plug and jack:** The male and female connector parts, respectively.

NOTE — The term socket is used in CCITT Recommendation I.430, Section 4, in referring to the female connector part or jack.

Examples of interface cabling configurations are given in annex A.

## 4 Connector

Eight-pole plugs and jacks are specified for the interconnection of TEs and NTs. One plug and jack pair is used to connect the TE connecting cord to the interface cable (at interface point I<sub>A</sub> in CCITT Recommendation I.430, figure 2/I.430) and a second plug and jack pair is used (optionally)<sup>2)</sup> to connect the NT connecting cord to the interface cable (at interface point I<sub>B</sub> in CCITT Recommendation I.430, figure 2/I.430). Interface cabling may have a passive bus of a point-to-point configuration. (Both configurations are illustrated in annex A.)

TE and NT connecting cords shall be terminated in plugs. Figure 1 illustrates the cord-terminating plug which provides for 4, 6 or 8 contacts. The number of physical contacts provided or required is dependent upon the use by the associated equipment, TE or NT, of the optional provisions for powering across the interface. The optional powering capabilities are described in CCITT Recommendation I.430, section 9, and are summarized in annex B.

Interface cables shall be terminated in jacks. Figure 2 illustrates the jack which provides 4, 6 or 8 contacts. As with the cord terminating plug, the number of contacts provided or required is dependent upon the provision for the powering options discussed in annex B.

Connector dimensions<sup>3)</sup> necessary to assure mating of plugs with jacks are specified in figures 3 to 5. Connectors for use in the applications covered by this International Standard shall conform<sup>4)</sup> to the dimensions specified in these figures. No additional provisions for keying shall be provided.

1) Red Book, Volume III — Fascicle III. 5, 1985.

2) The interface cable may or may not be directly connected to an NT. Where the NT is a multi-port device, for example, a PABX, the connection to the NT may involve a large connector arrangement which accommodates multiple interfaces.

3) See note to clause 1.

4) Compliance with this International Standard does not depend on compliance with any other standard.

Figure 3 gives the mechanical specification for mating of the 8-pole plug. Figure 4 gives the plug/jack contact specification for mating. Figure 5 gives the mechanical specification for mating of the 8-pole jack. While physical contacts are indicated for poles 1, 2, 7 and 8 of the plug and jack, contacts corresponding to these numbers are not required in some applications and, in such applications, may be omitted.

### 5 Assignment of contact numbers

Four contact numbers are assigned for the conductors of the two pairs used for the signal transmission from NT to TE and from TE to NT. Two contacts each are assigned for TRANSMIT and RECEIVE directions at TEs and, correspondingly, for RECEIVE and TRANSMIT directions at NTs. Contacts are also assigned, for sources and sinks at TEs and NTs, individually, for the two optional conductor pairs used for powering TEs from NTs or from other TEs (or NTs from TEs). The provision of twisted pairs for TRANSMIT and RECEIVE circuits and of conductors for powering shall be in conformance with the provisions of CCITT Recommendation I.430 in all applications. The assignments applicable to the interface on the NT1 side of NT2s shall be the same as for the interface at TEs.

The contact number assignments for plugs and jacks are given in the table. The individual contact, for each conductor pair, is designated "+" or "-".

For TRANSMIT and RECEIVE pairs, the contact designated "+" indicates the conductor (lead in CCITT Recommendation I.430) of the pair for which the framing pulse should be relatively positive. However, it is unnecessary to distinguish the individual conductors of transmit and receive circuit pairs in interface cables or extension cords in point-to-point interconnections.

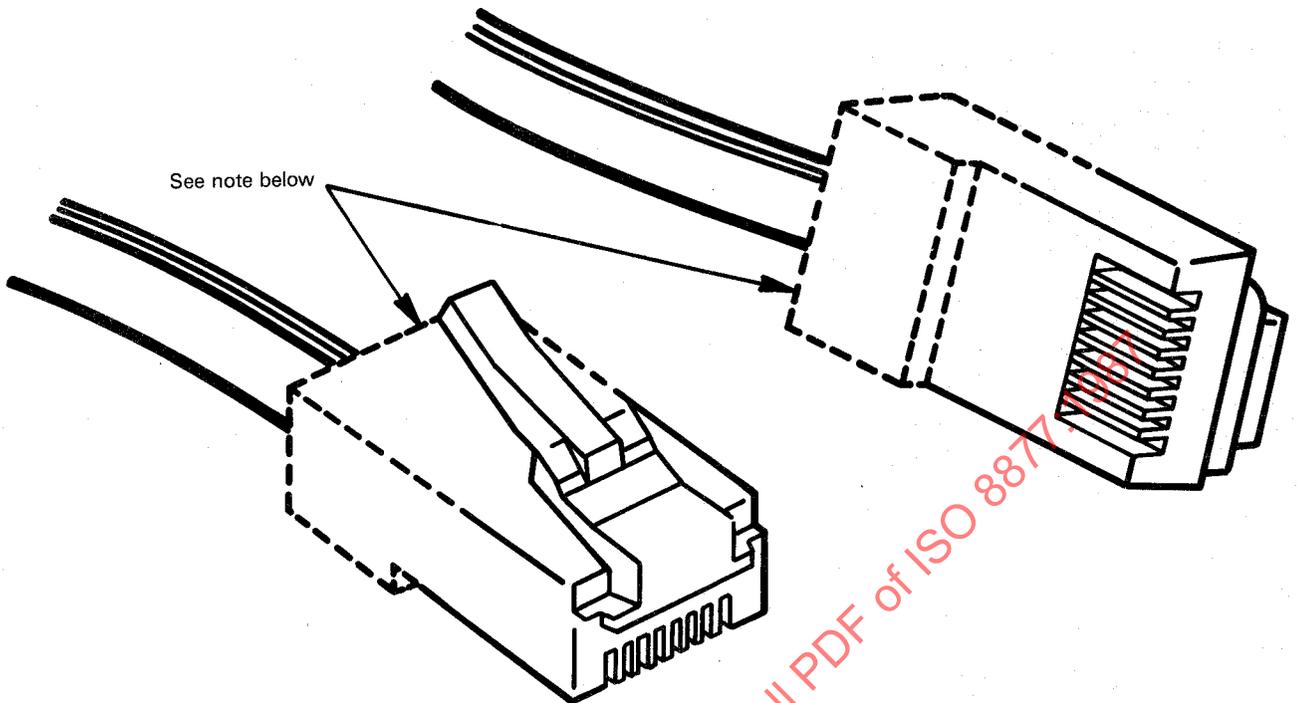
For pairs used for powering across the interface (see source 1 or 2 in section 9 of CCITT Recommendation I.430), the contact designated "+" indicates the conductor (lead in CCITT Recommendation I.430) of the pair that carries the relatively positive d.c. voltage.

Table – Contact assignments for plugs and jacks

Contact number	TE	NT	Polarity
1	Power source 3	Power sink 3	+
2	Power source 3	Power sink 3	-
3	Transmit	Receive	+
4	Receive	Transmit	+
5	Receive	Transmit	-
6	Transmit	Receive	-
7	Power sink 2	Power source 2	-
8	Power sink 2	Power source 2	+

NOTE – For its use in TE-to-TE interconnections, power source/sink 3 shall conform to the requirements, specified in CCITT Recommendation I.430, section 9.2, for power source/sink 2.

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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

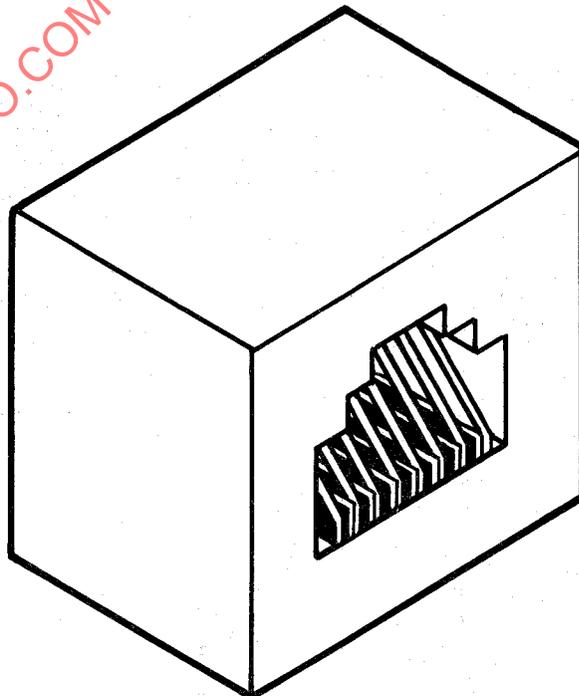


Figure 2 — Jack — 8 pole

Dimensions in millimetres (inches in parentheses)

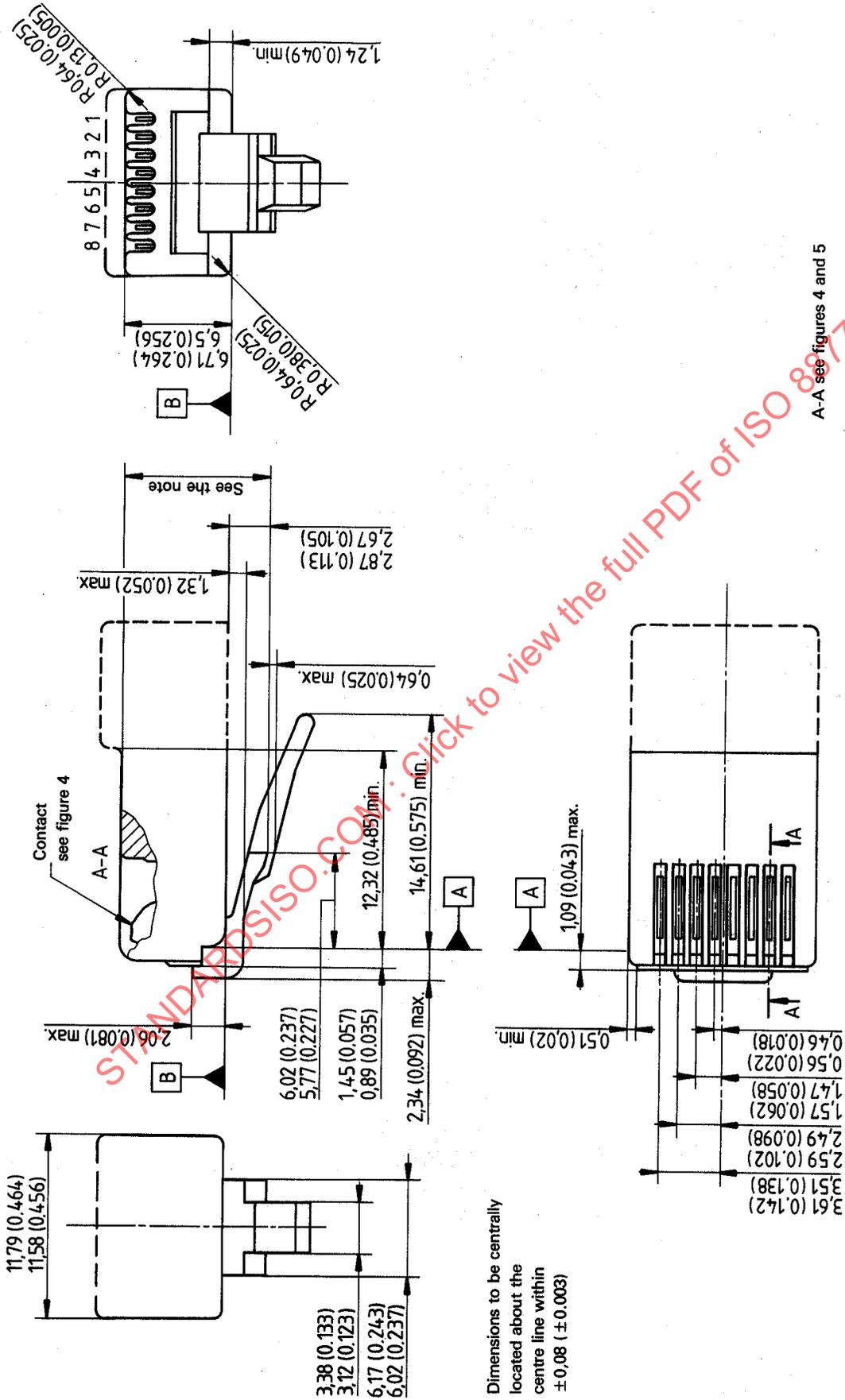
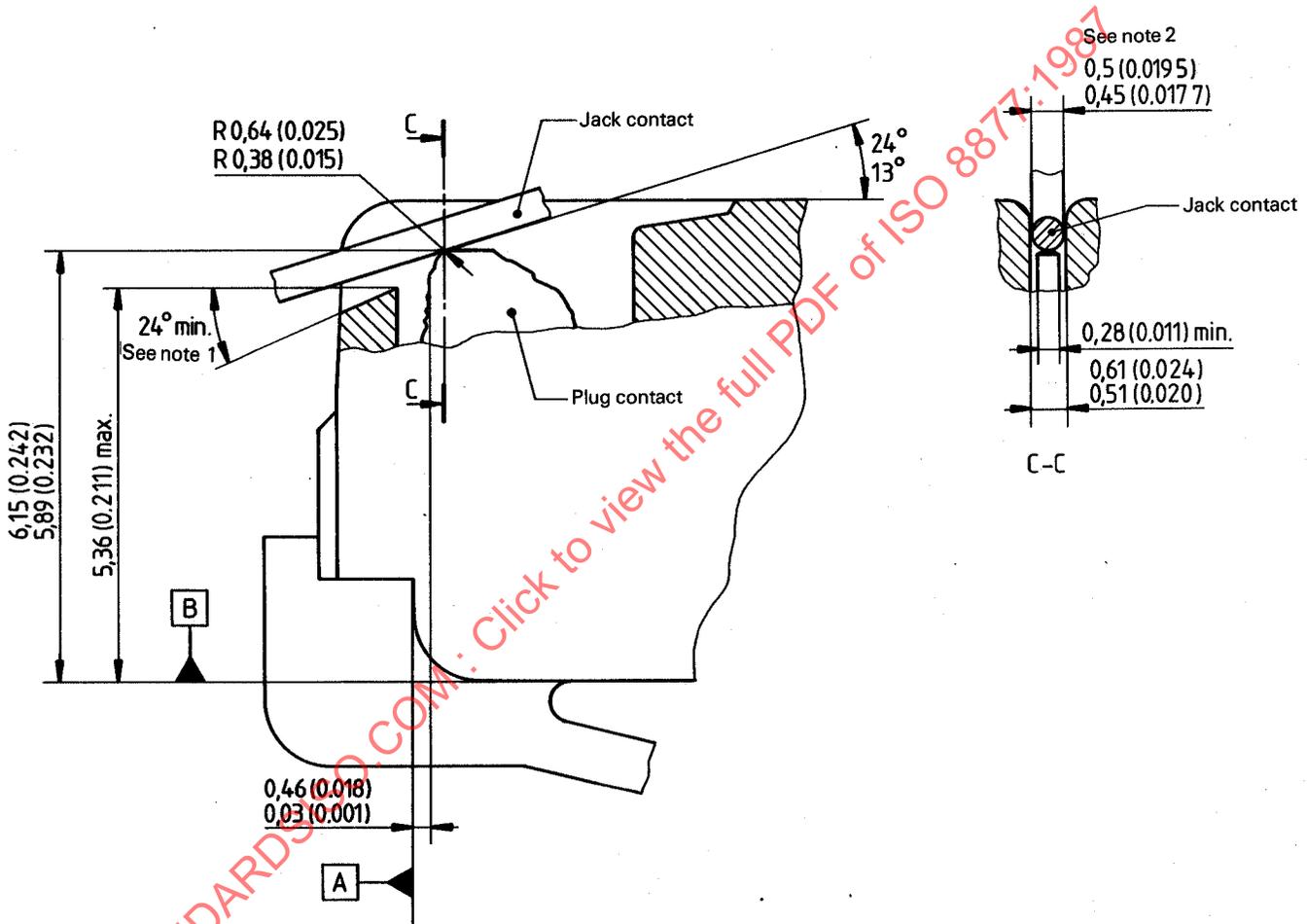


Figure 3 — Plug mechanical specification

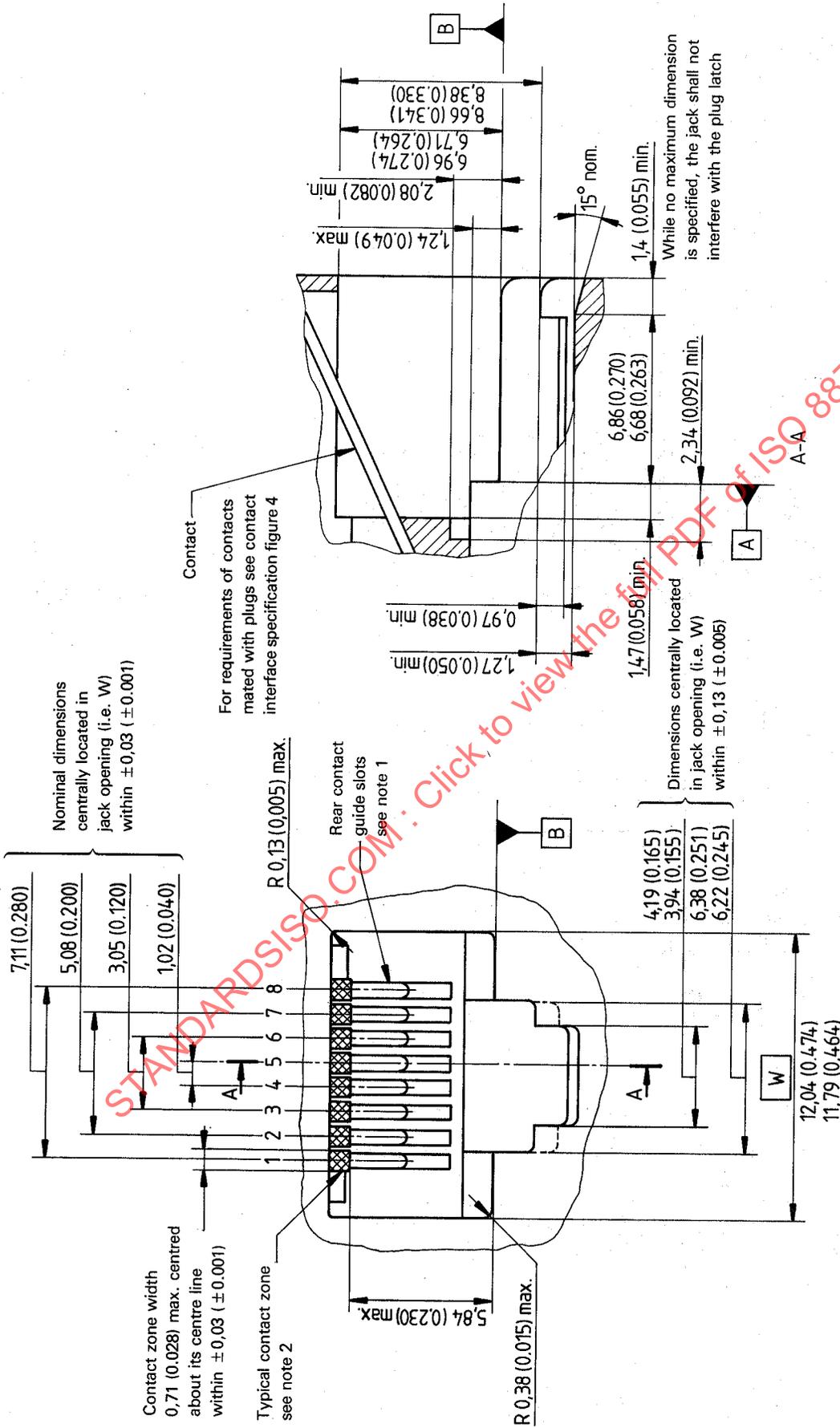
Dimensions in millimetres (inches in parentheses)



NOTES

- 1 The 24° min. angle applies only to plugs with front plastic walls higher than 4,83 mm (0,190 in).
- 2 Jack contacts may be rectangular with a width of 0,50 (0,019 5) max. and 0,36 (0,014) min.

Figure 4 — Plug/jack contact specification



NOTES

- 1 Guide slots shall prevent any individual contact from being displaced from its associated slot while permitting movement within individual slots.
- 2 Jack contacts shall be within their individual contact zone to ensure proper mating as a plug is inserted.

Figure 5 — Jack mechanical specification

## Annex A

### Interface cabling arrangements

(This annex does not form part of this standard.) Interface cabling arrangements are the subject of national regulations.

The interface cabling arrangements, implied by the requirements in CCITT Recommendation I.430, section 4, are described in this annex. Figure 6 illustrates the cabling arrangements, for the ISDN basic access interface, and shows the different parts of the physical interconnection: "connecting cords", "extension cord" and "interface cable".

The same contact numbers assigned at the interface (point I<sub>A</sub> in CCITT Recommendation I.430, figure 2/I.430) of TEs for TRANSMIT and RECEIVE conductor pairs are assigned at the interface (point I<sub>B</sub> in CCITT Recommendation I.430, figure 2/I.430) of NTs for RECEIVE and TRANSMIT, respectively, conductor pairs. This provides for a given conductor to be connected to the same contact in jacks at both ends of interface cables. However, it means that interface cables are suitable only for NT-to-TE and NT1-to-NT2 interconnections.

For TE-to-TE interconnections, an adaptor with a crossover to connect TRANSMIT to RECEIVE is required. The same crossover requirement applies to contacts/conductors (pairs assigned to contact numbers 1-2 and 7-8) for optional power transfer.

As indicated in CCITT Recommendation I.430, section 4, interface cables are terminated in the same type of connector part (jack) at both ends. This means that NTs or TEs may be connected at either end of point-to-point cables.

Extension cords have a plug at one end and a jack at the other end. They cannot be used to extend TE connecting cords in connections to Passive Bus wiring configurations because the bridging impedance of an extension cord (of even a short length) can adversely affect the operation of all TEs in Passive Bus configurations. The length of the extension cord(s) associated with a TE in point-to-point configurations is limited to 25 m.

Connecting cords provide a plug for connection to an interface cable (or extension cord). The acceptable maximum length of connecting cords will generally be limited by the need for compliance with transmit- and receive-circuit impedance requirements specified in CCITT Recommendation I.430, section 8. While there is no restriction on the minimum length of such cords in a particular application, TEs are required to include the option of a cord of at least 5 m in length. TE and NT connecting cords may be detachable from associated TE and NT equipment but the connector for these applications is not specified in this International Standard.

NOTE — A TE connector and contact assignment for a standard ISDN basic access TE connecting cord, which may optionally be used with a TE, is the subject of another International Standard.

It is also significant that, in most ISDN applications, the interface cable will be user's premises wiring and the jack must be available in a form suitable for wall mounting. Available assemblies of the specified jack, which are intended for such mountings, may provide a housing for a suitable mounting of the transmit- and receive-pair terminating resistors. As specified in CCITT Recommendation I.430, figure 2/I.430, the terminating resistors must be located, for point-to-point wiring configurations, in or at the jack and must be connected across contact pairs 4-5 and 3-6. For passive bus wiring configurations, the terminating resistors may be mounted in such jack assemblies located at both ends of the bus.

It is equally important to recognize that the interface cable may be wired directly to NTs without the interface connector and with the interchange circuit terminating resistors provided internal to the equipment. This is possible where the interface cable is provided in association with, or as part of, the NT. In such applications, the only interface of significance (at which the requirements of CCITT Recommendation I.430 apply) may be at the jack(s) (point I<sub>A</sub> in CCITT Recommendation I.430, figure 2/I.430) for the connection of TEs. In addition, the combination of the NT connecting cord and interface cabling may be of zero length.

Another alternative NT connection arrangement uses a jack mounted on the NT equipment entity, which includes the terminating resistors. The jack may not conform to this International Standard, but where the jack does conform, the contact assignment shall be as specified. Where a cord, terminated at each end with a plug, is used to connect to the interface wiring, the cord is considered a part of such wiring.

For NT2s (e.g. PABX) serving multiple TEs, multiple interface cables may be connected to the NT2 with a larger connector, which does not conform to this International Standard.