INTERNATIONAL STANDARD

ISO 9524

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Machine tools — Front faces of spindle holders for machining centres — Functional dimensions

Machines-outils — Faces avant de porte-broches de centres d'usinage — Dimensions fonctionnelles

Reference number
ISO 9524:1993(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9524 was prepared by Technical Committee ISO/TC 39, *Machine tools*.

Annex A of this International Standard is for information only.

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Machine tools — Front faces of spindle holders for machining centres — Functional dimensions

1 Scope

This International Standard specifies the functional connecting dimensions of the front faces of spindle holders for machining centres and of their various machining and measuring accessories to ensure that interchangeability, fixing by means of automatic tool changing devices and correct machine operation of these accessories is possible.

The main accessories are

a) electrically operated accessories;

b) coolant feed accessories, and

c) mechanical indexing accessories, i.e.

   1) angle heads,

   2) drilling-tapping heads,

   3) speed-increasing gears, etc.

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 7-1:1982, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Designation, dimensions and tolerances.*

ISO 7388-1:1983, *Tool shanks with 7/24 taper for automatic tool changers — Part 1: Shanks Nos. 40, 45 and 50 — Dimensions.*

ISO 7388-1:1983/Add.1:1984, *Addendum 1: Conicity tolerances.*

3 Main accessories

3.1 General

To enable use of these accessories in automatic operating systems, they shall be mounted on shanks complying with ISO 7388-1 and ISO 7388-1/Add.1.

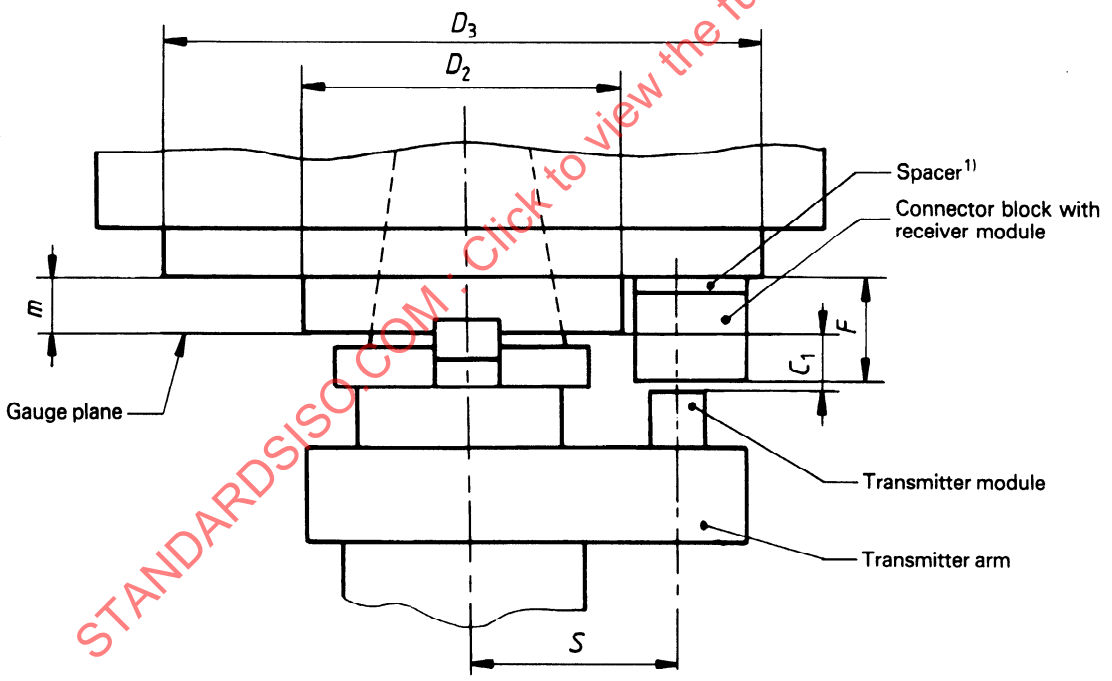
The indexing angle of the connecting arm of the accessory shall be adjustable.

3.2 Electrically operated accessories (see figure 1)

When the accessory is located by means of an automatic changer, the transmitter arm projecting over the sensor is in line with the receiver module. The receiver module is inserted in the connector block which is located on the spindle holder.

The dimensions are given in table 1.

The functional connecting dimensions are the centre distance S and the distance C_1 between the face of the transmitter module and the gauge plane of the shank.



1) Only for shanks Nos. 45 and 50.

Figure 1

3.3 Coolant feed accessories (see figure 2)

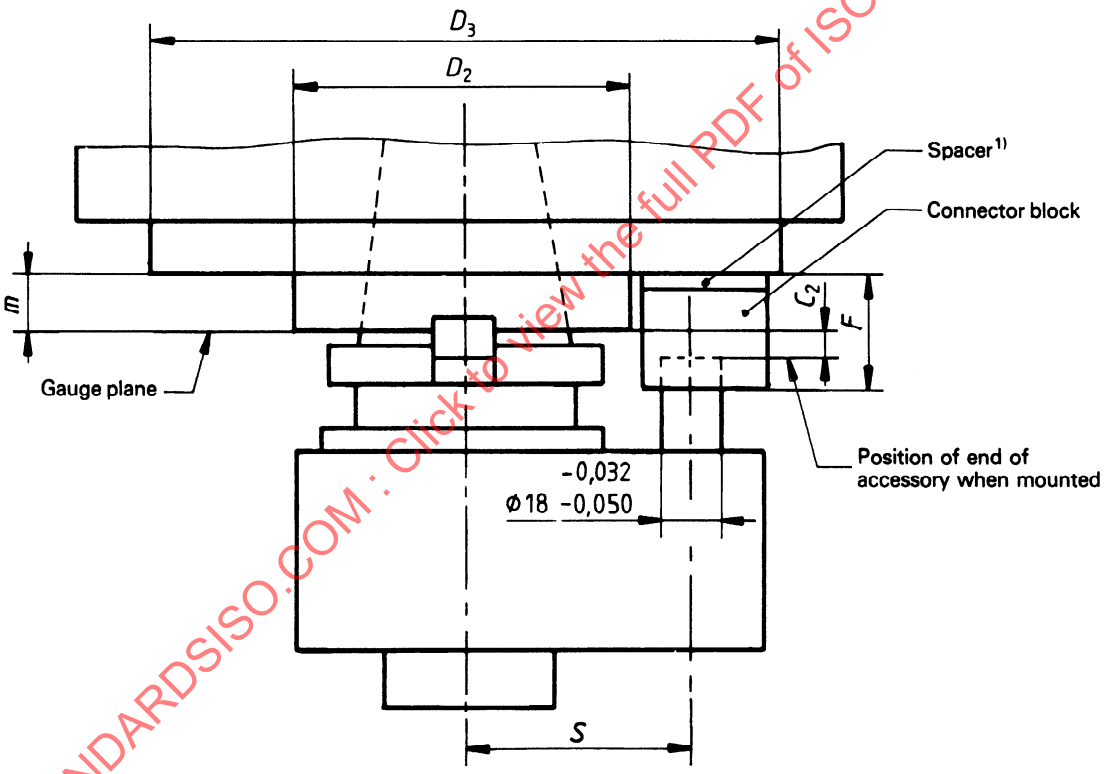
When the accessory is located by means of an automatic changer, its end is inserted in the corresponding hole or slot in the connector block which is located on the spindle holder.

The dimensions are given in figure 2 and table 1.

The initial position of the end of the accessory shall not overlap the top face of the flange and the travel of the end shall be sufficient to ensure good connection with the receiver of the connector block.

The functional connecting dimensions are the centre distance S, the distance C_2 between the face of the end and the gauge plane, and the diameter ($18\ ^{-0,032}_{-0,050}$ mm) of the end.

Dimensions in millimetres



1) Only for shanks Nos. 45 and 50.

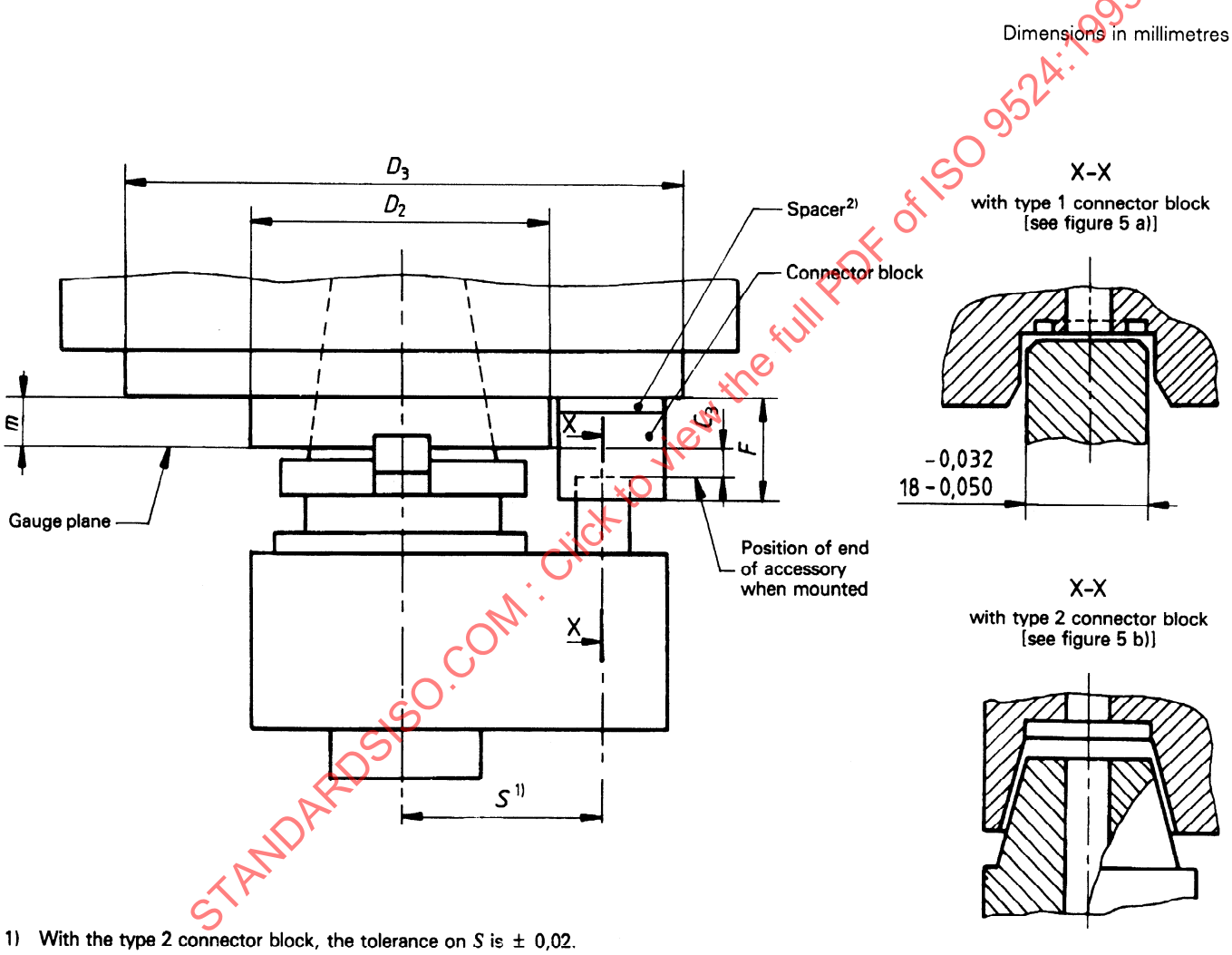
Figure 2

3.4 Mechanical indexing accessories (see figure 3)

When the accessory is located by means of an automatic changer, its end is inserted in the corresponding hole or slot in the connector block which is located on the spindle holder.

The dimensions are given in figure 3 and table 1.

The functional connecting dimensions are the centre distance S defining the radial position of the connector block on the front face, the distance C_3 between the face of the indexing end and the gauge plane, and the width ($18\ ^{-0,032}_{-0,050}$ mm) of the indexing end.



1) With the type 2 connector block, the tolerance on S is ± 0,02.

2) Only for shanks Nos. 45 and 50.

Figure 3

3.5 Dimensions and tolerances

See table 1.

Table 1

Dimensions in millimetres

Shank No.	D_2 max.	D_3 min.	m [1]	S	C_1 [2] $^{-0,3}_{-0,5}$	C_2 $^{0}_{-0,1}$	C_3 Type 1 min.	C_3 Type 2	F	B [3]
40	100	170	16	65	19	9	9	7	35	—
45	130	200	18	80					37	2
50	130	200	19	80					38	3

1) This distance between the gauge plane of the spindle taper and the front face of the spindle holder is in accordance with that defined and specified in ISO 9270.

2) C_1 may vary depending on the type of electrical connection.

3) Thickness of the spacer (see 4.1.3).

4 Connector blocks

4.1 Dimensions and tolerances

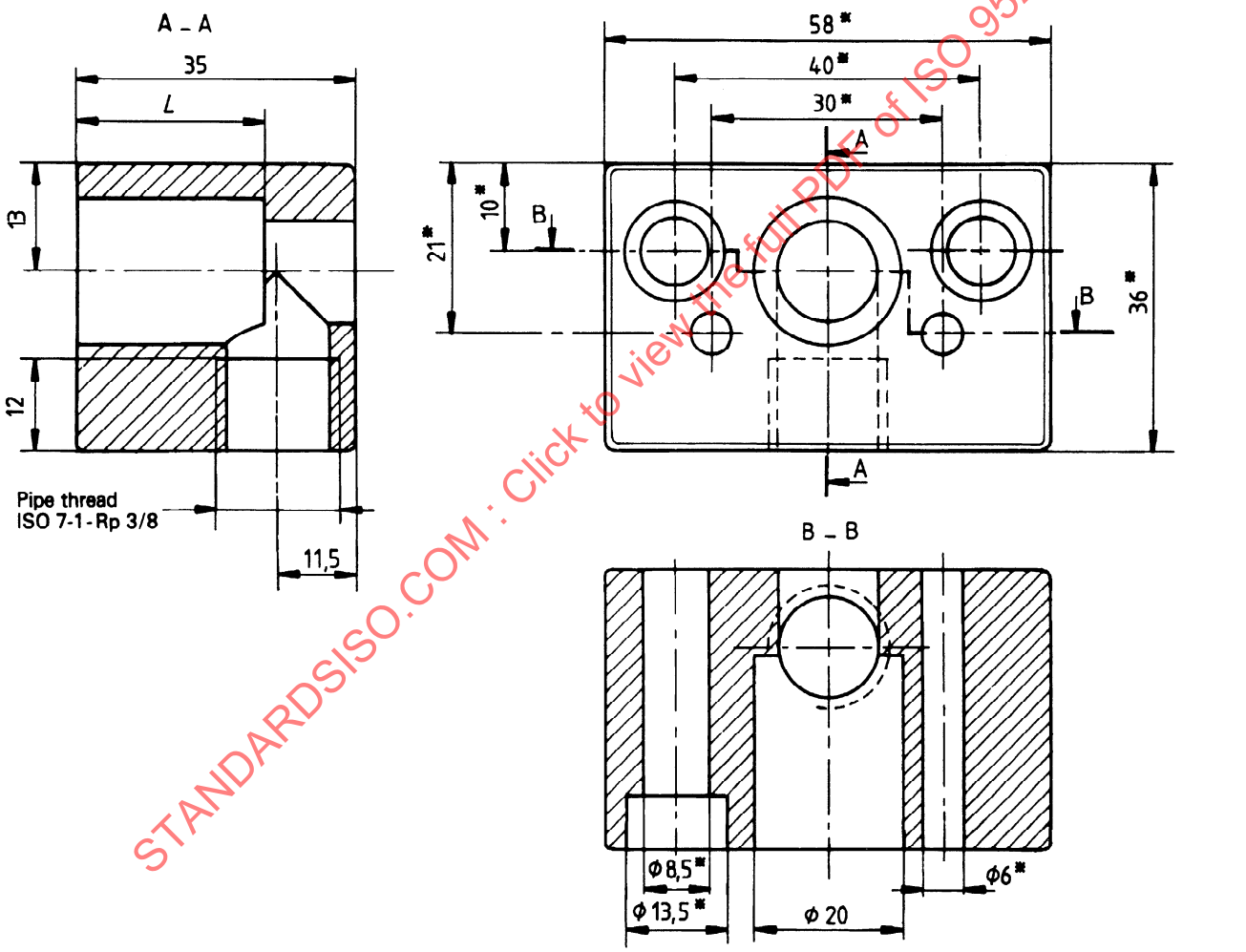
A connector block comprises either the "receiver module" in the case of electrically operated accessories, or the hole or slot in the case of coolant feed accessories and mechanical indexing accessories.

Connector blocks are fixed by means of two M8 screws and located by two pins of diameter 6 mm.

4.1.1 Connector block for electrically operated accessories (see figure 4)

4.1.2 Connector blocks for coolant feed accessories and mechanical indexing accessories [see figure 5 a) and b)]

Dimensions in millimetres



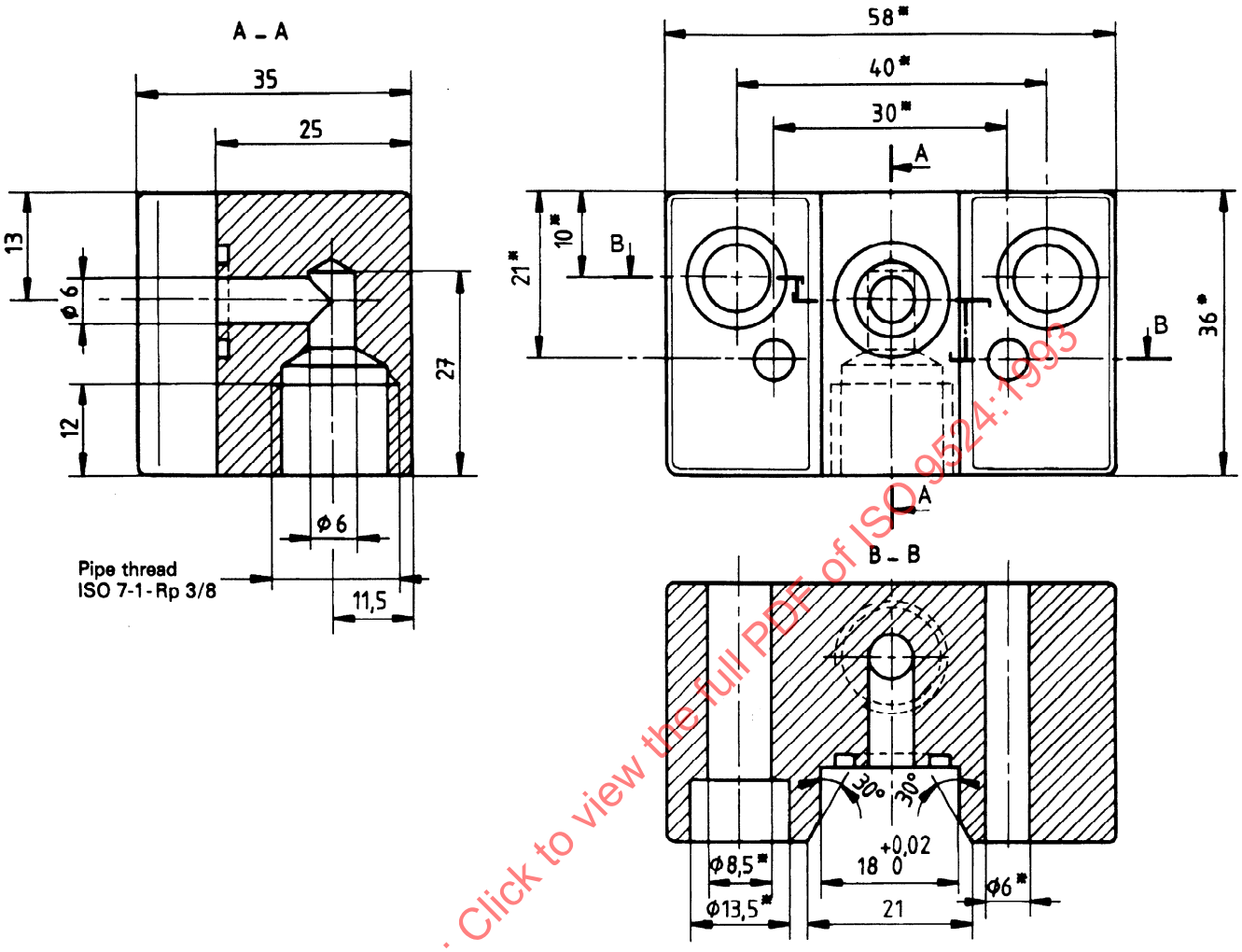
NOTES

1 The depth L is left to the manufacturer's discretion.

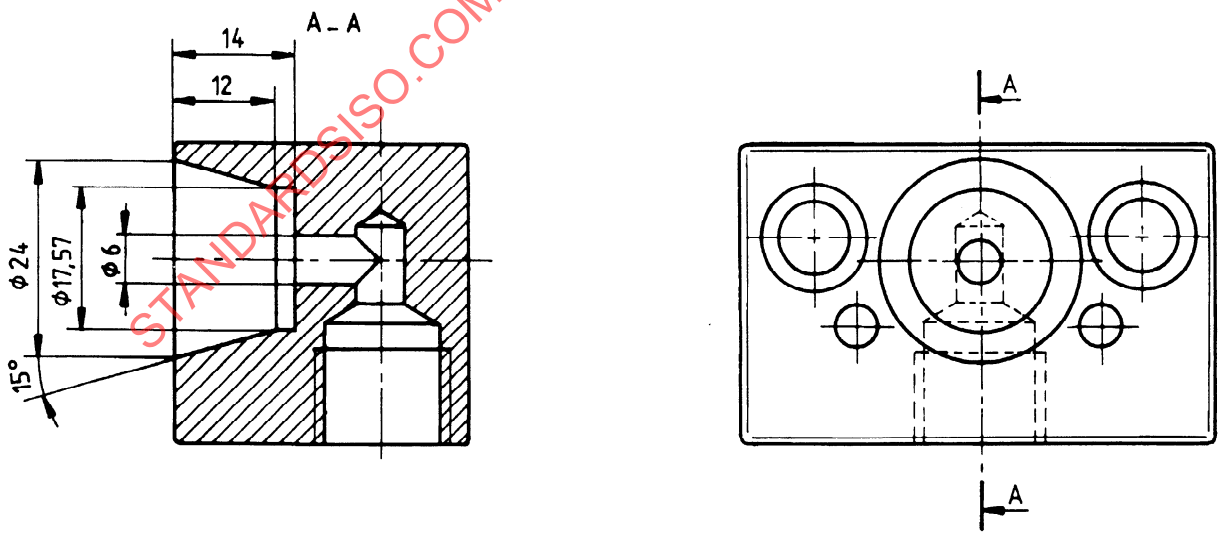
2 Dimensions marked with an asterisk are not functional, but if they are modified care should be taken to ensure interchangeability.

Figure 4

Dimensions in millimetres



a) **Type 1 connector block**



b) **Type 2 connector block** (for the dimensions not indicated, see type 1)

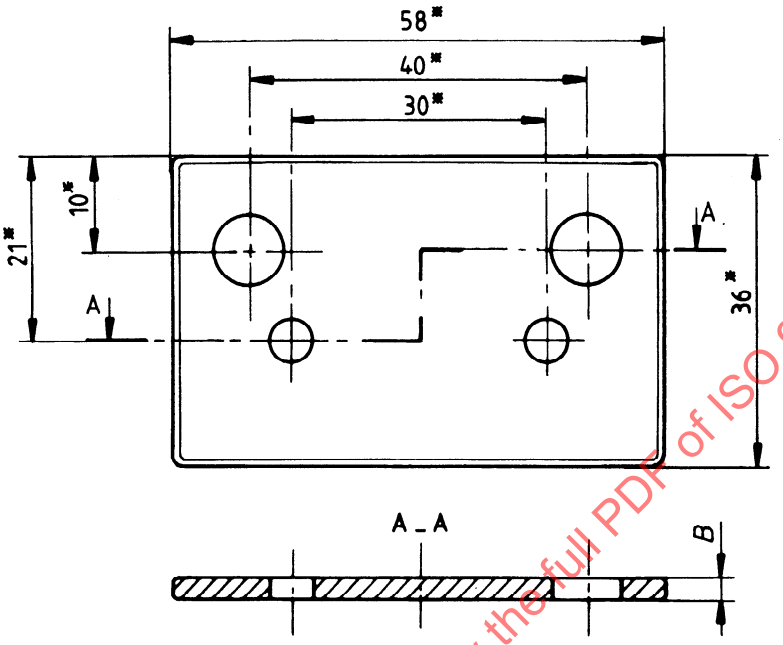
NOTES
1 The shape and dimensions of the sealing ring are left to the manufacturer's discretion.
2 Dimensions marked with an asterisk are not functional, but if they are modified care should be taken to ensure interchangeability.

Figure 5

4.1.3 **Spacer** (see figure 6)

NOTE 1 A spacer is used only for shanks Nos. 45 and 50.

Dimensions in millimetres



NOTES

1 Dimension *B* is given in table 1.

2 Dimensions marked with an asterisk are not functional, but if they are modified care should be taken to ensure interchangeability.

Figure 6

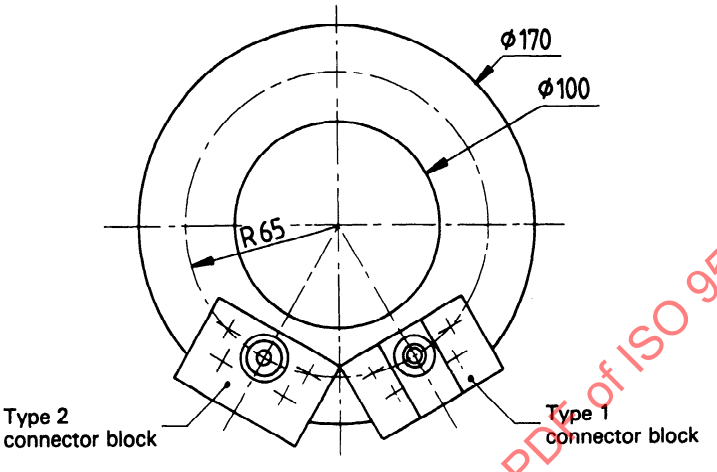
4.2 Material

The connector block shall be made of type 35 CD4 steel treated to give a rupture strength of 1 400 MPa, or any material having equivalent properties.

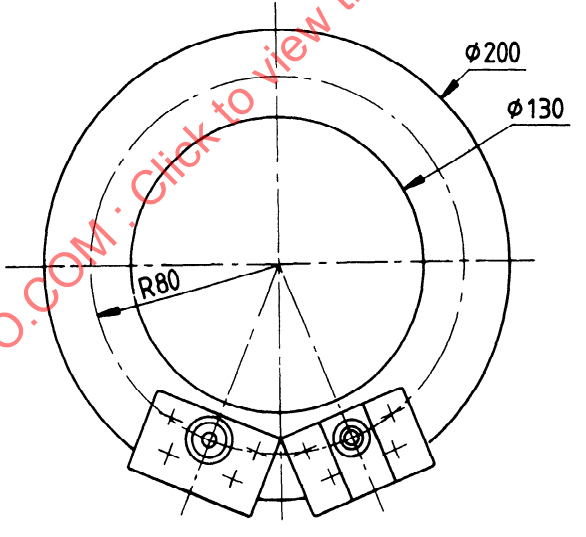
5 Mounting of accessories on the spindle holder [see figure 7 a) and b)]

The clamping angle of the various accessories shall be adjustable. It is adjusted on each tool once only as a function of the configuration of the front face of the spindle holder of the machine and the restrictions imposed by the automatic tool changer.

Dimensions in millimetres



a) Shank No. 40



b) Shank Nos. 45 and 50

Figure 7

Annex A
(informative)

Bibliography

[1] ISO 9270:1992, *7/24 tapers for tool shanks for automatic changing — Tapers for spindle noses.*