INTERNATIONAL STANDARD ISO 2905

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Modular units for machine tool construction — Spindle noses and adjustable adaptors for multi-spindle heads

Éléments standard pour la construction des machines-outils — Nez de broches et douilles de réglage pour têtes multibroches

First edition — 1974-12-01

UDC 621.9-112

Ref. No. ISO 2905-1974 (E)

Descriptors : machine tools, modular structures, spindles, adaptors, dimensions.

Price based on 6 pages

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.

International Standard ISO 2905 was drawn up by Technical Committee ISO/TC 39, *Machine tools*. It is a combination of drafts ISO/DIS 2905 and 2956, which were circulated to the Member Bodies in August 1972 and February 1973 respectively.

Draft ISO/DIS 2905 has been approved by the Member Bodies of the following countries :

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Italy
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Modular units for machine tool construction — Spindle noses and adjustable adaptors for multi-spindle heads

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies dimensions for spindle noses for use with adjustable adaptors and quick-change adaptors used in multi-spindle heads.

It specifies requirements for three types of adjustable adaptors for the receipt of taper shank drills, reamers and spot-facing cutters, used in multi-spindle heads.

2 REFERENCES

ISO 296, *Self-holding tapers for tool shanks.*

ISO 2901, *ISO metric trapezoidal screw threads — Basic profile and maximum material profiles.*[1)]

ISO 2903, *ISO metric trapezoidal screw threads — Tolerances.*[1)]

3 SPINDLE NOSES

3.1 Nominal sizes

The nominal size of the spindle nose shall be its nominal bore, which shall be identical with the nominal diameter of the adjustable adaptor with which it is to be used.

The range of nominal sizes is as follows :

8, 10, 12, 16, 20, 25, 28, 36 and 48 mm

3.2 Interchangeability

Spindle noses shall be capable of accepting adjustable adaptors manufactured in accordance with clause 4.

3.3 Dimensions

Dimensions shall comply with those given in table 1.

3.4 Locking screw

For reasons of safety, it is important that the locking screw when tightened does not protrude beyond the outside diameter of the spindle nose. Therefore, locking screws are to be reduced in length if necessary; this correction should be carried out when the position of the adjustable adaptor in the spindle nose corresponds with the maximum wear of the tool.

1) At present at the stage of draft.

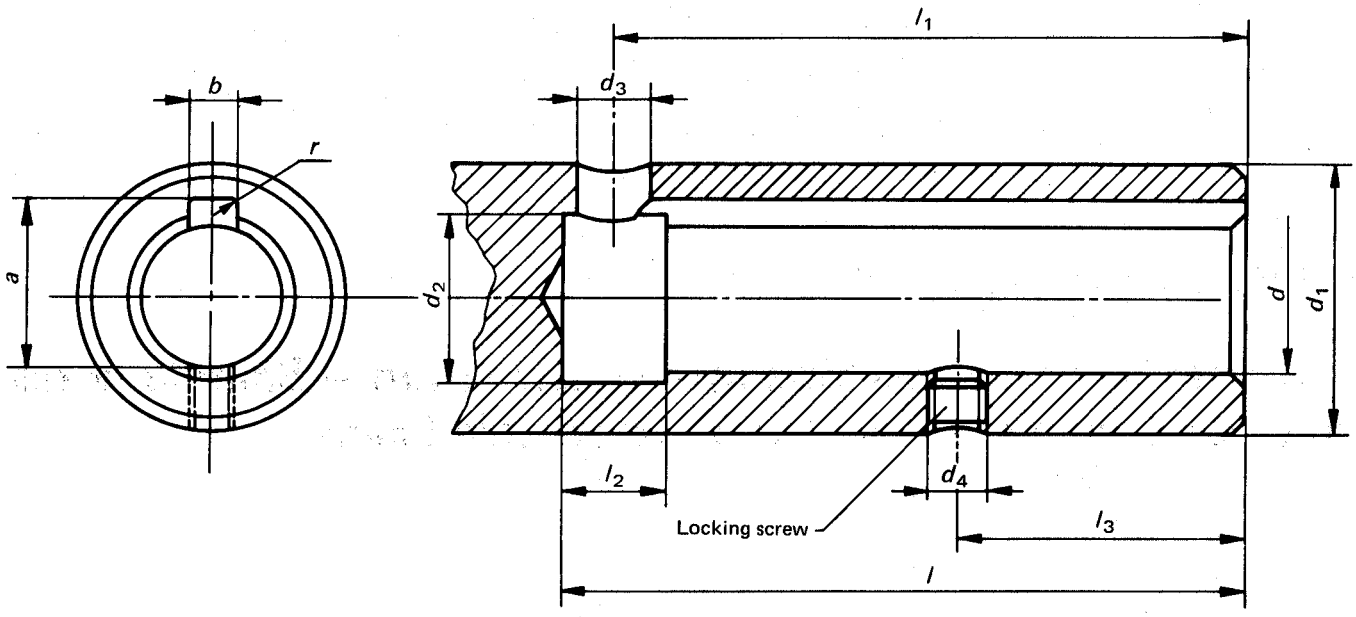


TABLE 1

Dimensions in millimetres

d H7	a $^{+0,3}_{0}$	b C11	d_1 [1]	d_2 [2]	d_3	d_4 6H	l min.	l_1	l_2	l_3 ± 0,1	r max.	Locking screw
8	9	2	15	8,6	3,5	M4	42	35	8	16	0,2	M4-5
10	11	3	18	10,6	5	M5	52	48	8	22	0,2	M5-5
12	13	3	20	12,6	5	M5	52	48	8	22	0,2	M5-5
16	17,3	5	25	16,4	6	M6	74	70	8	34	0,2	M6-6
20	21,3	5	32	20,4	6	M6	77	73	8	34	0,2	M6-6
25	26,7	6	37	25,4	8	M8	85	80	10	38	0,4	M8-6
28	29,7	6	40	28,4	8	M8	85	80	10	38	0,4	M8-8
36	37,7	8	50	36,6	10	M8	106	101	10	45	0,4	M8-8
48	50,1	10	67	48,6	12	M10	129	123	12	57	0,4	M10-10

1) For nominal diameters 8 to 12, diameter d_1 depends on the design requirements; the values are therefore given for information only.

For nominal diameters 16 to 48, the tolerance on d_1 is f7 only if quick-change adaptors are to be used.

2) These values are given for information only.

4 ADJUSTABLE ADAPTORS

4.1 Nominal sizes

The nominal size of an adaptor shall be its nominal outside diameter, which shall be identical with the nominal bore of the spindle nose with which it is to be used.

The range of nominal sizes is as follows :

8, 10, 12, 16, 20, 25, 28, 36 and 48 mm

4.2 Interchangeability

Adaptors shall be capable of fitting spindle noses manufactured in accordance with clause 3.

4.3 Dimensions

Dimensions shall comply with those given in tables 2 and 3.

4.4 Threads

Threads shall comply with ISO 2901 and ISO 2903, except, in the case of special material requirements for major diameter on which the tolerance shall be h6 and for the pitch of 1 mm provided for the nominal size of 8 mm.

4.5 Bore taper

The bore of the adaptor body shall be tapered in accordance with ISO 296.

4.6 Drift slot

The drift slot of the appropriate self-holding taper complying with ISO 296 shall be provided 90° from the Woodruff key.

4.7 Locking screw (for nominal diameters 16 to 48)

For reasons of safety, it is important that the locking screw when tightened does not protrude beyond the outside diameter of the knurled portion of the nut. Therefore, locking screws are to be reduced in length if necessary so that they do not protrude when the nut is locked.

4.8 Lead-in of the adjustable adaptors in the spindle noses

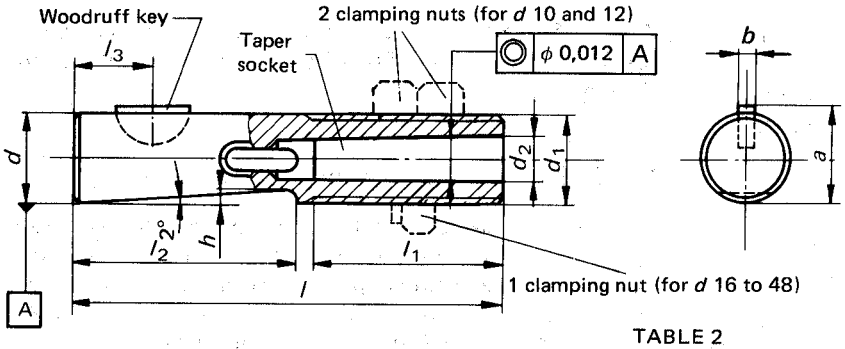
For the types A and B, a suitable form of lead-in shall be machined on the closed end of the adaptor body, to facilitate insertion into the spindle nose.

4.9 Marking

The body of the adaptor shall be marked with the type, nominal size, size of Morse taper and, for type B adaptors only, the extension length.

Examples : A 10/Metr. 6
B 20/1/50
C 28/3

Type A — Short



Type B — Long

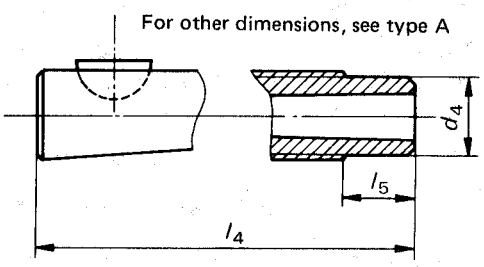


TABLE 2

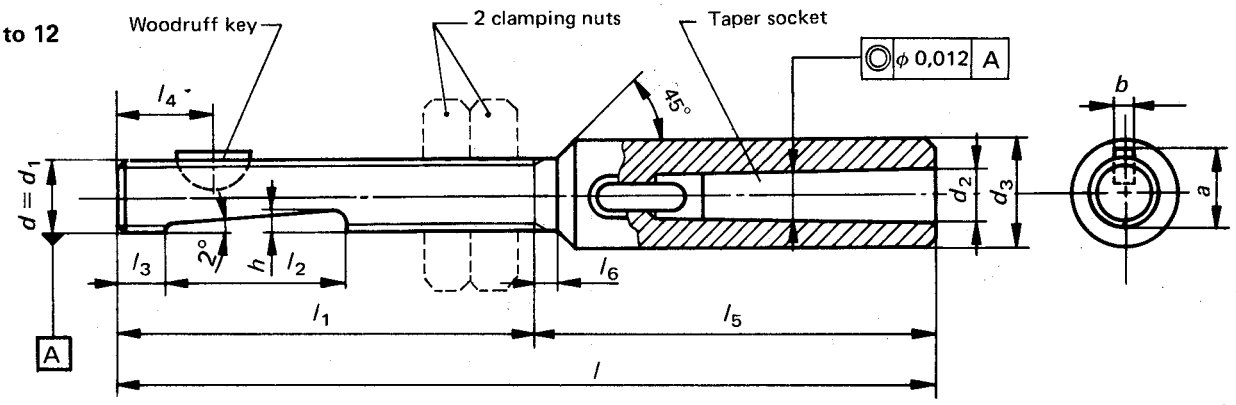
Dimensions in millimetres

d h6	d_1*	d_2 Taper	d_2 Basic ϕ	a	a Tol.	b P9/h9	h max.	l	l_1	l_2	l_3	d_4	l_4	l_5	Woodruff key	Range of adjustment
10	Tr 10 X 1,5	Metr. No. 6	6	10,9	0 −0,15	3	1	62	28	32	10	8	72	10	3 X 5	16
													82	20		
													92	30		
12	Tr 12 X 1,5	Metr. No. 6	6	12,9	0 −0,20	3	1	62	28	32	10	10	72	10	3 X 5	16
													82	20		
													92	30		
													102	40		
16	Tr 16 X 1,5	Morse No. 0 or 1	9,045 or 12,065	17,1	0 −0,25	5	1,3	85	40	43	11	14	110	25	5 X 6,5	28
													135	50		
													160	75		
													185	100		
20	Tr 20 X 2	Morse No. 1	12,065	21,1	0 −0,25	5	1,3	88	40	46	13	17	113	25	5 X 7,5	28
													138	50		
													163	75		
													188	100		
25	Tr 25 X 2	Morse No. 1 or 2	12,065 or 17,780	26,5	0 −0,25	6	1,5	95	42	51	15	22	120	25	6 X 9	30
													145	50		
													170	75		
													195	100		
28	Tr 28 X 2	Morse No. 1 or 2	12,065 or 17,780	29,5	0 −0,25	6	1,5	95	42	51	15	25	120	25	6 X 9	30
													145	50		
													170	75		
													195	100		
36	Tr 36 X 2	Morse No. 2 or 3	17,780 or 23,825	37,5	0 −0,35	8	1,7	118	50	65	20	33	148	30	8 X 11	36
													178	60		
													208	90		
													238	120		
48	Tr 48 X 2	Morse No. 3 or 4	23,825 or 31,267	49,9	0 −0,35	10	2,2	144	65	76	24	45	184	40	10 X 13	47
													224	80		
													264	120		
													304	160		

* Tolerance h6 on the major diameter.

Type C — Extra long

d 8 to 12



d 16 to 36

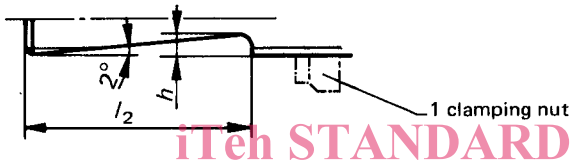
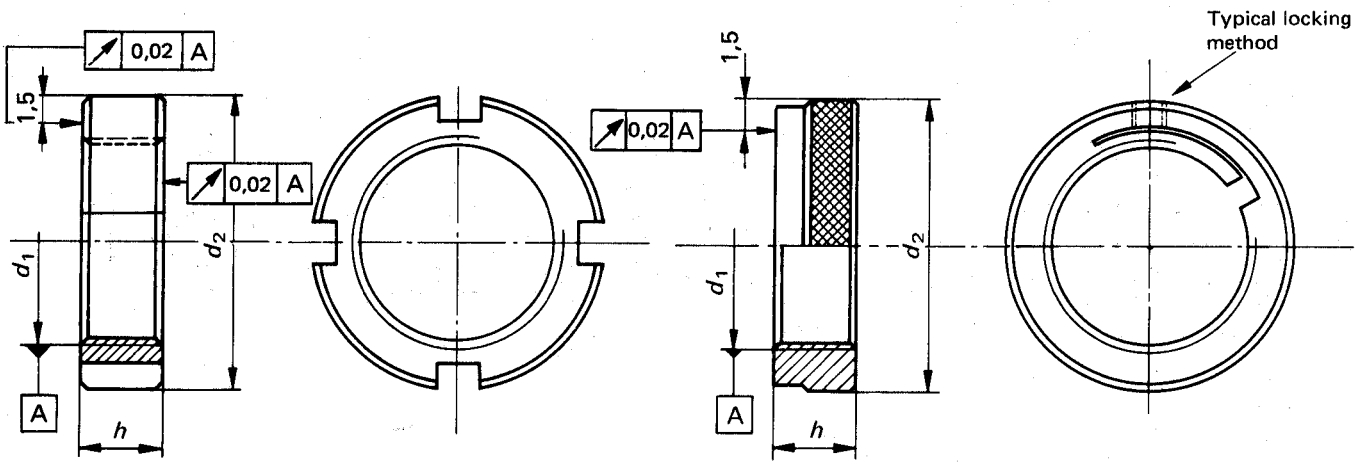


TABLE 3

Dimensions in millimetres

d h6	d_1	d_2 Taper	d_2 basic ϕ	d_3	*a*	*a* Tol.	*b* P9/h9	*h* max.	*l*	l_1	l_2	l_3	l_4	l_5	l_6	Woodruff key	Range of adjustment
8	Tr 8 X 1	Metr. No. 6	6	12	8,8	$^{0}_{-0,1}$	2	1,5	96	50	22	4	10	46	2	2 X 3,7	12
10	Tr 10 X 1,5	Morse No. 0	9,045	18	10,9	$^{0}_{-0,15}$	3	2	135	62	28	4	10	73	3	3 X 5	16
12	Tr 12 X 1,5	Morse No. 0	9,045	18	12,9	$^{0}_{-0,2}$	3	2	135	62	28	4	10	73	3	3 X 5	16
16	Tr 16 X 1,5	Morse No. 2	17,780	28	17,1	$^{0}_{-0,25}$	5	1,3	182	88	43	–	11	94	3	5 X 6,5	28
20	Tr 20 X 2	Morse No. 2	17,780	28	21,1	$^{0}_{-0,25}$	5	1,3	182	88	46	–	13	94	3	5 X 7,5	28
25	Tr 25 X 2	Morse No. 3	23,825	36	26,5	$^{0}_{-0,25}$	6	1,5	212	95	51	–	15	117	3	6 X 9	30
28	Tr 28 X 2	Morse No. 3	23,825	36	29,5	$^{0}_{-0,25}$	6	1,5	212	95	51	–	15	117	3	6 X 9	30
36	Tr 36 X 2	Morse No. 4	31,267	48	37,5	$^{0}_{-0,35}$	8	1,7	264	118	65	–	20	146	3	8 X 11	36

5 CLAMPING NUTS



Nominal sizes 8 to 12

Nominal sizes 8 to 12

TABLE 4

Dimensions in millimetres

Nominal size	d_1 Thread	d_2	h
8	Tr 8 X 1	$14{,}8\ ^{0}_{-0{,}2}$	5
10	Tr 10 X 1,5	$17{,}8\ ^{0}_{-0{,}2}$	6
12	Tr 12 X 1,5	$19{,}7\ ^{0}_{-0{,}2}$	6
16	Tr 16 X 1,5	24,6	12
20	Tr 20 X 2	31,6	12
25	Tr 25 X 2	36,6	12
28	Tr 28 X 2	39,6	12
36	Tr 36 X 2	49,6	14
48	Tr 48 X 2	66,6	18