INTERNATIONAL STANDARD

ISO 702-2

Second edition
2007-10-15

Machine tools — Connecting dimensions of spindle noses and work holding chucks —

Part 2: **Camlock type**

Machines-outils — Dimensions d'assemblage des nez de broches et des mandrins porte-pièces —

Partie 2: Type Camlock

Reference number
ISO 702-2:2007(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 702-2 was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 8, *Work holding spindles and chucks*.

This second edition cancels and replaces the first edition (ISO 702-2:1975), of which all the clauses, tables and figures have been technically revised.

ISO 702 consists of the following parts, under the general title *Machine tools — Connecting dimensions of spindle noses and work holding chucks*:

— *Part 1: Conical connection*

— *Part 2: Camlock type*

— *Part 3: Bayonet type*

— *Part 4: Cylindrical connection*

Machine tools — Connecting dimensions of spindle noses and work holding chucks —

Part 2:
Camlock type

1 Scope

This part of ISO 702 specifies the sizes for interchangeability of cylindrical spindle noses and corresponding connecting faces of face plates or work holding chucks.

NOTE The “conical connection”, “bayonet type” and “cylindrical connection” are dealt with in ISO 702-1, ISO 702-3 and ISO 702-4, respectively.

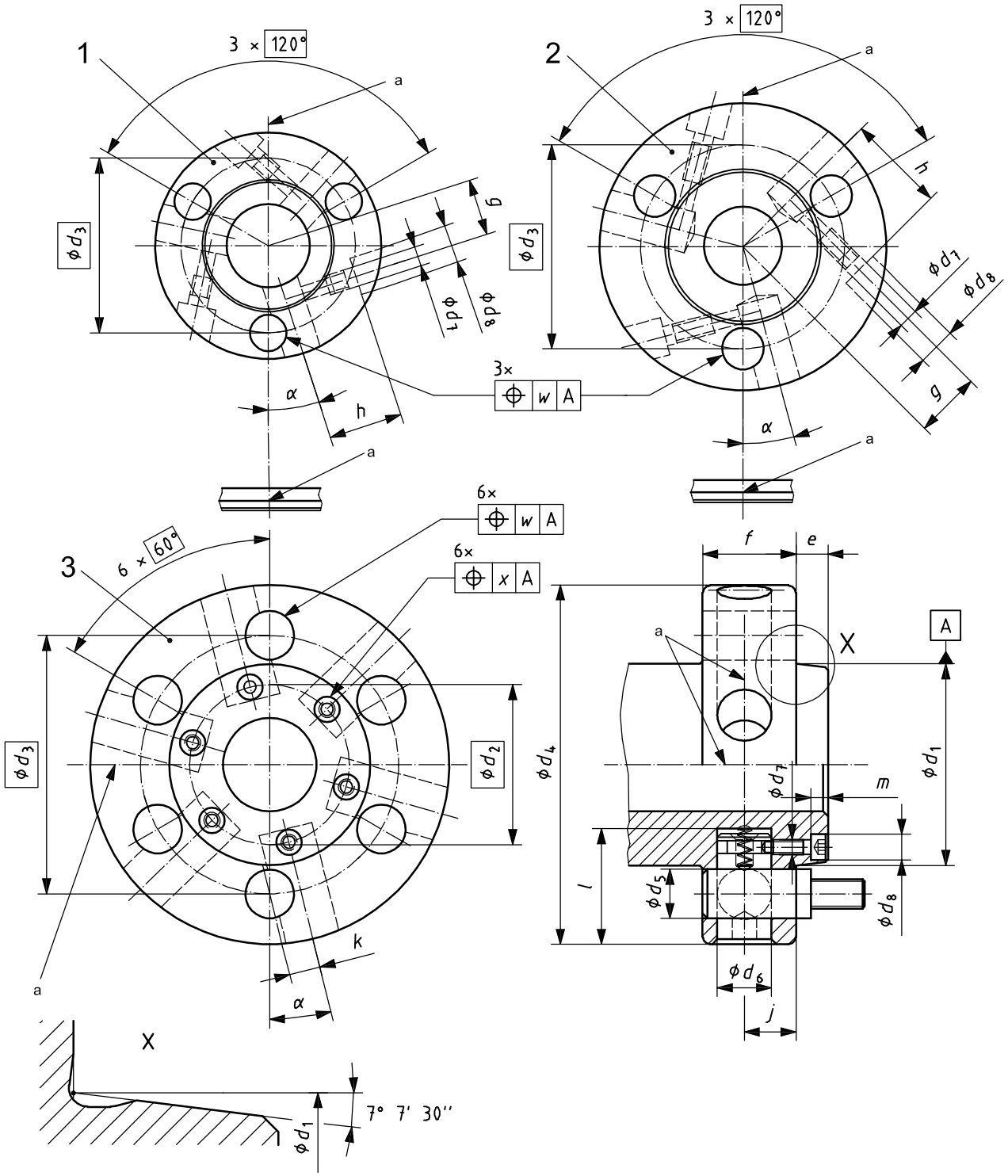
2 Interchangeability

In this part of ISO 702, all the dimensions and tolerances are expressed in millimetres.

Although internal mounting components and assembly screws are not respectively interchangeable, as they may conform with either the metric or inch series, there is complete interchangeability between metric spindle noses and face plates in inches and vice versa.

3 Sizes for interchangeability

3.1 Spindle noses



Key

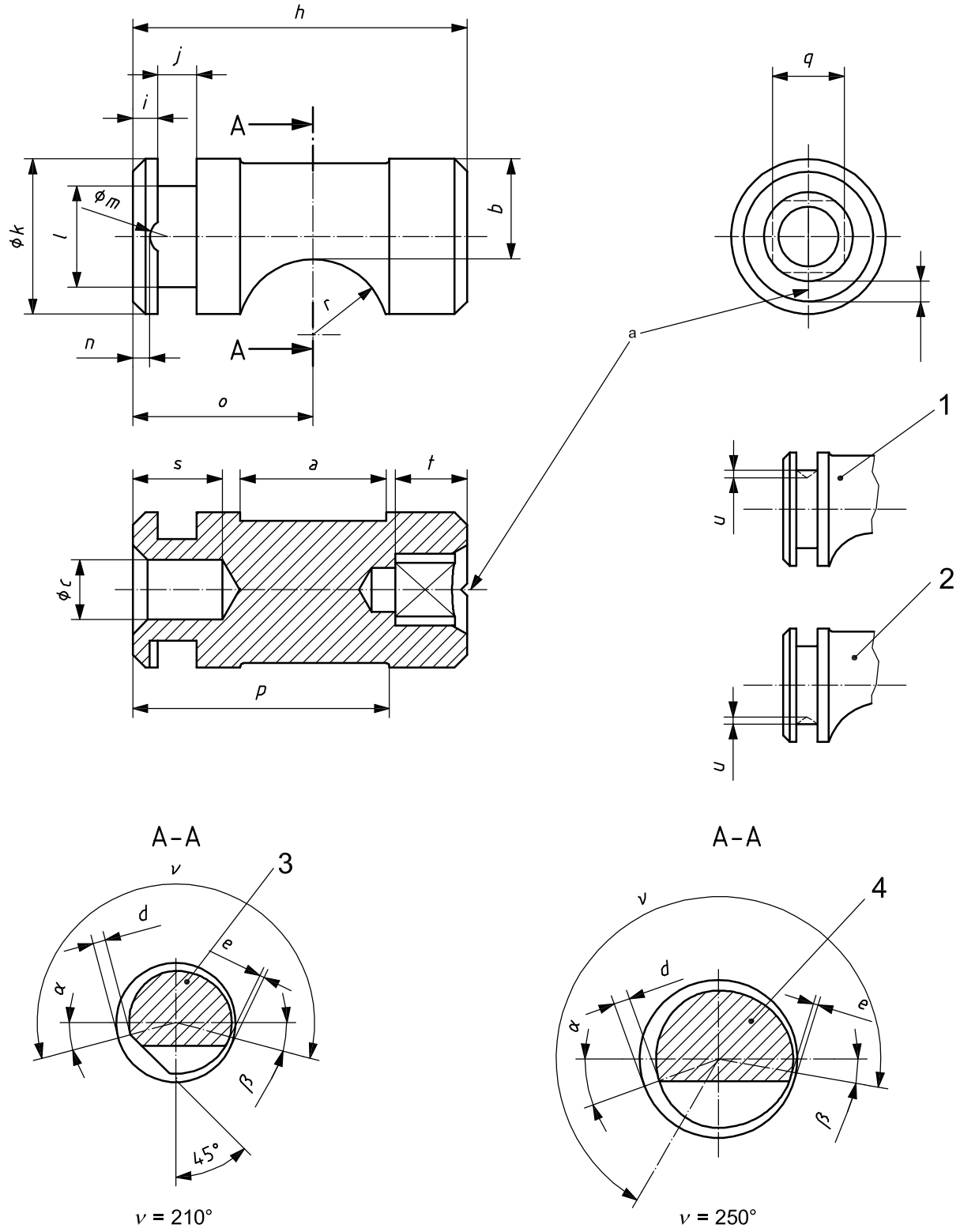
1 size No. 3
2 size No. 4
3 size Nos. 5 to 20
a Reference line.

Figure 1 — Spindle noses

Table 1 — Dimensions of spindle noses

Dimension		Size No.							
		3	**4**	**5**	**6**	**8**	**11**	**15**	**20**
d_1	nom.	53,975	63,513	82,563	106,375	139,719	196,869	285,775	412,775
	tol.	+0,008 0	+0,008 0	+0,010 0	+0,010 0	+0,012 0	+0,014 0	+0,01 0	+0,020 0
d_2				65	82	114	172	258	380
d_3		70,6	82,6	104,8	133,4	171,4	235,0	330,2	463,6
d_4		92	117	146	181	225	298	403	546
d_5	+0,05 0	15,1	16,7	19,8	23,0	26,2	31,0	35,7	42,1
d_6	H8	19	19	22	26	29	32	35	42
d_7		M8	M8	M6	M8	M8	M8	M10	M10
d_8		15,5	15,5	10,5	13,5	13,5	13,5	16,5	16,5
e		11	11	13	14	16	18	19	21
f	min.	32	34	38	45	50	60	70	82
g	± 0,05	22,6	27,0						
h	± 0,2	30	40						
j		17,5	17,5	20,6	23,8	27,0	31,8	36,5	42,9
k	± 0,1	11,1	11,1	13,5	15,9	18,25	21,45	24,6	28,6
l	+0,2 0	27,5	36	46	57	64	75	84	94
m				7	9	9	9	11	11
w		0,1	0,15	0,15	0,15	0,15	0,15	0,15	0,15
x		0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
α		18° 18,6'	15° 36'	14° 55'	13° 46'	12° 18'	10° 30'	8° 35'	7° 05'
NOTE General tolerance for untoleranced dimensions: ± 0,4 mm.									

3.2 Cams



Key

1 size No. 3

2 size No. 4

[a] Reference line.

Figure 2 — Cams

Table 2 — Dimensions of cams

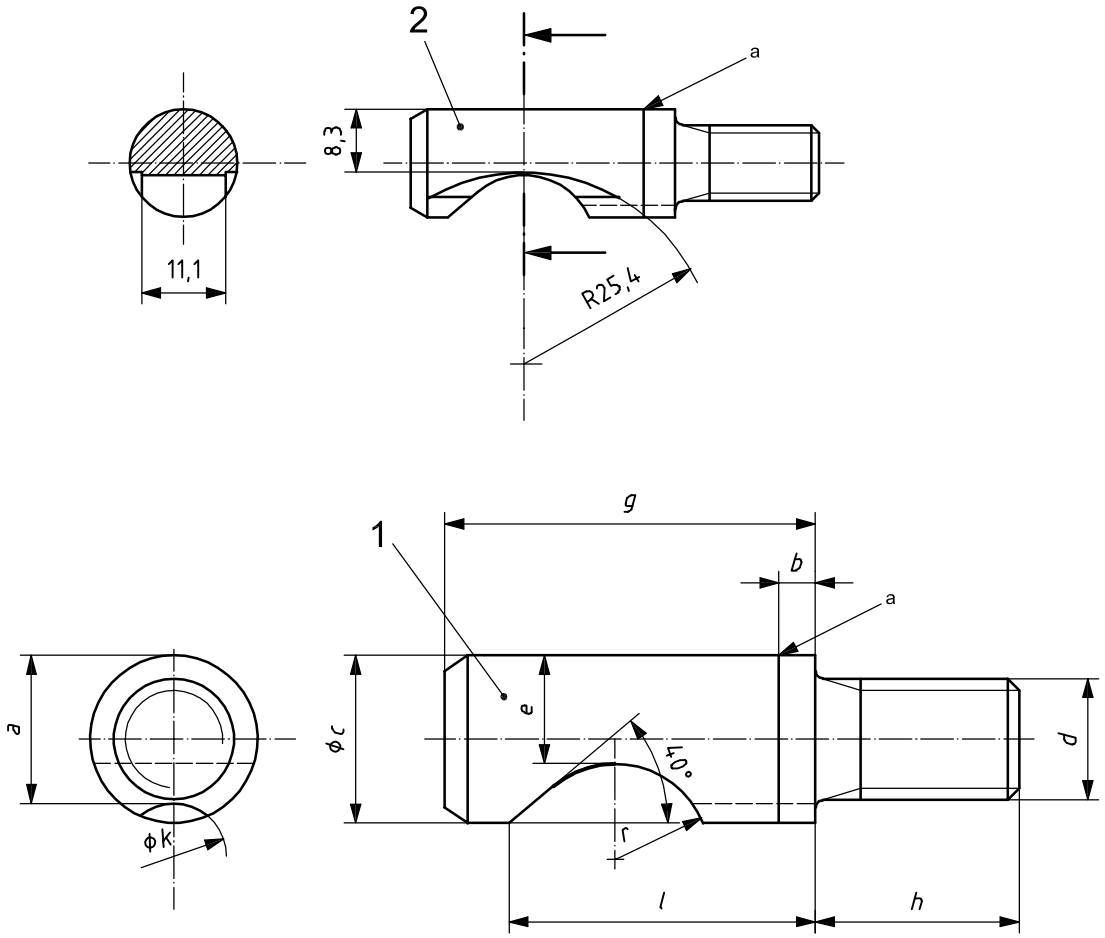
Dimension	Size No.							
	3	**4**	**5**	**6**	**8**	**11**	**15**	**20**
a min.	13	17	22	25	28	32	37	43
b $^{0}_{-0,2}$	13,4	11,9	14,2	16,7	18,9	21,2	23,5	27,8
c			7	10	10	10	10	10
d $^{+0,3}_{0}$	1,65	1,60	1,45	2,56	2,46	2,44	2,35	3,10
e $^{+0,1}_{0}$	0,15	0,15	0	0,45	0,36	0,28	0,20	0,50
h $^{0}_{-0,1}$	26,5	35	45	56	63	73	82	92
i ± 0,1	2,2	2,2	3,0	4,2	5,3	8,7	6,0	6,0
j	3,6 ± 0,05	3,6 ± 0,05	5,0 ± 0,1	6,5 ± 0,1	6,5 ± 0,1	6,5 ± 0,1	8,5 ± 0,1	8,5 ± 0,1
k e8	19	19	22	26	29	32	35	42
l	13 ± 0,2	13 ± 0,2	14	17	21	24	27	33
m ± 0,05			4,5	6	6	6	8	8
n ± 0,1			2,0	2,85	3,95	7,35	5,2	5,2
o ± 0,2	14,9	16,7	22,4	30,2	33,2	39,5	43,6	48,4
p	21,4	26,5	35,0	43,0	49,0	59,0	62,0	69,0
q D12	8	10	11	12	14	17	17	22
r	7,5	9,5	11,1	12,7	14,2	16,7	19,0	22,2
s			13	15	15	15	15	15
t	8	9	11	12	14	16	16	20
u	1,2	1,2						
Slope on v [a]	1,60	1,90	1,90	2,64	2,64	2,64	2,64	3,18
β	15°	10°	10°	10°	10°	15°	15°	15°
α	15°	15°	15°	20°	20°	20°	20°	20°

NOTE General tolerance for untoleranced dimensions: ± 0,4 mm.

[a] See tolerance on dimensions *d* and *e*.

3.3 Studs

Dimensions in millimetres



Key

1 size Nos. 4 to 20

2 size No. 3

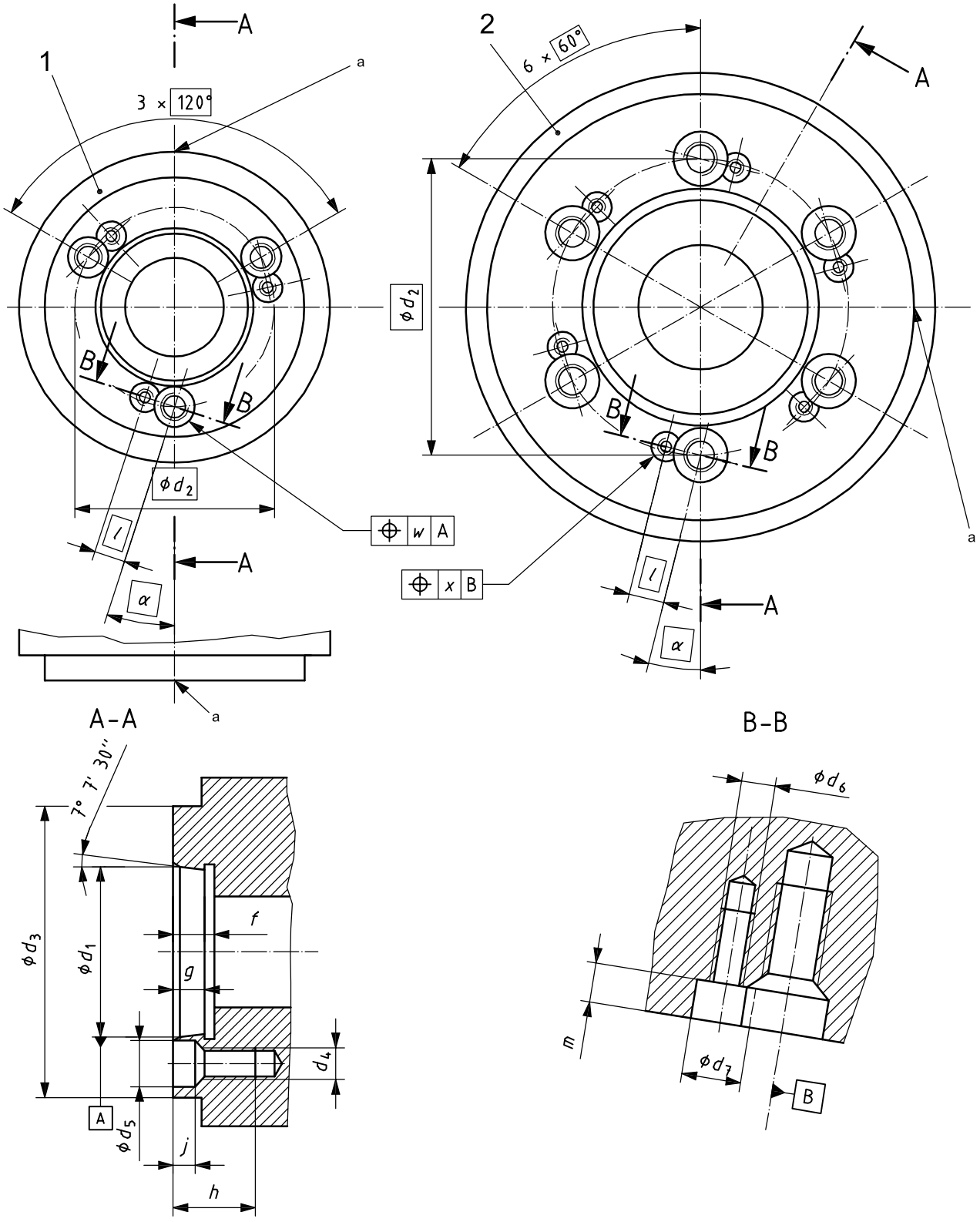
[a] Circular reference line for setting position of stud.

Figure 3 — Studs

Table 3 — Dimensions of studs

Dimension	Size No.							
	3	**4**	**5**	**6**	**8**	**11**	**15**	**20**
a ± 0,1	12,7	13,5	16,5	19,6	23,2	26,8	32,0	38,5
b ± 0,2	4,2	4,8	4,8	4,8	4,8	6,4	6,4	6,4
c $^{0}_{-0,1}$	14,3	15,9	19,0	22,2	25,4	30,2	34,9	41,3
d	M10 × 1	M10 × 1	M12 × 1	M16 × 1,5	M20 × 1,5	M22 × 1,5	M24 × 1,5	M27 × 2
e ± 0,1	8,7	9,5	11,9	14,3	16,7	20,6	24,6	28,6
g	35	37	43	49	55,5	67	76	89
h	19	19	22	27	30,5	35	40	44
k	11	11	11	14	14	14	14	14
l ± 0,2	30,0	31,0	35,7	40,5	44,5	53,2	58,7	69,0
r	9,5	9,5	11,25	12,7	14,3	15,9	17,5	20,6
NOTE General tolerance for untoleranced dimensions: ± 0,4 mm.								

3.4 Face plates



Key

1 size Nos. 3 and 4

2 size Nos. 5 to 20

a Reference line.

Figure 4 — Face plates

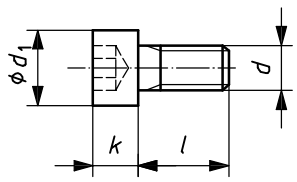
Table 4 — Dimensions of face plates

Dimension	Size No.							
	3	4	5	6	8	11	15	20
d_1	53,975	63,513	82,563	106,375	139,719	196,869	285,775	412,775
tol. Type 1 [a]	+0,003 −0,005	+0,003 −0,005	+0,004 −0,006	+0,004 −0,006	+0,004 −0,008	+0,004 −0,010	+0,004 −0,012	+0,005 −0,015
tol. Type 2 [a]	+0,008 0	+0,008 0	+0,010 0	+0,010 0	+0,012 0	+0,014 0	+0,016 0	+0,020 0
d_2	70,6	82,6	104,8	133,4	171,4	235,0	330,2	463,6
d_3	92	117	146	181	225	298	403	546
d_4	M10 × 1	M10 × 1	M12 × 1	M16 × 1,5	M20 × 1,5	M22 × 1,5	M24 × 1,5	M27 × 2
d_5	14,6	16,2	19,4	22,6	25,8	30,6	35,4	41,6
d_6	M6	M6	M6	M8	M8	M8	M8	M8
d_7	10,5	10,5	10,5	13,5	13,5	13,5	13,5	13,5
f min.	13	13	15	16	18	20	21	23
g	10	10	12	13	14	16	17	19
h	26	28	30	35	38	45	50	55
j	7	8	8	9,5	9,5	13	13	13
l	11,0	11,0	12,5	15,5	17,5	18,7	21,5	24,8
m	7	7	7	9	9	9	9	9
w	0,1	0,15	0,2	0,2	0,2	0,2	0,2	0,2
x	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
α	18° 18,6'	15° 36'	14° 55'	13° 46'	12° 18'	10° 30'	8° 35'	7° 05'
NOTE General tolerance for untoleranced dimensions: ± 0,4 mm.								
[a] The type identification shall be marked.								

3.5 Accessories for spindle noses and face plates

3.5.1 Hexagon-socket head screw for studs

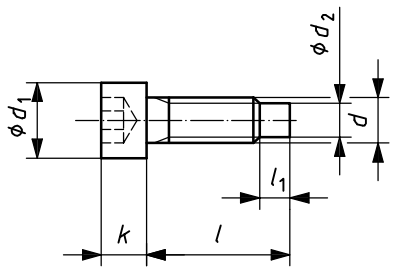
Table 5 — Dimension of hexagon-socket head screw for studs



Dimension	Size No.							
	3	4	5	6	8	11	15	20
d	M6	M6	M6	M8	M8	M8	M8	M8
d_1	10	10	10	13	13	13	13	13
k	6	6	6	8	8	8	8	8
l	12	12	12	14	14	14	14	14

3.5.2 Hexagon-socket head screw for cams

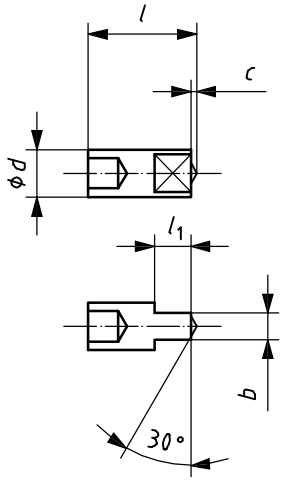
Table 6 — Dimension of hexagon-socket head screw for cams



Dimension	Size No.							
	3	4	5	6	8	11	15	20
d			M6	M8	M8	M8	M10	M10
d_1			10	13	13	13	16	16
d_2 max.			4,5	6	6	6	8	8
k			6	8	8	8	10	10
l			19	20	23	28	30	35
l_1			4	5	5	5	5	5

3.5.3 Stop-bolt for cams

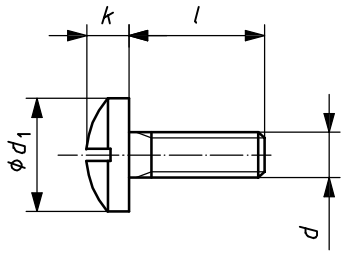
Table 7 — Dimension of stop-bolt for cams



Dimension	Size No.							
	3	4	5	6	8	11	15	20
b $^{0}_{-0,05}$	3,5	3,5						
c	0,8	0,8						
d	6,3	6,3						
l $^{0}_{-0,2}$	14,4	14,4						
l_1	4,8	4,8						

3.5.4 Cheese head screw for cams

Table 8 — Dimension of cheese head screw for cams



Dimension	Size No.							
	3	4	5	6	8	11	15	20
d	M8	M8						
d_1 max.	15	15						
k max.	5,6	5,6						
$l \times 0,2$	8	18						

Bibliography

[1] ISO 702-1, *Machine tools — Connecting dimensions of spindle noses and work holding chucks — Part 1: Conical connection*

[2] ISO 702-3, *Machine tools — Connecting dimensions of spindle noses and work holding chucks — Part 2: Bayonet type*

[3] ISO 702-4, *Machine tools — Connecting dimensions of spindle noses and work holding chucks — Part 4: Cylindrical connection*

ICS 25.060.20

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