

JIS

JAPANESE INDUSTRIAL STANDARD

Keys and their corresponding keyways

Ⓔ **JIS B 1301—1996**

Translated and Published

by

Japanese Standards Association

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JAPANESE INDUSTRIAL STANDARD

JIS B 1301: 1996

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April, 1999

ERRATA

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In Attached Table 4, when the Nominal dimension of key is 90×45 or 100×50, the numerical value of the Fastening type is changed as follows:

Error - 0.0124

Correct - 0.124

Remarks: This erratum is for correcting the first edition of this Standard.

Japanese Standards Association

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ERRATA

Page 10

Attached Table 4, in column 4 (Sliding type b_2 , Tolerance(D10))

In lines 1 and 2, replace $\begin{matrix} +0.060 \\ -0.020 \end{matrix}$ by $\begin{matrix} +0.060 \\ +0.020 \end{matrix}$.

Page 12

Attached Table 6, in column 3 (Normal type b_1 , Tolerance(N9))

In lines 1 and 2, replace $\begin{matrix} 0.004 \\ -0.029 \end{matrix}$ by $\begin{matrix} -0.004 \\ -0.029 \end{matrix}$.

Remarks: This errata is for correcting the first edition of this Standard.

Japanese Standards Association



JAPANESE INDUSTRIAL STANDARD

J I S

Keys and their corresponding keyways

B 1301-1996

1. **Scope** This Japanese Industrial Standard specifies the parallel keys, taper keys and Woodruff keys made of steel used for general machines (hereafter referred to as "keys" in generic term) and their corresponding keyways.

Remarks 1. The standards cited in this Standard are as follows:

JIS B 0651 Instruments for the measurement of surface roughness by the stylus method

JIS Z 2241 Method of tensile test for metallic materials

2. The International Standards corresponding to this Standard are as follows.

ISO/R 773:1969 Rectangular or square parallel keys and their corresponding keyways

ISO/R 774:1969 Taper keys with or without gib head and their corresponding keyways

ISO 3912:1977 Woodruff keys and keyways

2. Classification and symbol of keys

2.1 **Key** The key shall be classified into six classes as shown in Table 1 according to its shape.

Table 1. Classification and symbol of keys

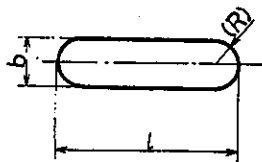
Shape		Symbol
Parallel key	Without hole for screw thread	P
	With hole for screw thread	PS
Taper key	Without gib head	T
	With gib head	TG
Woodruff key	Normal form	WA
	Whitney form	WB

2.2 **Key end** The end of parallel key shall be classified into three classes as shown in Fig. 1 according to its shape.

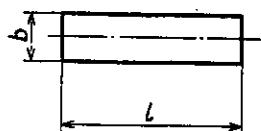
If not designated, key ends shall be of both ends rectangular or square.

Fig. 1. End of key

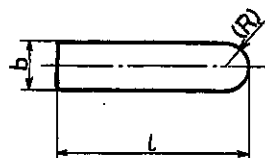
Both ends round
(symbol A)



Both ends rectangular
or square
(symbol B)



One end round
(symbol C)



Remarks: The end of round shape is allowed to be large chamfer in accordance with agreement between the interested parties.

3. Quality of key

3.1 Appearance The key shall be free from cracks and harmful flaws, burrs and rust in appearance.

3.2 Strength The tensile strength of key shall be 600 N/mm² or more when measured in accordance with 7.1.

4. Shape and dimension of key The shape and dimension of key shall be as follows:

(1) Parallel key See Attached Table 1.

For the shape of the end, see Fig. 1.

(2) Taper key See Attached Table 2.

(3) Woodruff key See Attached Table 3.

5. Relationship between key, and shaft and hub The keys are used for assembly of three types shown in Table 2 by selecting tolerances on the dimensions of keyways in shaft and hub.

Table 2. Assembly of shaft and hub by key

Type	Explanation	Applicable key
Sliding type	Assembly that shaft and hub can slide relatively in axial direction.	Parallel key
Normal type	Assembly that hub is put into the key fixed on shaft ⁽¹⁾ .	Parallel key and Woodruff key
Fastening type	Assembly that hub is fastened on the key fixed on shaft ⁽¹⁾ or assembly that key is driven in between the combined shaft and hub.	Parallel key, taper key and Woodruff key

Note (1) In selection, fit is required.

6. Shape and dimension of keyway The shape and dimension of keyway shall be as follows:

- (1) For parallel key The shape and dimension of keyway used for the parallel key shall be as shown in Attached Table 4.
- (2) For taper key The shape and dimension of keyway used for the taper key shall be as shown in Attached Table 5. $\frac{1}{100}$ slope should be given to the keyway in hub.
- (3) For Woodruff key The shape and dimension of keyway used for the Woodruff key shall be as shown in Attached Table 6.

7. Measuring method

7.1 Tensile strength The tensile strength of key shall be measured in accordance with JIS Z 2241.

7.2 Surface roughness The surface roughness of key shall be measured by using the measuring apparatus specified in JIS B 0651 or those equivalent or superior thereto in performance.

7.3 Dimension and geometric deviation

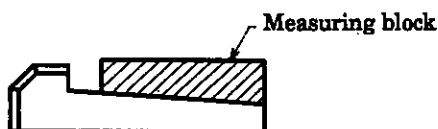
7.3.1 Parallel key The measuring method for dimension and geometric deviation of parallel key and keyway shall be as follows:

- (1) The measuring position of width (b) and height (h) of the key shall be optional one point for keys of 20 mm or shorter in length (l), optional two points for those exceeding 20 mm and not longer than 100 mm and optional three points for those longer than 100 mm.
- (2) The straightness of keys shall be obtained by measuring projection or dent at the middle between both ends in the directions of width and height for the keys of length (l) exceeding five times the width (b).
- (3) The measuring positions of width (b_1) and depth (t_1) of the keyway in shaft shall be the same as in (1), and they shall be the place near both ends for width (b_2) and depth (t_2) of the keyway in hub.

7.3.2 Taper key The methods shown below and in 7.3.1 apply to the measurement of the dimensions of taper key and keyway.

- (1) The measuring positions of the key height (h) shall be the larger end for the taper key without gib head and the place f apart from the head for the taper key with gib head.
- (2) The depth (t_2) of keyway in hub shall be measured at the larger end.
- (3) The gradient of key and keyway shall be obtained by measuring the height of the places near the both ends in such a manner as putting a measuring block of $\frac{1}{100}$ slope on the slope surface of the key or keyway (see Fig. 2).

Fig. 2. Measurement of gradient



7.3.3 Woodruff key 7.3.1 applies to the measuring method for the dimension of Woodruff key and keyway.

8. Inspection The key shall be inspected on quality, and shape and dimension, and the results shall conform to the specifications in 3. and 4.

9. Designation of products The key shall be designated by the Standard number, class (or its symbol) and nominal dimension $\times$ length (only nominal dimension in the case of Woodruff key). The classes of parallel key without hole for screw thread and taper key without gib head may be written as simple as "parallel key" and "taper key" respectively.

If it is necessary to indicate the shape of end of parallel key, the relevant shape (or their symbols putting a hyphen between them) shall be written following the class.

Example 1. JIS B 1301 parallel key without hole for screw thread
both ends round $25 \times 14 \times 90$, or
JIS B 1301 P-A $25 \times 14 \times 90$

Example 2. JIS B 1301 taper key with gib head $20 \times 12 \times 70$, or
JIS B 1301 TG $20 \times 12 \times 70$

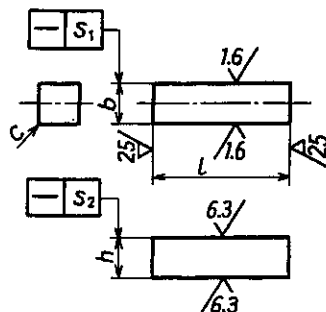
Example 3. JIS B 1301 Woodruff key of normal form 3×16 , or
JIS B 1301 WA 3×16

10. Marking The following information shall be marked on the package of the keys.

- (1) Class or symbol
- (2) Nominal dimension $\times$ length (only nominal dimension in the case of Woodruff key)
- (3) Shape of end or symbol (in the case of parallel key)
- (4) Symbol for material
- (5) Manufacturer's name or abbreviation

Attached Table 1. Shape and dimension of parallel key

Key body



$$s_1 = \text{Allowance of } b \times \frac{1}{2}$$

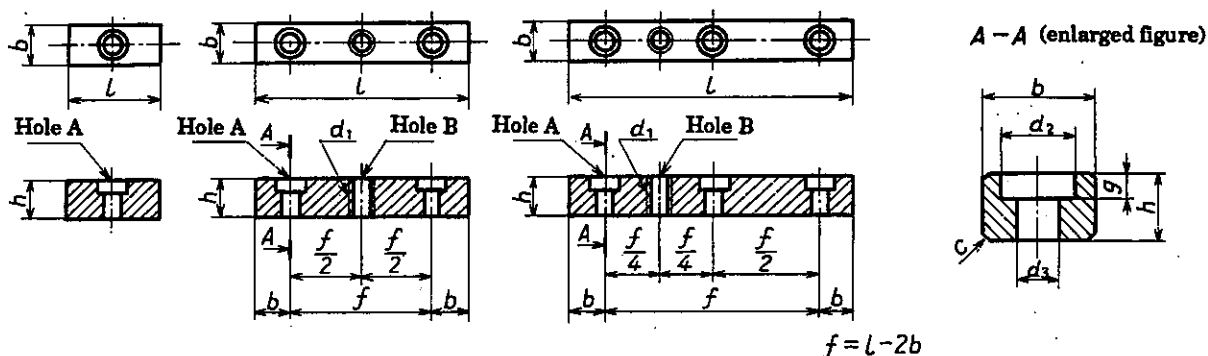
$$s_2 = \text{Allowance of } h \times \frac{1}{2}$$

Hole for screw thread (hole A : hole for screwing hole B : hole for unscrewing)

$l \leq 4b$

$4b < l \leq 8b$

$8b < l$



Unit: mm

Nominal dimension of key $b \times h$	Key body						Hole for screw thread			
	b		h				Nominal designation of screw thread d_1	d_2	d_3	g
	Basic dim.	Tolerance (h9)	Basic dim.	Tolerance						
2×2	2	0 -0.025	2	0 -0.025	h9	0.16 to 0.25	—	—	—	—
3×3	3		3				—	—	—	—
4×4	4	0 -0.030	4	0 -0.030			—	—	—	—
5×5	5		5		h11	0.25 to 0.40	—	—	—	—
6×6	6		6				—	—	—	—
(7×7)	7	0 -0.036	7	0 -0.036			—	—	—	—
8×7	8		7	0 -0.090	h11	0.40 to 0.60	M 3	6.0	3.4	2.3
10×8	10		8				M 3	6.0	3.4	2.3
12×8	12	0 -0.043	8				M 4	8.0	4.5	3.0
14×9	14		9				M 5	10.0	5.5	3.7
(15×10)	15		10				M 5	10.0	5.5	3.7
16×10	16		10				M 5	10.0	5.5	3.7
18×11	18		11	0 -0.110			M 6	11.5	6.6	4.3
20×12	20	0 -0.052	12			0.60 to 0.80	M 6	11.5	6.6	4.3
22×14	22		14				M 6	11.5	6.6	4.3
(24×16)	24		16				M 8	15.0	9.0	5.7
25×14	25		14				M 8	15.0	9.0	5.7
28×16	28		16				M 10	17.5	11.0	10.8
32×18	32	0 -0.062	18				M 10	17.5	11.0	10.8
(35×22)	35		22	0 -0.130		1.00 to 1.20	M 10	17.5	11.0	10.8

Attached Table 1. (continued)

Unit: mm

Nominal dimension of key $b \times h$	Key body						Hole for screw thread					
	b		h				Nominal designation of screw thread d_1	d_2	d_3	g		
	Basic dim.	Tolerance (h9)	Basic dim.	Tolerance								
36×20 (38×24) 40×22 (42×26) 45×25 50×28 56×32 63×32 70×36 80×40 90×45 100×50	36 38 40 42 45 50 56 63 70 80 90 100	0 -0.062	20 24 22 26 25 28	0 -0.130 h11	1.00 to 1.20	— — — — — —	M12 M10 M12 M10 M12 M12	20.0 17.5 20.0 17.5 20.0 20.0	14.0 11.0 14.0 11.0 14.0 14.0	13.0 10.8 13.0 10.8 13.0 13.0		
		0 -0.074	32 32 36 40	0 -0.160	1.60 to 2.00	— — —	M12 M12 M16	20.0 20.0 26.0	14.0 14.0 18.0	13.0 13.0 17.5		
						2.50 to 3.00	— — —	M16 M20 M20	26.0 32.0 32.0	18.0 22.0 22.0	17.5 21.5 21.5	

Notes (1) l should be selected from among the following within a limit shown in the Table.

The tolerance on the dimension l shall be h12.

6, 8, 10, 12, 14, 16, 18, 20, 22, 25, 28, 32, 36, 40, 45, 50, 56, 63, 70, 80, 90, 100, 110, 125, 140, 160, 180, 200, 220, 250, 280, 320, 360, 400

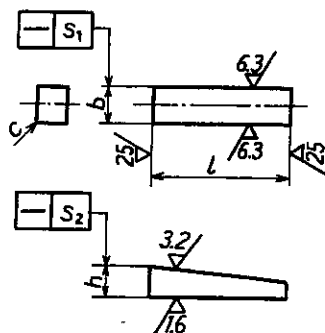
(2) The roundness (r) may be allowed instead of 45° chamfer (c).

Remarks: Those of parenthesized nominal dimensions which are not specified in the International Standards shall not be used in new design.

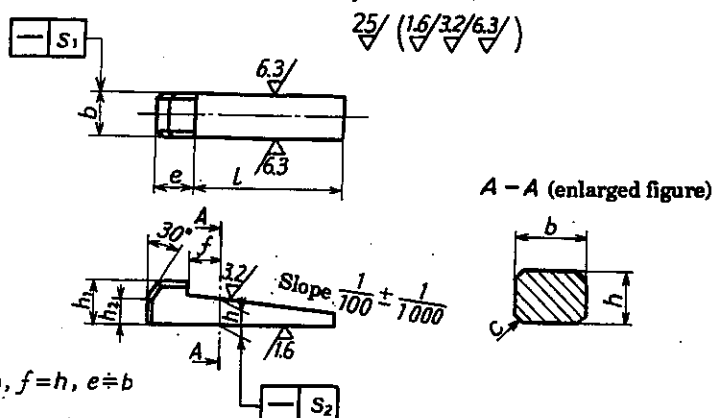
Informative reference: If the key of smaller allowance than the tolerance of key shown in Attached Table 1 is required, the tolerance on the width b of key shall be h7. In this case, the tolerance on the height h shall be h7 for the nominal dimension of key 7 × 7 or smaller and h11 for the nominal dimension of key 8 × 7 or larger.

Attached Table 2. Shape and dimension of taper key

Taper key without gib head
(Symbol T)



Taper key with gib head
(Symbol TG)



$$s_1 = \text{Allowance of } b \times \frac{1}{2}$$

$$h_2 = h, f = h, e \neq b$$

$$s_2 = \text{Allowance of } h \times \frac{1}{2}$$

Unit: mm

Nominal dimension of key $b \times h$	Key body						
	b		h		h_1	$c^{(2)}$	$l^{(1)}$
	Basic dim.	Tolerance (h9)	Basic dim.	Tolerance			
2 × 2	2	0 -0.025	2	0 -0.025	h9	0.16 to 0.25	6 to 30
3 × 3	3		3				6 to 36
4 × 4	4	0 -0.030	4	0 -0.030			8 to 45
5 × 5	5		5		8	0.25 to 0.40	10 to 56
6 × 6	6		6		10		14 to 70
(7 × 7)	7	0 -0.036	7.2	0 -0.036	10		16 to 80
8 × 7	8		7	0 -0.090	h11		18 to 90
10 × 8	10		8		12	0.40 to 0.60	22 to 110
12 × 8	12	0 -0.043	8		12		28 to 140
14 × 9	14		9		14		36 to 160
(15 × 10)	15		10.2	0 -0.070	h10		40 to 180
16 × 10	16		10	0 -0.090	h11		45 to 180
18 × 11	18		11	0 -0.110			50 to 200
20 × 12	20	0 -0.052	12		20	0.60 to 0.80	56 to 220
22 × 14	22		14		22		63 to 250
(24 × 16)	24		16.2	0 -0.070	h10		70 to 280
25 × 14	25		14	0 -0.110	h11		70 to 280
28 × 16	28		16		25		80 to 320
32 × 18	32	0 -0.062	18		28		90 to 360
(35 × 22)	35		22.3	0 -0.084	h10	1.00 to 1.20	100 to 400

Attached Table 2. (continued)

Unit: mm

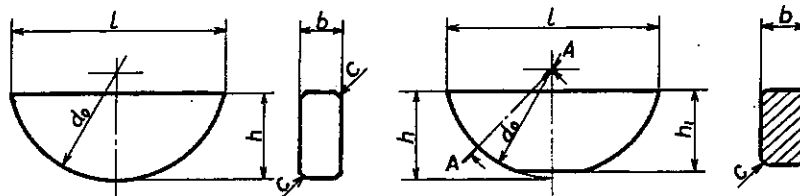
Nominal dimension of key $b \times h$	Key body							
	b		h			h_1	$c^{(2)}$	$l^{(1)}$
	Basic dim.	Tolerance (h9)	Basic dim.	Tolerance				
36×20	36	0 -0.062	20	0 -0.130	h11	32	1.00 to 1.20	—
(38×24)	38		24.3	0 -0.084	h10	36		—
40×22	40		22	0 -0.130	h11	36		—
(42×26)	42		26.3	0 -0.084	h10	40		—
45×25	45		25	0 -0.130	h11	40		—
50×28	50		28			45		—
56×32	56	0 -0.074	32	0 -0.160		50	1.60 to 2.00	—
63×32	63		32			50		—
70×36	70		36			56		—
80×40	80		40			63	2.50 to 3.00	—
90×45	90	0 -0.087	45	70	—			
100×50	100		50	80	—			

Remarks: Those of parenthesized nominal dimensions which are not specified in the International Standards shall not be used in new design.

Attached Table 3. Shape and dimension of Woodruff key

Normal form
(Symbol WA)Whitney form
(Symbol WB)

A-A



Remarks: The surface roughness shall be $1.6 \mu mRa$ on the both sides and $6.3 \mu mRa$ on the other parts.

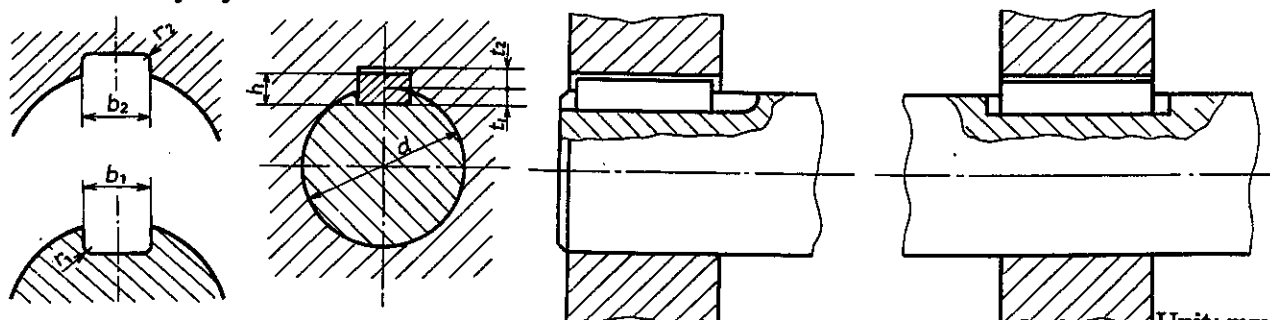
Unit: mm

Nominal dimension of key $b \times d_0$	Dimension of key								$c^{(2)}$	Informative reference l (Calculated value)
	b		d_0		h		h_1			
	Basic dim.	Tolerance (h9)	Basic dim.	Tolerance	Basic dim.	Tolerance (h11)	Basic dim.	Tolerance		
1×4	1	$\begin{smallmatrix} 0 \\ -0.025 \end{smallmatrix}$	4	$\begin{smallmatrix} 0 \\ -0.120 \end{smallmatrix}$	1.4	$\begin{smallmatrix} 0 \\ -0.060 \end{smallmatrix}$	1.1	± 0.1	0.16 to 0.25	—
1.5×7	1.5		7	$\begin{smallmatrix} 0 \\ -0.150 \end{smallmatrix}$	2.6		2.1			—
2×7	2		7		2.6		2.1			—
2×10			10		3.7	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	3.0			—
2.5×10	2.5		10		3.7		3.0			9.6
(3×10)	3		10	$\begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$	3.7		3.55			9.6
3×13			13	$\begin{smallmatrix} 0 \\ -0.180 \end{smallmatrix}$	5.0		4.0	± 0.2		12.6
3×16			16		6.5	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	5.2			15.7
(4×13)	4	$\begin{smallmatrix} 0 \\ -0.030 \end{smallmatrix}$	13	$\begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$	5.0	$\begin{smallmatrix} 0 \\ -0.075 \end{smallmatrix}$	4.75			12.6
4×16			16	$\begin{smallmatrix} 0 \\ -0.180 \end{smallmatrix}$	6.5	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	5.2		0.25 to 0.40	15.7
4×19			19	$\begin{smallmatrix} 0 \\ -0.210 \end{smallmatrix}$	7.5		6.0			18.5
5×16	5		16	$\begin{smallmatrix} 0 \\ -0.180 \end{smallmatrix}$	6.5		5.2			15.7
5×19			19	$\begin{smallmatrix} 0 \\ -0.210 \end{smallmatrix}$	7.5		6.0			18.5
5×22			22		9.0		7.2			21.6
6×22	6		22		9.0		7.2			21.6
6×25			25		10.0		8.0			24.4
(6×28)			28	$\begin{smallmatrix} 0 \\ -0.2 \end{smallmatrix}$	11.0	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	10.6			27.3
(6×32)			32		13.0		12.5			31.4
(7×22)	7	$\begin{smallmatrix} 0 \\ -0.036 \end{smallmatrix}$	22	$\begin{smallmatrix} 0 \\ -0.1 \end{smallmatrix}$	9.0	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	8.5			21.6
(7×25)			25	$\begin{smallmatrix} 0 \\ -0.2 \end{smallmatrix}$	10.0		9.5			24.4
(7×28)			28		11.0	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	10.6			27.3
(7×32)			32		13.0		12.5			31.4
(7×38)			38		15.0		14.0			37.1
(7×45)			45		16.0		15.0			43.0
(8×25)	8		25		10.0	$\begin{smallmatrix} 0 \\ -0.090 \end{smallmatrix}$	9.5		24.4	
8×28			28	$\begin{smallmatrix} 0 \\ -0.210 \end{smallmatrix}$	11.0	$\begin{smallmatrix} 0 \\ -0.110 \end{smallmatrix}$	8.8		0.40 to 0.60	27.3
(8×32)			32	$\begin{smallmatrix} 0 \\ -0.2 \end{smallmatrix}$	13.0		12.5			0.25 to 0.40
(8×38)			38		15.0		14.0		37.1	
10×32	10		32	$\begin{smallmatrix} 0 \\ -0.250 \end{smallmatrix}$	13.0		10.4		0.40 to 0.60	31.4
(10×45)			45	$\begin{smallmatrix} 0 \\ -0.2 \end{smallmatrix}$	16.0		15.0			43.0
(10×55)			55		17.0		16.0		± 0.3	50.8
(10×65)			65		19.0	$\begin{smallmatrix} 0 \\ -0.130 \end{smallmatrix}$	18.0			59.0
(12×65)	12	$\begin{smallmatrix} 0 \\ -0.043 \end{smallmatrix}$	65		19.0		18.0			59.0
(12×80)			80		24.0		22.4			73.3

Remarks: Those of parenthesized nominal dimensions which are not specified in the International Standards shall not be used in new design.

Attached Table 4. Shape and dimension of keyway for parallel key

Section of keyway



Unit: mm

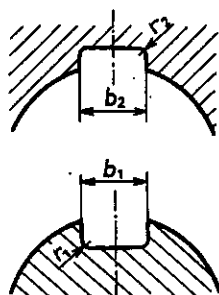
Nominal dimension of key $b \times h$	Basic dim. of b_1 and b_2	Sliding type		Normal type		Fastening type	r_1 and r_2	Basic dim. of t_1	Basic dim. of t_2	Tolerances on t_1 and t_2	Informative reference Applicable shaft diameter ⁽³⁾ d
		b_1 Tolerance (H9)	b_2 Tolerance (D10)	b_1 Tolerance (N9)	b_2 Tolerance (Js9)	b_1 and b_2 Tolerance (P9)					
2×2	2	+0.025	+0.060	-0.004	±0.012 5	-0.006	0.08 to 0.16	1.2	1.0	+0.1 0	6 to 8
3×3	3	0	-0.020	-0.029		-0.031		1.8	1.4		8 to 10
4×4	4	+0.030	+0.078	0	±0.015 0	-0.012	0.16 to 0.25	2.5	1.8	+0.2 0	10 to 12
5×5	5	0	+0.030	-0.030		-0.042		3.0	2.3		12 to 17
6×6	6							3.5	2.8		17 to 22
(7×7)	7	+0.036	+0.098	0	±0.018 0	-0.015		4.0	3.3		20 to 25
8×7	8	0	+0.040	-0.036		-0.051	0.25 to 0.40	4.0	3.3	+0.3 0	22 to 30
10×8	10							5.0	3.3		30 to 38
12×8	12	+0.043	+0.120	0	±0.021 5	-0.018		5.0	3.3		38 to 44
14×9	14	0	+0.050	-0.043		-0.061		5.5	3.8		44 to 50
(15×10)	15						0.40 to 0.60	5.0	5.3	+0.3 0	50 to 55
16×10	16							6.0	4.3		50 to 58
18×11	18							7.0	4.4		58 to 65
20×12	20	+0.052	+0.149	0	±0.026 0	-0.022		7.5	4.9		65 to 75
22×14	22	0	+0.065	-0.052		-0.074	0.70 to 1.00	9.0	5.4	+0.3 0	75 to 85
(24×16)	24							8.0	8.4		80 to 90
25×14	25							9.0	5.4		85 to 95
28×16	28							10.0	6.4		95 to 110
32×18	32	+0.062	+0.180	0	±0.031 0	-0.026	1.20 to 1.60	11.0	7.4	+0.3 0	110 to 130
(35×22)	35	0	+0.080	-0.062		-0.088		11.0	11.4		125 to 140
36×20	36							12.0	8.4		130 to 150
(38×24)	38							12.0	12.4		140 to 160
40×22	40						2.00 to 2.50	13.0	9.4	+0.3 0	150 to 170
(42×26)	42							13.0	13.4		160 to 180
45×25	45							15.0	10.4		170 to 200
50×28	50							17.0	11.4		200 to 230
56×32	56	+0.074	+0.220	0	±0.037 0	-0.032	2.00 to 2.50	20.0	12.4	+0.3 0	230 to 260
63×32	63	0	+0.100	-0.074		-0.106		20.0	12.4		260 to 290
70×36	70							22.0	14.4		290 to 330
80×40	80							25.0	15.4		330 to 380
90×45	90	+0.087	+0.260	0	±0.043 5	-0.037	2.00 to 2.50	28.0	17.4	+0.3 0	380 to 440
100×50	100	0	+0.120	-0.087		-0.0124		31.0	19.5		440 to 500

Notes (3) The applicable shaft diameter which is obtained from the torque corresponding to the strength of key is shown as a standard for general use. If the size of key is adequate for the torque to be transmitted, a larger shaft than the applicable shaft diameter may be used. In this case, t_1 and t_2 should be recalculated so that the side of key touches uniformly the shaft and hub. It should not be used for a thinner shaft than the applicable shaft diameter.

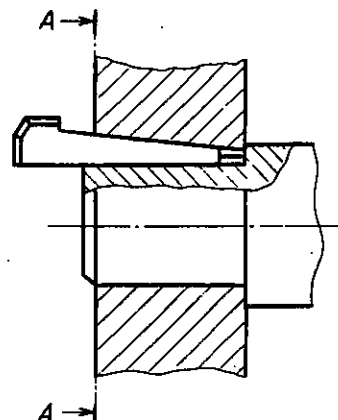
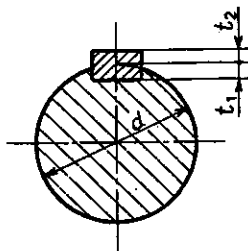
Remarks: Those of parenthesized nominal dimensions which are not specified in the International Standards shall not be used in new design.

Attached Table 5. Shape and dimension of keyway for taper key

Section of keyway



A-A

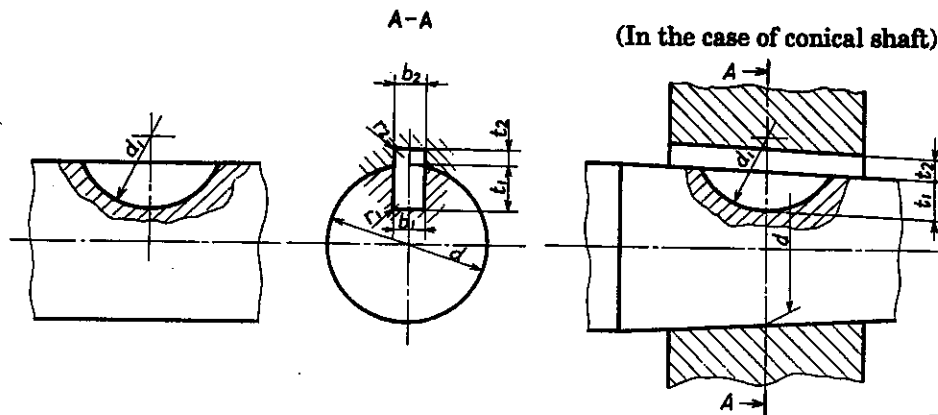


Unit: mm

Nominal dimension of key $b \times h$	b_1 and b_2		r_1 and r_2	Basic dim. of t_1	Basic dim. of t_2	Tolerances on t_1 and t_2	Informative reference Applicable shaft diameter d (3)
	Basic dim.	Tolerance (D10)					
2×2	2	+0.060 +0.020	0.08 to 0.16	1.2	0.5	+0.05 0	6 to 8
3×3	3			1.8	0.9		8 to 10
4×4	4	+0.078 +0.030	0.16 to 0.25	2.5	1.2	+0.1 0	10 to 12
5×5	5			3.0	1.7		12 to 17
6×6	6			3.5	2.2		17 to 22
(7×7)	7	+0.098 +0.040		4.0	3.0		20 to 25
8×7	8		0.25 to 0.40	4.0	2.4	+0.2 0	22 to 30
10×8	10			5.0	2.4		30 to 38
12×8	12	+0.120 +0.050		5.0	2.4		38 to 44
14×9	14			5.5	2.9		44 to 50
(15×10)	15		0.40 to 0.60	5.0	5.0	+0.1 0	50 to 55
16×10	16			6.0	3.4	+0.2 0	50 to 58
18×11	18			7.0	3.4		58 to 65
20×12	20	+0.149 +0.065		7.5	3.9		65 to 75
22×14	22		0.70 to 1.00	9.0	4.4	+0.1 0	75 to 85
(24×16)	24			8.0	8.0		80 to 90
25×14	25			9.0	4.4	+0.2 0	85 to 95
28×16	28			10.0	5.4		95 to 110
32×18	32	+0.180 +0.080	1.20 to 1.60	11.0	6.4		110 to 130
(35×22)	35			11.0	11.0	+0.15 0	125 to 140
36×20	36			12.0	7.1	+0.3 0	130 to 150
(38×24)	38			12.0	12.0	+0.15 0	140 to 160
40×22	40		2.00 to 2.50	13.0	8.1	+0.3 0	150 to 170
(42×26)	42			13.0	13.0	+0.15 0	160 to 180
45×25	45			15.0	9.1	+0.3 0	170 to 200
50×28	50			17.0	10.1		200 to 230
56×32	56	+0.220 +0.100	2.00 to 2.50	20.0	11.1		230 to 260
63×32	63			20.0	11.1		260 to 290
70×36	70			22.0	13.1		290 to 330
80×40	80			25.0	14.1		330 to 380
90×45	90	+0.260 +0.120	2.00 to 2.50	28.0	16.1		380 to 440
100×50	100			31.0	18.1		440 to 500

Remarks: Those of parenthesized nominal dimensions which are not specified in the International Standards shall not be used in new design.

Attached Table 6. Shape and dimension of keyway for Woodruff key



Unit: mm

Nominal dimension of key $b \times d_0$	Basic dim. of b_1 and b_2	Normal type		Fastening type b_1 and b_2 Tolerance (P9)	t_1		t_2		r_1 and r_2	d_1	
		b_1 Tolerance (N9)	b_2 Tolerance (Js9)		Basic dim.	Tolerance	Basic dim.	Tolerance		Basic dim.	Tolerance
1×4	1	0.004 -0.029	±0.012	-0.006 -0.031	1.0	+0.1 0	0.6	+0.1 0	0.08 to 0.16	4	+0.1 0
1.5×7	1.5				2.0		0.8			7	
2×7	2				1.8		1.0			7	
2×10					2.9					10	+0.2 0
2.5×10	2.5				2.7		1.2			10	
(3×10)	3				2.5		1.4			10	
3×13					3.8	+0.2 0				13	
3×16					5.3					16	
(4×13)	4				3.5	+0.1 0	1.7			13	
4×16		0 -0.030	±0.015	-0.012 -0.042	5.0	+0.2 0	1.8		0.16 to 0.25	16	
4×19					6.0					19	+0.3 0
5×16	5				4.5		2.3			16	+0.2 0
5×19					5.5					19	+0.3 0
5×22					7.0	+0.3 0				22	
6×22	6				6.5		2.8			22	
6×25					7.5			+0.2 0		25	
(6×28)					8.6	+0.1 0	2.6	+0.1 0		28	
(6×32)					10.6					32	
(7×22)	7	0 -0.036	±0.018	-0.015 -0.051	6.4		2.8		0.25 to 0.40	22	
(7×25)					7.4					25	
(7×28)					8.4					28	
(7×32)					10.4					32	
(7×38)					12.4					38	
(7×45)					13.4					45	
(8×25)	8				7.2		3.0			25	
8×28					8.0	+0.3 0	3.3	+0.2 0		28	
(8×32)					10.2	+0.1 0	3.0	+0.1 0		32	
(8×38)					12.2					38	
10×32	10	0 -0.043	±0.022	-0.018 -0.061	10.0	+0.3 0	3.3	+0.2 0	0.25 to 0.40	32	
(10×45)					12.8	+0.1 0	3.4	+0.1 0		45	
(10×55)					13.8					55	
(10×65)					15.8					65	+0.5 0
(12×65)	12				15.2		4.0			65	
(12×80)					20.2					80	

- Remarks 1. Those of parenthesized nominal dimensions which are not specified in the International Standards shall not be used in new design.
2. For the applicable shaft diameter, see Informative reference Table 1.

Informative reference Table 1. Shaft diameter applicable to Woodruff key

Unit: mm

Nominal dimension of key	Series 1	Series 2	Series 3	Shearing cross-section area (mm ²)
1 × 4	3 to 4	3 to 4	—	—
1.5 × 7	4 to 5	4 to 6	—	—
2 × 7	5 to 6	6 to 8	—	—
2 × 10	6 to 7	8 to 10	—	—
2.5 × 10	7 to 8	10 to 12	7 to 12	21
(3 × 10)	—	—	8 to 14	26
3 × 13	8 to 10	12 to 15	9 to 16	35
3 × 16	10 to 12	15 to 18	11 to 18	45
(4 × 13)	—	—	11 to 18	46
4 × 16	12 to 14	18 to 20	12 to 20	57
4 × 19	14 to 16	20 to 22	14 to 22	70
5 × 16	16 to 18	22 to 25	14 to 22	72
5 × 19	18 to 20	25 to 28	15 to 24	86
5 × 22	20 to 22	28 to 32	17 to 26	102
6 × 22	22 to 25	32 to 36	19 to 28	121
6 × 25	25 to 28	36 to 40	20 to 30	141
(6 × 28)	—	—	22 to 32	155
(6 × 32)	—	—	24 to 34	180
(7 × 22)	—	—	20 to 29	139
(7 × 25)	—	—	22 to 32	159
(7 × 28)	—	—	24 to 34	179
(7 × 32)	—	—	26 to 37	209
(7 × 38)	—	—	29 to 41	249
(7 × 45)	—	—	31 to 45	288
(8 × 25)	—	—	24 to 34	181
8 × 28	28 to 32	40 to —	26 to 37	203
(8 × 32)	—	—	28 to 40	239
(8 × 38)	—	—	30 to 44	283
10 × 32	32 to 38	—	31 to 46	295
(10 × 45)	—	—	38 to 54	406
(10 × 55)	—	—	42 to 60	477
(10 × 65)	—	—	46 to 65	558
(12 × 65)	—	—	50 to 73	660
(12 × 80)	—	—	58 to 82	834

- Remarks
- Those of parenthesized nominal dimensions which are not specified in the International Standards shall not be used in new design.
 - The series 1 and 2 are the shaft diameters given in the corresponding International Standards, and are as follows:

Series 1: Adequate for the assembly where the torque is transmitted by key.

Series 2: Adequate for the case where the positioning is made by key and the torque is not transmitted by it, e.g., where the shaft and the hub are in a fit of "interference fit".
 - Series 3 corresponds to the shearing strength at the shearing cross-section area shown in the Table. This shearing cross-section area is the calculated value of the part to be sheared at the time when the key is sinking completely in the keyway.

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