

*Indian Standard*

(Reaffirmed 1999)

SPECIFICATION FOR  
PARALLEL KEYS AND KEYWAYS*( Second Revision )*

**1. Scope** — Covers the dimensions and tolerances for parallel keys and keyways.

**2. Types** — The keys shall be of the following types:

Type A — Keys with both ends round.

Type B — Keys with both ends square.

Type C — Keys with both ends round with hole for one retaining screw ( for sizes  $8 \times 7$  and upwards and for key lengths above the stepped line in Table 4 ).

Type D — Keys with both ends square with hole for one retaining screw ( for sizes  $8 \times 7$  and upwards and for key lengths above the stepped line in Table 4 ).

Type E — a) Keys with both ends round with holes for two retaining screws ( for sizes  $8 \times 7$  and  $10 \times 8$  and for key lengths below the stepped line in Table 4 ),

b) Additionally provided with tapped hole for one or two jacking screws for sizes  $12 \times 8$  and upwards.

Type F — a) Keys with both ends square with holes for two retaining screws ( for sizes  $8 \times 7$  and  $10 \times 8$  and for key lengths below the stepped line in Table 4 ).

b) Additionally provided with tapped hole for one or two jacking screws for sizes  $12 \times 8$  and upwards.

Type G — Keys with both ends square with chamfer and hole for one retaining screw.

Type H — Keys with both ends square with chamfer and holes for two retaining screws.

Type J — Keys with both ends square with chamfer and hole for one spring dowel sleeve.

**Note** — Types A, C and E are meant for machine tools application also.

**3. Dimensions**

**3.1 Keys** — Dimensions for keys are given in Table 1 read with Fig. 1.

**3.1.1** Retaining screws, jacking screws and spring dowel sleeves for keys are given in Table 2.

**3.2 Keyways** — Dimensions for keyways are given in Table 3.

**3.3 Preferred length and weight of keys** — Preferred length and weight of keys is given in Table 4.

**4. Designation** — A parallel key of Type A, width 12 mm, height 8 mm and length 50 mm shall be designated as:

Parallel Key A  $12 \times 8 \times 50$

**4.1** If keys of Types E and F from  $12 \times 8$  size upwards are required to be supplied without holes for jacking screws ( oS ), this shall be stated when ordering. In this case the designation for a key of Type E, width 12 mm, height 8 mm and length 50 mm shall be as follows:

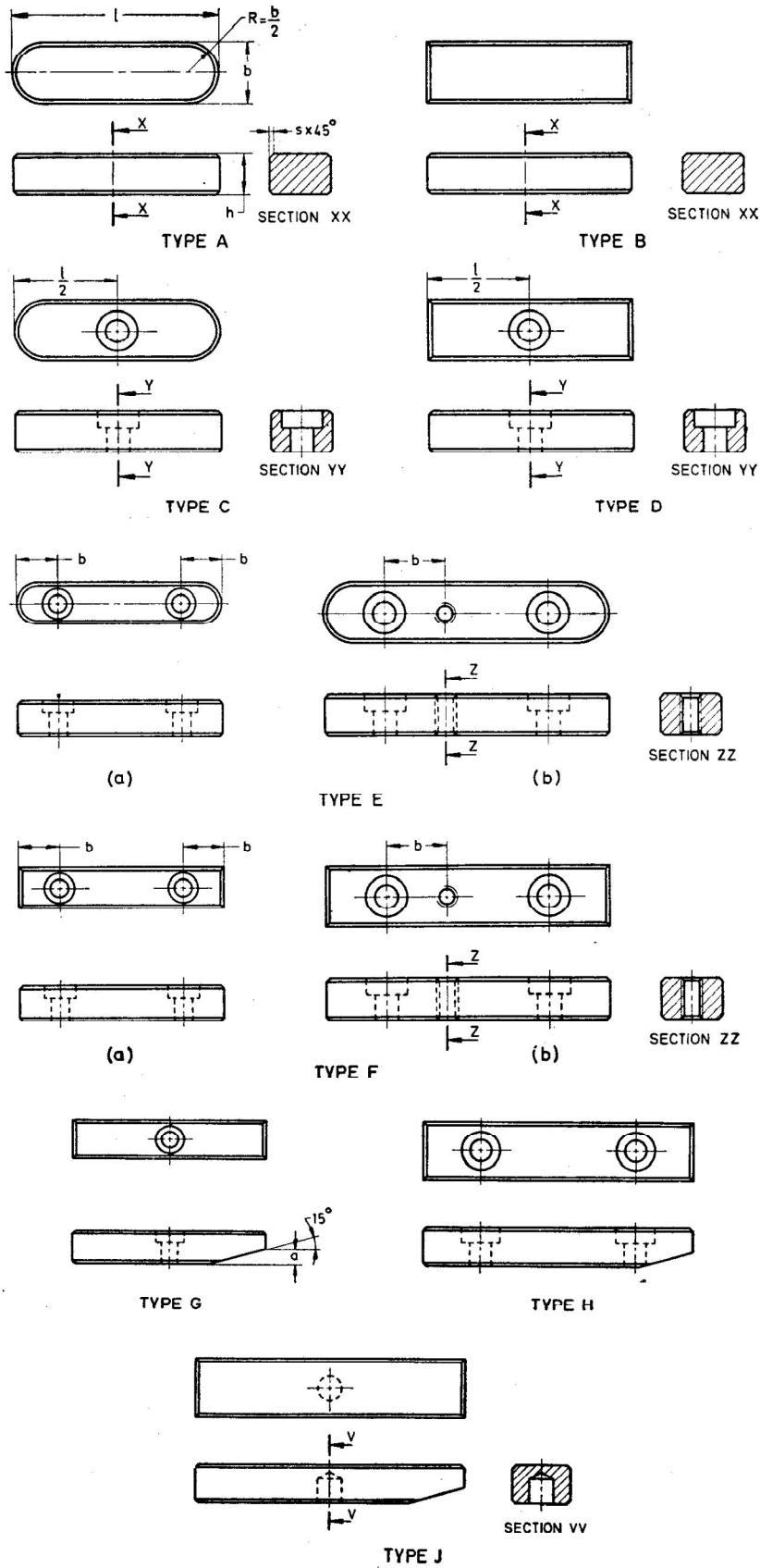
Parallel Key EoS  $12 \times 8 \times 50$

Adopted 17 January 1983

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Note — Types A, C and E are meant for machine tools application also.

FIG. 1 DIMENSIONS AND TYPES OF KEYS ( see Table 1 )

TABLE 1 DIMENSIONS FOR KEYS

( Clause 3.1 and Fig. 1 )

All dimensions in millimetres.

b	Tol on b h9	h	Tol on h*	a	s		Range of Key Length l		Range of Key Length ( for Machine Tools Only )			
					Min	Max	Min	Max	Min	Max		
2	0 -0.025	2	0 -0.025	—	0.16	0.25	6	20	—	—		
3		3		—	0.16	0.25	6	36	—	—		
4	0 -0.030	4	0 -0.030	—	0.16	0.25	8	45	10	45		
5		5		—	0.25	0.40	10	56	12	56		
6		6		—	0.25	0.40	14	70	16	70		
8	0 -0.036	7	0 -0.090	3	0.25	0.40	18	90	20	90		
10		8		3	0.40	0.60	22	110	25	110		
12	0 -0.043	8		3	0.40	0.60	28	140	32	140		
14		9		3.5	0.40	0.60	36	160	40	160		
16		10		4	0.40	0.60	45	180	45	180		
18		11		4.5	0.40	0.60	50	200	50	200		
20		12		5	0.60	0.80	56	220	56	220		
22		0 -0.052		14	0 -0.110	5.5	0.60	0.80	63	250	63	250
25	14			5.5		0.60	0.80	70	280	70	250	
28	16			6.5		0.60	0.80	80	320	80	250	
32	18		7	0.60		0.80	90	360	90	250		
36	0 -0.062	20	0 -0.130	8		1.00	1.20	100	400	100	250	
40		22		9		1.00	1.20	110	400	110	250	
45		25		10		1.00	1.20	125	400	—	—	
50		28		11		1.00	1.20	140	400	—	—	
56	0 -0.074	32		0 -0.160		13	1.60	2.00	160	400	—	—
63		32				13	1.60	2.00	180	400	—	—
70		36			14	1.60	2.00	200	400	—	—	
80		40			16	2.50	3.00	220	400	—	—	
90	0 -0.087	45	18		2.50	3.00	250	400	—	—		
100		50	20		2.50	3.00	280	400	—	—		

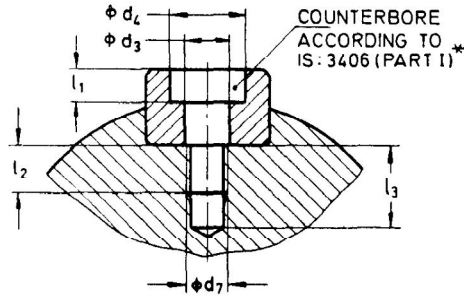
Note — Keys with b = 4 to 40 are meant for machine tools application also.

\*Tol on h : Square Section h9;  
Rectangular Section h11.

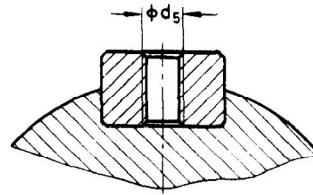
**TABLE 2 DIMENSIONS FOR RETAINING SCREWS, JACKING SCREWS, AND SPRING DOWEL SLEEVES FOR KEYS**

( Clause 3.1.1 )

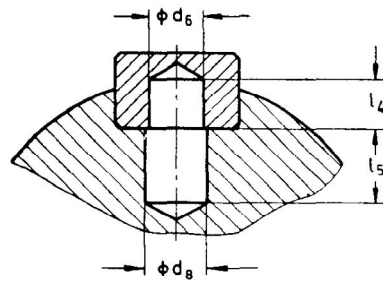
All dimensions in millimetres.



HOLE FOR RETAINING SCREW



HOLE FOR JACKING SCREW



HOLE FOR SPRING DOWEL SLEEVE

Key <i>b</i> × <i>h</i>	Holes for Retaining Screws, Jacking Screws and Spring Dowel Sleeves											Retaining Screw†	Spring Dowel Sleeve‡
	Key						Shaft						
	<i>d</i> <sub>3</sub>	<i>d</i> <sub>4</sub>	<i>d</i> <sub>5</sub>	<i>d</i> <sub>6</sub>	<i>l</i> <sub>1</sub>	<i>l</i> <sub>2</sub>	<i>d</i> <sub>7</sub>	<i>d</i> <sub>8</sub>	<i>l</i> <sub>2</sub>	<i>l</i> <sub>3</sub>	<i>l</i> <sub>5</sub>		
2 × 2	—	—	—	—	—	—	—	—	—	—	—	—	—
3 × 3	—	—	—	—	—	—	—	—	—	—	—	—	—
4 × 4	—	—	—	—	—	—	—	—	—	—	—	—	—
5 × 5	—	—	—	—	—	—	—	—	—	—	—	—	—
6 × 6	—	—	—	—	—	—	—	—	—	—	—	—	—
8 × 7	3.4	6	M3	4	2.4	4	M3	4.5	4	7	5	M3 × 8	4 × 8
10 × 8	3.4	6	M3	4	2.4	4	M3	4.5	5	8	5	M3 × 10	4 × 8
12 × 8	4.5	8	M4	5	3.2	5	M4	5.5	6	10	7	M4 × 10	5 × 10
14 × 9	5.5	10	M5	6	4.1	6	M5	6.5	6	10	8	M5 × 10	6 × 12
16 × 10	5.5	10	M5	6	4.1	6	M5	6.5	6	10	8	M5 × 10	6 × 12
18 × 11	6.6	11	M6	8	4.8	7	M6	9	6	11	11	M6 × 12	8 × 16
20 × 12	6.6	11	M6	8	4.8	8	M6	9	6	11	10	M6 × 12	8 × 16
22 × 14	6.6	11	M6	8	4.8	8	M6	9	8	13	10	M6 × 16	8 × 16
25 × 14	9.0	14	M8	10	6.0	10	M8	11	9	15	12	M8 × 16	10 × 20
28 × 16	11	18	M10	12	7.3	10	M10	13	9	16	18	M10 × 16	12 × 24
32 × 18	11	18	M10	12	7.3	12	M10	13	10	17	16	M10 × 20	12 × 24
36 × 20	14	20	M12	16	8.3	14	M12	17	12	20	20	M12 × 25	16 × 30
40 × 22	14	20	M12	16	8.3	16	M12	17	12	20	18	M12 × 25	16 × 30
45 × 25	14	20	M12	16	8.3	16	M12	17	15	22	18	M12 × 30	16 × 30
50 × 28	14	20	M12	16	8.3	16	M12	17	12	19	18	M12 × 30	16 × 32
56 × 32	14	20	M12	16	8.3	16	M12	17	13	20	18	M12 × 35	16 × 32
63 × 32	14	20	M12	16	8.3	16	M12	17	13	20	18	M12 × 35	16 × 32
70 × 36	18	26	M16	20	11.5	20	M16	21	17	24	24	M16 × 40	20 × 40
80 × 40	18	26	M16	20	11.5	20	M16	21	18	25	24	M16 × 45	20 × 40
90 × 45	22	33	M20	25	13.5	25	M20	26	20	28	30	M20 × 50	25 × 40
100 × 50	22	33	M20	25	13.5	25	M20	26	20	28	30	M20 × 55	25 × 50

**Note** — Retaining screw and jacking screws are meant for machine tool applications also.

\*Dimensions for countersinks and counterbores.

†Retaining screw: cheese head screw conforming to IS : 1366-1982 'Specification for slotted cheese head screws (second revision)' or hexagon socket head cap screw conforming to IS : 2269-1981 'Specification for hexagon socket head cap screws (second revision)'.

‡Dowel sleeve conforming to IS : 5988-1970 'Specification for spring dowel sleeves (light and heavy patterns) for use in foundries'.



TABLE 4 PREFERRED LENGTH AND WEIGHT OF KEYS  
( Clause 3.3 )

Preferred Length (l) mm	Key (b x h), mm																										
	2x2	3x3	4x4	5x5	6x6	8x7	10x8	12x8	14x9	16x10	18x11	20x12	22x14	25x14	28x16	32x18	36x20	40x22	45x25	50x28	56x32	63x32	70x36	80x40	90x45	100x50	
*Weight for Keys Type B, kg/1000 Pieces ( Approx )																											
6	0.199	0.422																									
8	0.251	0.565	1.01																								
10	0.314	0.707	1.26	1.95																							
12	0.377	0.848	1.51	2.35																							
14	0.440	0.989	1.76	2.75	3.94																						
16	0.502	1.13	2.01	3.14	4.52																						
18	0.565	1.27	2.26	3.53	5.09	7.93																					
20	0.628	1.41	2.51	3.92	5.65	8.80																					
22		1.55	2.76	4.32	6.22	9.67	13.8																				
25		1.77	3.14	4.91	7.07	11.0	15.7																				
28		1.98	3.52	5.50	7.91	12.3	17.6	21.1																			
32		2.26	4.02	6.28	9.04	14.1	20.1	24.1																			
36		2.54	4.52	7.08	10.2	15.8	22.6	27.1	35.6																		
40			5.09	7.95	11.3	17.6	25.1	30.1	39.6																		
45			5.65	8.83	12.7	19.8	28.3	33.9	44.5	56.5																	
50			6.28	9.81	14.1	22.0	31.4	37.7	49.5	62.8	77.7																
56			11.0	15.8	24.6	35.2	42.2	55.4	70.3	87.0	106																
63			17.6	21.1	39.9	47.3	62.3	79.1	97.9	119	152																
70			19.8	30.8	44.0	52.8	69.2	88.0	109	132	169	192															
80			35.2	50.2	60.3	79.1	100	124	151	193	220	281															
90			39.6	56.5	67.8	89.0	113	140	170	218	247	317	407														
100			62.8	75.4	98.9	124	155	188	242	275	352	452	565														
110			69.1	82.9	109	138	171	207	266	302	387	497	622	760													
125					94.2	124	157	194	235	302	343	440	565	706	863	1100											
140						106	138	176	218	264	328	385	492	633	791	967	1240	1540									
160							158	201	249	301	387	440	563	723	904	1110	1410	1760	2080								
180								226	280	339	435	495	633	814	1020	1240	1590	1980	2340	2750							
200								311	377	464	550	703	904	1130	1380	1770	2200	2600	3080	3800							
220									414	512	604	774	995	1240	1520	1940	2420	2860	3370	4180	5120						
250										604	687	880	1130	1410	1730	2210	2750	3250	3830	4750	5780	7000					
280											769	985	1270	1580	1930	2470	3080	3640	4290	5320	6500	7830	9300	11000	13000		
320												1130	1440	1810	2210	2820	3510	4170	4900	6090	7430	8820	10400	12200			
360													1630	2040	2480	3180	3950	4690	5510	6850	8300	9900	11700	13700			
400														2260	2760	3530	4400	5200	6120	7600	9200	11000	13000	15200			
Weight deduction for Type A	0.015	0.045	0.108	0.211	0.364	0.755	1.35	1.94	2.97	4.31	6.00	8.09	11.4	14.7	21.1	31.1	43.7	59.3	85.3	118	169	214	298	433	615	844	

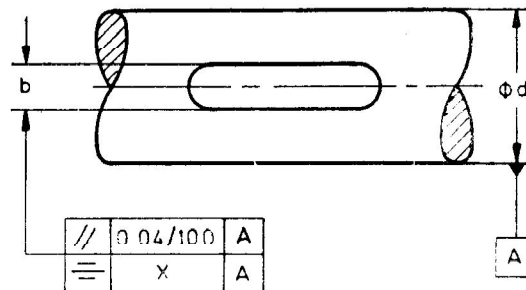
Note — For machine tools application for keys (b x h), 4x4 to 40x22 preferred length (l) ranges from 10 to 250.

\*For calculations of weights, density of steel taken as 7.85 g/cm<sup>3</sup>.

## 5. Tolerances on Length of Keys and Keyways

Length of Key mm	Tolerance on	
	Key Length mm	Keyway Length mm
Up to 28	- 0.2	+ 0.2
32 to 80	- 0.3	+ 0.3
90 and above	- 0.5	+ 0.5

## 6. Error of Symmetry and Parallelism



Diameter of Shaft	Above	10	12	17	22	30	38	44	50	58	65	75	85	95	110	130
	Up to	12	17	22	30	38	44	50	58	65	75	85	95	110	130	150
<i>b</i>		4	5	6	8	10	12	14	16	18	20	22	25	28	32	36
<i>X</i>		0.1			0.16			0.2			0.3			0.4		

**7. Material of Key** — Steel of tensile strength not less than 600 MP<sub>s</sub> shall be used as material for key.

### 8. Packing

**8.1** Packages shall be made in such a way that keys are protected against mechanical damage in transit.

### 9. Marking

**9.1** Such marks as may be specified by the purchaser shall be marked on the top or bottom surface of the parallel keys or in the packaging containing keys.

**9.2 Certification Marking** — Details available with the Bureau of Indian Standards.

## EXPLANATORY NOTE

Parallel keys and keyways were formerly covered in IS : 2048-1975 'Specification for parallel keys and keyways (first revision)'. However, parallel keys and keyways meant for machine tools were covered in IS : 2710-1975 'Specification for parallel keys and keyways for machine tools (first revision)'.

The dimensions and tolerances of keys of sizes 4 × 4 to 40 × 22 covered in IS : 2048-1975 were exactly the same as those covered in IS : 2710-1975, which specification was applicable to machine tools. Only the range of key lengths and dimensions of keyways differed for machine tool applications.

In the present revision of IS : 2048, the requirements of keys for machine tools including the range of key lengths and details of keyway have been incorporated. In addition, the original range of sizes 2 × 2 to 100 × 50 as also the types A to J have been retained.

This version of the standard ( IS : 2048-1983 ) shall supersede IS : 2710-1975 after its publications.

AMENDMENT NO. 1 SEPTEMBER 1986  
TO  
IS: 2048-1983 SPECIFICATION FOR PARALLEL KEYS  
AND KEYWAYS

*(Second Revision)*

*(Page 7, clause 6)* - Delete clause 6 along  
with figure and informal table.

(EDC 44)



**AMENDMENT NO. 2 OCTOBER 2005  
TO**

**IS 2048 : 1983 SPECIFICATION FOR PARALLEL KEYS AND KEYWAYS**

*( Second Revision )*

[ Page 7, clause 6 ( see also Amendment No. 1 ) ] — Insert the following new clause 6 after 5:

**6 ERROR OF SYMMETRY AND PARALLELISM**

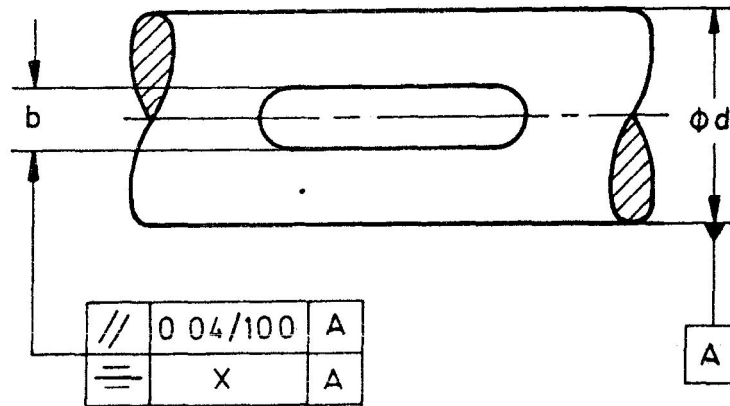


FIG.

<b>Diameter of Shaft</b>	Above	10	12	17	22	30	38	44	50	58	65	75	85	95	110	130
	Up to	12	17	22	30	38	44	50	58	65	75	85	95	110	130	150
<i>b</i>		4	5	6	8	10	12	14	16	18	20	22	25	28	32	36
<i>X</i>		0.1		0.16		0.2			0.3			0.4				