



Rotary Shafts – D Tolerance h9 (Cold-Drawn) / h7 & g6 (Ground)

Straight with Keyways

Rotary Shafts with Keyways have been standardized. No. of keyways can be specified up to 3. Specification of Keyways has become easier.

Rotary Shafts – Straight with Keyways

RoHS10

Type	D Tolerance	Material	Surface Treatment
(1) NSFMKR SFMKR PSFMKR SSFMRK	h9 (Cold-Drawn)	1045 Carbon Steel or Equivalent	—
			Black Oxide
		304 Stainless Steel	Electroless Nickel Plating
(2) NSFHKR SFHKR PSFHKR SSFHKR	h7 (Ground)	1045 Carbon Steel or Equivalent	—
			Black Oxide
		304 Stainless Steel	Electroless Nickel Plating
(3) NSFGKR SFGKR PSFGKR SSFGRK	g6 (Ground)	1045 Carbon Steel or Equivalent	—
			Black Oxide
		304 Stainless Steel	Electroless Nickel Plating

Detailed Keyway Dimensions

Shaft Diameter: Reference Dimension, Tolerance (N9), Reference Dimension, Tolerance, r

Shaft Diameter	Reference Dimension	Tolerance (N9)	Reference Dimension	Tolerance	r
6	2	-0.004	1.2		0.08
8-10	3	-0.004	1.8		0.16
12	4	-0.009	2.5	+0.1	
13-17	5	0	3.0	0	
18-22	6	-0.03	3.5		0.16
25-30	8	0	4.0		0.25
35	10	-0.036	5.0	+0.2	
40	12	0	5.0	0	0.25
50	14	-0.043	5.5		0.4

Ⓢ When KA=0, KA+A=L, KB+B=L, KC+C=L, keyway shape is as shown below.

Circularity of Part D

Over	D	or Less	Circularity M
5	13		0.004
13	20		0.005
20	40		0.006
40	50		0.007

Ⓢ Not applicable to h9 (Cold-Drawn).

Circularity and Straightness

Ⓢ Not applicable to h9 (Cold-Drawn).

Perpendicularity

Ⓢ Not applicable to h9 (Cold-Drawn).

(1) h9 (Cold-Drawn)

Type	Part Number	D _{h9}	Tolerance	L 0.1 mm Increment	Keyway Dimensions		
					Keyway (1) KA / A	Keyway (2) KB / B	Keyway (3) KC / C
NSFMKR SFMKR PSFMKR SSFMRK D6 is not available for SSFMRK.	6	0	-0.030	15.0-500.0	KA+A≤L	KB+B≤L	KC+C≤L
	8	0	-0.036	15.0-500.0			
	10	0	-0.036	15.0-800.0			
	12	0	-0.036	15.0-900.0			
	15	0	-0.043	15.0-1000.0	KA≥0	KB≥0	KC≥0
	20	0	-0.052	20.0-1000.0			
	25	0	-0.052	20.0-1000.0	b≤A≤100	b≤B≤100	b≤C≤100
	30	0	-0.052	20.0-1000.0			
	35	0	-0.062	70.0-1000.0			
	35	0	-0.062	70.0-1000.0			

(2) h7 (Ground)

Type	Part Number	D _{h7}	Tolerance	L 0.1mm Increment	Keyway Dimensions		
					Keyway (1) KA / A	Keyway (2) KB / B	Keyway (3) KC / C
NSFMKR SFMKR PSFMKR SSFMRK	6	0	-0.012	15.0-500.0	KA+A≤L	KB+B≤L	KC+C≤L
	8	0	-0.015	15.0-500.0			
	10	0	-0.015	15.0-800.0			
	12	0	-0.015	15.0-900.0			
	15	0	-0.018	15.0-1000.0	KA≥0	KB≥0	KC≥0
	17	0	-0.018	20.0-1000.0			
	20	0	-0.021	20.0-1000.0	b≤A≤100	b≤B≤100	b≤C≤100
	25	0	-0.021	20.0-1000.0			
	30	0	-0.021	20.0-1000.0			
	50	0	-0.025	100.0-1000.0			

(3) g6 (Ground)

Type	Part Number	D _{g6}	Tolerance	L 0.1 mm Increment	Keyway Dimensions		
					Keyway (1) KA / A	Keyway (2) KB / B	Keyway (3) KC / C
NSFGKR SFGKR PSFGKR SSFGRK D13, 16, 18 and 22 are not available for SSFGRK.	6	-0.004	-0.012	15.0-500.0	KA+A≤L	KB+B≤L	KC+C≤L
	8	-0.005	-0.014	15.0-500.0			
	10	-0.005	-0.014	15.0-800.0			
	12	-0.005	-0.014	15.0-900.0			
	13	-0.006	-0.017	15.0-900.0	KA≥0	KB≥0	KC≥0
	15	-0.006	-0.017	15.0-1000.0			
	16	-0.007	-0.020	15.0-1000.0	b≤A≤100	b≤B≤100	b≤C≤100
	17	-0.007	-0.020	20.0-1000.0			
	18	-0.007	-0.020	20.0-1000.0			
	20	-0.007	-0.020	20.0-1000.0			
	22	-0.007	-0.020	20.0-1000.0			
	25	-0.007	-0.020	20.0-1000.0			
	30	-0.007	-0.020	20.0-1000.0			
	35	-0.007	-0.020	20.0-1000.0			
	40	-0.009	-0.025	70.0-1000.0			
	50	-0.009	-0.025	70.0-1000.0			

Rotary Shafts – D Tolerance h9 (Cold-Drawn) / h7 & g6 (Ground)

Straight with Keyways, *continued*

Available Types

(1) h9 (Cold-Drawn)

Type	NSFMKR, SFMKR, PSFMKR										SSFMRK									
	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Max.	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Max.
6	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	Max.	—	—	—	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(2) h7 (Ground) (3) g6 (Ground)

Type	NSFMKR, NSFGRK, SFHKR, SFGKR, PSFHKR, PSFGKR										SSFHKR, SSFGRK									
	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Max.	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	L800.1	Max.
6	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	Max.	—	—	—	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
16	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
35	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Part Number Example

Part Number - L - Keyway (1) - Keyway (2) - Keyway (3)

1 Keyway: SFMKR10 - 325 - KA20 - A50

2 Keyways: SFHKR30 - 330 - KA20 - A50 - KB120 - B20

3 Keyways: SFGKR25 - 350 - KA10 - A10 - KB90 - B30 - KC210 - C30

Application Example

Number of keyways can be specified up to 3.

Part Number Alterations

Part Number - L - KA - A - KB - B - KC - C - (FC, SFC...etc.)

SFHKR30 - 300 - KA20 - A50 - KB120 - B20 - LKC

Alterations	Set Screw Flat	2 Set Screw Flats (Angle Specified)	Slit Cam Groove	Wrench Flats
	Code	FC / WFC	SFC	UC
Spec.	FC: Adds 1 set screw flat. Ordering Code: FC10-G3 WFC: Adds 2 set screw flats. Ordering Code: WFC10-J3-W10-V3 Ⓢ FC, G, WFC, J, W, V = 1 mm Increment Ⓢ G, J, V ≥ 50 Ⓢ Set screw flat and keyway (s) are added to the same surface.	Adds a set screw flat at any designated angle besides the datum plane (0°). SFC, SG = 1 mm Increment AG = 15° Increment Ⓢ SG ≤ 50 Ordering Code: SFC10-SG3-AG120 When combined with other alterations, ±2 degree phase differential may occur.	Adds a slit cam groove. UC = 1 mm Increment Ordering Code: UC10 Ⓢ UC + ℓ ₁ ≤ L Ⓢ UC ≥ 1 Ⓢ Not applicable to D13 or more.	Adds a wrench flat. SC = 1 mm Increment Ⓢ SC + ℓ ₂ ≤ L Ⓢ SC = 0 or SC ≥ 1 Ⓢ A wrench flat is added to the opposite surface of keyway alteration.

Alterations	L Dimension Tolerance	2 Set Screw Flats at Both Ends	Set Screw Flat Depth	Retaining Ring Groove	C Chamfer Change on D										
	Code	LKC	KWC	WC	TA, TB	CD									
Spec.	Changes L Dimension Tolerance. Ordering Code: LKC Ⓢ L < 500C L ± 0.05 Ⓢ L ≥ 500C L ± 0.1	Adds 2 Set Screw Flats at both ends. KWC = 1 mm Increment Ordering Code: KWC20 Ⓢ KWC ≤ B-m, S-m Ⓢ L ≤ 680 is applicable Ⓢ Not applicable to D dimensions other than indicated above.	Set Screw Flat Depth can be specified in 0.1 mm increments. Ordering Code: WC6.8 Ⓢ D8 or more is applicable. Ⓢ Applicable only when KWC alteration is performed.	Adds a retaining ring groove. (Applicable retaining rings are included.) TA, TB = 1 mm Increment Ordering Code: TA10-TB10 Ⓢ 2 ≤ TA, TB < 150 Ⓢ For dimensions of the retaining ring groove, please refer to P.853.	CD = Selection from Table below. Ordering Code: CD2 <table border="1"> <thead> <tr> <th>Chamber (CD)</th> <th>Applicable Dia.</th> </tr> </thead> <tbody> <tr><td>C2</td><td>φ6 - φ51</td></tr> <tr><td>C3</td><td>φ8 - φ51</td></tr> <tr><td>C4</td><td>φ10 - φ51</td></tr> <tr><td>C5</td><td>φ12 - φ51</td></tr> </tbody> </table>	Chamber (CD)	Applicable Dia.	C2	φ6 - φ51	C3	φ8 - φ51	C4	φ10 - φ51	C5	φ12 - φ51
Chamber (CD)	Applicable Dia.														
C2	φ6 - φ51														
C3	φ8 - φ51														
C4	φ10 - φ51														
C5	φ12 - φ51														

856

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857