


# Rotary Shafts - D Tolerance h9 (Cold-drawn) / h7 (Ground) / g6 (Ground)

## Retaining Ring Grooves on Both Ends with Keyway

For products uncovered by the e-Catalog Standard, see P.131.

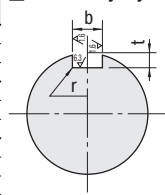
Number of keyways can be specified up to 3.



RoHS 10

Type	Standard	Retaining Ring	D Tolerance	M Material	S Surface Treatment
(1) h9 (Cold-drawn)	SFMKRR	SFMKRRR	h9	S45C Equivalent SUS304	Black Oxide
	PSFMKRR	PSFMKRRR			Electroless Nickel Plating
	SSFMKRR	SSFMKRRR			-
(2) h7 (Ground)	SFHKRR	SFHKRRR	h7	S45C Equivalent SUS304	Black Oxide
	PSFHKRR	PSFHKRRR			Electroless Nickel Plating
	SSFHKRR	SSFHKRRR			-
(3) g6 (Ground)	SFGKRR	SFGKRRR	g6	S45C Equivalent SUS304	Black Oxide
	PSFGKRR	PSFGKRRR			Electroless Nickel Plating
	SSFSGKRR	SSFSGKRRR			-

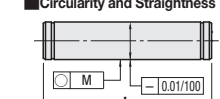
### Detailed Keyway Dimensions



Shaft Dia.	Reference Dimension	Tolerance (N9)	Reference Dimension	Tolerance	r
6	2	-0.004	1.2	+0.1	0.08-0.16
8, 10	3	-0.029	1.8		
12	4	0	2.5		
13-17	5	-0.03	3.0		0.16-0.25
18-22	6	0	3.5		
25, 30	8	0	4.0		
35	10	-0.036	5.0	+0.2	0.25-0.4
40	12	0	5.0		
50	14	-0.043	5.5		

When KA<L, KA+A=L, KB+B=L and L-KC-C<L, keyway is shaped as shown below.

### Circularity and Straightness



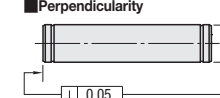
Not applicable to h9 (Cold-drawn).

### Circularity of Part D

D over 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).

### Perpendicularity



Not applicable to h9 (Cold-drawn).

### Tolerances of L and Other Dimensions

Dimension over or Less	Tolerance	
2	6	±0.1
6	30	±0.2
30	120	±0.3
120	400	±0.5
400	1000	±0.8

### (1)h9 (Cold-drawn)

Part Number		Dh9 Tolerance	L 1mm Increment	F, S 0.1mm Increment	Keyway (1) KA, A	Keyway (2) KB, B	Keyway (3) KC, C	Retaining Ring No. Accessory: Retaining Ring 2 pcs. (Retaining Ring Type only)
Type	Retaining Ring							
SFMKRR	SFMKRRR	6 0.030	15.0-400.0	2≤F, S<L/2	KA+A≤L-S	KB+B≤L-S	KC+C≤L-S	NETWS5
PSFMKRR	PSFMKRRR	8 0	15.0-500.0	3≤F, S<L/2				STWS10
SSFMKRR	SSFMKRRR	10 -0.043	15.0-600.0	4≤F, S<L/2				STWS15
		12 0	15.0-700.0	5≤F, S<L/2	b≤A≤100	b≤B≤100	b≤C≤100	STWS20
		15 -0.052	30.0-1000.0					STWS25
		20 0	50.0-1000.0					STWS30
		25 -0.062	60.0-1000.0					STWS35
		30 0	70.0-1000.0					STWS35

### (2)h7 (Ground)

Part Number		Dh7 Tolerance	L 1mm Increment	F, S 0.1mm Increment	Keyway (1) KA, A	Keyway (2) KB, B	Keyway (3) KC, C	Retaining Ring No. Accessory: Retaining Ring 2 pcs. (Retaining Ring Type only)
Type	Retaining Ring							
SFHKRR	SFHKRRR	6 0.012	15.0-400.0	2≤F, S<L/2	KA+A≤L-S	KB+B≤L-S	KC+C≤L-S	NETWS5
PSFHKRR	PSFHKRRR	8 0	15.0-500.0	3≤F, S<L/2				STWS10
SSFHKRR	SSFHKRRR	10 -0.018	15.0-600.0	4≤F, S<L/2				STWS15
		12 0	15.0-700.0	5≤F, S<L/2	b≤A≤100	b≤B≤100	b≤C≤100	STWS20
		15 -0.021	30.0-900.0					STWS25
		20 0	30.0-1000.0					STWS30
		25 -0.025	50.0-1000.0					STWS35
		30 0	60.0-1000.0					STWS40
		35 -0.025	70.0-1000.0					STWS50

### (3)g6 (Ground)

Part Number		Dg6 Tolerance	L 1mm Increment	F, S 0.1mm Increment	Keyway (1) KA, A	Keyway (2) KB, B	Keyway (3) KC, C	Retaining Ring No. Accessory: Retaining Ring 2 pcs. (Retaining Ring Type only)
Type	Retaining Ring							
SFGKRR	SFGKRRR	6 0.004	15.0-400.0	2≤F, S<L/2	KA+A≤L-S	KB+B≤L-S	KC+C≤L-S	NETWS5
PSFGKRR	PSFGKRRR	8 -0.005	15.0-500.0	3≤F, S<L/2				STWS10
SSFSGKRR	SSFSGKRRR	10 -0.014	15.0-600.0	4≤F, S<L/2				STWS15
		12 -0.006	15.0-700.0	5≤F, S<L/2	b≤A≤100	b≤B≤100	b≤C≤100	STWS20
		13 -0.017	15.0-700.0					STWS25
		15 -0.017	15.0-800.0					STWS30
		16 -0.007	15.0-900.0					STWS35
		17 -0.020	30.0-900.0					STWS40
		18 -0.009	30.0-1000.0					STWS40
		20 -0.025	30.0-1000.0					STWS50
		22 -0.009	40.0-1000.0					STWS50
		25 -0.025	50.0-1000.0					STWS50
		30 -0.009	60.0-1000.0					STWS50
		35 -0.025	70.0-1000.0					STWS50
		40 -0.009	80.0-1000.0					STWS50
		50 -0.025	100.0-1000.0					STWS50

Ordering Example: Part Number - L - F - S - Keyway (1) KA - A - Keyway (2) KB - B - Keyway (3) KC - C

1 Keyway SFMKRR10 - 325 - F10 - S10 - KA20 - A50  
 2 Keyways SFHKRR30 - 300 - F10 - S10 - KA20 - A20 - KB120 - B20  
 3 Keyways SFHKRR25 - 350 - F10 - S10 - KA10 - A10 - KB90 - B30 - KC210 - C30

### (1)h9 (Cold-drawn)

Type	SFMKRR (S45C Equivalent, Black Oxide)								PSFMKRR (S45C Equivalent, Electroless Nickel Plating)								SSFMKRR (SUS304)										
	Min.	L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	Min.	L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	Min.	L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1			
D	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000.0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

Type	SFHKRR, SFGKRR (S45C Equivalent, Black Oxide)								PSFHKRR, PSFGKRR (S45C Equivalent, Electroless Nickel Plating)								SSFHKRR, SSFGKRR (SUS304)										
	Min.	L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	Min.	L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	Min.	L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1			
D	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	1000.0
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Alterations Part Number - L - F - S - KA - A - KB - B - KC - C - (FC, KFC, etc.)  
 SFHKRR30 - 300 - F10 - S10 - KA20 - A50 - KB120 - B20 - FC80-G5

### Set Screw Flat

1	2	2 Set Screw Flats (Angle Specified)	2 Set Screw Flats at both ends	Chamfering Depth Configurable
Code: FC	Code: WFC	Code: SFC	Code: KWC	Code: WC
Dimension Increment: FC, G = 1mm Increment	Dimension Increment: WFC, J, V, W = 1mm Increment	Dimension Increment: SFC, SG = 1mm Increment, AG = 15° Increment	Dimension Increment: KWC = 1mm Increment	Dimension Increment: WC = 0.1mm
Ordering Example: FC10-G3	Ordering Example: WFC10-J15-W10-V20	Ordering Example: SFC10-SG3-AG120	Ordering Example: KWC10	Ordering Example: WC6.8
Conditions: For H dim., see P843. G, J, V, SG ≤ 70			Conditions: Not applicable when Shaft Dia. ≤ Ø6, when D = 13, 16, 17, 18 or 22, or when L>680. Only when KWC is specified, WC is available.	

### Slit Cam Groove

Slit Cam Groove	L Dimension Tolerance	Wrench Flats	Changes Part D Chamfering
Code: UC	Code: LKC	Code: SC	Code: CD
Dimension Increment: UC = 1mm Increment	Dimension Increment: -	Dimension Increment: SC = 1mm Increment	Dimension Increment: CD = Selectable
Ordering Example: UC10	Ordering Example: LKC	Ordering Example: SC10	Ordering Example: CD2
Conditions: Not applicable when Shaft Dia. ≥ 13.		Conditions: For W dim., L2 dim., see P843. Not applicable when D≤5.	

For details about Alterations, see Alteration Overview (P843).  
 When combined with other alterations, ±2 degree phase difference may occur. Provide 2mm or more clearance between this alteration and others.  
 When multiple keyways or set screw flats are specified, they are added in the same plane. When the distance of the alterations are over 500mm, ±2 degree phase difference may occur.