

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

Retaining Ring Grooves on Both Ends with Keyway

Number of keyways can be specified up to 3.

RoHS 10

Type	Standard	Retaining Ring	D Tolerance	Material	Surface Treatment
① h9 (Cold-drawn)	SFMKRR	SFMKRR	h9	EN 1.1191 Equiv.	Black Oxide
	PSFMKRR	PSFMKRR	h9	EN 1.4301 Equiv.	Electroless Nickel Plating
	SSFHKRR	SSFHKRR	h9	EN 1.4301 Equiv.	Electroless Nickel Plating
② h7 (Ground)	SFHKRR	SFHKRR	h7	EN 1.1191 Equiv.	Black Oxide
	PSFHKRR	PSFHKRR	h7	EN 1.4301 Equiv.	Electroless Nickel Plating
	SSFHKRR	SSFHKRR	h7	EN 1.4301 Equiv.	Electroless Nickel Plating
③ g6 (Ground)	SFGKRR	SFGKRR	g6	EN 1.1191 Equiv.	Black Oxide
	PSFGKRR	PSFGKRR	g6	EN 1.4301 Equiv.	Electroless Nickel Plating
	SSFSGKRR	SSFSGKRR	g6	EN 1.4301 Equiv.	Electroless Nickel Plating

Surface roughness of D part for h9 (Cold-drawn) is $\sqrt{6.3}$. Surface roughness for h7 (Ground) and g6 (Ground) is $\sqrt{1.6}$.
Number of keyways can be specified up to 3.
The position of keyways should be specified within inner dimension (L-F-S) of a retaining ring.

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	0	0.16-0.25
12	4	0	2.5	+0.2	0.25-0.4
13-17	5	-0.03	3.0	0	
18-22	6	0	3.5	0	
25, 30	8	0	4.0	0	
35	10	-0.036	5.0	0	
40	12	0	5.0	0	
50	14	-0.043	5.5	0	

When KA=0, KA+A=L, KB+B=L, KC+C=L, keyway shape is 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).

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	800	±0.8

Not applicable to h9 (Cold-drawn).

Perpendicularity

Not applicable to h9 (Cold-drawn).

Part Number		Dh9 Tolerance	L=0.1mm Increment	F, S 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							
Standard	Standard							
SFMKRR	SFMKRR	6	20.0~300.0	2≤F, S<L/2	KA+A≤L-S	KB+B≤L-S	KC+C≤L-S	NETWS5
		8	20.0~400.0	3≤F, S<L/2				NETWS7
		10	25.0~500.0	4≤F, S<L/2				STWS10
PSFMKRR	PSFMKRR	12	40.0~600.0	4≤F, S<L/2	KA≥F	KB≥KA+A	KC≥KB+B	STWS12
		15	50.0~700.0	5≤F, S<L/2				STWS15
		20	70.0~800.0	5≤F, S<L/2				STWS20
SSFHKRR	SSFHKRR	25	80.0~800.0	5≤F, S<L/2	b≤A≤100	b≤B≤100	b≤C≤100	STWS25
		30	80.0~800.0	5≤F, S<L/2				STWS30
		35	80.0~800.0	5≤F, S<L/2				STWS35

Part Number		Dh7 Tolerance	L=0.1mm Increment	F, S 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							
Standard	Standard							
SFHKRR	SFHKRR	6	20.0~300.0	2≤F, S<L/2	KA+A≤L-S	KB+B≤L-S	KC+C≤L-S	NETWS5
		8	20.0~400.0	3≤F, S<L/2				NETWS7
		10	25.0~500.0	4≤F, S<L/2				STWS10
PSFHKRR	PSFHKRR	12	40.0~600.0	4≤F, S<L/2	KA≥F	KB≥KA+A	KC≥KB+B	STWS12
		15	50.0~700.0	5≤F, S<L/2				STWS15
		20	70.0~800.0	5≤F, S<L/2				STWS20
SSFHKRR	SSFHKRR	25	80.0~800.0	5≤F, S<L/2	b≤A≤100	b≤B≤100	b≤C≤100	STWS25
		30	80.0~800.0	5≤F, S<L/2				STWS30
		35	80.0~800.0	5≤F, S<L/2				STWS35

Part Number		Dg6 Tolerance	L=0.1mm Increment	F, S 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							
Standard	Standard							
SFGKRR	SFGKRR	6	20.0~300.0	2≤F, S<L/2	KA+A≤L-S	KB+B≤L-S	KC+C≤L-S	NETWS5
		8	20.0~400.0	3≤F, S<L/2				NETWS7
		10	25.0~500.0	4≤F, S<L/2				STWS10
PSFGKRR	PSFGKRR	12	40.0~600.0	4≤F, S<L/2	KA≥F	KB≥KA+A	KC≥KB+B	STWS12
		15	50.0~700.0	5≤F, S<L/2				STWS15
		20	70.0~800.0	5≤F, S<L/2				STWS20
SSFSGKRR	SSFSGKRR	25	80.0~800.0	5≤F, S<L/2	b≤A≤100	b≤B≤100	b≤C≤100	STWS25
		30	80.0~800.0	5≤F, S<L/2				STWS30
		35	80.0~800.0	5≤F, S<L/2				STWS35

Ordering Example: Part Number - L - F - S - Keyway ① - Keyway ② - Keyway ③

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 - KC10 - C30

① h9 (Cold-drawn)

Type	SFMKRR (EN 1.1191 Equiv., Black Oxide)								PSFMKRR (EN 1.1191 Equiv., Electroless Nickel Plating)								SSFHKRR (EN 1.4301 Equiv.)							
D	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1
6	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0
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10																								
12																								
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② h7 (Ground) ③ g6 (Ground)

Type	SFHKRR, SFGKRR (EN 1.1191 Equiv., Black Oxide)								PSFHKRR, PSFGKRR (EN 1.1191 Equiv., Electroless Nickel Plating)								SSFHKRR, SSFGKRR (EN 1.4301 Equiv.)							
D	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1	Min. L	L50.1	L100.1	L150.1	L200.1	L300.1	L400.1	L600.1
6	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0	50.0	100.0	150.0	200.0	300.0	400.0	600.0	800.0
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Alterations: Part Number - L - F - S - KA - A - KB - B - KC - C - (FC, SFC, etc.)

SFHKRR30 - 300 - F10 - S10 - KA20 - A50 - KB120 - B20 - FC80-G5

Example

Alterations	Set Screw Flat	2 Set Screw Flats (Angle Specified)	Slit Cam Groove	Wrench Flats
Code	FC, WFC	SFC	UC	SC
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 = 1mm Increment G, J, V: 50 Set screw flat and keyway(s) are added to the same surface. Keyway(s) and set screw flats are added in the same plane. When the distance of the alterations are over 500mm, ±2 degree phase differential may occur.	Adds a set screw flat at any designated angle besides the datum plane (0°). SFC, SG = 1mm Increment AG = 15° Increment SG ≤ 50 Ordering Code SFC10-SG3-AG120	Adds a slit cam groove. UC = 1mm Increment Ordering Code UC10 UC = 1mm UC ≤ 1 Not applicable to D13 or more.	Adds a wrench flat. SC = 1mm Increment SC = 0 or SC ≥ 1 A wrench flat is added to the opposite surface of keyway alteration. D W #2 D W #2 6 5 25 22 10 8 7 30 27 15 10 9 35 30 20 12 13 40 36 15 16 50 41 20 17 18 14 20 22 17

