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

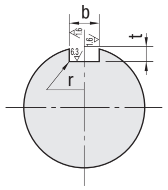
One End Tapped with Keyway

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

■Number of keyways can be specified up to 3.

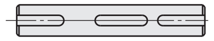
	Type	D Tolerance	Material	Surface Treatment
(1)	SFMKRT	h9 (Cold-drawn)	S45C Equivalent	Black Oxide
	PSFMKRT		S45C Equivalent	Electroless Nickel Plating
	SSFMKRT		SUS304	-
(2)	SFHKRT	h7 (Ground)	S45C Equivalent	Black Oxide
	PSFHKRT		S45C Equivalent	Electroless Nickel Plating
	SSFHKRT		SUS304	-
(3)	SFGKRT	g6 (Ground)	S45C Equivalent	Black Oxide
	PSFGKRT		S45C Equivalent	Electroless Nickel Plating
	SSFGKRT		SUS304	-

■Detailed Keyway Dimensions

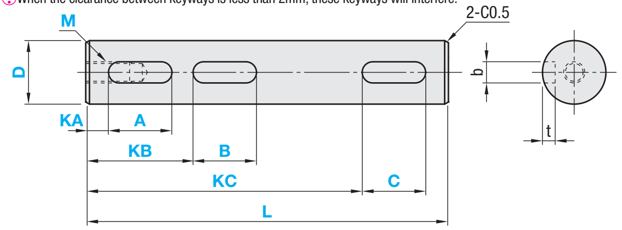


Shaft Dia.	b Reference Dimension	b Tolerance (N9)	t Reference Dimension	t Tolerance	r
6	2	-0.004 -0.029	1.2	+0.1 0	0.08~0.16
8, 10	3		1.8		
12	4	0 -0.03	2.5		
13~17	5		3.0		0.16~0.25
18~22	6		3.5		
25, 30	8	0 -0.036	4.0	+0.2 0	
35	10		5.0		0.25~0.4
40	12	0 -0.043	5.0		
50	14		5.5		

When KA<1, KA+A=L, KB+B=L and L-KC-C<1, keyway is shaped as shown below.

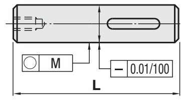


Surface roughness of Part D for h9 (Cold-drawn) is 6.3. Surface roughness for h7 (Ground) and g6 (Ground) is 1.6.
The number of keyways can be specified within the range between 1 and 3.
When the clearance between keyways is less than 2mm, these keyways will interfere.



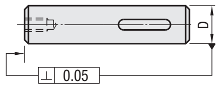
Tapped depth of M (Coarse) is Mx2.

■Circularity and Straightness



Not applicable to h9 (Cold-drawn).

■Perpendicularity



Not applicable to h9 (Cold-drawn).

■Circularity of Part D

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).

■Tolerances of L and Other Dimensions

Dimension over	Dimension 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)

Type	D_{h9}	Tolerance	L 1mm Increment	M (Coarse) Selection	Keyway (1) KA, A (0.1mm Increment)	Keyway (2) KB, B (0.1mm Increment)	Keyway (3) KC, C (0.1mm Increment)
SFMKRT PSFMKRT SSFMKRT (D6 is not available for SSFMKRT.)	6	0 -0.030	15.0~400.0	(2.6) (3) (4)	KA+A≤L KA≥0 b≤A≤100	KB+B≤L KB≥KA+A b≤B≤100	KC+C≤L KC≥KB+B b≤C≤100
	8	0 -0.036	15.0~500.0	(2.6) (3) (4) (5) (6)			
	10		15.0~600.0	3 4 (5) (6)			
	12	0 -0.043	15.0~700.0	4 5 (6) (8)			
	15		15.0~800.0	4 5 6 (8)			
	20	0 -0.052	30.0~1000.0	4 5 6 8 10			
	25		50.0~1000.0	4 5 6 8 10 12			
	30		60.0~1000.0	6 8 10 12 16			
	35	0 -0.062	70.0~1000.0	6 8 10 12 16 20			

M Sizes in ( ) is selectable when KA≥Mx2. When L≤Mx3, the pilot hole may go through.

(2)h7 (Ground)

Type	D_{h7}	Tolerance	L 1mm Increment	M (Coarse) Selection	Keyway (1) KA, A (0.1mm Increment)	Keyway (2) KB, B (0.1mm Increment)	Keyway (3) KC, C (0.1mm Increment)
SFHKRT PSFHKRT SSFHKRT	6	0 -0.012	15.0~400.0	(2.6) (3) (4)	KA+A≤L KA≥0 b≤A≤100	KB+B≤L KB≥KA+A b≤B≤100	KC+C≤L KC≥KB+B b≤C≤100
	8	0 -0.015	15.0~500.0	(2.6) (3) (4) (5) (6)			
	10		15.0~600.0	3 4 (5) (6)			
	12	0 -0.018	15.0~700.0	4 5 (6) (8)			
	15		15.0~800.0	4 5 6 (8)			
	17		30.0~900.0	4 5 6 (8) (10) (12)			
	20	0 -0.021	30.0~1000.0	4 5 6 8 (10) (12) (16)			
	25		50.0~1000.0	4 5 6 8 10 12 (16)			
	30		60.0~1000.0	6 8 10 12 16			
	35	0 -0.025	70.0~1000.0	6 8 10 12 16 20			
	40		80.0~1000.0	10 12 16 20 24			
	50		100.0~1000.0	12 16 20 24 30			

M Sizes in ( ) is selectable when KA≥Mx2. When L≤Mx3, the pilot hole may go through.

(3)g6 (Ground)

Type	D_{g6}	Tolerance	L 1mm Increment	M (Coarse) Selection	Keyway (1) KA, A (0.1mm Increment)	Keyway (2) KB, B (0.1mm Increment)	Keyway (3) KC, C (0.1mm Increment)
SFGKRT PSFGKRT SSFGKRT (D13, D16, D18 or D22 is not available for SSFGKRT.)	6	-0.004 -0.012	15.0~400.0	(2.6) (3) (4)	KA+A≤L KA≥0 b≤A≤100	KB+B≤L KB≥KA+A b≤B≤100	KC+C≤L KC≥KB+B b≤C≤100
	8	-0.005 -0.014	15.0~500.0	(2.6) (3) (4) (5) (6)			
	10		15.0~600.0	3 4 (5) (6)			
	12	-0.006 -0.017	15.0~700.0	4 5 (6) (8)			
	13		15.0~700.0	4 5 6 (8)			
	15		15.0~800.0	4 5 6 (8)			
	16		15.0~900.0	4 5 6 8 (10)			
	17		30.0~900.0	4 5 6 8 (10) (12)			
	18		30.0~900.0	4 5 6 8 (10) (12)			
	20	-0.007 -0.020	30.0~1000.0	4 5 6 8 10 (12) (16)			
	22		40.0~1000.0	4 5 6 8 10 12 (16)			
	25		50.0~1000.0	4 5 6 8 10 12 (16)			
	30		60.0~1000.0	6 8 10 12 16			
	35	-0.009 -0.025	70.0~1000.0	6 8 10 12 16 20			
	40		80.0~1000.0	10 12 16 20 24			
	50		100.0~1000.0	12 16 20 24 30			

M Sizes in ( ) is selectable when KA≥Mx2. When L≤Mx3, the pilot hole may go through.

Ordering Example

	Part Number	-	L	-	M	-	Keyway (1) KA - A	-	Keyway (2) KB - B	-	Keyway (3) KC - C
1 Keyway	SFMKRT10	-	325	-	M4	-	KA20 - A50				
2 Keyways	SFHKRT30	-	300	-	M10	-	KA20 - A50	-	KB120 - B20		
3 Keyways	SFGKRT25	-	350	-	M8	-	KA10 - A60	-	KB90 - B30	-	KC210 - C30

(1)h9 (Cold-drawn)

Type	SFMKRT (S45C Equivalent, Black Oxide)									PSFMKRT (S45C Equivalent, Electroless Nickel Plating)									SSFMKRT (SUS304)								
D	Min. L~50.0	L50.1~100.0	L100.1~150.0	L150.1~200.0	L200.1~300.0	L300.1~400.0	L400.1~600.0	L600.1~800.0	L800.1~1000.0	Min. L~50.0	L50.1~100.0	L100.1~150.0	L150.1~200.0	L200.1~300.0	L300.1~400.0	L400.1~600.0	L600.1~800.0	L800.1~1000.0	Min. L~50.0	L50.1~100.0	L100.1~150.0	L150.1~200.0	L200.1~300.0	L300.1~400.0	L400.1~600.0	L600.1~800.0	L800.1~1000.0
6							-	-	-							-	-	-	-	-	-	-	-	-	-	-	-
8								-	-								-	-								-	-
10								-	-								-	-								-	-
12									-									-									-
15									-									-									-
20																											
25																											
30	-									-									-								
35	-									-									-								

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

Type	SFHKRT, SFGKRT (S45C Equivalent, Black Oxide)									PSFHKRT, PSFGKRT (S45C Equivalent, Electroless Nickel Plating)									SSFHKRT, SSFGKRT (SUS304)								
D	Min. L~50.0	L50.1~100.0	L100.1~150.0	L150.1~200.0	L200.1~300.0	L300.1~400.0	L400.1~600.0	L600.1~800.0	L800.1~1000.0	Min. L~50.0	L50.1~100.0	L100.1~150.0	L150.1~200.0	L200.1~300.0	L300.1~400.0	L400.1~600.0	L600.1~800.0	L800.1~1000.0	Min. L~50.0	L50.1~100.0	L100.1~150.0	L150.1~200.0	L200.1~300.0	L300.1~400.0	L400.1~600.0	L600.1~800.0	L800.1~1000.0
6							-	-	-							-	-	-							-	-	-
8								-	-								-	-								-	-
10								-	-								-	-								-	-
12									-									-									-
13									-									-	-	-	-	-	-	-	-	-	-
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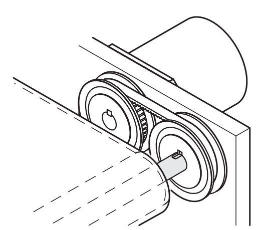
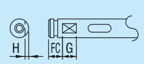
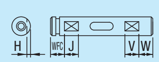
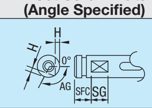
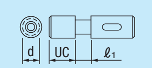
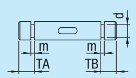
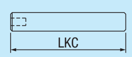
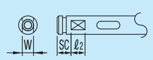
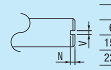
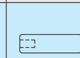
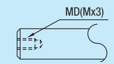
Example



Alterations

Part Number	-	L	-	M	-	KA	-	A	-	KB	-	B	-	KC	-	C	-	(LKC, FC···etc.)
SFHKRT30	-	300	-	M10	-	KA20	-	A50	-	KB120	-	B20					-	LKC

For details, see Alteration Overview P.843	Set Screw Flat 1	Set Screw Flat 2	2 Set Screw Flats (Angle Specified)	Slit Cam Groove	Retaining Ring Groove
Alterations				 For d, ℓ1 dim., see P.843.	
Code	FC	WFC	SFC	UC	TA, TB
Dimension Increment	FC, G = 1mm Increment	WFC, J, V, W = 1mm Increment	SFC, SG = 1mm Increment AG = 15° Increment	UC = 1mm Increment	TA, TB = 0.1mm Increment
Ordering Example	FC10-G3	WFC10-J15-W10-V20	SFC10-SG3-AG120	UC10	TA10
Conditions	For H dim., see P.843. G, J, V, SG ≤ 70			Not applicable when Shaft Dia. ≥ Ø13.	2≤TA≤150 For m dim., see P.844.

For details, see Alteration Overview P.843	L Dimension Tolerance	Wrench Flats	Slit Added	Changes Part D Chamfering	Tapped Depth
Alterations	 L<500··· L±0.05 L≥500··· L±0.1		 D 6~13: N 1.2, V 1.5; D 15~20: N 2.0, V 2.5; D 22~30: N 3.0, V 3.8. Slit is added on the opposite side to the tapped thread.	 Chamfering (CD) C2: Applicable Dia. (D) Ø6~Ø50; C3: Ø8~Ø50; C4: Ø10~Ø50; C5: Ø12~Ø50	
Code	LKC	SC	MM	CD	MD (To specify this Alteration, replace M with MD.)
Dimension Increment	-	SC = 1mm Increment	-	CD = Selectable	-
Ordering Example	LKC	SC10	MM	CD2	MD6
Conditions	Not applicable when L≥800.	For W dim., ℓ2 dim., see P.843. Not applicable when D≤5.	Not applicable when Shaft Dia. ≥ Ø35.	The tapped side is not machined.	Not applicable when M = 2, 2.6, 24 or 30.

For details about Alterations, see Alteration Overview (P.843).
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.