

One End Stepped, Both Ends Tapped

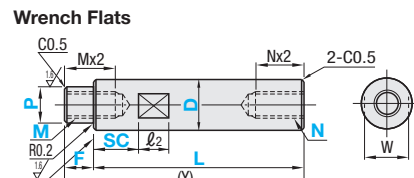
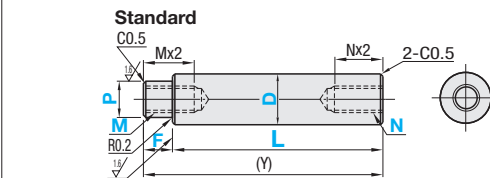
■ Select from h9 (Cold-drawn), h7 (Ground) and g6 (Ground) for your applications. Furthermore, h7 or g6 can be selected for P part tolerance of h9 (Cold-drawn).



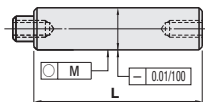
Type		Tolerance		Material	Surface Treatment	
Standard	Wrench Flats	D	P			
①	SFRMHA	SFRMHAS	h9 (Cold-drawn)	h7	EN 1.1191 Equiv.	Black Oxide
	PSFRMHA	PSFRMHAS			EN 1.4301 Equiv.	Electroless Nickel Plating
	SFRMHA	SFRMHAS				-
②	SFRMGA	SFRMGAS	g6 (Ground)	h7	EN 1.1191 Equiv.	Black Oxide
	PSFRMGA	PSFRMGAS			EN 1.4301 Equiv.	Electroless Nickel Plating
	SFRMGA	SFRMGAS				-
③	SFRHA	SFRHAS	h7 (Ground)	h7	EN 1.1191 Equiv.	Black Oxide
	PSFRHA	PSFRHAS			EN 1.4301 Equiv.	Electroless Nickel Plating
	SFRHA	SFRHAS				-
④	SFRFA	SFRFAS	g6 (Ground)	g6	EN 1.1191 Equiv.	Black Oxide
	PSFRFA	PSFRFAS			EN 1.4301 Equiv.	Electroless Nickel Plating
	SFRFA	SFRFAS				-

Tolerance Table			
D, P	h9 (Cold-drawn)	h7 (Ground)	g6 (Ground)
3.1-6	0 -0.030	0 -0.012	-0.004 -0.012
6.1-10	0 -0.036	0 -0.015	-0.005 -0.014
10.1-18	0 -0.043	0 -0.018	-0.006 -0.017
18.1-30	0 -0.052	0 -0.021	-0.007 -0.020
30.1-50	0 -0.062	0 -0.025	-0.009 -0.025

Surface roughness of D part for h9 (Cold-drawn) is $\sqrt{6.3}$.
Surface roughness for h7 (Ground) and g6 (Ground) is $\sqrt{1.6}$.



■Circularity and Straightness



⚠ Not applicable to h9 (Cold-drawn).

■Circularity of Part D

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

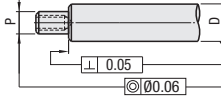
⦿ Not applicable to h0 (Cold drawn)

⚠ Not applicable to h9 (Cold-drawn).

■ Tolerances of L, Y and Other Dimensions

Dimension		Tolerance
over	or Less	
2	6	± 0.1
6	30	± 0.2
30	120	± 0.3
120	400	± 0.5
400	800	± 0.8

Concentricity and Perpendicularity



⚠ Not applicable to h9 (Cold-drawn).

①D tolerance h9 (Cold-drawn) / P tolerance h7 ②D tolerance h9 (Cold-drawn) / P tolerance g6

[illegible]

③h7 (Ground)

Part Number		0.1mm Increment		1mm Increment	M (Coarse) Selection		N (Coarse) Selection		W	ℓ ₂	(M) max
Type		D	L	F	P						
Standard	Wrench Flats										
SFRHA	SFRHAS	6	20.0–298.0	2sF≤Px5	5	3	3	5	5	7	300
		8	20.0–398.0			3 4 5	3 4 5 6	7	8	400	
		10	20.0–498.0		For M3 – M8	4 5 6	4 5 6	8		500	
		12	30.0–598.0		M+2sP<D	5 6 8	5 6 8	10		600	
		15	30.0–698.0		For M10 – 16	5 6 8 10	5 6 8 10	13		700	
PSFRHA	PSFRHAS	17	40.0–798.0		M+3sP<D	5 6 8 10 12	5 6 8 10 12	14	10		
		20	40.0–798.0		For M20 or M24	5 6 8 10 12	5 6 8 10 12 16	17			
		25	50.0–798.0		M+4sP<D	5 6 8 10 12 16	5 6 8 10 12 16	22			
SSFRHA	SSFRHAS	30	60.0–798.0			8 10 12 16 20	8 10 12 16 20	27	15	800	
		35	70.0–798.0		For M30	8 10 12 16 20 24	8 10 12 16 20 24	30			
		40	80.0–798.0	M+5sP<D	12 16 20 24 30	12 16 20 24 30	36				
		50	100.0–798.0		16 20 24 30	16 20 24 30	41	20			

④g6 (Ground)

Part Number		0.1mm Increment		1mm Increment	M (Coarse) Selection	N (Coarse) Selection	1mm Increment SC Wrench Flats Type only	W	ℓ ₂	(Y) max
Type		D	L	F	P					
Standard	Wrench Flats									
SFRA	SFRAS	6	20.0-298.0	2sF≤Px5	5	3	3	SC+ℓ ₂ ≤L SC=0 or SC≤1	5	300
		8	20.0-398.0		3 4 5	3 4 5 6	7		400	
		10	20.0-498.0		4 5 6	4 5 6	8		500	
		12	30.0-598.0		5 6 8	5 6 8	10		600	
		13	30.0-598.0		5 6 8 10	5 6 8 10	11			
		15	30.0-698.0		5 6 8 10	5 6 8 10	13		700	
		16	40.0-798.0		5 6 8 10 12	5 6 8 10 12	14			
		17	40.0-798.0		5 6 8 10 12	5 6 8 10 12	15			
		18	40.0-798.0		5 6 8 10 12	5 6 8 10 12 16	17			
		20	40.0-798.0		5 6 8 10 12	5 6 8 10 12 16	19			
PSFRA	PSFRAS	22	50.0-798.0	2sF≤Px5	For M30 – M8	5 6 8 10 12 16	5 6 8 10 12 16	When SC≤Mx3-F or L-SC≤Nx3, W-M (N)≥2	20	800
		25	50.0-798.0		M+2sP<D	5 6 8 10 12 16	5 6 8 10 12 16		21	
		30	60.0-798.0		For M10 – 16	5 6 8 10 12	5 6 8 10 12		22	
		35	70.0-798.0		M+3sP<D	5 6 8 10 12	5 6 8 10 12		23	
		40	80.0-798.0		For M20 or M24	5 6 8 10 12	5 6 8 10 12 16		27	
		45	90.0-798.0		M+4sP<D	5 6 8 10 12 16	5 6 8 10 12 16		28	
		50	100.0-798.0		For M30	5 6 8 10 12 16	5 6 8 10 12 16		30	
					M+5sP<D	8 10 12 16 20	8 10 12 16 20		31	
						8 10 12 16 20 24	8 10 12 16 20 24		32	
						12 16 20 24 30	12 16 20 24 30		36	
			16 20 24 30	16 20 24 30	41					

When $D - P \leq 2$, chamfer C at the step is 0.2 or less. Overall length requires $Nx3 \leq L$. $Mx2 + Nx2 \leq (Y)$ is required for (Y)



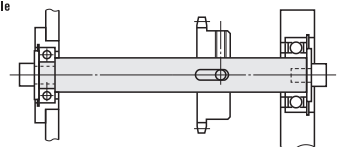
Ordering Example	Part Number	L	F	P	M	N	SC
① D part h9 / P part h7	SFRMHA30	250	F30	P16	M10	N10	
③ h7 (Ground) with Wrench Flat	SFRMHAS25	200	F40	P20	M10	N10	SC30

①D tolerance h9 (Cold-drawn) / P tolerance h7 ②D tolerance h9 (Cold-drawn) / P tolerance g6

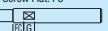
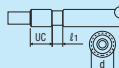
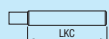
Type	SFRMHA, SFRMGA (EN 1.1191 Equiv., Black Oxide)							PSFRMHA, PSFRMGA (EN 1.1191 Equiv., Electroless Nickel Plating)							SSFRMHA, SSFRMGA (EN 1.4301 Equiv.)										
	SFRMHAS, SFRMGAS							PSFRMHAS, PSFRMGAS							SSFRMHAS, SSFRMGAS										
D	Min. L 50.0	L50.1 100.0	L100.1 150.0	L150.1 200.0	L200.1 300.0	L300.1 400.0	L400.1 600.0	L600.1 798.0	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	L600.1 798.0	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	L600.1 798.0	
6						-	-	-							-	-	-							-	-
8							-	-								-	-	-						-	-
10								-									-								-
12								-									-								-
15																									
20																									
25																									
30	-								-								-								
35	-								-								-								

③h7 (Ground) ④g6 (Ground)

Type	SFRHA, SFRA (EN 1.1191 Equiv., Black Oxide)								PSFRHA, PSFRA (EN 1.1191 Equiv., Electroless Nickel Plating)								SSFRHA, SSFRA (EN 1.4301 Equiv.)								
	SFRHAS, SFRAS								PSFRHAS, PSFRAS								SSFRHAS, SSFRAS								
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	L600.1 798.0	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	L600.1 798.0	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	L600.1 798.0	
6						-	-	-						-	-	-							-	-	-
8						-	-	-						-	-	-							-	-	-
10																-								-	-
12																-								-	-
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30	-								-								-								
35	-								-								-								
40	-								-								-								
50	-								-								-								



Alterations Part Number - L - F - P - M - N - SC - (KC, WKC, FC...etc.)
SFRMHAS8 - 150 - F20 - P7 - M5 - N5 - SC20 - LKC

	Keyway	Set Screw Flats	2 Set Screw Flats (Angle Specified)	Slit Cam Groove	L Dimension Tolerance	Concentricity																																					
Alterations	• 1 Keyway: KC  • 2 Keyways: WK 	• 1 Set Screw Flat: FC  • 2 Set Screw Flats: WFC 																																									
Code	KC, WK	FC, WFC	SFC	UC	LKC	CKC																																					
Spec.	KC: Adds a keyway. <u>Ordering Code</u> KC50-A10 WK: Adds two keyways. <u>Ordering Code</u> WK50-C8-K40-E10 ⚡ KC, A, WK, C, K, E = 1mm Increment ⚡ A, E, C, 100 ⚡ For Keyway Details, refer to P820. ⚡ If 3 keyways are required, use both KC and WK. ⚡ When the keyway position is less than 1mm away from the end face, R is not applied. Ex.  ⚡ 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.	FC: Adds 1 set screw flat. <u>Ordering Code</u> FC10-G3 WFC: Adds 2 set screw flats. <u>Ordering Code</u> WFC10-J3-W10-V3 ⚡ FC, G, WFC, J, W, V = 1mm Increment ⚡ G, J, V, 50 <table><tr><th>D</th><th>H</th></tr><tr><td>6~17</td><td>1</td></tr><tr><td>18~40</td><td>2</td></tr><tr><td>50</td><td>3</td></tr></table> ⚡ When combined with other alterations, ±2 degree phase differential may occur.	D	H	6~17	1	18~40	2	50	3	Adds a set screw flat at any desired angle besides the datum plane (0°). SFC, SG= 1mm Increment AG = 15° Increment ⚡ SG: 50 <u>Ordering Code</u> SFC10-SG3-AG90 <table><tr><th>D</th><th>H</th></tr><tr><td>6~17</td><td>1</td></tr><tr><td>18~40</td><td>2</td></tr><tr><td>50</td><td>3</td></tr></table> ⚡ When combined with other alterations, ±2 degree phase differential may occur.	D	H	6~17	1	18~40	2	50	3	Adds a slit cam groove. UC = 1mm Increment <u>Ordering Code</u> UC10 ⚡ UC: ±1.5 ⚡ UC: 1 ⚡ Not applicable to D13 or more. <table><tr><th>D</th><th>d</th><th>±t</th></tr><tr><td>6</td><td>5</td><td>4</td></tr><tr><td>8</td><td>7</td><td></td></tr><tr><td>10</td><td>8</td><td></td></tr><tr><td>12</td><td>10</td><td>5</td></tr></table>	D	d	±t	6	5	4	8	7		10	8		12	10	5	Changes L dimension tolerance. <u>Ordering Code</u> LKC ⚡ L: 500 → L ± 0.05 L ≥ 500 → L ± 0.1	Changes the concentricity to 00.02. <u>Ordering Code</u> CKC ⚡ Specify a value within dimension L range in the table below. <table><tr><th>D</th><th>Lmax</th></tr><tr><td>6~22</td><td>450</td></tr><tr><td>25~50</td><td>600</td></tr></table> ⚡ Not applicable to D part of h9 (Cold-drawn).	D	Lmax	6~22	450	25~50	600
D	H																																										
6~17	1																																										
18~40	2																																										
50	3																																										
D	H																																										
6~17	1																																										
18~40	2																																										
50	3																																										
D	d	±t																																									
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