High Precision Linear Shafts

Both Ends Stepped and Tapped / Both Ends Stepped and Tapped with Wrench Flats

■Suitable for assemblies of parts requiring high precision and high perpendicular precision of the shaft end (⊥ 0.03).

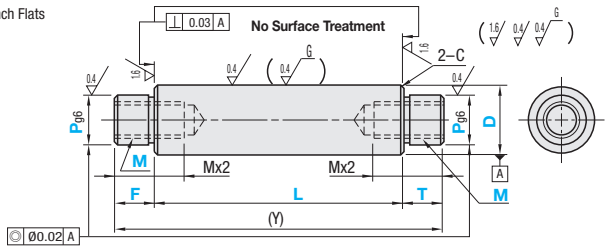
RoHS 10

- (P) Annealing may lower hardness at shaft end machined areas (effective thread length + approx. 10mm). P.112
- (P) Full Length Hardness Guaranteed Shafts P.127
- (P) L Dimension Tolerance, Circularity, Straightness, Perpendicularity, Concentricity and Changes in Hardness P.111
- (P) Features of Low Temp. Black Chrome Plating P.128

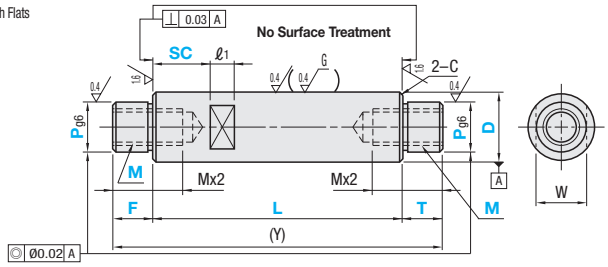
Type		D Tol.	Material	Hardness	Surface Treatment
W/o Wrench Flats	With Wrench Flats				
VFAH	VFPH	g6	SUJ2 Equivalent	Induction Hardened Effective Hardened Depth P.112	-
VSFAH	VSFPH		SUS440C or 13Cr stainless		Hard Chrome Plating Plating Hardness HV750 ~ Plating Thickness: 5μ or More
VPFAH	VPFPH		SUJ2 Equivalent		
VPSFAH	VPSFPH		SUS440C or 13Cr stainless		
VRAH	VRPH		SUJ2 Equivalent	SUJ2 Equivalent 58HRC~	Low Temp. Black Chrome Plating
VSRAH	VSRPH		SUS440C or 13Cr stainless	SUS440C or 13Cr stainless 56HRC~	

D Tol.	
D	g6
8	-0.005 -0.014
10	
12	-0.006 -0.017
13	
15	
16	
18	
20	-0.007 -0.020
25	
30	

W/o Wrench Flats



With Wrench Flats



Part Number		1mm Increment			M (Coarse) Selection	Wrench Flats Dimensions			(Y) Max.	C
Type		D	L	F, T	P		SC	W	ℓ1		
(W/o Wrench Flats)	(With Wrench Flats)	8	25~296	2≤F≤Px4 2≤T≤Px4	6	3	SC=1mm Increment (P) SC+ℓ1≤L (P) SC≥0 (P) Details of Wrench Flats P.112	7	8	300	0.5 or Less
		10	25~346		6~8	3 4 5		8		350	
		12	25~346		6~10	3 4 5 6		10		350	
VFAH	VFPH	13	25~346		6~11	3 4 5 6 8		11		350	
VSFAH	VSFPH	15	25~346		6~13	3 4 5 6 8 10		13		350	
VPFAH	VPFPH	16	25~346		6~14	3 4 5 6 8 10		14	10	350	
VPSFAH	VPSFPH	18	25~346		8~16	4 5 6 8 10 12		16		350	
VRAH	VRPH	20	25~446		8~17	4 5 6 8 10 12		17		450	1.0 or Less
VSRAH	VSRPH	25	25~446		8~22	4 5 6 8 10 12 16		22		450	
		30	25~446		9~27	5 6 8 10 12 16 20 24		27	15	450	

(P) P dimensions require M+3≤P. (P) (Y) dimensions require Mx4≤(Y). Tap pilot holes may go through.

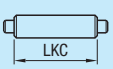
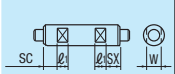
Ordering Example

Part Number	-	L	-	F	-	P	-	M	-	T	-	SC
VFAH20	-	100	-	F20	-	P10	-	M8	-	T20		
VFPH20	-	100	-	F20	-	P10	-	M8	-	T20	-	SC20

Alterations

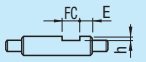
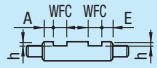
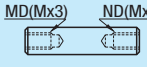
Part Number	-	L	-	F	-	P	-	M (MD, ND)	-	T	-	SC	-	(LKC···etc)
VFAH20	-	100	-	F20	-	P10	-	M8	-	T20			-	LKC
VFPH20	-	100	-	F20	-	P10	-	M8	-	T20	-	SC20	-	FC10-E8

Alteration Details P.113

Alterations	Code	Spec.
	LKC	Alteration to L dimension tolerance Ordering Code LKC Application Notes Applicable when L=200 or less. (X) Not applicable when D-P≤2. L dimensions can be specified in 0.1mm increment for LKC. (P) L≤200···L±0.03
	SX	Second Set of Wrench Flats Ordering Code SX15 Application Notes Only applicable to Shafts with Wrench Flats. WSC, X=1mm Increment (X) Orientation between two set screw flats is not coplanar.

D	W	ℓ1
8	7	8
10	8	
12	10	
13	11	10
15	13	
16	14	
18	16	

D	W	ℓ1
20	17	10
25	22	
30	27	15

Alterations	Code	Spec.
	FC	Set Screw Flat at One Location Ordering Code FC10-E8 FC, E=1mm Increment (P) FC≤3xD (P) When 1.5xD<FC, FC≤L/2 (P) E=0 or E≥2 (X) Not available in combination with WFC.
	WFC	Set Screw Flats at Two Locations Ordering Code WFC8-A8-E4 WFC, A, E=1mm Increment (P) WFC≤3xD (P) When 1.5xD<WFC, 2WFC≤L/2 (P) A(E)=0 or A(E)≥2 (X) Orientation between set screw flats is not coplanar. Not available in combination with FC.
	MD ND	Change the effective tap depth to M(N)x3. Ordering Code MD6/ND6 (M is changed to MD, N is changed to ND) Application Notes Only applicable to D=12~30, M(N)=6~20 (P) One End Tapped: MDx3.5+4≥L (P) Both Ends Tapped: MDx3.5+4+NDx3.5+4≥L

D	h
8~18	1
20~30	2

D	h
8~18	1
20~30	2

(P) Please see Shaft Alteration Overview for details if provided. P.113
(P) When selecting multiple alteration additions, the distance between machined areas should be greater than 2mm.
(P) Alterations may lower hardness. See P.112