Driving Shafts
One End Stepped

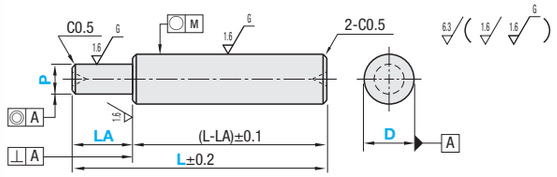
■**Features**: Rotary Shafts suitable for driving motion. Accuracies and shapes needed for rotary driving applications are selectable.

RoHS10

Type	D, P Tolerance	Concentricity	Perpendicularity	M Material	H Hardness	S Surface Treatment
KZBE	h7	Ø0.05	⊥0.05	S45C	-	Black Oxide
KZBN	h6	Ø0.01	⊥0.01	S45C	-	-
KZBC						Black Oxide
KZBP						Electroless Nickel Plating
KZBF				S45C	Induction Hardened Surface Hardness 50HRC~	-

D	Tolerance h7	Tolerance h6
10	0 -0.015	0 -0.009
12		
15	0 -0.018	0 -0.011
17		
20	0 -0.021	0 -0.013
25		
30		
35	-	0 -0.016
40		
45		
50		

D	Circularity M KZBE	Circularity M Others
10	0.004	0.003
12		
15	0.005	
17		
20		
25	0.006	0.005
30		
35	-	
40		
45		
50		



- LA≤L/2
- The shaft may have centering holes on ends.
- There is an undercut 1.5mm or less in width and 0.3mm or less in depth on the stepped part.
- Step P of KZBE has no grinding undercut. Step R=0.2 or Less

Part Number Type	D	0.5mm Increment L	1mm Increment P	0.5mm Increment LA
KZBE (D10~30)	10	50.0~300.0	7~9	10.0~50.0
	12		7~11	
	15	100.0~400.0	10~14	10.0~70.0
	17		10~16	
	20		14~19	10.0~100.0
KZBN KZBC KZBP KZBF	25		14~24	
	30	100.0~500.0	20~29	
	*35		20~34	20.0~150.0
	*40		20~39	
	*45	200.0~500.0	20~44	
	*50		25~49	20.0~200.0

Ordering Example: Part Number - L - P - LA → KZBN30 - 320 - P25 - LA40

・About KZBF (Induction Hardened)

When alterations on the right-hand page are specified, the shafts are induction hardened (except the threaded sections) after machining.
As a result, these may occur:
①: Due to thermal conduction to the thread, the threads may be hardened by 2 ~ 3mm.
②: Induction Hardened may shrink the keyway width (around -0.01 ~ -0.02). If the key becomes hard to fit, adjust it by gauging.

* marked sizes are not available for KZBE.

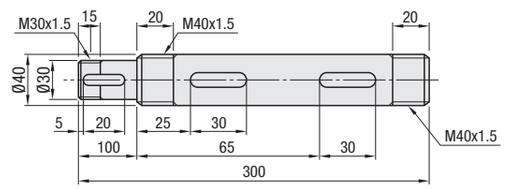
Type	KZBE					KZBN					KZBC				
D	Min. L ~100.0	L100.5 ~200.0	L200.5 ~300.0	L300.5 ~400.0	L400.5 ~500.0	Min. L ~100.0	L100.5 ~200.0	L200.5 ~300.0	L300.5 ~400.0	L400.5 ~500.0	Min. L ~100.0	L100.5 ~200.0	L200.5 ~300.0	L300.5 ~400.0	L400.5 ~500.0
10				-	-				-	-				-	-
12				-	-				-	-				-	-
15					-					-					-
17					-					-					-
20					-					-					-
25															
30															
35	-	-	-	-	-										
40	-	-	-	-	-	-					-				
45	-	-	-	-	-	-					-				
50	-	-	-	-	-	-					-				

Type	KZBP					KZBF				
D	Min. L ~100.0	L100.5 ~200.0	L200.5 ~300.0	L300.5 ~400.0	L400.5 ~500.0	Min. L ~100.0	L100.5 ~200.0	L200.5 ~300.0	L300.5 ~400.0	L400.5 ~500.0
10				-	-				-	-
12				-	-				-	-
15					-					-
17					-					-
20					-					-
25										
30										
35										
40	-					-				
45	-					-				
50	-					-				

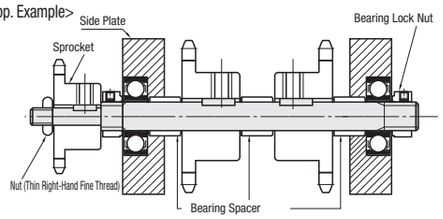
■Selection of Driving Shaft

In selecting a driving shaft, select the basic shape and size from the specification table, then select necessary alterations such as thread machining, keyway addition etc.

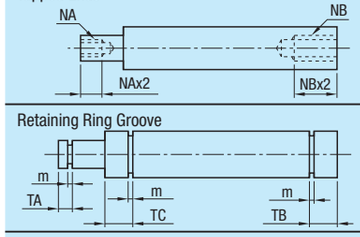
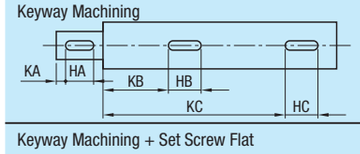
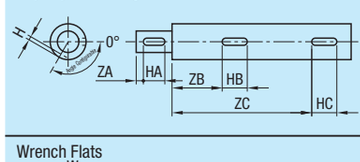
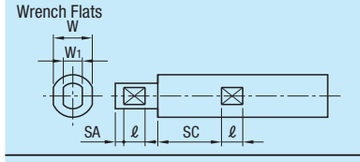
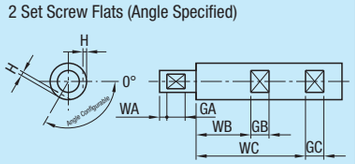
<Selection Example of Part Number>
・Alteration Selection: Three Keyways, Three Threaded Ends (Fine Thread)



<App. Example>



Alterations: Part Number - L - P - LA - (MA, NA, KA, TA, SA, WA···etc.)
KZBN40 - 300 - P30 - LA100 - MSA15 - MSD20 - MSB20 - KA5 - HA20 - KB25 - HB30 - KC65 - HC30

Alterations	Code Left End	Code Right End	Spec.
Threaded Ends 	MA MSA MMA MD MSD MMD	MB MSB MMB	Adds threads at shaft ends. Specify the length of the threads. (Accuracy, coarse or fine threads can be specified by ordering code.) Ordering Code MA15-MSB15 1mm Increment 5≤ Thread Length ≤Mx5, LA-2
Tapped Ends 	NA	NB	Adds taps on shaft ends. Select the thread diameter. Ordering Code NA5-NB5 NA,NB≤D(P)-4
Retaining Ring Groove 	TA TC	TB	Adds a retaining ring groove. Specify the position of a retaining ring groove. Ordering Code TA10-TB10-TC10 TA, TB, TC = 1mm Increment 4≤TA≤LA-3 Retaining rings are included. For dimensions of the retaining ring groove, **P.820** P=27,31,33,34,36~39,41~44, Not available for 46~49.
Keyway Machining 	KA KB KC		Adds a keyway. Specify the position and the length of the keyway. Ordering Code KA10-HA30-KB100-HB50 KA, HA, KB, HB, KC, HC = 1mm Increment 3≤HA,HB,HC≤100 Keyway Details **P.820** When more than 2 keyways are added, the tolerances may shift by up to 0.2°. Specify the keyway position more than 2mm away from the stepped part.
Keyway Machining + Set Screw Flat 	ZA ZB ZC		Adds a flat at any designated angle based on the keyways. Specify the position and the length for each keyway, and the angle for the set screw flats. Ordering Code ZA40-HA20-AA90 ZA, HA, ZB, HB, ZC, HC= 1mm Increment AA, AB, AC = 30° Increment 30°≤ AA, AB, AC ≤330° 3≤HA,HB,HC≤100 Keyway Details **P.820** Specify the keyway position more than 2mm away from the stepped part.
Wrench Flats	SA SC		Adds a wrench flat. Specify the position of a wrench flat. Ordering Code SA5 SA, SC = 1mm Increment 0≤ SA, SC ≤LA-ℓ, L-ℓ
2 Set Screw Flats (Angle Specified)	WA WB WC		Adds a flat at any designated angle besides the datum plane 0°. Specify the position, the length and the angle of the set screw flats. When 0° is specified, only one set screw flat is machinable. Ordering Code WA15-GA10-AA0 WA, WB, WC, GA, GB, GC= 1mm Increment AA, AB, AC = 30° Increment 0°≤ AA, AB, AC ≤330°

・Ordering Code

Keyway Position Specified	Keyway Width Specified	Angle Specified 30° Increment
ZA	HA	AA
ZB	HB	AB
ZC	HC	AC

D, P	7~17	18~40	41~50
H	1	2	3

The length of each set screw flat is the same as that of each keyway.
For a keyway and the angle of a set screw flat, the tolerances may shift by up to ±0.2°.

D	10	12	15	17	20	25	30	35	40	45	50
W	8	10	13	14	17	22	27	30	36	38	41
ℓ	8	10					15		20		

P	7	8~10	11~13	14~15	16~18	19~21	22~25	26~28	29~31	32~37	38~41	42~45	46~49
W1	5.5	7	10	13	14	17	19	22	27	30	36	38	41
ℓ	8	10					15		20				

NA (Coarse) NB (Coarse) Selection

M3	M4	M5	M6	M8
M10	M12	M16	M20	
M24	M30	M36		

P = 7, 8: Retaining Ring Type E P≥9, D≥10: Retaining Ring Type C

Driving Shafts M Material	Driving Shafts H Hardness	Driving Shafts S Surface Treatment	Retaining Ring M Material
S45C	-	-	Spring Steel
		Black Oxide	
		Electroless Nickel Plating	SUS304-CSP
	Surface 50HRC~	-	Spring Steel

Code	Screw Accuracy	
Left End	Right End	
MA MD	MB	Coarse JIS 6h (Class 2)
MSA MSD	MSB	Fine (Standard) JIS 6h (Class 2)
MMA MMD	MMB	Fine (Precision) JIS 4h (Class 1)

M (Coarse)	Pitch	M (Fine)	Pitch	M (Fine)	Pitch
M8	1.25	M8	0.75	M25	1.5
M10	1.5	M10	0.75	M30	1.5
M12	1.75	M12	1.0	M35	1.5
M20	2.5	M15	1.0	M40	1.5
M24	3	M17	1.0	M45	1.5
M30	3.5	M20	1.0	M50	1.5
M36	4				

When D, P=M, thread length can be specified.
Fine (Precision Grade) is not available for KZBE.