Driving Shafts

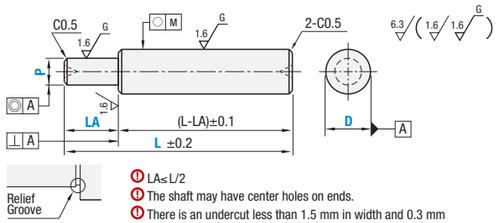
One End Stepped

Rotary Shafts suitable for driving motion. Accuracies and shapes needed for rotary driving applications are selectable.

Driving Shafts – One End Stepped

RoHS 10

Type	D, P Tolerance	Concentricity	Perpendicularity	Material	Hardness	Surface Treatment
KZBE	h7	ϕ0.05	⊥0.05	1045 Carbon Steel or Equivalent	—	Black Oxide
KZBN	h6	ϕ0.01	⊥0.01	1045 Carbon Steel or Equivalent	—	—
KZBC						Black Oxide
KZBP						Electroless Nickel Plating
KZBF				1045 Carbon Steel or Equivalent	Induction Hardened Surface Hardness 50 HRC min.	—



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

D	Tolerance h7	Tolerance h6
10	0 -0.015	0 -0.009
12	0 -0.018	0 -0.011
15		
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		

Part Number Type	Part Number D	0.5 mm Increment L	1 mm Increment P	0.5 mm Increment LA
KZBE (D10–30) KZBN KZBC KZBP KZBF	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
	25	100.0–500.0	14–24	
	30		20–29	20.0–150.0
	*35		20–34	
	*40	200.0–500.0	20–39	
	*45		20–44	
	*50		25–49	20.0–200.0

! * marked sizes are not available for KZBE.

Part Number Example

Part Number	-	L	-	P	-	LA
KZBN30	-	320	-	P25	-	LA40

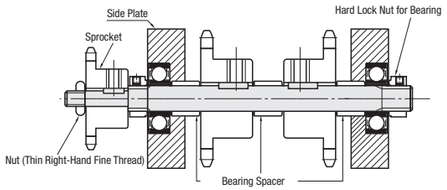
KZBF (Induction Hardened)

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

Available Types

Type	KZBE					KZBN, KZBC, 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	—	—	—	—	—	—	•	•	•	•

Application Example

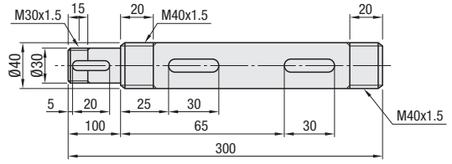


Selection of Driving Shaft

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 No. >

Alteration Selection: Three Keyways, Three Threaded Ends (Fine Thread)



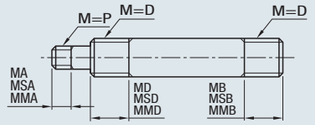
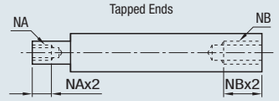
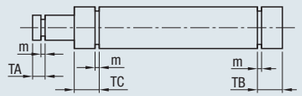
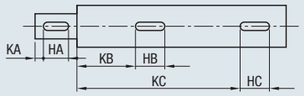
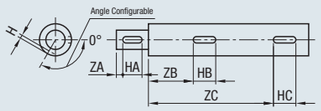
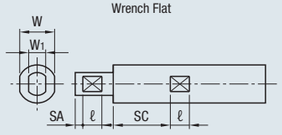
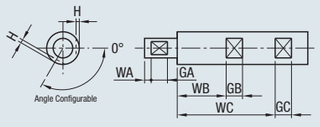
MiSUMi

Driving Shafts

One End Stepped, *continued*

Part Number 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. (For accuracy, coarse or fine threads can be specified by an ordering code.) **Ordering Code:** MA15-MSB15 1 mm Increment 5≤Thread Length≤Mx5, LA-2
Tapped Ends 	NA	NB	Adds a tap at the shaft end. 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= 1 mm Increment 4≤TA≤LA-3 ! Retaining rings are attached. ! For dimensions of the retaining ring groove / see **P.853**. ⊗ P = 27, 31, 33–34, 36–39 & 41–44 not available for 46–48.
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 = 1 mm Increment ! 3≤HA / HB / HC≤100 ! For keyway details refer to **P.853**. ! 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 = 1 mm Increment AA / AB / AC = 30° Increment 30°≤AA / AB / AC≤330° ! 3≤HA / HB / HC≤100 ! For keyway details refer to **P.853**. ! Specify the keyway position more than 2mm away from the stepped part.
Wrench Flat 	SA SC		Adds a Wrench Flat. Specify the position of a wrench flat. **Ordering Code:** SA5 SA / SC= 1 mm 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, length and the angle of the set screw flats. When 0° is specified, only one set screw flat is machinable. **Ordering Code:** WA15-GA10-AA0WA / WB / WC / GA / GB / GC=1 mm 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°.

Ordering Code:

Set Screw Flat Position Specified	Set Screw Flat Width Specified	Angle Specified 30° Increment
WA	GA	AA
WB	GB	AB
WC	GC	AC

D	10–17	18–40	45, 50
H	1	2	3

Code Left End	Code Right End	Screw Precision		M (Coarse)	Pitch	M (Fine)	Pitch	M (Fine)	Pitch
MA	MB	Coarse	JIS6h (Class 2)	M8	1.25	M8	0.75	M25	1.5
MSA	MSB	Fine (Coarse)	JIS6h (Class 2)	M10	1.5	M10	0.75	M30	1.5
MMA	MMB	Fine (Precision)	JIS4h (Class 1)	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 Thread (Precision Class) is not available for KZBE.

NA (Coarse) NB (Coarse) Selection

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

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				

Driving Shafts

Material	Hardness	Surface Treatment	Retaining Ring Material
1045 Carbon Steel or Equivalent	—	—	Spring Steel
		Black Oxide	
		Electroless Nickel Plating	304 Stainless Steel-CSP
	Surface 50 HRC min.	—	Spring Steel

! For dimensions of the retaining ring groove **P.853**.
! For Keyway details, see **P.853**.