

Driving Shafts

Straight

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

Driving Shafts – Straight

RoHS10

Type	D Tolerance	Material	Hardness	Surface Treatment	D		Circularity M		
					h7	h6	Unhardened	Hardened	
KZAN	h7	1045 Carbon Steel or Equivalent	—	—	10	0	10	0.004	
KZAC					12	-0.015	-0.009		12
KZAP					15	0	0		15
KZAF	h6	1045 Carbon Steel or Equivalent	Induction Hardened	Surface Hardness 50 HRC min.	17	-0.018	-0.011	17	0.005
					20	0	0	20	
					25	0	0	25	
					30	-0.021	-0.013	30	
					35	0	0	35	
					40	0	0	40	
					45	-0.025	-0.016	45	
50	0	0	50	0.007					

Please note that D dimension tolerance of KZAF is different from that of KZAN, KZAC and KZAP.

*For KZAF, 1.6/1.6 G will be 1.6/1.6 G. *KZAF may have Center holes on shaft ends.

Type	Part Number	
	D	L
KZAN KZAC KZAP KZAF	10	50.0–300.0
	12	100.0–400.0
	15	
	17	
	20	
KZAF	25	100.0–500.0
	30	
	35	
	40	200.0–500.0
	45	
50		

KZAF (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:

- Due to thermal conduction to the thread, the threads may be hardened by 2–3 mm.
- Induction Hardened may shrink the keyway width (around -0.01–-0.02). If the key becomes hard to fit, adjust it by gauging.

Part Number Example: **KZAN50 - 500**

Available Types

Type	KZAN, KZAC, KZAP				
	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	•	•	•	•	•

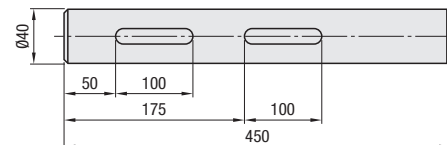
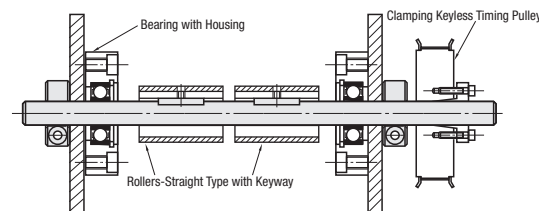
Type	KZAF				
	Min. L–100.0	L100.5–200.0	L200.5–300.0	L300.5–400.0	L400.5–500.0
10	•	•	•	—	—
12	•	•	•	—	—
15	•	•	•	—	—
17	•	•	•	—	—
20	•	•	•	—	—
25	•	•	•	•	•
30	•	•	•	•	•
35	•	•	•	•	•
40	•	•	•	•	•
45	—	•	•	•	•
50	—	•	•	•	•

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 No. >
Alteration Selection: Two Keyways

Application Example



The example below shows the keyway shape under the following conditions:
 KA / KB / KC / KD / ZA / ZB / ZC / ZD = 0
 KA + HA / KB + HB / KC + HC / KD + HD / ZA + HA / ZB + HB / ZC + HC / ZD + HD = L



Driving Shafts

Straight, continued

Part Number Alterations: **KZAF40 - 450 - KA50 - HA100 - KB175 - HB100**

Alterations	Code		Spec.																																																																						
	Left End	Right End																																																																							
Threaded Ends 	MA MSA MMA	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 <table border="1"> <thead> <tr> <th colspan="2">Code</th> <th colspan="2">Screw Precision</th> <th>M (Coarse)</th> <th>Pitch</th> <th>M (Fine)</th> <th>Pitch</th> <th>M (Fine)</th> <th>Pitch</th> </tr> </thead> <tbody> <tr> <td>Left End</td> <td>Right End</td> <td>M10</td> <td>1.5</td> <td>M10</td> <td>0.75</td> <td>M25</td> <td>1.5</td> <td></td> <td></td> </tr> <tr> <td>MA</td> <td>MB</td> <td>Coarse</td> <td>JIS 6h (Class 2)</td> <td>M12</td> <td>1.75</td> <td>M12</td> <td>1.0</td> <td>M30</td> <td>1.5</td> </tr> <tr> <td>MSA</td> <td>MSB</td> <td>Fine (Coarse)</td> <td>JIS 6h (Class 2)</td> <td>M20</td> <td>2.5</td> <td>M15</td> <td>1.0</td> <td>M35</td> <td>1.5</td> </tr> <tr> <td>MMA</td> <td>MMB</td> <td>Fine (Precision)</td> <td>JIS 4h (Class 1)</td> <td>M30</td> <td>3.5</td> <td>M17</td> <td>1.0</td> <td>M40</td> <td>1.5</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>M20</td> <td>1.0</td> <td>M45</td> <td>1.5</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>M50</td> <td>1.5</td> </tr> </tbody> </table> <p>Ⓢ When D=M, thread length can be specified. Ⓢ MMA / MMB (Fine Thread / Precision Class) is available for KZAF only.</p>	Code		Screw Precision		M (Coarse)	Pitch	M (Fine)	Pitch	M (Fine)	Pitch	Left End	Right End	M10	1.5	M10	0.75	M25	1.5			MA	MB	Coarse	JIS 6h (Class 2)	M12	1.75	M12	1.0	M30	1.5	MSA	MSB	Fine (Coarse)	JIS 6h (Class 2)	M20	2.5	M15	1.0	M35	1.5	MMA	MMB	Fine (Precision)	JIS 4h (Class 1)	M30	3.5	M17	1.0	M40	1.5							M20	1.0	M45	1.5									M50	1.5
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Tapped Ends 	NA	NB	Adds a tap at the shaft end. Select the thread diameter. Ordering Code: NA5-NB5 Ⓢ NA, NB≤D-4 <table border="1"> <thead> <tr> <th>NA (Coarse)</th> <th>NB (Coarse)</th> </tr> </thead> <tbody> <tr> <td>M3 M4 M5 M6 M8</td> <td>Selectable</td> </tr> <tr> <td>M10 M12 M16 M20</td> <td></td> </tr> <tr> <td>M24 M30 M36</td> <td></td> </tr> </tbody> </table>	NA (Coarse)	NB (Coarse)	M3 M4 M5 M6 M8	Selectable	M10 M12 M16 M20		M24 M30 M36																																																															
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Retaining Ring Groove 	TA	TB	Adds a retaining ring groove. Specify the position of a retaining ring groove. Ordering Code: TA10-TB10 TA / TB=1 mm Increment 4≤TA (TB) Ⓢ Retaining rings are included. Ⓢ For dimensions of the retaining ring groove, see P.853. <table border="1"> <thead> <tr> <th colspan="3">Driving Shafts</th> <th>Retaining Ring Type C</th> </tr> <tr> <th>Material</th> <th>Hardness</th> <th>Surface Treatment</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td rowspan="3">1045 Carbon Steel or Equivalent</td> <td rowspan="3">Surface 50 HRC min.</td> <td>—</td> <td>Spring Steel</td> </tr> <tr> <td>Black Oxide</td> <td>—</td> </tr> <tr> <td>Electroless Nickel Plating</td> <td>304 Stainless Steel-CSP</td> </tr> </tbody> </table>	Driving Shafts			Retaining Ring Type C	Material	Hardness	Surface Treatment	Material	1045 Carbon Steel or Equivalent	Surface 50 HRC min.	—	Spring Steel	Black Oxide	—	Electroless Nickel Plating	304 Stainless Steel-CSP																																																						
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Keyway 	KA KB KC KD		Adds a keyway. Specify the position and the length of the keyway. Ordering Code: KA10-HA30-KB100-HB50 KA / HA / KB / HB / KC / HC / KD / HD = 1 mm Increment Ⓢ 3≤HA / HB / HC / HD≤100 Ⓢ For keyway details refer to P.853. Ⓢ When more than 2 keyways are added, the tolerances may shift by up to 0.2".																																																																						
Keyway Machining + Set Screw Flat 	ZA ZB ZC ZD		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 / ZD / HD=1 mm Increment AA / AB / AC / AD=30° Increment 30°≤AA / AB / AC / AD≤330° Ⓢ 3≤HA / HB / HC / HD≤100 Ⓢ For keyway details refer to P.853. <table border="1"> <thead> <tr> <th rowspan="2">Keyway Position Specified</th> <th rowspan="2">Keyway Width Specified</th> <th rowspan="2">Angle Specified 30° Increment</th> <th colspan="3">D</th> </tr> <tr> <th>10–17</th> <th>18–40</th> <th>45, 50</th> </tr> </thead> <tbody> <tr> <td>ZA</td> <td>HA</td> <td>AA</td> <td>H</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>ZB</td> <td>HB</td> <td>AB</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>ZC</td> <td>HC</td> <td>AC</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>ZD</td> <td>HD</td> <td>AD</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Ⓢ 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".</p>	Keyway Position Specified	Keyway Width Specified	Angle Specified 30° Increment	D			10–17	18–40	45, 50	ZA	HA	AA	H	1	2	3	ZB	HB	AB					ZC	HC	AC					ZD	HD	AD																																					
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Wrench Flat 	SC		Adds a Wrench Flat. Specify the position of a wrench flat. Ordering Code: SC180SC = 1 mm Increment 0≤SC≤L-ℓ <table border="1"> <thead> <tr> <th>D</th> <th>10</th> <th>12</th> <th>15</th> <th>17</th> <th>20</th> <th>25</th> <th>30</th> <th>35</th> <th>40</th> <th>45</th> <th>50</th> </tr> </thead> <tbody> <tr> <td>W</td> <td>8</td> <td>10</td> <td>13</td> <td>14</td> <td>17</td> <td>22</td> <td>27</td> <td>30</td> <td>36</td> <td>38</td> <td>41</td> </tr> <tr> <td>ℓ</td> <td>8</td> <td></td> <td></td> <td></td> <td>10</td> <td></td> <td></td> <td>15</td> <td></td> <td></td> <td>20</td> </tr> </tbody> </table>	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																																		
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2 Set Screw Flats (Angle Specified) 	WA WB WC	GA GB GC	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 = 1 mm Increment AA / AB / AC=30° Increment 0°≤AA / AB / AC≤ 330° <table border="1"> <thead> <tr> <th rowspan="2">Set Screw Flat Position Specified</th> <th rowspan="2">Set Screw Flat Width Specified</th> <th rowspan="2">Angle Specified 30° Increment</th> <th colspan="3">D</th> </tr> <tr> <th>10–17</th> <th>18–40</th> <th>45, 50</th> </tr> </thead> <tbody> <tr> <td>WA</td> <td>GA</td> <td>AA</td> <td>H</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>WB</td> <td>GB</td> <td>AB</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>WC</td> <td>GC</td> <td>AC</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Set Screw Flat Position Specified	Set Screw Flat Width Specified	Angle Specified 30° Increment	D			10–17	18–40	45, 50	WA	GA	AA	H	1	2	3	WB	GB	AB					WC	GC	AC																																												
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Ⓢ For dimensions of the retaining ring groove P.853.
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