

High Lead Precision Rolled Ball Screws LPR Series

Compact ball nut heralding in the next generation standard.
Extended maintenance free operation with NSK K1[®]
lubrication unit and new grease retaining seal.
Suitable for high speed and long stroke operation.



A 25% reduction in the ball nut diameter compared to the current series

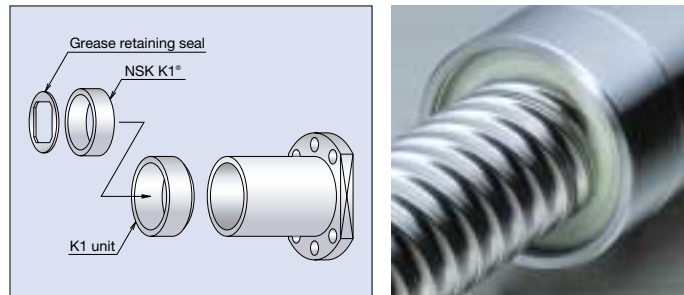
No backlash, high speed and long stroke operation is possible. Extended maintenance free operation achieved with **NSK K1®** lubrication unit and new grease retaining seal, thus contributing to total cost reduction.

Compact ball nut

- Saves assembly space
- Suitable for rotating ball nut applications because of its low inertia and balanced design

Remarkable improvement in sealing performance (introduction of grease retaining seal)

- Grease retention capabilities substantially enhanced
- Assists clean environment maintenance due to minimum grease scattering
- Superb sealing capabilities in contaminated environments

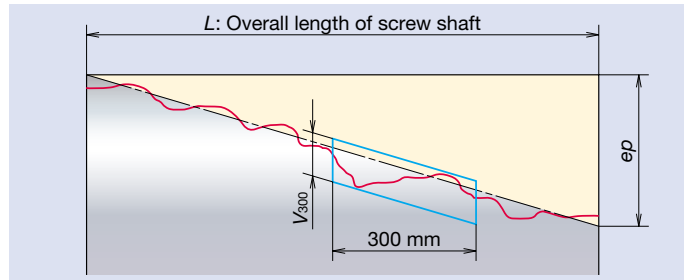


Maintenance free (equipped with NSK K1® lubrication unit as a standard feature)

NSK K1® lubrication unit, that is molded from resin and is impregnated with lubrication oil, supplies fresh oil onto the ball rolling surfaces. In unison with grease it retains the lubricating ability for an extended period of time. Since its first appearance on the market in 1996, it has been widely accepted in many industrial fields.

Accuracy grade

Accuracy grades of Ct5 and Ct7 are available.



Grade	Ct5	Ct7
ep: Tolerance on specified travel	$ep = \frac{2 \cdot L}{300} \cdot V_{300}$ (mm)	
	L: Overall length of screw shaft	
Travel variation in a 300 mm range (anywhere in useful travel)	0.023 mm	0.052 mm

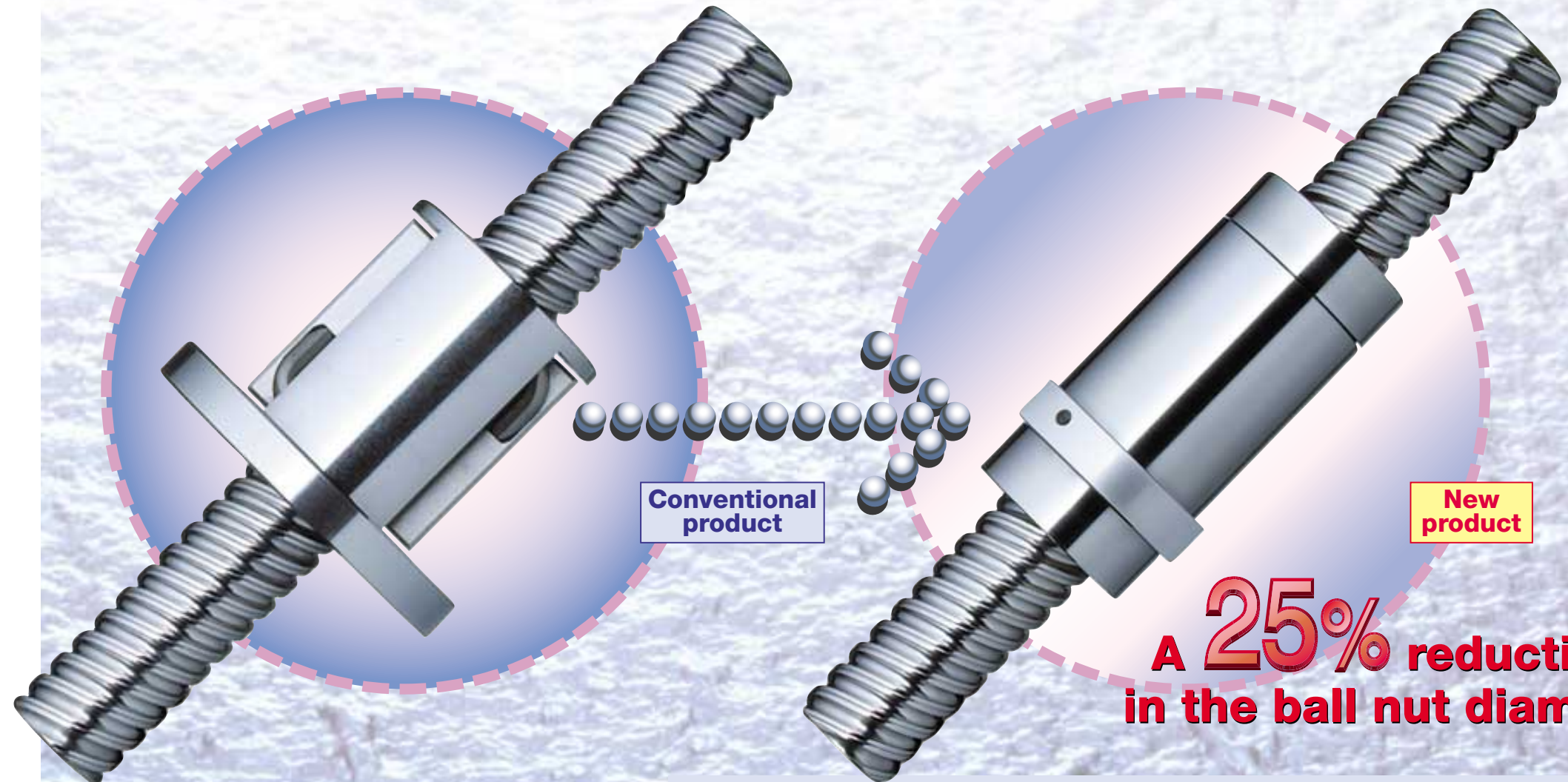
Options

Support unit (sold separately)
NSK provides the support bearing units to accompany the ball screw shafts. For further details, please refer to the NSK catalog: Precision Machine Components (CAT. No. E3159). The bearing journal configurations of the screw shaft are provided on the following pages.

Applications

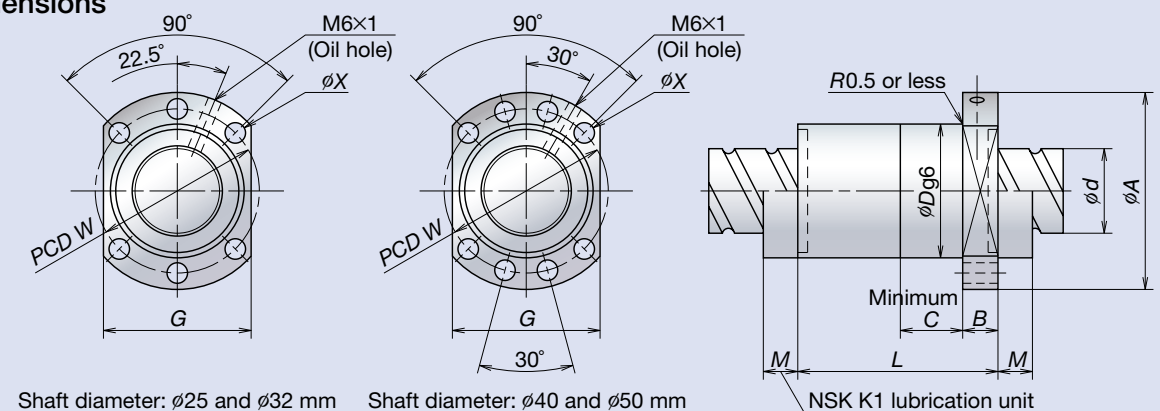
Woodworking machines,
general transporting equipment,
feeders, robots, etc.

High Lead Precision Rolled Ball Screws LPR Series



A 25% reduction in the ball nut diameter

Ball nut dimensions



Model No.	Shaft diameter d	Lead l	Effective turns of balls	Basic load rating (N)		Dimensions										Maximum screw shaft length	
				Dynamic load rating C _a	Static load rating C _{0a}	D	A	G	B	L	C	W	X	M	Ct5	Ct7	
LPR2525	25	25	1.7×2	11 000	27 500	40	62	48	14	63	30	51	6.5	21	2 500	3 200	
LPR3232	32	32	1.7×2	16 300	43 900	50	80	62	14	79	40	65	9	21	3 200	4 000	
LPR4040	40	40	1.7×2	29 000	76 200	63	93	70	16	94	45	78	9	21	4 000	6 500	
LPR5050	50	50	1.7×2	32 200	96 200	75	110	85	18	115	45	93	11	21	4 000	6 500	

Unit: mm

1. High Lead Precision Rolled Ball Screws LPR Series

1.1 Specification number

For ordering, please quote the specification number.

Reference number: **H S P 40 40 K D - 2002 S A1**

Accuracy grade and axial play
HSP (Ct5, axial play 0 mm)
VSP (Ct7, axial play 0 mm)

Model number
2525: Screw shaft diameter 25, Lead 25
3232: Screw shaft diameter 32, Lead 32
4040: Screw shaft diameter 40, Lead 40
5050: Screw shaft diameter 50, Lead 50

K: Equipped with NSK K1 unit
N: No NSK K1 unit
(Equipped with grease retaining seal only)

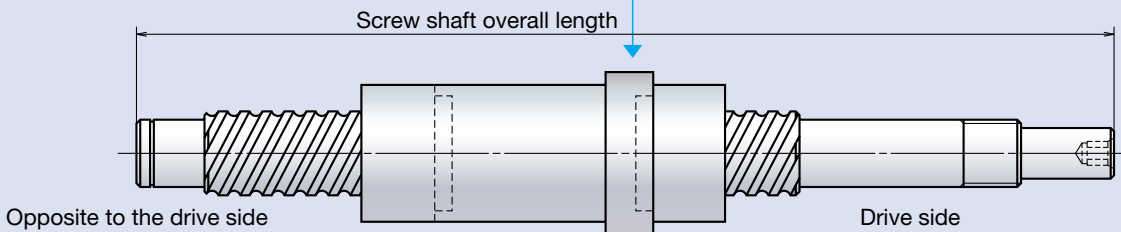
Position of ball nut flange
D: Screw shaft drive side
S: Opposite to drive side

Bearing journal for fixed support side: please refer to the configuration of the screw shaft end outlined in the catalog.

Bearing journal for simple support side: please refer to the configuration of the screw shaft end outlined in the catalog.

Overall length of screw shaft
If the length is less than 1000 mm, enter 0 to the fourth digit.
The available lengths are as follows:

Model number	Ct5	Ct7
2525	0300—2500	0300—3200
3232	0300—3200	0300—4000
4040	0500—4000	0300—6500
5050	0500—4000	0300—6500



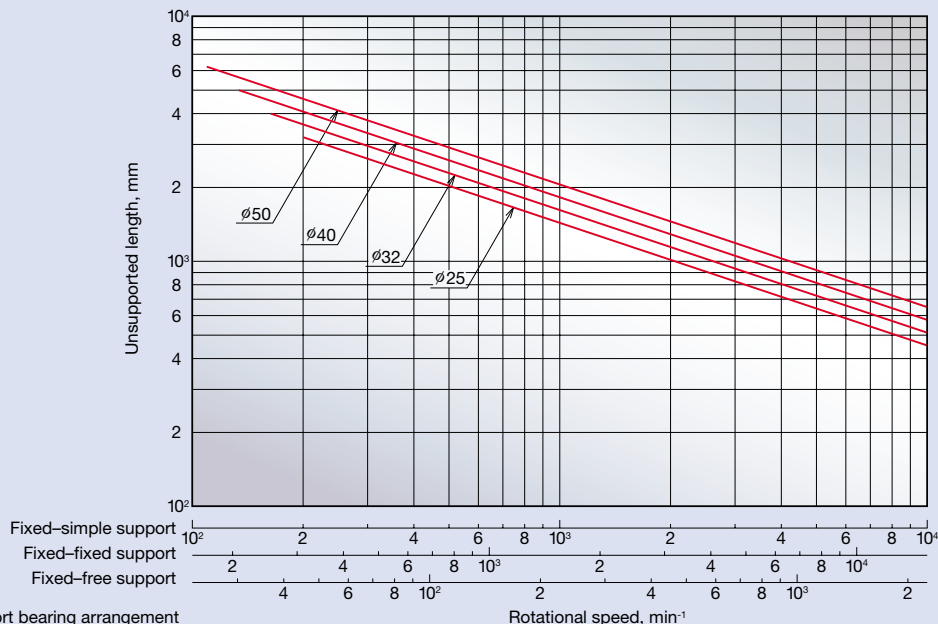
1.2 Permissible rotational speed of high lead precision rolled ball screws

We strongly recommend reviewing the allowable speed of the screw shaft.

The allowable rotational speed of the ball screw shall be checked on the following.

- $d \cdot N$ value, which is involved in damaging the ball re-circulation components
(Where, d : shaft diameter measured in mm, N : rotational speed measured in rpm)
- Critical speed of the screw shaft (caused by the resonance of the screw shaft)
- Permissible $d \cdot N$
Preferably 150 000 rpm or less ($d \cdot N \leq 150\,000$). Please consult with NSK if your ball screw exceeds the limitation.
- Critical speed
See the chart below. For detailed calculations, please refer to the catalog: Precision Machine Component (CAT No. E3159).

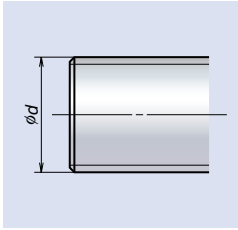
Permissible rotational speed vs. critical speed.



2. Recommendation of Screw Shaft End Configuration

2.1 Opposite to drive side shaft end: P

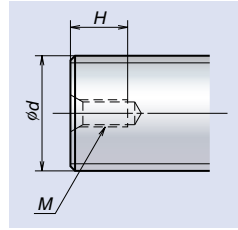
Unit: mm



Screw shaft
Diameter d
25
32
40
50

2.2 Opposite to drive side shaft end: R

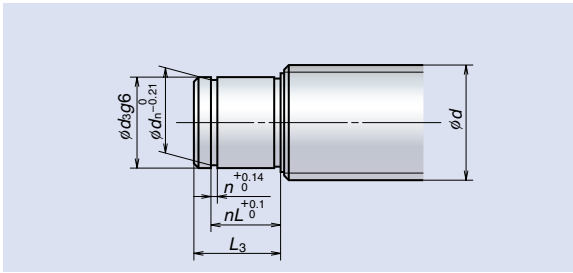
Unit: mm



Screw shaft	Tap hole	
Diameter d	Size M	Depth H
25	M6×1	12
32	M6×1	12
40	M8×1.25	16
50	M8×1.25	16

2.3 Opposite to drive side shaft end: S

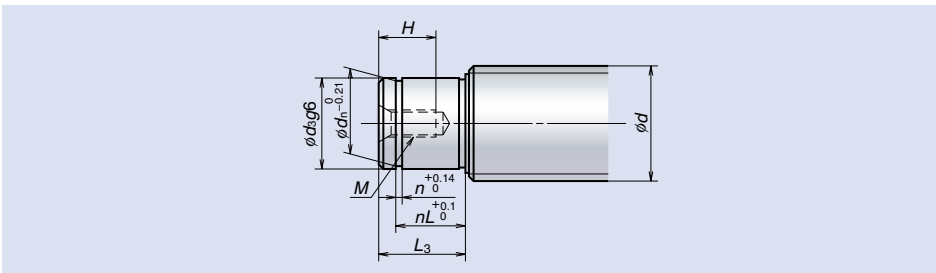
Unit: mm



Support unit	Screw shaft	Bearing journal		Snap ring groove		
Reference number	Diameter d	Diameter d_3	Length L_3	Width n	Diameter dn	Position nL
WBK20S-01	25	20	19	1.35	19	15.35
WBK25S-01	32	25	20	1.35	23.9	16.35
(6206)	40	30	22	1.75	28.6	17.75
(6207)	50	35	25	1.75	33	18.75

(): Reference number of bearing

2.4 Opposite to drive side shaft end: T

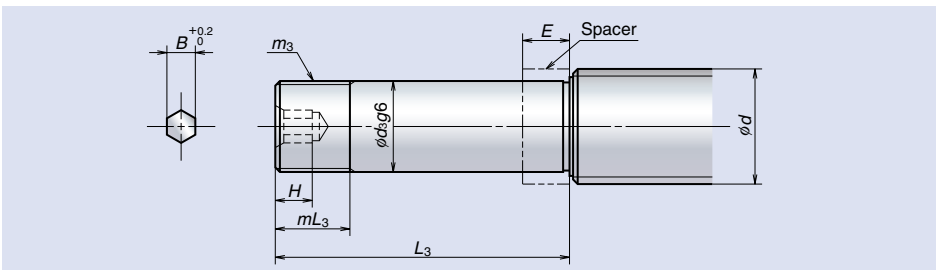


Unit: mm

Support unit	Screw shaft	Bearing journal		Snap ring groove			Tap hole	
Reference number	Diameter d	Diameter d_3	Length L_3	Width n	Diameter dn	Position nL	Size M	Depth H
WBK20S-01	25	20	19	1.35	19	15.35	M6×1	12
WBK25S-01	32	25	20	1.35	23.9	16.35	M6×1	12
(6206)	40	30	22	1.75	28.6	17.75	M8×1.25	16
(6207)	50	35	25	1.75	33	18.75	M8×1.25	16

(): Reference number of bearing

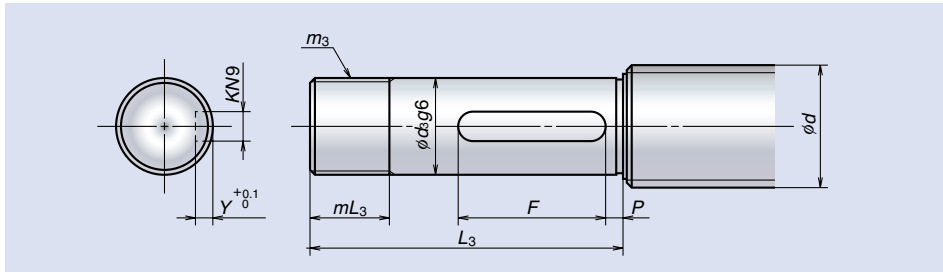
2.5 Opposite to drive side shaft end: U



Unit: mm

Support unit		Spacer	Screw shaft	Bearing journal		Lock nut thread		Hexagon hole	
Reference number		Reference number	Diameter d	Diameter d_3	Length L_3	Nominal m_3	Length mL_3	Width across the flats B	Depth H
WBK20-01	WBK20-11	WBK20K	25	20	64	M20×1	16	6	8
WBK25-01	WBK25-11	WBK25K	32	25	76	M25×1.5	20	8	10
WBK30DF-31		Not required	40	30	89	M30×1.5	26	10	12
WBK35DF-31		Not required	50	35	92	M35×1.5	30	12	14

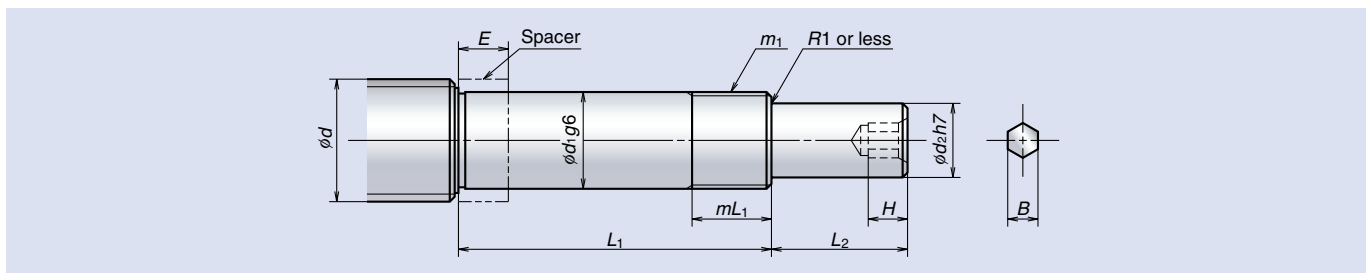
2.6 Opposite to drive side shaft end: V



Unit: mm

Support unit	Screw shaft	Bearing journal	Lock nut thread		Key seat				
Reference number	Diameter d	Diameter d_3	Length L_3	Nominal m_3	Length mL_3	Width K	Position P	Depth Y	Length F
	25	20	64	M20×1	16	6	4	3.5	30
	32	25	76	M25×1	20	8	4	4	40
	40	30	89	M30×1.5	26	8	5	4	40
	50	35	92	M35×1.5	30	10	5	5	50

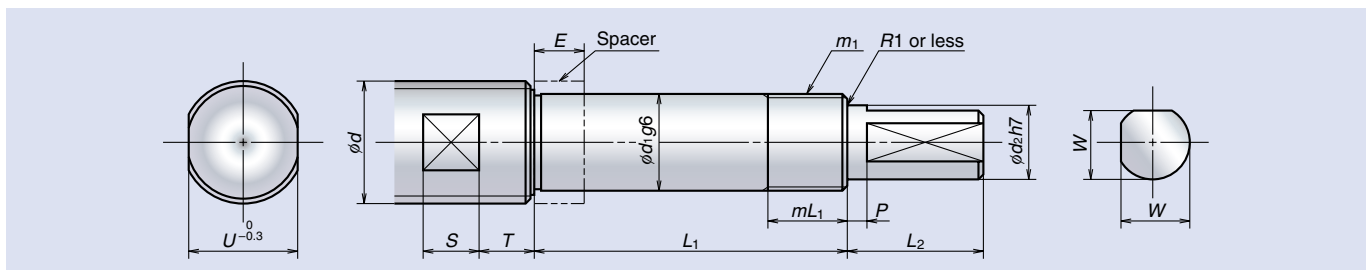
2.7 Drive side shaft end: A1



Unit: mm

Support unit	Spacer	Screw shaft	Bearing journal	Lock nut thread		Drive section		Hexagon hole			
Reference number	Reference number	Diameter d	Diameter d_1	Length L_1	Nominal m_1	Length mL_1	Diameter d_2	Length L_2	Width across the flats B	Depth H	
WBK20-01	WBK20-11	WBK20K	25	20	64	M20×1	16	15	27	6	8
WBK25-01	WBK25-11	WBK25K	32	25	76	M25×1.5	20	20	33	8	10
WBK30DF-31	Not required	40	30	89	M30×1.5	26	25	61	10	12	
WBK35DF-31	Not required	50	35	92	M35×1.5	30	30	63	12	14	

2.8 Drive side shaft end: A3

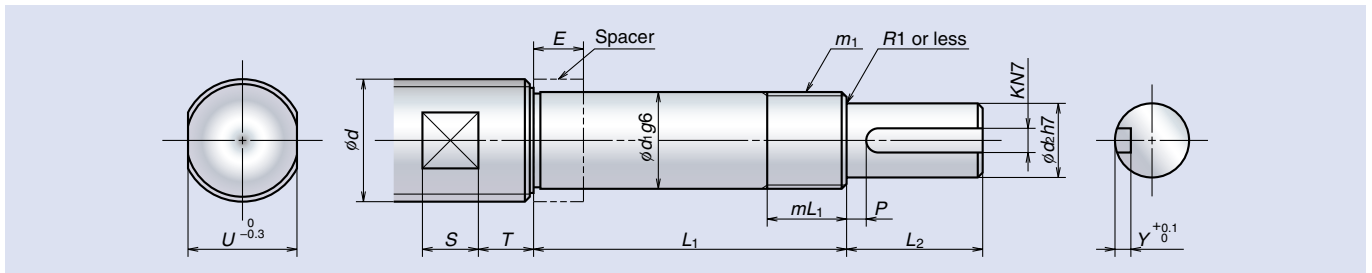


Unit: mm

Support unit	Spacer	Screw shaft	Bearing journal	Lock nut thread		Drive section		D		Wrench flats				
Reference number	Reference number	Diameter d	Diameter d_1	Length L_1	Nominal m_1	Length mL_1	Diameter d_2	Length L_2	Position P	Depth W	Width across the flats U	Position T	Length S	
WBK20-01	WBK20-11	WBK20K	25	20	64	M20×1	16	15	27	4	14	22	10	11
WBK25-01	WBK25-11	WBK25K	32	25	76	M25×1.5	20	20	33	4	19	32	10	15
WBK30DF-31	Not required	40	30	89	M30×1.5	26	25	61	5	24	36	16	16	
WBK35DF-31	Not required	50	35	92	M35×1.5	30	30	63	5	29	41	16	18	

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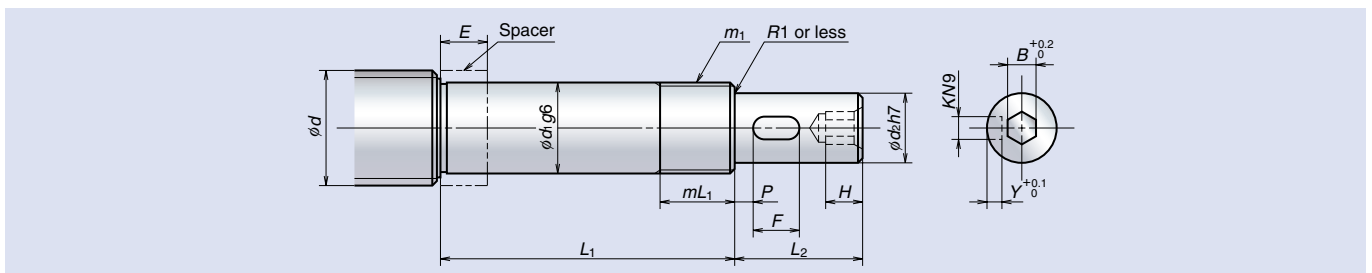
2.9 Drive side shaft end: A4



Unit: mm

Support unit		Spacer	Screw shaft			Lock nut thread		Drive section		Key seat			Wrench flats		
Reference number		Reference number	Diameter d	Diameter d_1	Length L_1	Nominal m_1	Length mL_1	Diameter d_2	Length L_2	Width K	Position P	Depth Y	Width across the flats U	Position T	Length S
WBK20-01	WBK20-11	WBK20K	25	20	64	M20×1	16	15	27	5	4	3	22	10	11
WBK25-01	WBK25-11	WBK25K	32	25	76	M25×1.5	20	20	33	6	4	3.5	32	10	15
WBK30DF-31		Not required	40	30	89	M30×1.5	26	25	61	8	5	4	36	16	16
WBK35DF-31		Not required	50	35	92	M35×1.5	30	30	63	8	5	4	41	16	18

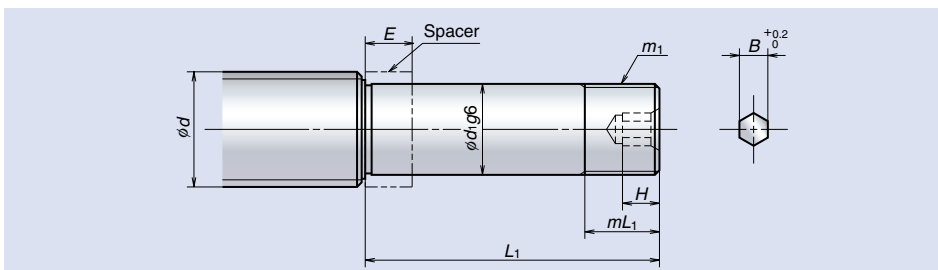
2.10 Drive side shaft end: A5



Unit: mm

Support unit		Spacer	Screw shaft			Lock nut thread		Drive section		Key seat			Hexagon hole		
Reference number		Reference number	Diameter d	Diameter d_1	Length L_1	Nominal m_1	Length mL_1	Diameter d_2	Length L_2	Width K	Position P	Depth Y	Length F	Width across the flats B	Depth H
WBK20-01	WBK20-11	WBK20K	25	20	64	M20×1	16	15	27	5	4	3	10	6	8
WBK25-01	WBK25-11	WBK25K	32	25	76	M25×1.5	20	20	33	6	4	3.5	15	8	10
WBK30DF-31		Not required	40	30	89	M30×1.5	26	25	61	8	5	4	40	10	12
WBK35DF-31		Not required	50	35	92	M35×1.5	30	30	63	8	5	4	40	12	14

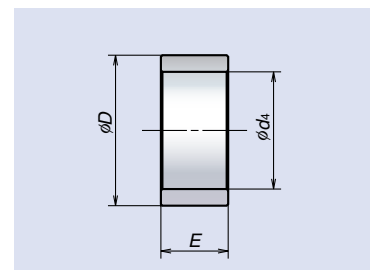
2.11 Drive side shaft end: C



Unit: mm

Support unit		Spacer	Screw shaft			Lock nut thread		Hexagon hole	
Reference number		Reference number	Diameter d	Diameter d_1	Length L_1	Nominal m_1	Length mL_1	Width across the flats B	Depth H
WBK20-01	WBK20-11	WBK20K	25	20	64	M20×1	16	6	8
WBK25-01	WBK25-11	WBK25K	32	25	76	M25×1.5	20	8	10
WBK30DF-31		Not required	40	30	89	M30×1.5	26	10	12
WBK35DF-31		Not required	50	35	92	M35×1.5	30	12	14

2.12 Spacer



Unit: mm

Reference number	Bearing journal	Spacer dimensions		
	Diameter d_1	Bore d_4	Diameter D	Width E
WBK20K	20	20	25.5	11
WBK25K	25	25	32	14