

+ BALL SCREWS – INTERCHANGEABLE



As one of the world's leading manufacturers of rolling bearings, linear technology components and steering systems, we can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.



The NSK company

NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context, we develop technologies in the fields of rolling bearings, linear systems, components for the automotive industry and mechatronic systems. Our research and production facilities in Europe, Americas and Asia are linked together in a global technology

network. Here we concentrate not only on the development of new technologies, but also on the continuous optimisation of quality – at every process stage.

Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

Trademarks on this catalogue

All NSK product and service names listed in this catalogue are trademarks or registered trademarks of NSK Ltd.

Ball Screws – Interchangeable

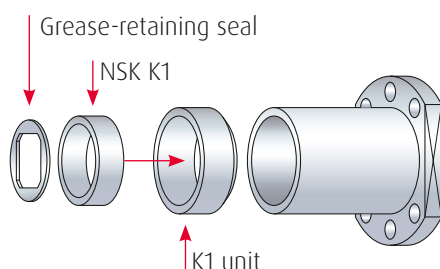
NSK developed the 'Ball screws – interchangeable' series based on many years of experience and with the help of the most advanced technology. The series complies 100% with DIN 69051. The spindle nut and spindle shaft are available separately and are universally exchangeable. The new 'Ball screws – interchangeable' series features an extreme reduction in noise and can be used in high-speed applications. As an option, the NSK K1 lubrication unit, proven in use over many years, can be integrated.

Features

- › Nut and shaft are completely interchangeable
- › 100% DIN-compliant
- › High-speed/low-noise nut design
($d \cdot n = 160.000$, max 5000 1/min)

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

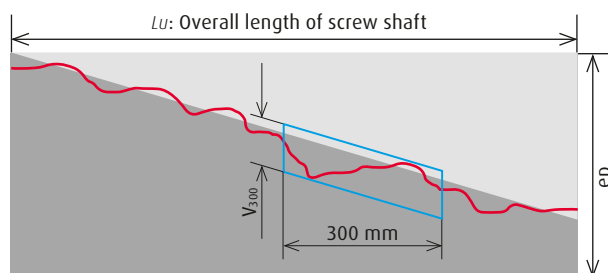


Maintenance-free long-term with NSK K1 lubrication unit (sold separately)

- › NSK K1 is a lubrication unit which combines oil and resin in a single unit
- › The porous resin contains a large amount of lubrication oil
- › The NSK K1 contacts the shaft raceway, giving a constant supply of fresh oil which seeps from the resin
- › NSK K1 lubrication has been accepted in many industrial fields since 1996

Accuracy grade

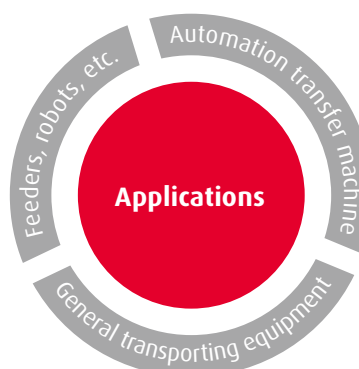
- › An accuracy grade of Ct7 is available



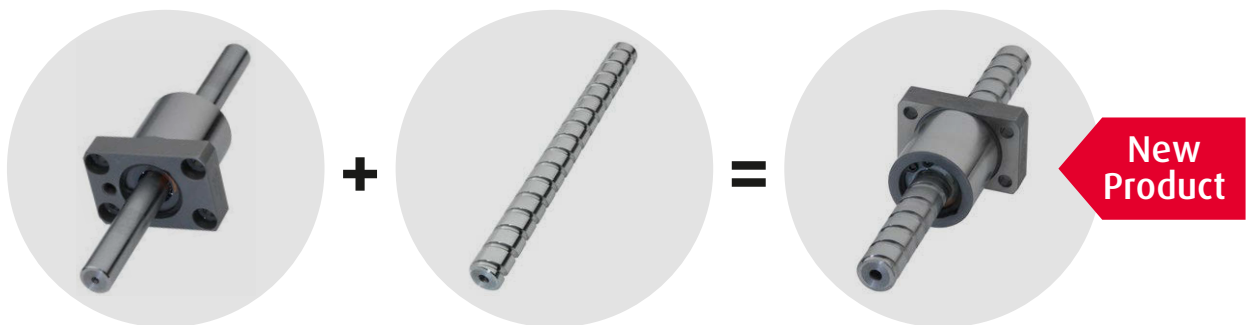
Grade	Ct7
ep: Tolerance on specified travel	$ep = \pm \frac{Lu}{300} \cdot V_{300} \text{ (mm)}$ Lu: Overall length of screw shaft
Travel variation in a 300 mm range (anywhere in useful travel)	0.052 mm
Repeatability	0.003 mm
Clearance	0.020 mm to light preload

Options

- › Support unit (sold separately)
- › NSK provides the support bearing units which go with the ball screw shafts
- › The bearing journal configurations of the screw shaft are provided on the following pages



Ball Screws – Interchangeable

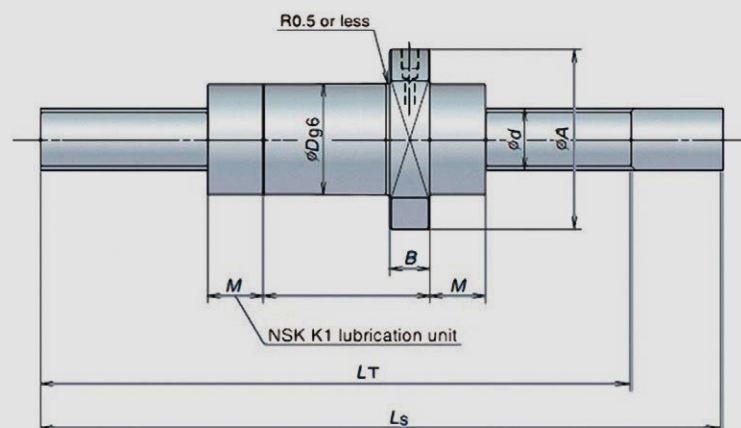


Please use the following designations for your order

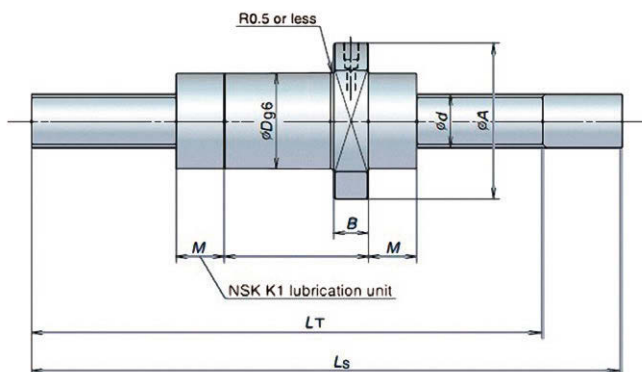
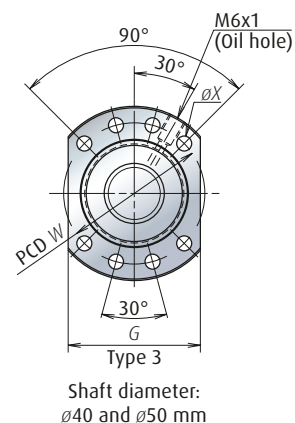
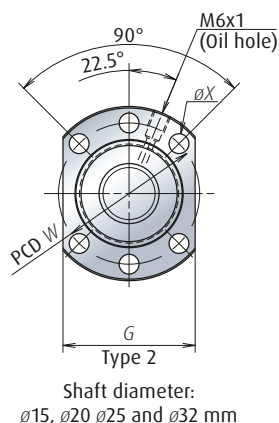
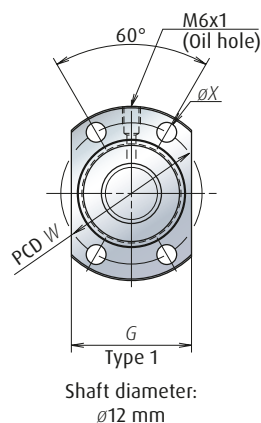
Reference No.:

F C S 40 10 A S N J A 1 4

Accuracy F: C7	F	C	S	40	10	A	S	N	J	A	1	4	Shaft total length A14: Total length Shaft Blank: for Nut
Specification C: Interchangeable													Lubrication J: Rust preventive oil
Item S: Shaft N: Nut													Surface treatment N: No treatment
Spindle diameter (mm)													Clearance S: Less than 0.020 mm
lead (mm)													Specification A: Internal design for Shaft V: Internal Design for Nut



Ball nut dimensions

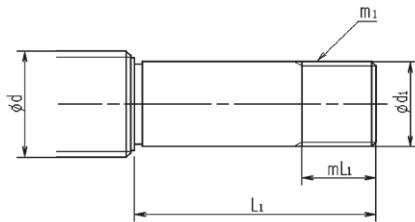


Specification number

Model	Shaft	lead	Ca	Coa	D	A	G	B	L	Type	W	X	M	Short Version		Long Version	
No.	OD [mm]	[mm]	[N]	[N]	[mm]	[mm]	[mm]	[mm]	[mm]	No.	[mm]	[mm]	[mm]	Thread length LT	Total length LS	Thread length LT	Total length LS
FCN1205	12	5	3,750	5,810	24	40	26	11	30	1	32	4.5	(18)	617	800	-	-
FCN1210	12	10	3,750	5,780	24	40	26	11	43	1	32	4.5	(18)	617	800	-	-
FCN1505	15	5	6,410	10,100	28	48	40	11	30	2	38	5.5	(18)	1303	1486	1760	1900
FCN1510	15	10	6,530	10,200	28	48	40	11	43	2	38	5.5	(18)	1303	1486	1760	1900
FCN1520	15	20	5,660	8,700	32	48	40	11	51	2	42	5.5	(18)	1293	1476	1760	1900
FCN2005	20	5	10,400	18,500	36	58	44	13	31	2	47	6.6	(18)	1303	1486	1760	1900
FCN2010	20	10	10,200	18,600	36	58	44	13	45	2	47	6.6	(18)	1303	1486	1760	1900
FCN2020	20	20	6,790	11,800	36	58	44	13	54	2	47	6.6	(18)	1293	1476	1760	1900
FCN2505	25	5	18,500	40,900	40	62	48	12	42	2	51	6.6	(21)	1303	1486	1760	1900
FCN2510	25	10	15,000	32,400	40	62	48	12	56	2	51	6.6	(21)	1303	1486	1760	1900
FCN2520	25	20	7,650	14,800	40	62	48	12	54	2	51	6.6	(21)	1293	1476	1760	1900
FCN2525	25	25	7,490	14,600	40	62	48	12	63	2	51	6.6	(21)	1288	1471	1760	1900
FCN3205	32	5	16,800	41,700	50	80	62	12	41	2	65	9	(21)	1303	1486	1760	1900
FCN3210	32	10	23,000	51,300	50	80	62	12	59	2	65	9	(21)	1303	1486	1760	1900
FCN3220	32	20	22,600	51,100	50	80	62	12	98	2	65	9	(21)	1293	1476	1760	1900
FCN4010	40	10	39,800	90,700	63	93	70	14	60	3	78	9	(21)	1303	1486	1760	1900

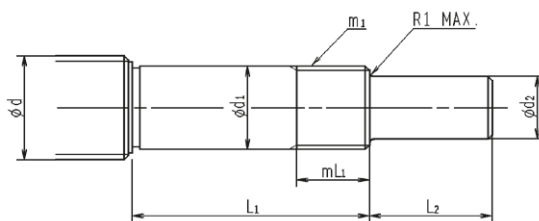
Recommended screw shaft end configuration

Basic 1



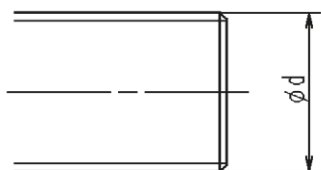
Screw shaft	lead	BSBD					
		Bearing journal		Lock nut thread		Width	
d	l	d1 g6	L1	m1	mL1	BSN/BSF	BSN/BSF-DT
12	all	8	32	M8x1	9	-	-
15	all	12	33	M12x1	10	-	-
20	all	15	38	M15x1	15	25	50
25	all	20	43	M20x1	16	28	56
32	all	25	53	M25x1.5	20	28	56
40	10	30	91	M30x1.5	30	38	76

Basic 2



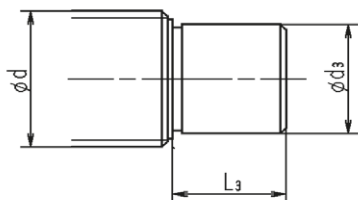
Screw shaft	lead	BSBD							
		Bearing journal		Lock nut thread		Width		Drive section	
d	l	d1 g6	L1	m1	mL1	BSN/BSF	BSN/BSF-DT	d2 h7	L2
12	all	8	32	M8x1	9	-	-	6	10
15	all	12	33	M12x1	10	-	-	10	15
20	all	15	38	M15x1	15	25	50	12	20
25	all	20	43	M20x1	16	28	56	15	27
32	all	25	53	M25x1.5	20	28	56	20	33
40	10	30	91	M30x1.5	30	38	76	25	61

Basic 3



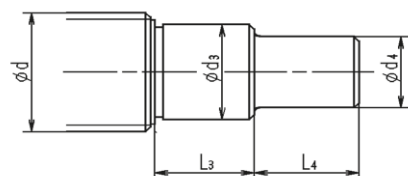
Screw shaft d
12
15
20
25
32
40

Basic 4



Screw shaft d	Support unit WBK
12	WBK08S-01
15	WBK12S-01
20	WBK15S-01
25	WBK20S-01
32	WBK25S-01
40	6206

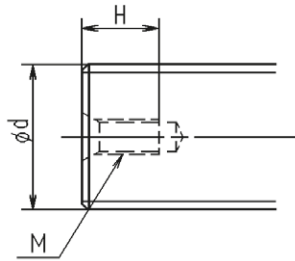
Basic 5



Screw shaft d	Support unit WBK
12	WBK08S-01
15	WBK12S-01
20	WBK15S-01
25	WBK20S-01
32	WBK25S-01
40	6206

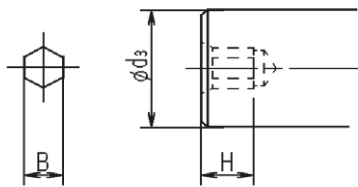
Recommended screw shaft end configuration

Option 1



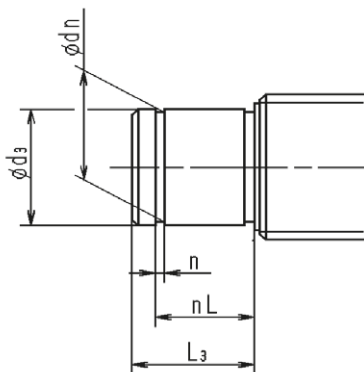
d	M	H
12	M3x0.5	9
15	M4x0.7	10
20	M6x1.0	12
25	M6x1.0	12
32	M6x1.0	12
40	M8x1.25	16

Option 2



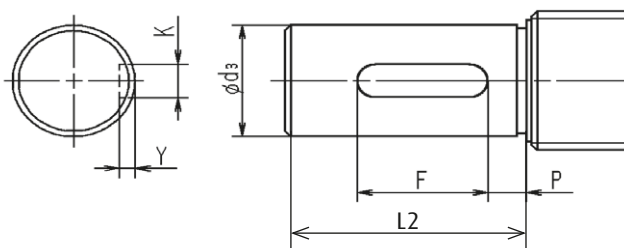
Screw shaft d	Hexagon hole		d3 g6
	B (0/+0.2)	H	
12	-	-	6
15	4	6	10
20	5	7	15
25	6	8	20
32	8	10	25
40	10	12	30

Option 3



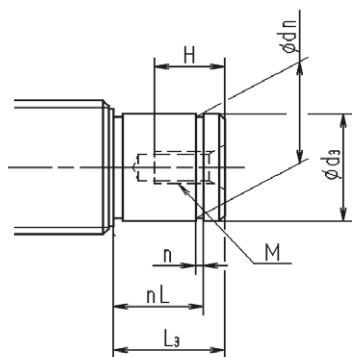
Screw shaft d	Snap ring groove			Bearing journal	
	n	dn	nL	d3 g6	L3
12	0.8 (0/+0.1)	5.7 (0/-0.06)	6.8	6	9
15	1.15 (0/+0.14)	9.6 (0/-0.09)	9.15	10	12
20	1.15 (0/+0.14)	14.3 (0/-0.11)	10.15	15	13
25	1.35 (0/+0.14)	19 (0/-0.21)	15.35	20	19
32	1.35 (0/+0.14)	23.9 (0/-0.21)	16.35	25	20
40	1.75 (0/+0.14)	28.6 (0/-0.21)	17.75	30	22

Option 4



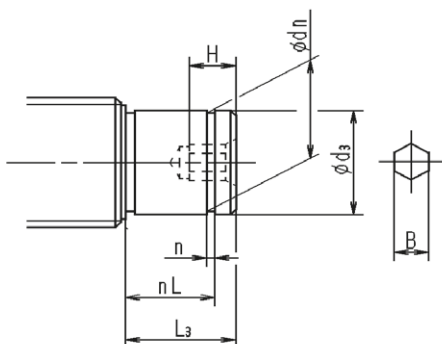
Screw shaft d	Key way				d3 g6	Drive selection L2
	K N9	P	Y (0/+0.1)	F		
12	2	3	1.2	14	8	10
15	4	3	2.5	20	12	15
20	5	3	3	25	15	20
25	6	4	3.5	30	20	27
32	8	4	4	40	25	33
40	8	5	4	40	30	61

Option 5



Screw shaft d	Bearing Journal d3 g6	Snap ring groove			Tap hole		
		n	dn	nL	M	H	L3
12	6	0.8 (0/+0.1)	5.7 (0/-0.06)	6.8	M3x0.5	9	9
15	10	1.15 (0/+0.14)	9.6 (0/-0.09)	9.15	M4x0.7	10	12
20	15	1.15 (0/+0.14)	14.3 (0/-0.11)	10.15	M6x1.0	12	13
25	20	1.35 (0/+0.14)	19 (0/-0.21)	15.35	M6x1.0	12	19
32	25	1.35 (0/+0.14)	23.9 (0/-0.21)	16.35	M6x1.0	12	20
40	30	1.75 (0/+0.14)	28.6 (0/-0.21)	17.75	M8x1.25	16	22

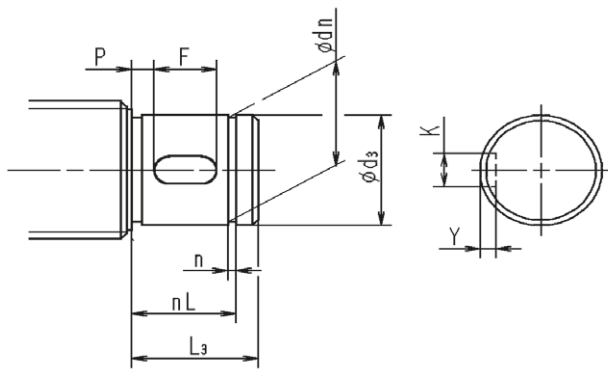
Option 6



Screw shaft d	Bearing Journal d3 g6	Snap ring groove			Hexagon hole		
		n	dn	nL	B (0/+0.2)	H	L3
12	6	0.8 (0/+0.1)	5.7 (0/-0.06)	6.8	-	-	9
15	10	1.15 (0/+0.14)	9.6 (0/-0.09)	9.15	4	6	12
20	15	1.15 (0/+0.14)	14.3 (0/-0.11)	10.15	5	7	13
25	20	1.35 (0/+0.14)	19 (0/-0.21)	15.35	6	8	19
32	25	1.35 (0/+0.14)	23.9 (0/-0.21)	16.35	8	10	20
40	30	1.75 (0/+0.14)	28.6 (0/-0.21)	17.75	10	12	22

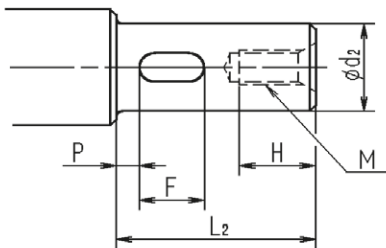
Recommended screw shaft end configuration

Option 7



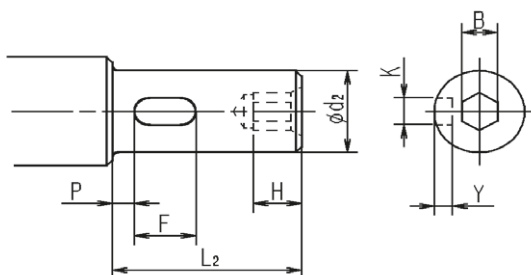
Screw shaft	Snap ring groove			Key way			Bearing journal	
	d	n	dn	nL	K N9	P	F	L3
12		0.8 (0/+0.1)	5.7 (0/-0.06)	6.8	2	3	14	9
15		1.15 (0/+0.14)	9.6 (0/-0.09)	9.15	4	3	20	12
20		1.15 (0/+0.14)	14.3 (0/-0.11)	10.15	5	3	25	13
25		1.35 (0/+0.14)	19 (0/-0.21)	15.35	6	4	30	19
32		1.35 (0/+0.14)	23.9 (0/-0.21)	16.35	8	4	40	20
40		1.75 (0/+0.14)	28.6 (0/-0.21)	17.75	8	5	40	22

Option 8



Screw shaft	Tap hole		Key way				Drive section	
	d	M	H	K N9	P	Y (0/+0.1)	F	L2
12		M3x0.5	9	2	3	1.2	-	10
15		M4x0.7	10	4	3	2.5	-	15
20		M6x1.0	12	5	3	3	7	20
25		M6x1.0	12	6	4	3.5	10	27
32		M6x1.0	12	8	4	4	15	33
40		M8x1.25	16	8	5	4	40	61

Option 9



Screw shaft	Hexagon hole		Key way				Drive section	
	d	B (0/+0.2)	H	K N9	P	Y (0/+0.1)	F	L2
12		-	-	2	3	1.2	-	10
15		4	6	4	3	2.5	-	15
20		5	7	5	3	3	7	20
25		6	8	6	4	3.5	10	27
32		8	10	8	4	4	15	33
40		10	12	8	5	4	40	61

Screw shaft end configuration service

It is possible to have customised modifications of our ball screws implemented quickly and reliably by our service.

The following services can be provided as an alternative:

- › Modification of ball screws based on a desired configuration
- › End machining
- › Change in preload
- › Fitting of various wipers and lubrication systems
- › Fit holes
- › Tap holes
- › Coatings
- › Special packing
- › Customised production
- › Production even in the smallest lot sizes of 1-50 units
- › Individual and special production

Please request these optional services from NSK separately.



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