

+ 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

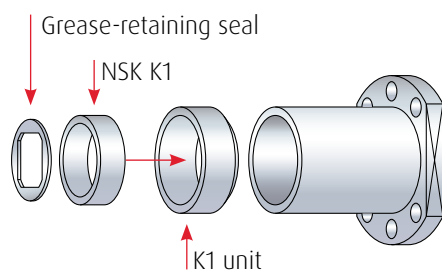
NSK developed the 'Ball screws – interchangeable' series based on many years of experience and with the help of the most advanced technology. The series complies 100% with DIN 69051. The spindle nut and spindle shaft are available separately and are universally exchangeable. The new 'Ball screws – interchangeable' 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-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

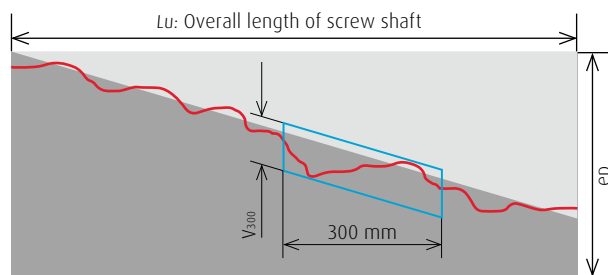


Maintenance-free long-term with NSK K1 lubrication unit (sold separately)

- › 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

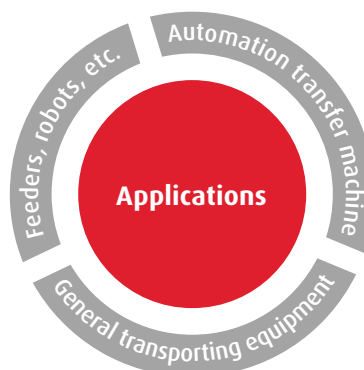
- › An accuracy grade of Ct7 is available



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

Options

- › NSK provides the support bearing units which go with the ball screw shafts, which are sold separately.
- › Possible bearing journal configurations of the shaft are provided on the following pages as suggestion



Ball Screws – Interchangeable



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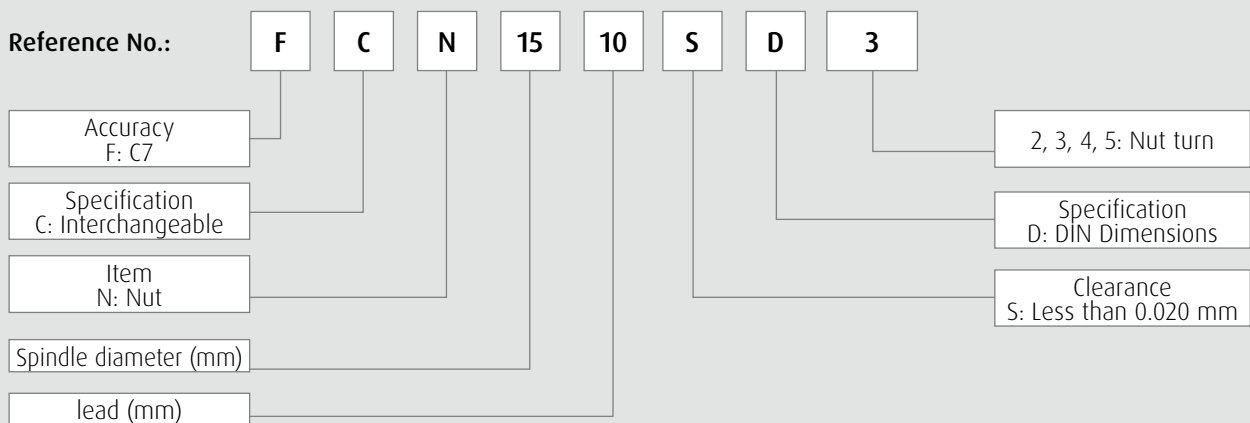
**New
Product**

Please use the following designation, if you order a **shaft**:

Reference No.:	F	C	S	15	10	S	A	1	4	8	6	
Accuracy F: C7	└─┘											Shaft total length 1486: length shaft
Specification C: Interchangeable		└─┘										Specification A, D: Internal design
Item S: Shaft			└─┘									Clearance S: Less than 0.020 mm
Spindle diameter (mm)				└─┘								
lead (mm)					└─┘							

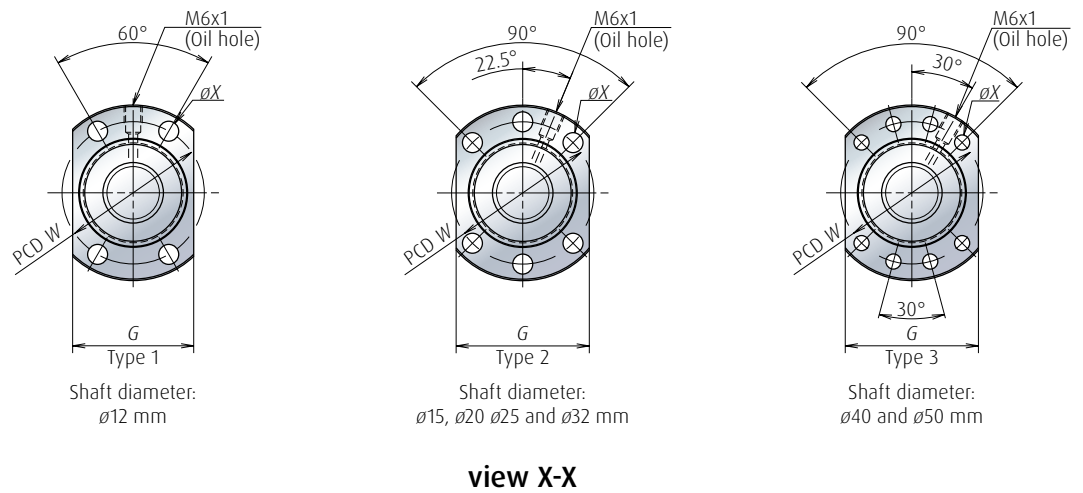


Please use the following designation, if you order a **nut**:



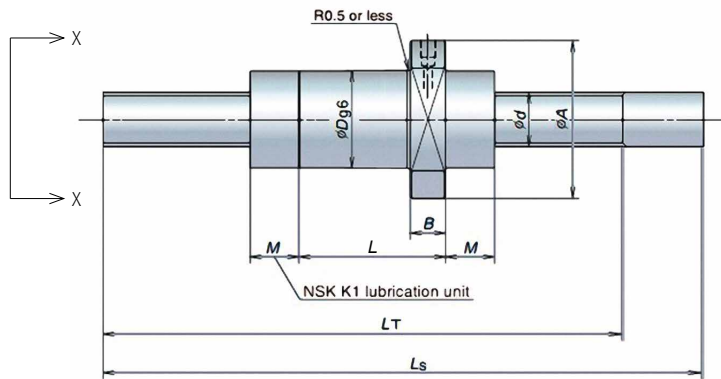
Ball Screws – Interchangeable

Ball nut dimensions



Specification number

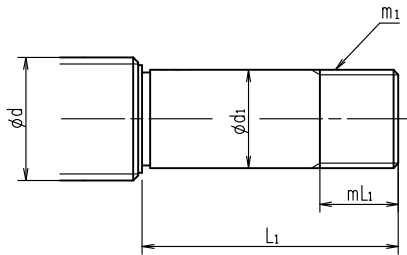
Model No.	Shaft OD [mm]	lead [mm]	Turns	Ca [N]	Coa [N]	D [mm]	A [mm]	G [mm]	B [mm]	L [mm]
FCN1205	12	5	3	3 750	5 810	24	40	26	11	30
FCN1210	12	10	3	3 750	5 780	24	40	26	11	43
FCN1505	15	5	3	6 410	10 100	28	48	40	11	30
FCN1510	15	10	3	6 530	10 200	28	48	40	11	43
FCN1520	15	20	2	5 660	8 700	32	48	40	11	51
FCN2005	20	5	3	10 400	18 500	36	58	44	13	31
FCN2010	20	10	3	10 200	18 600	36	58	44	13	45
FCN2020	20	20	2	6 790	11 800	36	58	44	13	54
FCN2505	25	5	5	18 500	40 900	40	62	48	12	42
FCN2510	25	10	4	15 000	32 400	40	62	48	12	56
FCN2520	25	20	2	7 650	14 800	40	62	48	12	54
FCN2525	25	25	2	7 490	14 600	40	62	48	12	63
FCN3205	32	5	4	16 800	41 700	50	80	62	12	44
FCN3210	32	10	4	23 000	51 300	50	80	62	12	59
FCN3220	32	20	4	22 600	51 100	50	80	62	12	98
FCN4010	40	10	4	39 800	90 700	63	93	70	14	60



Type No.	W [mm]	X [mm]	M [mm]	Short Version (on stock available)		Long Version (on demand)	
				Thread length LT	Total length LS	Thread length LT	Total length LS
1	32	4.5	(18)	617	800	-	-
1	32	4.5	(18)	617	800	-	-
2	38	5.5	(18)	1303	1486	1760	1900
2	38	5.5	(18)	1303	1486	1760	1900
2	42	5.5	(18)	1293	1476	1760	1900
2	47	6.6	(18)	1303	1486	1760	1900
2	47	6.6	(18)	1303	1486	1760	1900
2	47	6.6	(18)	1293	1476	1760	1900
2	51	6.6	(21)	1303	1486	1760	1900
2	51	6.6	(21)	1303	1486	1760	1900
2	51	6.6	(21)	1293	1476	1760	1900
2	51	6.6	(21)	1288	1471	1760	1900
2	65	9	(21)	1303	1486	1760	1900
2	65	9	(21)	1303	1486	1760	1900
2	65	9	(21)	1293	1476	1760	1900
3	78	9	(21)	1303	1486	1760	1900

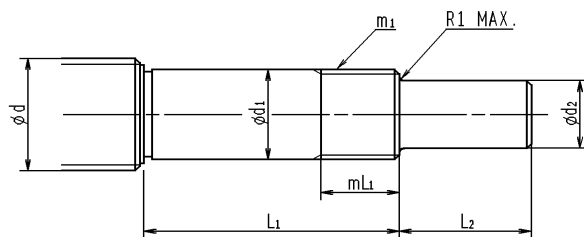
Recommended screw shaft end configuration

Basic 1



to use WBK							
Screw shaft d	lead l	Support unit		Bearing journal		Lock nut thread	
		fix side	support side	d ₁ g6	L ₁	m ₁	mL ₁
12	all	WBK08-01A	WBK08-11	8	27	M8x1	9
15	all	WBK12-01A	WBK12-11	12	30	M12x1	10
20	all	WBK15-01A	WBK15-11	15	40	M15x1	15
25	all	WBK20-01	WBK20-11	20	53	M20x1	16
32	all	WBK25-01	WBK25-11	25	89	M25x1.5	20
40	10	WBK30DFD-31H	6206	30	104	M30x1.5	30

Basic 2



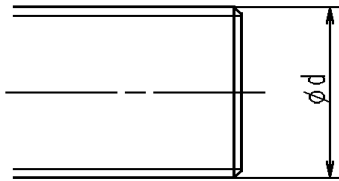
to use WBK							
Screw shaft d	lead l	Support unit		Bearing journal		Lock nut thread	
		fix side	support side	d ₁ g6	L ₁	m ₁	mL ₁
12	all	WBK08-01A	WBK08-11	8	27	M8x1	9
15	all	WBK12-01A	WBK12-11	12	30	M12x1	10
20	all	WBK15-01A	WBK15-11	15	40	M15x1	15
25	all	WBK20-01	WBK20-11	20	53	M20x1	16
32	all	WBK25-01	WBK25-11	25	89	M25x1.5	20
40	10	WBK30DFD-31H	6206	30	104	M30x1.5	30

to use BSBD						
Screw shaft d	lead l	Bearing journal			Lock nut thread	
		d ₁ g6	L ₁ (single BSF/BSN)	L ₁ (DT BSF/BSN)	m ₁	mL ₁
12	all	-	-	-	-	-
15	all	12	33	-	M12x1	10
20	all	15	38	-	M15x1	15
25	all	20	42	-	M20x1	16
32	all	25	46	-	M25x1.5	20
40	10	30	52	80	M30x1.5	26

to use BSBD								
Screw shaft d	lead l	Bearing journal			Lock nut thread		Drive section	
		d ₁ g6	L ₁ (single BSF/BSN)	L ₁ (DT BSF/BSN)	m ₁	mL ₁	d ₂ h7	L ₂
12	all	-	-	-	-	-	-	-
15	all	12	33	-	M12x1	10	10	15
20	all	15	38	-	M15x1	15	12	20
25	all	20	42	-	M20x1	16	15	27
32	all	25	46	-	M25x1.5	20	20	33
40	10	30	52	80	M30x1.5	26	25	61

Recommended screw shaft end configuration

Basic 3



Screw shaft d

12

15

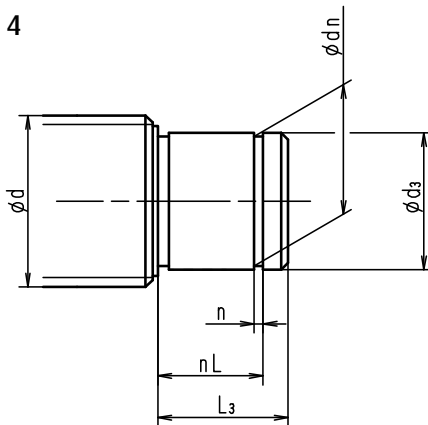
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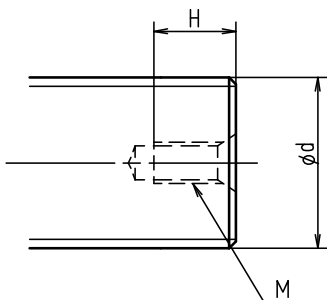
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Basic 4



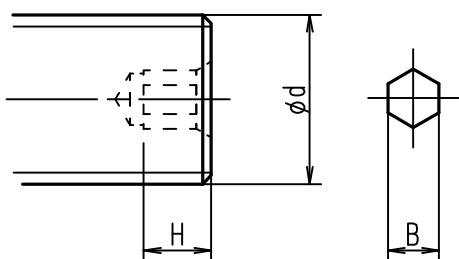
Screw shaft d	Snap ring groove			Bearing journal	
	n	dn	nL	d ₃ g6	L ₃
12	0.8 ^{+0.1} ₀	5.7 ⁰ _{-0.06}	6.8	6	9
15	1.15 ^{+0.14} ₀	9.6 ⁰ _{-0.09}	9.15	10	12
20	1.15 ^{+0.14} ₀	14.3 ⁰ _{-0.11}	10.15	15	13
25	1.35 ^{+0.14} ₀	19 ⁰ _{-0.21}	15.35	20	19
32	1.35 ^{+0.14} ₀	23.9 ⁰ _{-0.21}	16.35	25	20
40	1.75 ^{+0.14} ₀	28.6 ⁰ _{-0.21}	17.75	30	22

Option 1



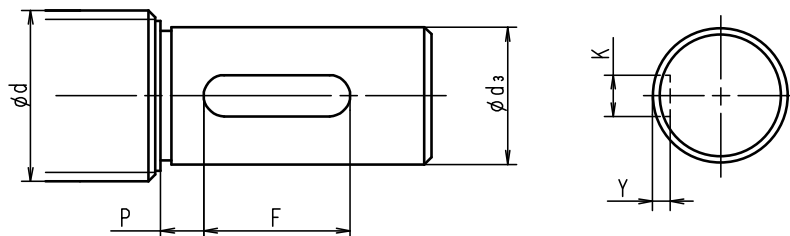
d	M	H
12	M3x0.5	9
15	M4x0.7	10
20	M6x1	12
25	M6x1	12
32	M6x1	12
40	M8x1.25	16

Option 2



Screw shaft d	Hexagon hole	
	$B^{+0.2}_0$	H
12	-	-
15	4	6
20	5	7
25	6	8
32	8	10
40	10	12

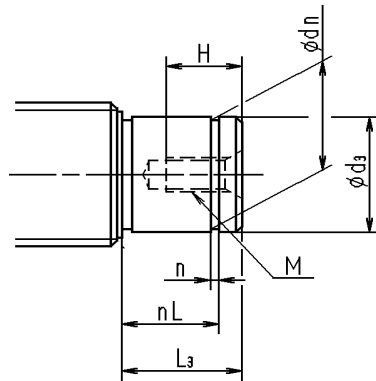
Option 3



Screw shaft d	Key way				
	K N9	$P^{+0.1}_0$	Y	F	$d_3 g6$
12	-	-	-	-	-
15	4	3	2.5	20	12
20	5	3	3	25	15
25	6	4	3.5	30	20
32	8	4	4	40	25
40	8	5	4	40	30

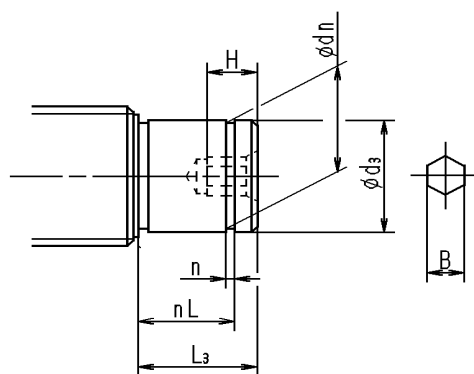
Recommended screw shaft end configuration

Option 4



Screw shaft d	Bearing journal d_3 g6	Snap ring groove			Tap hole		L_3
		n	dn	nL	M	H	
12	6	$0.8^{+0.1}_0$	$5.7^{0}_{-0.06}$	6.8	M3x0.5	9	9
15	10	$1.15^{+0.14}_0$	$9.6^{0}_{-0.09}$	9.15	M4x0.7	10	12
20	15	$1.15^{+0.14}_0$	$14.3^{0}_{-0.11}$	10.15	M6x1	12	13
25	20	$1.35^{+0.14}_0$	$19^{0}_{-0.21}$	15.35	M6x1	12	19
32	25	$1.35^{+0.14}_0$	$23.9^{0}_{-0.21}$	16.35	M6x1	12	20
40	30	$1.75^{+0.14}_0$	$28.6^{0}_{-0.21}$	17.75	M8x1.25	16	22

Option 5



Screw shaft d	Bearing Journal d_3 g6	Snap ring groove			Hexagon hole		L_3
		n	dn	nL	$B^{+0.2}_0$	H	
12	6	$0.8^{+0.1}_0$	$5.7^{0}_{-0.06}$	6.8	-	-	9
15	10	$1.15^{+0.14}_0$	$9.6^{0}_{-0.09}$	9.15	4	6	12
20	15	$1.15^{+0.14}_0$	$14.3^{0}_{-0.11}$	10.15	5	7	13
25	20	$1.35^{+0.14}_0$	$19^{0}_{-0.21}$	15.35	6	8	19
32	25	$1.35^{+0.14}_0$	$23.9^{0}_{-0.21}$	16.35	8	10	20
40	30	$1.75^{+0.14}_0$	$28.6^{0}_{-0.21}$	17.75	10	12	22