MOTION & CONTROL
NSK

High-speed and Low-noise Ball Screws

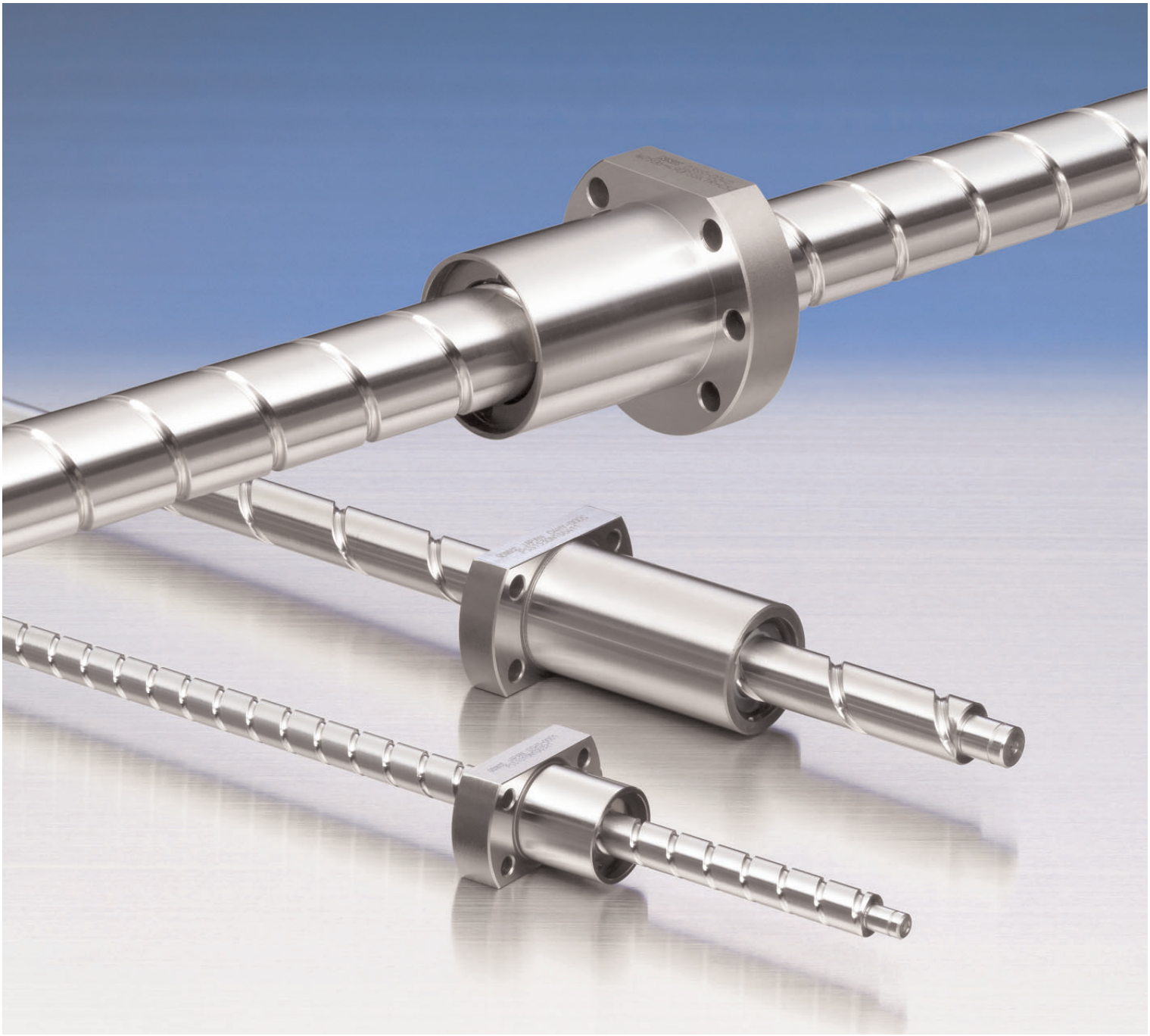
BSS Series

Patent Pending

New development

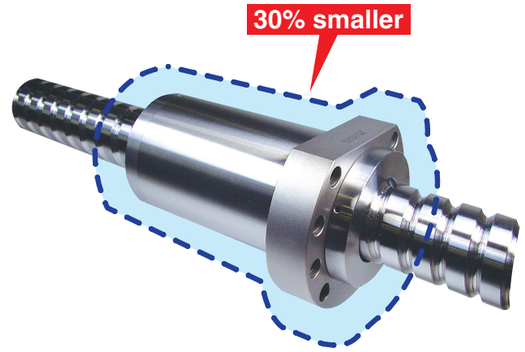
New!

Quiet and compact, with unparalleled high speed performance. Reduced-noise BSS Series ball screws for an extensive range of uses, from machine tools to transportation equipment.



BSS Series—Next-generation ball screws with quiet, high-speed performance in a compact size, the result of joining NSK's advanced technology with an innovative recirculation method

A new series has joined the NSK ball screws lineup that delivers unrivaled precision. Developed with the advanced technology NSK has gained over years of earning customer trust with proven performance, this series represents a groundbreaking achievement in reduced noise and high-speed operation in an amazingly compact size. The quiet performance is especially appreciated in machine tools, medical equipment, semiconductor-manufacturing equipment, LCD manufacturing equipment, and chip mounting equipment.



High speed, extremely low noise

Features

Quieter by 6 dB; nearly silent in typical applications

The average noise level is reduced by more than 6 dB compared with our conventional products. At low-speed rotation, the ball screws are nearly silent, while the lowest noise level is achieved at high-speed rotation*.

*Noise level measured with a microphone at a distance of 400 mm.

High-speed operation of up to 220,000 dN

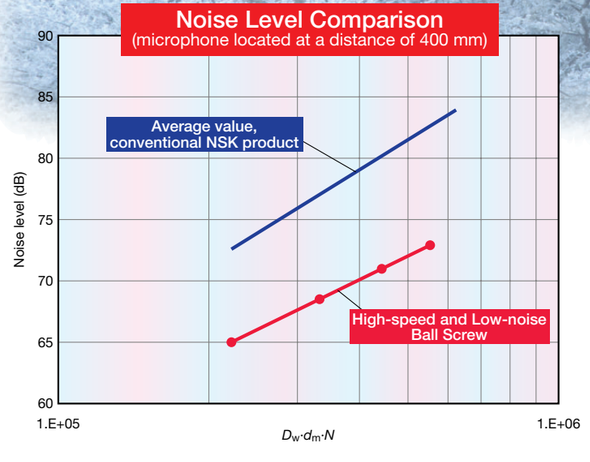
Realizes high-speed operation at a maximum of dN 220,000—outstanding for ball screws and far surpassing the 135,000 dN maximum performance of conventional return tube type products. For high lead ball screws, high-speed operation at over 200m/min is also possible.

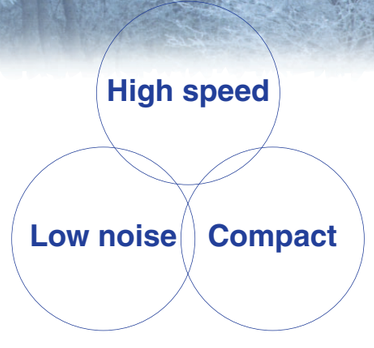
30% smaller

The external diameter of the ball nut is 30% smaller than our conventional models. Compact configurations are possible for low-profile XY tables as well as for other devices and equipment.

Grease fitting provided as standard equipment

The ball screws with shaft diameters of less than ϕ25 are standardly equipped with a grease fitting (M5 $\times$ 0.8). Lubrication ports are provided in 2 places to facilitate maintenance. The ball screws can be easily connected to an integrated lubrication system.





Application

Combinations of shaft diameter and lead of the high-speed and low-noise ball screws are shown in the table.

Shaft diameter	Lead													
	5	10	12	16	20	25	30	32	40	50	60	64	80	100
10	●	●												
12	●	●			●		●							
15	●	●			●		●							
20	●	●			●		●		●		●			
25	●	●			●	●	●			●				
32	●	●	●	●	●			●				●		
36	●	●	●	●	●									
40		●	●	●	●	●	●		●				●	
45		●	●	●	●	●	●							
50		●	●	●	●	●	●			●				●

Specifications

Recirculation method

A new internal ball recirculation method is applied for simpler, more compact ball nuts.

Preload and axial play

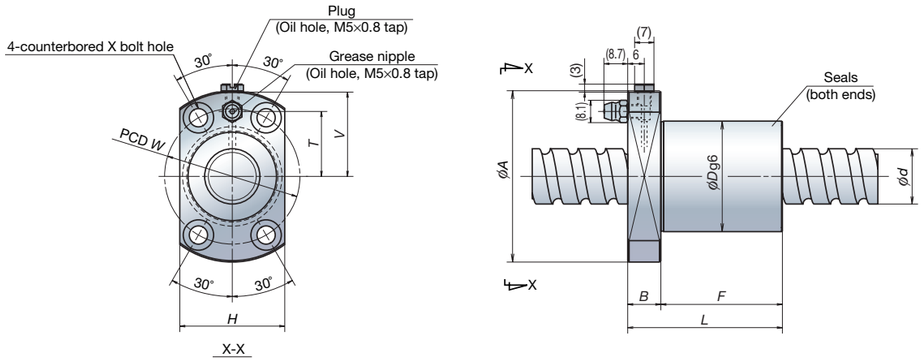
Adopts oversized ball preload, suitable for compact devices. Axial play can be selected from less than or equal to 0.005 mm (code T), 0.020 mm (code S), or 0.050 mm (code N). For more information, please see the general catalog of precision machine components.

Sealing

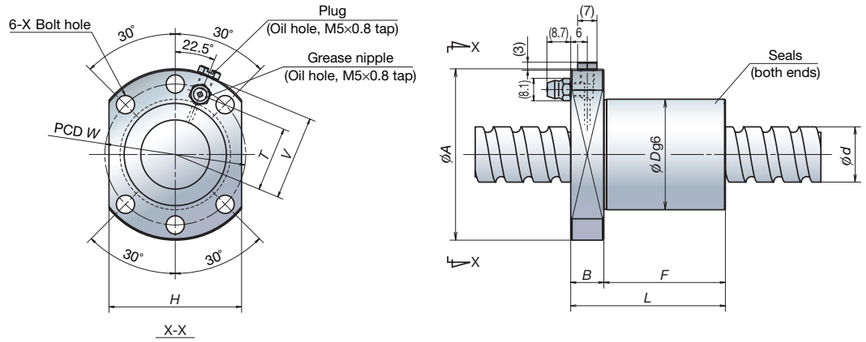
Adopts a new compact design high performance sealing.
Minimal grease scattering contributes to maintenance of a clean environment.

Options

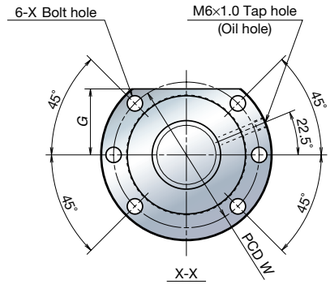
- Optional NSK K1™ lubrication unit, molded from resin and impregnated with lubrication oil, supplies fresh oil onto ball rolling surfaces, ensuring long-term, maintenance-free usage. Please contact NSK when using NSK K1.
- Please contact NSK about hollow shaft ball screws that are compatible with the forced cooling of the shaft center, which are effective for stabilizing positioning accuracy and shortening the warm-up period.



Type Ⅰ Flange



Type Ⅱ Flange



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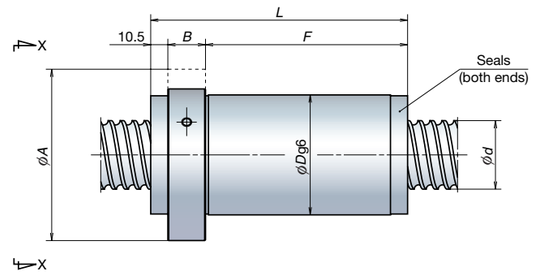
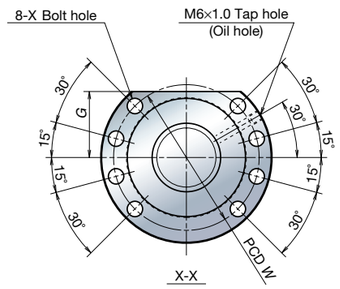
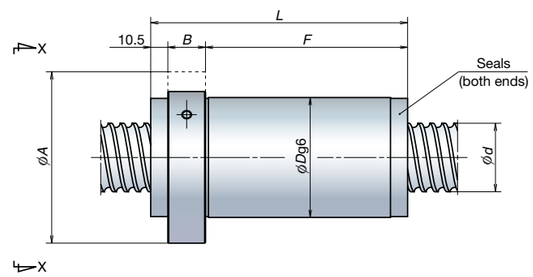




Type Ⅳ Flange



Model No.	Screw shaft diameter *d* (mm)	Lead *ℓ* (mm)	Effective turns of balls	Basic load rating Dynamic C_a(N)	Basic load rating Static C_{oa}(N)	Axial rigidity (N/*μ*m)	Ball nut dimensions (mm) *D*	*A*	*L*	*B*	*F*	*H*×*V*	TYPE	*W*	*X*	*T*
BSS1005-3E	10	5	3	2 930	4 790	126	23	43	29	11	18	26×21	Ⅰ	33	M4	14
BSS1010-2E		10	2	1 970	3 010	77			32		21					
BSS1205-3E	12	5	3	3 200	5 860	146	24	44	30	11	19	27×21.5	Ⅰ	34	M4	14.5
BSS1210-3E		10	3	3 200	5 860	142			43		32					
BSS1220-2E		20	2	2 150	3 610	83			50		39					
BSS1230-2E		30	2	2 150	3 610	75			70		59					
BSS1505-3E	15	5	3	5 460	10 200	183	28	51	30	11	19	31×25	Ⅰ	39	M5	18
BSS1510-3E		10	3	5 460	10 200	181			43		32					
BSS1520-2E		20	2	5 070	8 730	127	32	55	51		40	33×27		43		20
BSS1530-2E		30	2	5 070	8 730	116			71		60					
BSS2005-3E	20	5	3	8 790	18 500	268	36	62	31	13	18	38×30.5	Ⅰ	49	M6	23.5
BSS2010-3E		10	3	8 790	18 500	268			45		32					
BSS2020-2E		20	2	5 900	11 700	167			54		41					
BSS2030-2E		30	2	5 900	11 700	159			74		61					
BSS2040-2E		40	2	5 900	11 700	147			92		79					
BSS2060-2E		60	2	5 900	11 700	128			129		116					
BSS2505-3E	25	5	3	9 760	23 600	325	40	62	32	12	20	48×30.5	Ⅱ	51	M6	23.5
BSS2510-4E		10	4	12 800	32 300	437			56		44					
BSS2520-2E		20	2	6 560	14 600	203			54		42					
BSS2525-2E		25	2	6 560	14 600	197			63		51					
BSS2530-2E		30	2	6 560	14 600	194			74		62					
BSS2550-2E		50	2	6 560	14 600	177			114		102					

Note: Rigidity values in this table are theoretical values derived from elastic displacement between screw grooves and balls when axial load is applied to a ball nut for which preload is set at 3% of the basic dynamic load rating (C_a).
The shape and dimension of ball screws with shaft diameters less than ϕ25 are the same as NSK ball screws held in standard stock as the Compact FA Series.

Model No.	Screw shaft diameter *d* (mm)	Lead *ℓ* (mm)	Effective turns of balls	Basic load rating Dynamic C_a(N)	Basic load rating Static C_{oa}(N)	Axial rigidity (N/*μ*m)	Ball nut dimensions (mm) *D*	*A*	*L*	*B*	*F*	*G*	TYPE	*W*	*X*
BSS3205-5E	32	5	5	17 500	52 900	672	56	86	60	12	37.5	34	Ⅲ	71	M8
BSS3210-6E		10	6	43 300	111 000	865			104	18	75.5				
BSS3212-5E		12	5	36 700	90 800	716			103		74.5				
BSS3216-5E		16	5	36 700	90 800	716			122		93.5				
BSS3220-5E		20	5	36 700	90 800	708			141		112.5				
BSS3232-2E		32	2	15 300	32 400	261			94		65.5				
BSS3264-2E		64	2	15 300	32 400	232			153		124.5				
BSS3605-5E	36	5	5	18 400	59 500	740	65	95	60	12	37.5	36	Ⅳ	80	M8
BSS3610-6E		10	6	55 200	142 000	970			109	22	76.5				
BSS3612-6E		12	6	55 200	142 000	967			120		87.5				
BSS3616-6E		16	6	55 200	142 000	961			143		110.5				
BSS3620-6E		20	6	55 200	142 000	959			166		133.5				
BSS4010-6E	40	10	6	58 200	158 000	1 060	70	100	109	22	76.5	38.5	Ⅳ	85	M8
BSS4012-6E		12	6	58 200	158 000	1 050			120		87.5				
BSS4016-6E		16	6	58 200	158 000	1 050			143		110.5				
BSS4020-6E		20	6	58 200	158 000	1 050			166		133.5				
BSS4025-4E		25	4	40 100	103 000	686			145		112.5				
BSS4030-3E		30	3	30 600	74 000	505			134		101.5				
BSS4040-2E		40	2	20 600	46 600	319			110		77.5				
BSS4080-2E		80	2	20 600	46 600	286			184		151.5				
BSS4510-6E	45	10	6	60 700	178 000	1 160	75	110	109	22	76.5	43	Ⅳ	93	M10
BSS4512-6E		12	6	60 700	178 000	1 160			120		87.5				
BSS4516-6E		16	6	60 700	178 000	1 160			143		110.5				
BSS4520-6E		20	6	60 700	178 000	1 150			166		133.5				
BSS4525-5E		25	5	51 400	146 000	954			170		137.5				
BSS4530-4E		30	4	41 800	116 000	752			164		131.5				
BSS5010-6E	50	10	6	64 600	198 000	1 270	82	118	109	22	76.5	46	Ⅳ	100	M10
BSS5012-6E		12	6	64 600	198 000	1 270			120		87.5				
BSS5016-6E		16	6	64 600	198 000	1 270			143		110.5				
BSS5020-6E		20	6	64 600	198 000	1 260			166		133.5				
BSS5025-5E		25	5	54 700	164 000	1 040			170		137.5				
BSS5030-5E		30	5	54 700	164 000	1 040			194		161.5				
BSS5050-2E		50	2	22 800	58 300	383			130		97.5				
BSS50100-2E		100	2	22 800	58 300	342			224		191.5				

Note: Rigidity values in this table are theoretical values derived from elastic displacement between screw grooves and balls when axial load is applied to a ball nut for which preload is set at 3% of the basic dynamic load rating (C_a).