

SNR LINEAR MOTION: **BALL SCREWS**

NTN® **SNR**®

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With You

A global manufacturer of bearings



For almost a century, SNR has designed, developed and manufactured bearings to meet the most demanding of applications. In April 2008, SNR and the Japanese Group NTN joined forces.

As one of the 3 largest companies in the manufacture of bearings, our group offers its customers added value in terms of service, quality and products.

The NTN-SNR Group is distinguished by its global presence and by its company-wide quality assurance system.

We have been active in linear ball rail systems since 1985 and our complete range, based on innovative, high-quality products, has developed significantly.

Today, we can offer a solution for a vast range of applications that need linear motion systems.

This catalogue aims to help you discover our new standard range of ball screw products in rolled and ground versions.

The large range of nuts, options for custom machining and our extensive technical knowledge enable us to design and propose custom-made solutions for our customers.

Ball rail systems find applications in a diverse range of industries such as machine tools for metal, wood, plastic, specialist machinery, aeronautics, automated assembly lines and semi-conductor industries.

Our technical department draws on many years of experience in all these areas and is available to help you develop solutions suited to your needs.

With that in mind, this technical documentation was designed as a basis for dialogue. Our technical and sales engineers will provide you with any technical information you may require.

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Ball Screw Overview

Standard program. Rolled, precision class T7

Type	Nut type									
	CI	SH	SK	SW	TW	SU	DJ	SD	SC	DC
BSH00601_00_R			x							
BSH00801_00_R			x							
BSH00802_00_R			x							
BSH00802.5_00_R		x	x							
BSH01002_00_R		x	x							
BSH01004_00_R		x	x							
BSH01202_00_R			x							
BSH01204_00_R		x								
BSH01205_00_R		x								
BSH01402_00_R			x							
BSH01404_00_R		x								
BSH01604_00_R	x	x				x	x			
BSH01605_00_R	x	x		x	x	x	x			
BSH01610_00_R				x		x	x			
BSH02004_00_R	x					x	x			
BSH02005_00_R	x	x		x	x	x	x			
BSH02504_00_R	x					x	x			
BSH02505_00_R	x	x		x	x	x	x			
BSH02510_00_R	x			x	x	x	x			
BSH03204_00_R	x					x	x			
BSH03205_00_R	x			x	x	x	x			
BSH03210_00_R	x			x	x	x	x			
BSH04005_00_R	x			x	x	x	x			
BSH04010_00_R	x			x	x	x	x			
BSH05010_00_R	x			x	x	x	x			
BSH06310_00_R	x			x	x	x	x			
BSH06320_00_R						x	x			
BSH08010_00_R	x			x	x	x	x			
BSH08020_00_R						x				

BSH01205_01_R								x	x	
BSH01210_01_R								x		
BSH01605_01_R								x	x	x
BSH01610_01_R								x	x	x
BSH01616_01_R								x	x	
BSH01620_01_R								x	x	
BSH02005_01_R								x	x	x
BSH02010_01_R								x	x	x
BSH02020_01_R								x	x	
BSH02505_01_R								x	x	x
BSH02510_01_R								x	x	x
BSH02525_01_R								x	x	
BSH03205_01_R								x	x	x
BSH03210_01_R								x	x	x
BSH03220_01_R								x	x	x
BSH03232_01_R								x	x	
BSH04005_01_R								x	x	x
BSH04010_01_R								x	x	x
BSH04020_01_R								x	x	x
BSH04040_01_R								x	x	
BSH05005_01_R								x	x	x
BSH05010_01_R								x	x	x
BSH05020_01_R								x	x	x
BSH05050_01_R								x		



- d* Reference diameter [mm]
- d0* Nominal diameter [mm]
- d1* Outside diameter [mm]
- d2* Diameter at the thread root [mm]
- P* Pitch [mm]
- Lmax.* Maximum length of screw [mm]

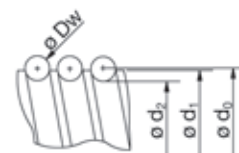
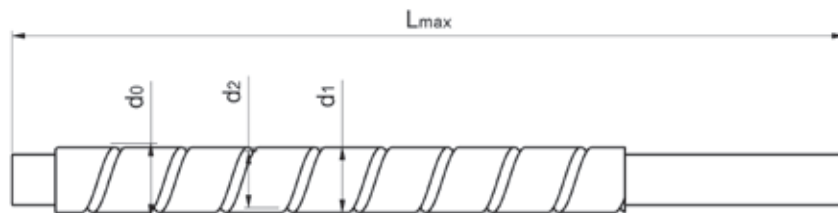
Type	Nominal diameter	Ball center circle diameter	Outer diameter	Root diameter	Mass	Rolled shafts
	<i>d</i> [mm]	<i>d0</i> [mm]	<i>d1</i> [mm]	<i>d2</i> [mm]	<i>m</i> [kg/m]	max. length [mm]
BSH00601_00_R	6	6,27	6,0	5,47	0,19	1 000
BSH00801_00_R	8	8,20	8,0	7,40	0,37	1 000
BSH00802_00_R	8	8,41	8,0	7,21	0,39	1 000
BSH00802.5_00_R	8	8,41	8,0	7,21	0,39	1 000
BSH01002_00_R	10	10,41	10,0	9,21	0,59	3 000
BSH01004_00_R	10	10,68	10,0	8,68	0,58	3 000
BSH01202_00_R	12	12,41	12,0	11,21	0,85	3 000
BSH01204_00_R	12	12,30	12,0	9,80	0,75	3 000
BSH01205_00_R	12	12,30	12,0	9,80	0,80	3 000
BSH01402_00_R	14	14,41	14,0	13,21	1,17	3 000
BSH01404_00_R	14	14,52	14,0	12,14	1,10	3 000
BSH01604_00_R	16	16,78	16,0	14,40	1,47	3 000
BSH01605_00_R	16	17,08	16,0	13,90	1,42	3 000
BSH01610_00_R	16	16,08	16,0	12,90	1,51	3 000
BSH02004_00_R	20	20,78	20,0	18,40	2,35	3 000
BSH02005_00_R	20	21,08	20,0	17,90	2,29	3 000
BSH02504_00_R	25	26,58	25,0	23,40	3,71	6 000
BSH02505_00_R	25	26,08	25,0	22,90	3,60	6 000
BSH02510_00_R	25	25,55	25,0	20,80	3,52	6 000
BSH03204_00_R	32	33,18	32,0	30,40	6,04	6 000
BSH03205_00_R	32	33,08	32,0	29,90	6,00	6 000
BSH03210_00_R	32	34,15	32,0	27,80	5,65	6 000
BSH04005_00_R	40	41,08	40,0	37,90	9,32	6 000
BSH04010_00_R	40	42,15	40,0	35,80	9,05	6 000
BSH05010_00_R	50	52,15	50,0	45,80	14,17	6 000
BSH06310_00_R	63	65,15	63,0	58,80	23,19	7 000
BSH06320_00_R	63	66,25	63,0	56,72	22,72	7 000
BSH08010_00_R	80	82,15	80,0	75,80	37,33	7 000
BSH08020_00_R	80	83,25	80,0	73,72	37,12	7 000

BSH01205_01_R	12	12,30	12,0	9,80	0,78	3 000
BSH01605_01_R	16	15,67	15,0	12,89	1,27	3 000
BSH01610_01_R	16	15,67	15,0	12,89	1,31	3 000
BSH01616_01_R	16	15,67	15,0	12,89	1,35	3 000
BSH01620_01_R	16	15,67	15,0	12,89	1,36	3 000
BSH02005_01_R	20	21,08	20,0	17,90	2,29	3 000
BSH02010_01_R	20	21,08	20,0	17,90	2,35	3 000
BSH02020_01_R	20	21,08	20,0	17,90	2,36	3 000
BSH02505_01_R	25	26,08	25,0	22,90	3,60	6 000
BSH02510_01_R	25	26,08	25,0	22,90	3,73	6 000
BSH02525_01_R	25	26,08	25,0	22,90	3,79	6 000
BSH03205_01_R	32	33,08	32,0	29,90	6,00	6 000
BSH03210_01_R	32	32,35	31,0	28,38	5,67	6 000
BSH03220_01_R	32	32,35	31,0	28,38	5,79	6 000
BSH03232_01_R	32	32,35	31,0	28,38	5,83	6 000
BSH04005_01_R	40	41,08	40,0	37,90	9,32	6 000
BSH04010_01_R	40	39,52	38,0	33,17	8,05	6 000
BSH04020_01_R	40	39,52	38,0	33,17	8,33	6 000
BSH04040_01_R	40	39,52	38,0	33,17	8,66	6 000
BSH05005_01_R	50	51,10	50,0	47,92	14,91	6 000
BSH05010_01_R	50	49,53	48,0	43,18	13,20	6 000
BSH05020_01_R	50	49,53	48,0	43,18	13,63	6 000

Standard program, whirled,
Precision class **T5** and **P5** (T3 and P3 on request)

Type	Nut type									
	CI	SH	SK	SW	TW	SU	DU	SD	SC	DC
BSH00801_00_W			x							
BSH00802_00_W			x							
BSH00802.5_00_W		x	x							
BSH01002_00_W		x	x							
BSH01004_00_W		x	x							
BSH01202_00_W			x							
BSH01204_00_W		x								
BSH01205_00_W		x								
BSH01402_00_W			x							
BSH01404_00_W		x								
BSH01604_00_W	x	x				x	x			
BSH01605_00_W	x	x		x	x	x	x			
BSH01610_00_W				x		x	x			
BSH02004_00_W	x					x	x			
BSH02005_00_W	x	x		x	x	x	x			
BSH02504_00_W	x					x	x			
BSH02505_00_W	x	x		x	x	x	x			
BSH02510_00_W	x			x	x	x	x			
BSH03204_00_W	x					x	x			
BSH03205_00_W	x			x	x	x	x			
BSH03210_00_W	x			x	x	x	x			
BSH04005_00_W	x			x	x	x	x			
BSH04010_00_W	x			x	x	x	x			
BSH05010_00_W	x			x	x	x	x			
BSH06310_00_W	x			x	x	x	x			
BSH06320_00_W						x	x			
BSH08010_00_W	x			x	x	x	x			
BSH08020_00_W						x				

BSH01205_01_W								x	x	
BSH01210_01_W								x		
BSH01605_01_W								x	x	x
BSH01610_01_W								x	x	x
BSH01616_01_W								x	x	
BSH01620_01_W								x	x	
BSH02005_01_W								x	x	x
BSH02010_01_W								x	x	x
BSH02020_01_W								x	x	
BSH02505_01_W								x	x	x
BSH02510_01_W								x	x	x
BSH02525_01_W								x	x	
BSH03205_01_W								x	x	x
BSH03210_01_W								x	x	x
BSH03220_01_W								x	x	x
BSH03232_01_W								x	x	
BSH04005_01_W								x	x	x
BSH04010_01_W								x	x	x
BSH04020_01_W								x	x	x
BSH04040_01_W								x	x	
BSH05005_01_W								x	x	x
BSH05010_01_W								x	x	x
BSH05020_01_W								x	x	x
BSH05050_01_W								x		



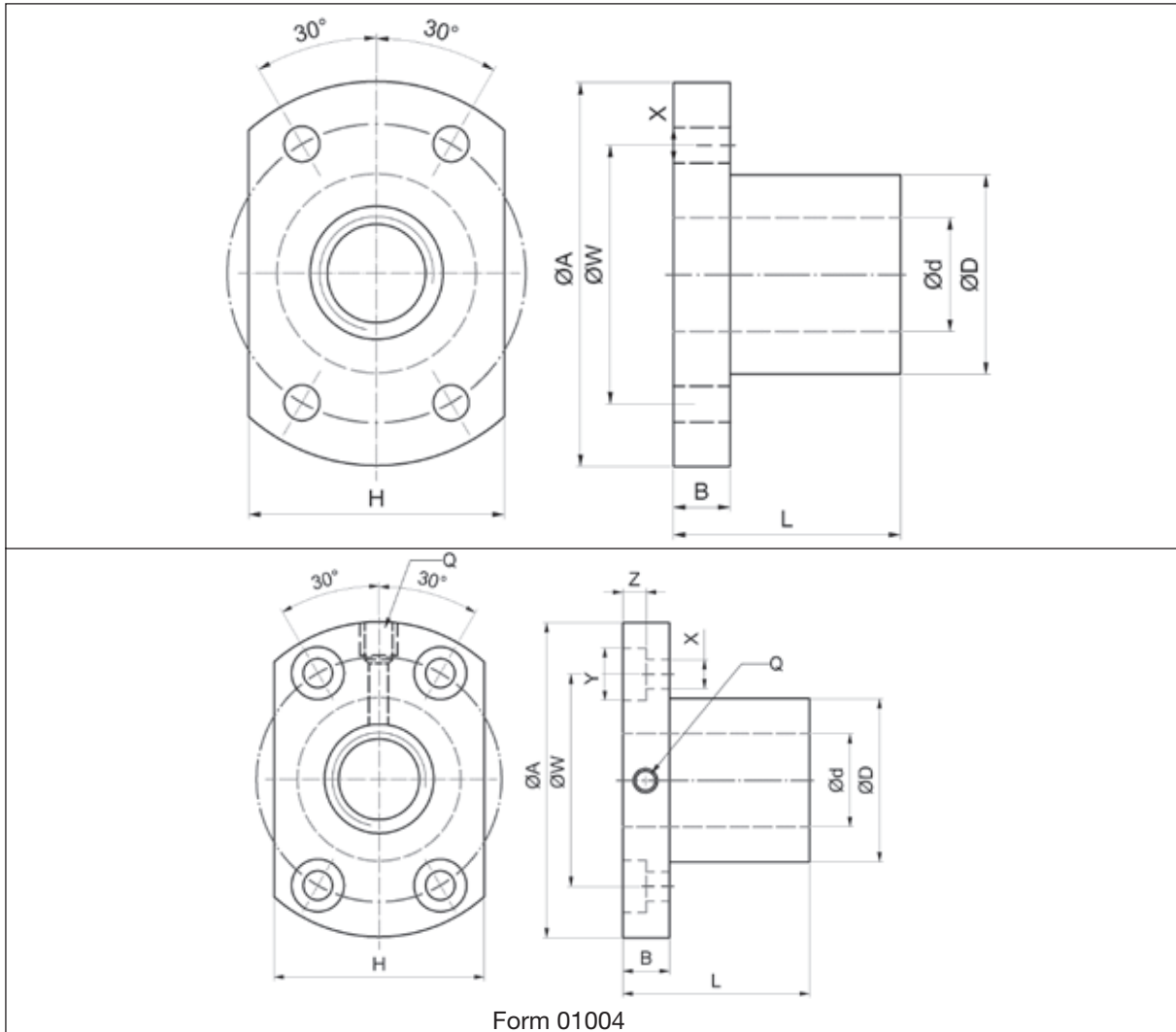
- d* Reference diameter [mm]
- d0* Nominal diameter [mm]
- d1* Outside diameter [mm]
- d2* Diameter at the thread root [mm]
- P* Pitch [mm]
- Lmax.* Maximum length of screw [mm]

Type	Nominal diameter	Ball center circle diameter	Outer diameter	Root diameter	Mass	Whirled shafts	
	<i>d</i> [mm]	<i>d₀</i> [mm]	<i>d₁</i> [mm]	<i>d₂</i> [mm]	<i>m</i> [kg/m]	max. length [mm]	usable thread length [mm]
BSH00801_00_W	8	8,17	8h6	7,37	0,37	3 000	2 400
BSH00802_00_W	8	8,40	8h6	7,20	0,39	3 000	2 400
BSH00802.5_00_W	8	8,40	8h6	7,20	0,39	3 000	2 400
BSH01002_00_W	10	10,41	10h6	9,21	0,59	3 000	2 400
BSH01004_00_W	10	10,42	10h6	8,42	0,58	3 000	2 400
BSH01202_00_W	12	12,41	12h6	11,21	0,85	3 000	2 400
BSH01204_00_W	12	12,00	12h6	9,50	0,75	3 000	2 400
BSH01205_00_W	12	12,55	12h6	10,05	0,80	3 000	2 400
BSH01402_00_W	14	14,41	14h6	13,21	1,17	3 000	2 400
BSH01404_00_W	14	14,52	14h6	12,14	1,10	3 000	2 400
BSH01604_00_W	16	16,52	16h6	14,14	1,47	6 000	5 400
BSH01605_00_W	16	16,68	16h6	13,50	1,42	6 000	5 400
BSH01610_00_W	16	16,68	16h6	13,50	1,51	6 000	5 400
BSH02004_00_W	20	20,52	20h6	18,14	2,35	6 000	5 400
BSH02005_00_W	20	20,68	20h6	17,50	2,29	6 000	5 400
BSH02504_00_W	25	25,52	25h6	23,14	3,71	6 000	5 400
BSH02505_00_W	25	25,68	25h6	22,50	3,60	6 000	5 400
BSH02510_00_W	25	26,01	25h6	21,25	3,52	6 000	5 400
BSH03204_00_W	32	32,52	32h6	30,14	6,04	6 000	5 400
BSH03205_00_W	32	32,68	32h6	29,50	6,00	6 000	5 400
BSH03210_00_W	32	33,35	32h6	27,00	5,65	6 000	5 400
BSH04005_00_W	40	40,68	40h6	37,50	9,32	6 000	5 400
BSH04010_00_W	40	41,35	40h6	35,00	9,05	6 000	5 400
BSH05010_00_W	50	51,35	50h6	45,00	14,17	6 000	5 400
BSH06310_00_W	63	64,35	63h6	58,00	23,19	6 000	5 400
BSH06320_00_W	63	66,25	63h6	56,72	22,72	6 000	5 400
BSH08010_00_W	80	81,35	80h6	75,00	37,33	6 000	5 400
BSH08020_00_W	80	82,25	80h6	72,72	37,12	6 000	5 400

BSH01205_01_W	12	12,00	12h6	9,50	0,78	3 000	2 400
BSH01210_01_W	12	12,00	12h6	9,50	0,83	3 000	2 400
BSH01605_01_W	16	15,28	15h6	12,50	1,27	6 000	5 400
BSH01610_01_W	16	15,28	15h6	12,50	1,31	6 000	5 400
BSH01616_01_W	16	15,28	15h6	12,50	1,35	6 000	5 400
BSH01620_01_W	16	15,28	15h6	12,50	1,36	6 000	5 400
BSH02005_01_W	20	20,68	20h6	17,50	2,29	6 000	5 400
BSH02010_01_W	20	20,68	20h6	17,50	2,35	6 000	5 400
BSH02020_01_W	20	20,36	20h6	17,18	2,36	6 000	5 400
BSH02505_01_W	25	25,68	25h6	22,50	3,60	6 000	5 400
BSH02510_01_W	25	25,68	25h6	22,50	3,73	6 000	5 400
BSH02525_01_W	25	25,68	25h6	22,50	3,79	6 000	5 400
BSH03205_01_W	32	32,68	32h6	29,50	6,00	6 000	5 400
BSH03210_01_W	32	31,71	31h6	27,74	5,67	6 000	5 400
BSH03220_01_W	32	31,71	31h6	27,74	5,79	6 000	5 400
BSH03232_01_W	32	31,71	31h6	27,74	5,83	6 000	5 400
BSH04005_01_W	40	40,68	40h6	37,50	9,32	6 000	5 400
BSH04010_01_W	40	38,72	38h6	32,37	8,05	6 000	5 400
BSH04020_01_W	40	38,72	38h6	32,37	8,33	6 000	5 400
BSH04040_01_W	50	38,72	38h6	32,37	8,66	6 000	5 400
BSH05005_01_W	50	50,68	50h6	47,50	14,91	6 000	5 400
BSH05010_01_W	50	49,35	48h6	43,00	13,20	6 000	5 400
BSH05020_01_W	50	49,35	48h6	43,00	13,63	6 000	5 400

Standard program

Type **SK** single miniature flange nut

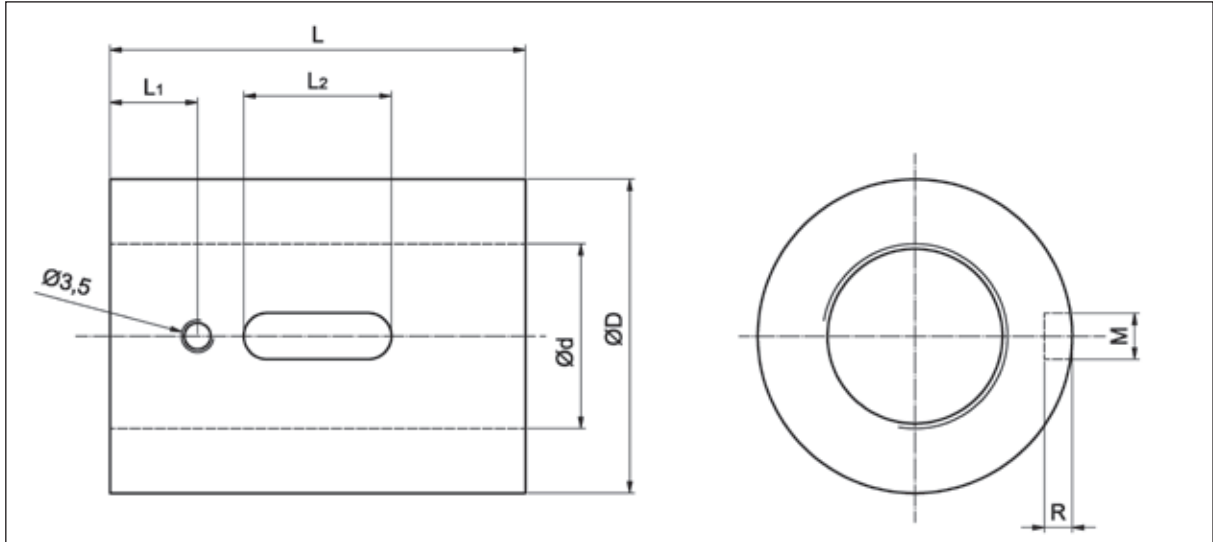


Size	Thread	Dimensions [mm]													Number of circuits	Load rating [kN]		Stiffness K, [N/μm]
		d	p*	Ball-ø	D g6	A	B	L	W	H ±0,10	X	Y	Z	Q		dyn. C _a	stat. C _{a0}	
00601	R	6	1	0,80	12	24	3,5	15	18	16	3,4	-	-	-	3	1,09	2,19	88
00801	R	8	1	0,80	14	27	4	16	21	18	3,4	-	-	-	4	1,58	3,95	137
00802	R	8	2	1,20	14	27	4	16	21	18	3,4	-	-	-	3	2,17	4,49	127
0082.5	R	8	2,5	1,20	16	29	4	26	23	20	3,4	-	-	-	3	2,17	4,49	127
01002	R	10	2	1,20	18	35	5	28	27	22	4,5	-	-	-	3	2,38	5,58	147
01004	R	10	4	2,00	26	46	10	34	36	28	4,5	8	4,5	M6	3	4,59	8,88	167
01202	R	12	2	1,20	20	37	5	28	29	24	4,5	-	-	-	4	3,28	8,88	216
01402	R	14	2	1,20	21	40	6	23	31	26	5,5	-	-	-	4	3,48	10,3	235

*p = Pitch

Type CI

single cylindrical nut

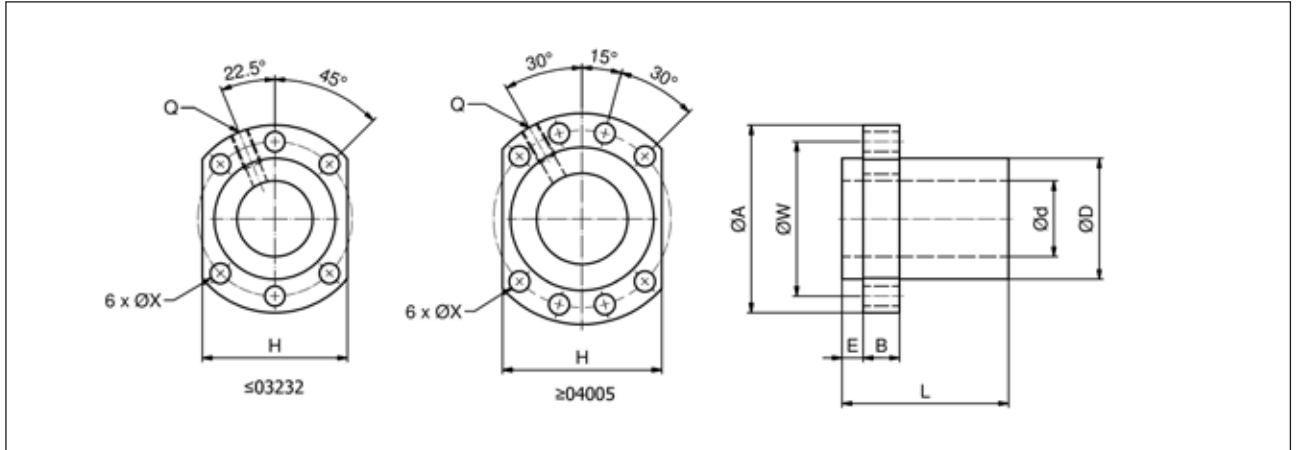


Size	Thread	Dimensions [mm]										Number of circuits	Load rating [kN]		Stiffness K, [N/µm]
		d	p*	Ball-ø	D g6	L	L ₁	L ₂	M	R	dyn. C _a		stat. C _{a0}		
01604-4	R	16	4	2,381	30	40	9	15	3	±0,05	1,5	4	9,54	23,59	314
01605-4	R/L	16	5	3,175	30	45	9	20	5	±0,05	3,0	4	13,53	29,93	324
02004-4	R	20	4	2,381	34	40	9	15	3	±0,05	1,5	4	10,15	29,29	363
02005-4	R/L	20	5	3,175	34	45	9	20	5	±0,05	3,0	4	15,20	38,00	382
02504-4	R	25	4	2,381	40	40	9	15	3	±0,05	1,5	4	11,58	37,22	422
02505-4	R/L	25	5	3,175	40	45	9	20	5	±0,05	3,0	4	16,91	48,09	441
02510-4	R	25	10	4,762	46	85	13	30	5	±0,05	3,0	4	28,96	71,54	500
03204-4	R	32	4	2,381	46	40	9	15	3	±0,05	1,5	4	12,71	47,44	481
03205-4	R/L	32	5	3,175	46	45	9	20	5	±0,05	3,0	4	18,85	62,21	510
03210-4	R	32	10	6,350	54	85	13	30	5	±0,05	3,0	4	47,12	119,72	608
04005-4	R/L	40	5	3,175	56	45	9	20	5	±0,05	3,0	4	20,69	78,34	579
04010-4	R/L	40	10	6,350	62	85	13	30	5	±0,05	3,0	4	52,95	152,00	706
05010-4	R	50	10	6,350	72	85	13	30	5	±0,05	3,0	4	58,88	192,35	814
06310-4	R	63	10	6,350	85	85	13	30	6	±0,05	3,5	4	65,89	248,58	932
08010-4	R	80	10	6,350	105	85	13	30	8	±0,10	4,5	4	72,04	313,36	1069

*p = Pitch

Type SD

Compacte single flange nut to DIN 69051 Form B

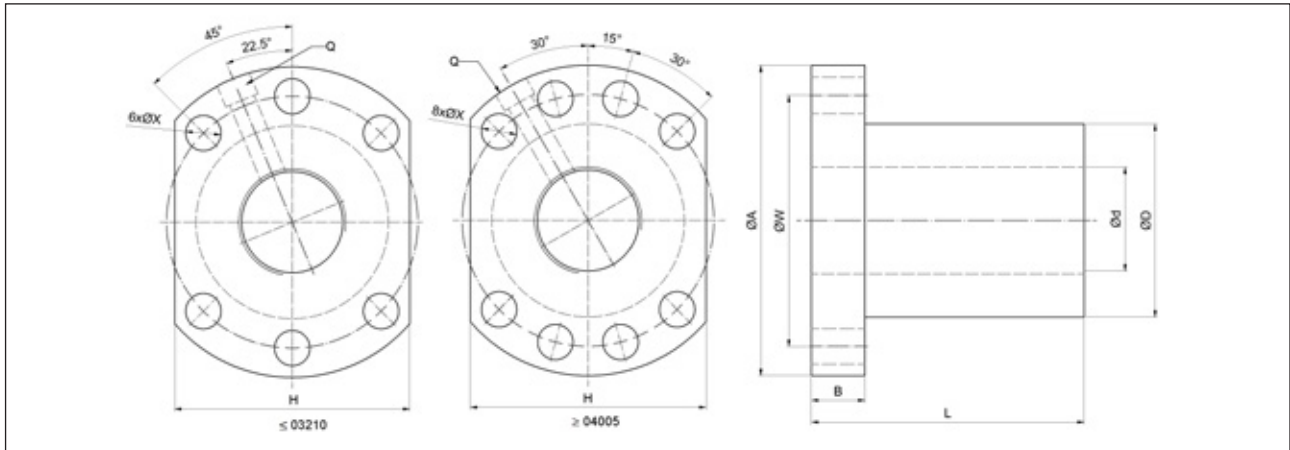


Type	Thread	Dimensions											Number of circuits	Load rating		Stiffness	
		d	p*	Ball ø	Dg6	A	B	E	L	W	H	X		Q	C _a		C _{0a}
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kN]	[kN]	[N/µm]
01205-2,8	R 12 5	2,500	24	40 ±0,15	10 ±0,10	5,0	30 ±0,15	32 ±0,15	30 ±0,10	4,5		2,8x1	6,49	12,90	186		
01210-2,8	R 12 10	2,500	24	40 ±0,15	10 ±0,10	5,0	45 ±0,15	32 ±0,15	30 ±0,10	4,5		2,8x1	6,30	12,62	186		
01605-3,8	R 16 5	2,778	28	48 ±0,15	10 ±0,10	5,0	37 ±0,15	38 ±0,15	40 ±0,15	5,5	M6	3,8x1	10,90	24,59	294		
01610-2,8	R 16 10	2,778	28	48 ±0,15	10 ±0,10	5,0	45 ±0,15	38 ±0,15	40 ±0,15	5,5	M6	2,8x1	8,23	17,86	226		
01616-1,8	R 16 16	2,778	28	48 ±0,15	10 ±0,10	5,0	45 ±0,15	38 ±0,15	40 ±0,15	5,5	M6	1,8x1	5,42	11,15	137		
01616-2,8	R 16 16	2,778	28	48 ±0,15	10 ±0,10	5,0	61 ±0,15	38 ±0,15	40 ±0,15	5,5	M6	2,8x1	7,92	17,34	216		
01620-1,8	R 16 20	2,778	28	48 ±0,15	10 ±0,10	5,0	58 ±0,15	38 ±0,15	40 ±0,15	5,5	M6	1,8x1	5,43	11,47	137		
02005-3,8	R 20 5	3,175	36	58 ±0,15	10 ±0,10	7,0	37 ±0,15	47 ±0,15	44 ±0,15	6,6	M6	3,8x1	15,55	36,10	363		
02010-3,8	R 20 10	3,175	36	58 ±0,15	10 ±0,10	7,0	55 ±0,15	47 ±0,15	44 ±0,15	6,6	M6	3,8x1	14,87	37,59	392		
02020-1,8	R 20 20	3,175	36	58 ±0,15	10 ±0,10	7,0	54 ±0,15	47 ±0,15	44 ±0,15	6,6	M6	1,8x1	7,96	17,24	186		
02020-2,8	R 20 20	3,175	36	58 ±0,15	10 ±0,10	7,0	74 ±0,15	47 ±0,15	44 ±0,15	6,6	M6	2,8x1	10,96	26,81	284		
02505-3,8	R 25 5	3,175	40	62 ±0,15	10 ±0,10	7,0	37 ±0,15	51 ±0,15	48 ±0,15	6,6	M6	3,8x1	16,18	45,68	422		
02510-3,8	R 25 10	3,175	40	62 ±0,15	12 ±0,10	7,0	55 ±0,15	51 ±0,15	48 ±0,15	6,6	M6	3,8x1	16,06	45,43	441		
02525-1,8	R 25 25	3,175	40	62 ±0,15	12 ±0,10	7,0	64 ±0,15	51 ±0,15	48 ±0,15	6,6	M6	1,8x1	8,26	21,57	215		
02525-2,8	R 25 25	3,175	40	62 ±0,15	12 ±0,10	7,0	89 ±0,15	51 ±0,15	48 ±0,15	6,6	M6	2,8x1	12,08	33,55	333		
03205-3,8	R 32 5	3,175	50	80 ±0,15	12 ±0,10	9,0	37 ±0,15	65 ±0,15	62 ±0,15	9,0	M6	3,8x1	18,03	59,10	500		
03210-3,8	R 32 10	3,969	50	80 ±0,15	12 ±0,10	9,0	57 ±0,15	65 ±0,15	62 ±0,15	9,0	M6	3,8x1	24,13	71,15	539		
03220-2,8	R 32 20	3,969	50	80 ±0,15	12 ±0,10	9,0	76 ±0,15	65 ±0,15	62 ±0,15	9,0	M6	2,8x1	18,70	53,76	422		
03232-1,8	R 32 32	3,969	50	80 ±0,15	12 ±0,10	9,0	80 ±0,15	65 ±0,15	62 ±0,15	9,0	M6	1,8x1	12,33	33,60	265		
03232-2,8	R 32 32	3,969	50	80 ±0,15	12 ±0,10	9,0	112 ±0,15	65 ±0,15	62 ±0,15	9,0	M6	2,8x1	18,02	52,30	412		
04005-3,8	R 40 5	3,175	63	93 ±0,15	15 ±0,10	9,0	42 ±0,15	78 ±0,15	62 ±0,15	9,0	M8	3,8x1	19,80	74,42	588		
04010-3,8	R 40 10	6,350	63	93 ±0,15	14 ±0,10	9,0	60 ±0,15	78 ±0,15	70 ±0,15	9,0	M8	3,8x1	49,37	136,73	657		
04020-2,8	R 40 20	6,350	63	93 ±0,15	14 ±0,10	9,0	80 ±0,15	78 ±0,15	70 ±0,15	9,0	M8	2,8x1	38,82	105,08	533		
04040-1,8	R 40 40	6,350	63	93 ±0,15	14 ±0,10	9,0	98 ±0,15	78 ±0,15	70 ±0,15	9,0	M8	1,8x1	25,35	65,19	333		
04040-2,8	R 40 40	6,350	63	93 ±0,15	14 ±0,10	9,0	138 ±0,20	78 ±0,15	70 ±0,15	9,0	M8	2,8x1	37,07	101,41	510		
05005-3,8	R 50 5	3,175	75	110 ±0,15	15 ±0,10	10,5	42 ±0,15	93 ±0,15	85 ±0,15	11,0	M8	3,8x1	21,65	93,58	667		
05010-3,8	R 50 10	6,350	75	110 ±0,15	18 ±0,10	10,5	60 ±0,15	93 ±0,15	85 ±0,15	11,0	M8	3,8x1	55,29	175,07	775		
05020-3,8	R 50 20	6,350	75	110 ±0,15	18 ±0,10	10,5	100 ±0,15	93 ±0,15	85 ±0,15	11,0	M8	3,8x1	56,38	181,27	853		
05050-1,8	R 50 50	6,350	75	110 ±0,15	18 ±0,10	10,5	120 ±0,20	93 ±0,15	85 ±0,15	11,0	M8	1,8x1	28,89	85,80	412		
05050-2,8	R 50 50	6,350	75	110 ±0,15	18 ±0,10	10,5	170 ±0,20	93 ±0,15	85 ±0,15	11,0	M8	2,8x1	42,25	133,47	637		

*p = Pitch

Type SW

Single flange nut to DIN 69051 Form B

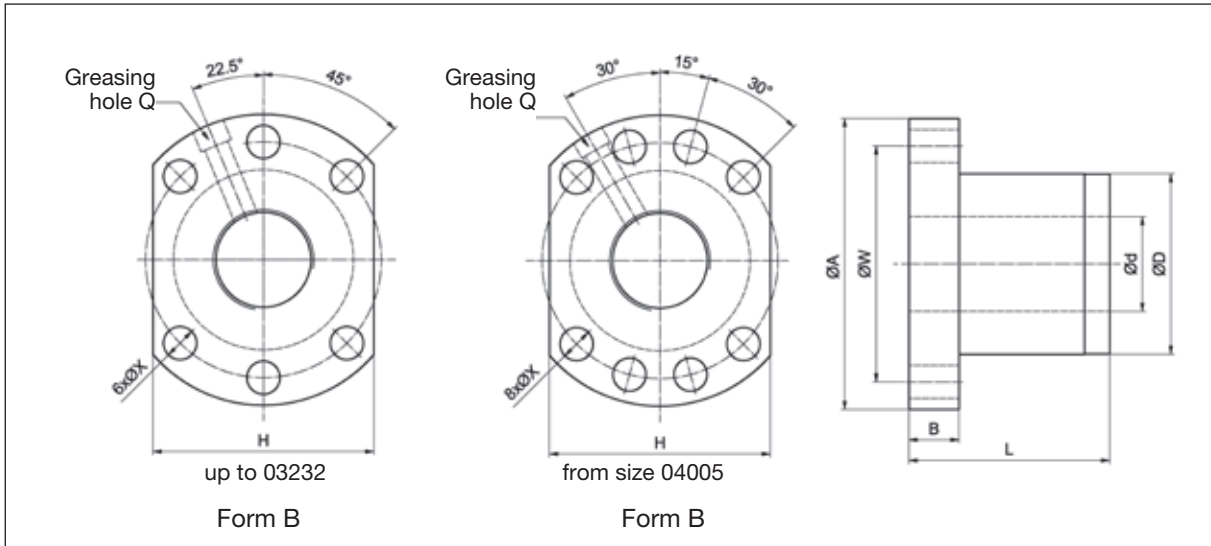


Type	Thread	Dimensions												Number of circuits	Load rating		Stiffness	
		d	p*	Ball ø	Dg6	A	B	E	L	W	H	X	Q		C _a	C _{0a}		K
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[kN]	[kN]		[N/μm]
01605-4	R 16 5	3,175	28	48 ±0,15	10 ±0,10	45 ±0,15	38 ±0,15	40 ±0,15	40 ±0,15	5,5 ±0,15	M6	1x4	13,53	29,92	314	186		
01610-3	R 16 10	3,175	28	48 ±0,15	10 ±0,10	57 ±0,15	38 ±0,15	40 ±0,15	40 ±0,15	5,5 ±0,15	M6	1x3	10,82	23,55	255	186		
02005-4	R 20 5	3,175	36	58 ±0,15	10 ±0,10	51 ±0,15	47 ±0,15	44 ±0,15	44 ±0,15	6,6 ±0,15	M6	1x4	15,21	38,00	382	294		
02505-4	R 25 5	3,175	40	62 ±0,15	10 ±0,10	51 ±0,15	51 ±0,15	48 ±0,15	48 ±0,15	6,6 ±0,15	M6	1x4	16,91	48,09	441	226		
02510-4	R 25 10	4,762	40	62 ±0,15	12 ±0,10	80 ±0,15	51 ±0,15	48 ±0,15	48 ±0,15	6,6 ±0,15	M6	1x4	28,96	71,54	490	137		
03205-4	R 32 5	3,175	50	80 ±0,15	12 ±0,10	52 ±0,15	65 ±0,15	62 ±0,15	62 ±0,15	9,0 ±0,15	M6	1x4	18,85	62,21	530			
03210-4	R 32 10	6,350	50	80 ±0,15	12 ±0,10	85 ±0,15	65 ±0,15	62 ±0,15	62 ±0,15	9,0 ±0,15	M6	1x4	47,12	119,72	598			
04005-4	R 40 5	3,175	63	93 ±0,15	14 ±0,10	55 ±0,15	78 ±0,15	70 ±0,15	70 ±0,15	9,0 ±0,15	M8	1x4	20,69	78,34	618			
04010-4	R 40 10	6,350	63	93 ±0,15	14 ±0,10	88 ±0,15	78 ±0,15	70 ±0,15	70 ±0,15	9,0 ±0,15	M8	1x4	52,95	152,00	716			
05010-4	R 50 10	6,350	75	110 ±0,15	16 ±0,10	88 ±0,15	93 ±0,15	85 ±0,15	85 ±0,15	11,0 ±0,15	M8	1x4	58,88	192,35	834			
06310-4	R 63 10	6,350	90	125 ±0,20	18 ±0,10	93 ±0,15	108 ±0,15	95 ±0,15	95 ±0,15	11,0 ±0,15	M8	1x4	65,89	248,68	970			
08010-4	R 80 10	6,350	105	145 ±0,20	20 ±0,10	93 ±0,15	125 ±0,15	110 ±0,20	110 ±0,20	13,5 ±0,15	M8	1x4	72,04	313,36	1 069			

*p = Pitch

Type SC

Single compact flange nut to DIN 69051

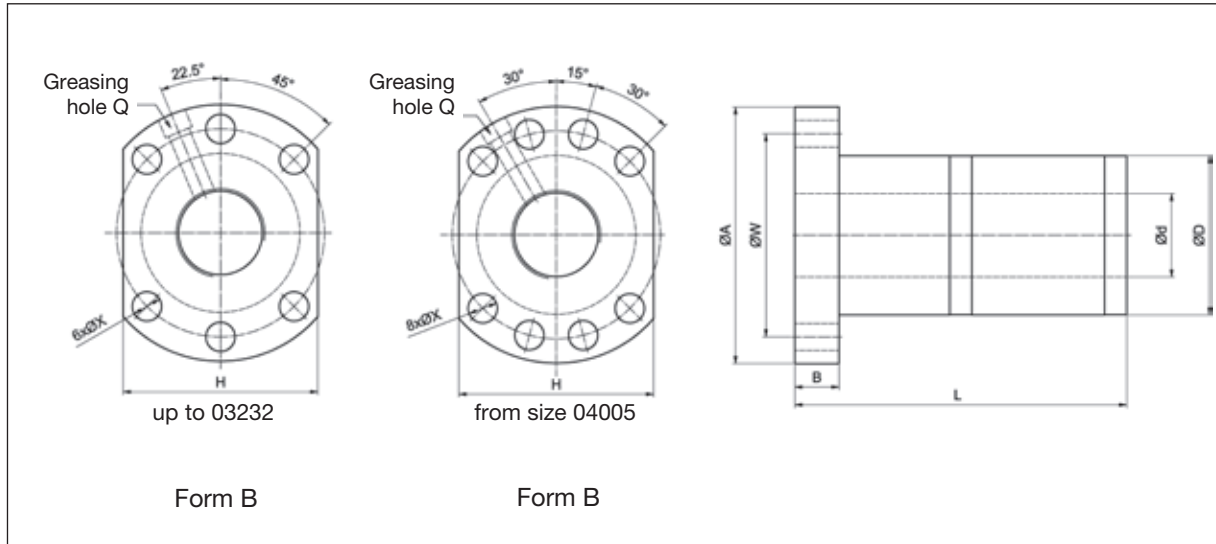


Size	Thread	Dimensions [mm]											Number of circuits	Load rating [kN]		Stiffness K [N/µm]	
		d	p*	Ball-ø	D _{g6}	A	B	L	W	H	X	Q		dyn. C _a	stat. C _{a0}		
01205-2,8	R	12	5	2,500	24	40	10	31	32	30	±0,10	4,5		2,8x1	6,49	12,90	186
01605-3,8	R	16	5	2,778	28	48	10	38	38	40	±0,15	5,5	M6x1P	3,8x1	10,90	24,59	294
01610-2,8	R	16	10	2,778	28	48	10	47	38	40	±0,15	5,5	M6x1P	2,8x1	8,23	17,86	226
01616-1,8	R	16	16	2,778	28	48	10	45	38	40	±0,15	5,5	M6x1P	1,8x1	5,42	11,15	137
01616-2,8	R	16	16	2,778	28	48	10	61	38	40	±0,15	5,5	M6x1P	2,8x1	7,92	17,34	216
01620-1,8	R	16	20	2,778	28	48	10	57	38	40	±0,15	5,5	M6x1P	1,8x1	5,43	11,47	137
02005-3,8	R	20	5	3,175	36	58	10	40	47	44	±0,15	6,6	M6x1P	3,8x1	15,55	36,10	363
02010-3,8	R	20	10	3,175	36	58	10	60	47	44	±0,15	6,6	M6x1P	3,8x1	14,87	37,59	392
02020-1,8	R	20	20	3,175	36	58	10	57	47	44	±0,15	6,6	M6x1P	1,8x1	7,96	17,24	186
02020-2,8	R	20	20	3,175	36	58	10	77	47	44	±0,15	6,6	M6x1P	2,8x1	10,96	26,81	284
02505-3,8	R	25	5	3,175	40	62	10	40	51	48	±0,15	6,6	M6x1P	3,8x1	16,18	45,68	422
02510-3,8	R	25	10	3,175	40	62	12	62	51	48	±0,15	6,6	M6x1P	3,8x1	16,06	45,43	441
02525-1,8	R	25	25	3,175	40	62	12	70	51	48	±0,15	6,6	M6x1P	1,8x1	8,26	21,57	2156
02525-2,8	R	25	25	3,175	40	62	12	95	51	48	±0,15	6,6	M6x1P	2,8x1	12,08	33,55	333
03205-3,8	R	32	5	3,175	50	80	12	42	65	62	±0,15	9,0	M6x1P	3,8x1	18,03	59,10	500
03210-3,8	R	31	10	3,969	50	80	13	62	65	62	±0,15	9,0	M6x1P	3,8x1	24,13	71,15	539
03220-2,8	R	31	20	3,969	50	80	12	80	65	62	±0,15	9,0	M6x1P	2,8x1	18,70	53,76	422
03232-1,8	R	31	32	3,969	50	80	13	84	65	62	±0,15	9,0	M6x1P	1,8x1	12,33	33,60	265
03232-2,8	R	31	32	3,969	50	80	13	116	65	62	±0,15	9,0	M6x1P	2,8x1	18,02	52,30	412
04005-3,8	R	40	5	3,175	63	93	15	45	78	70	±0,15	9,0	M8x1P	3,8x1	19,80	74,42	588
04010-3,8	R	38	10	6,350	63	93	14	63	78	70	±0,15	9,0	M8x1P	3,8x1	49,37	136,73	657
04020-2,8	R	38	20	6,350	63	93	14	82	78	70	±0,15	9,0	M8x1P	2,8x1	38,82	105,08	533
04040-1,8	R	38	40	6,350	63	93	15	105	78	70	±0,15	9,0	M8x1P	1,8x1	25,35	65,19	333
04040-2,8	R	38	40	6,350	63	93	15	145	78	70	±0,15	9,0	M8x1P	2,8x1	37,07	101,41	510
05005-3,8	R	50	5	3,175	75	110	15	45	93	85	±0,15	11,0	M8x1P	3,8x1	21,65	93,58	667
05010-3,8	R	48	10	6,350	75	110	18	68	93	85	±0,15	11,0	M8x1P	3,8x1	55,29	175,07	775
05020-3,8	R	48	50	6,350	75	110	18	108	93	85	±0,15	11,0	M8x1P	3,8x1	56,38	181,27	853

*p = Pitch

Type DC

Double compact flange nut to DIN 69051

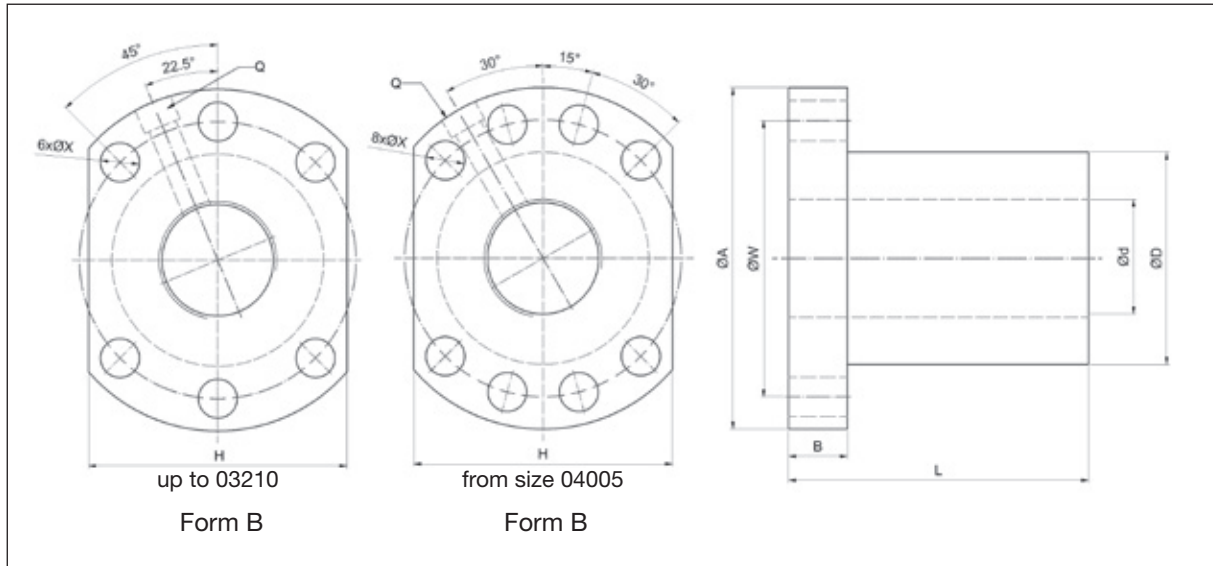


Size	Thread	Dimensions [mm]											Number of circuits	Load rating [kN]		Stiffness K [N/µm]	
		d	p*	Ball-Ø	D g6	A	B	L	W	H	X	Q		dyn. C _a	stat. C _{a0}		
01605-3,8	R	16	5	2,778	28	48	10	73	38	40	±0,15	5,5	M6x1P	3,8x1	10,90	24,59	402
01610-2,8	R	16	10	2,778	28	48	10	97	38	40	±0,15	5,5	M6x1P	2,8x1	8,23	17,86	304
02005-3,8	R	20	5	3,175	36	58	10	75	47	44	±0,15	6,6	M6x1P	3,8x1	15,55	36,10	490
02010-3,8	R	20	10	3,175	36	58	10	120	47	44	±0,15	6,6	M6x1P	3,8x1	14,87	37,59	520
02505-3,8	R	25	5	3,175	40	62	10	75	51	48	±0,15	6,6	M6x1P	3,8x1	16,18	45,68	579
02510-3,8	R	25	10	3,175	40	62	12	122	51	48	±0,15	6,6	M6x1P	3,8x1	16,06	45,43	598
03205-3,8	R	32	5	3,175	50	80	12	82	65	62	±0,15	9,0	M6x1P	3,8x1	18,03	59,10	696
03210-3,8	R	31	10	3,969	50	80	13	122	65	62	±0,15	9,0	M6x1P	3,8x1	24,13	71,15	735
03220-2,8	R	31	20	3,969	50	80	12	160	65	62	±0,15	9,0	M6x1P	2,8x1	18,70	53,76	569
04005-3,8	R	40	5	3,175	63	93	15	85	78	70	±0,15	9,0	M8x1P	3,8x1	19,80	74,42	814
04010-3,8	R	38	10	6,350	63	93	14	123	78	70	±0,15	9,0	M8x1P	3,8x1	49,37	136,73	892
04020-2,8	R	38	20	6,350	63	93	14	162	78	70	±0,15	9,0	M8x1P	2,8x1	38,82	105,08	716
05005-3,8	R	50	5	3,175	75	110	15	85	93	85	±0,15	11,0	M8x1P	3,8x1	21,65	93,58	941
05010-3,8	R	48	10	6,350	75	110	18	138	93	85	±0,15	11,0	M8x1P	3,8x1	55,29	175,07	1069
05020-3,8	R		20	6,350	75	110	18	218	93	85	±0,15	11,0	M8x1P	3,8x1	56,38	181,27	1138

*p = Pitch

Type SU

Single flange nut to DIN 69051

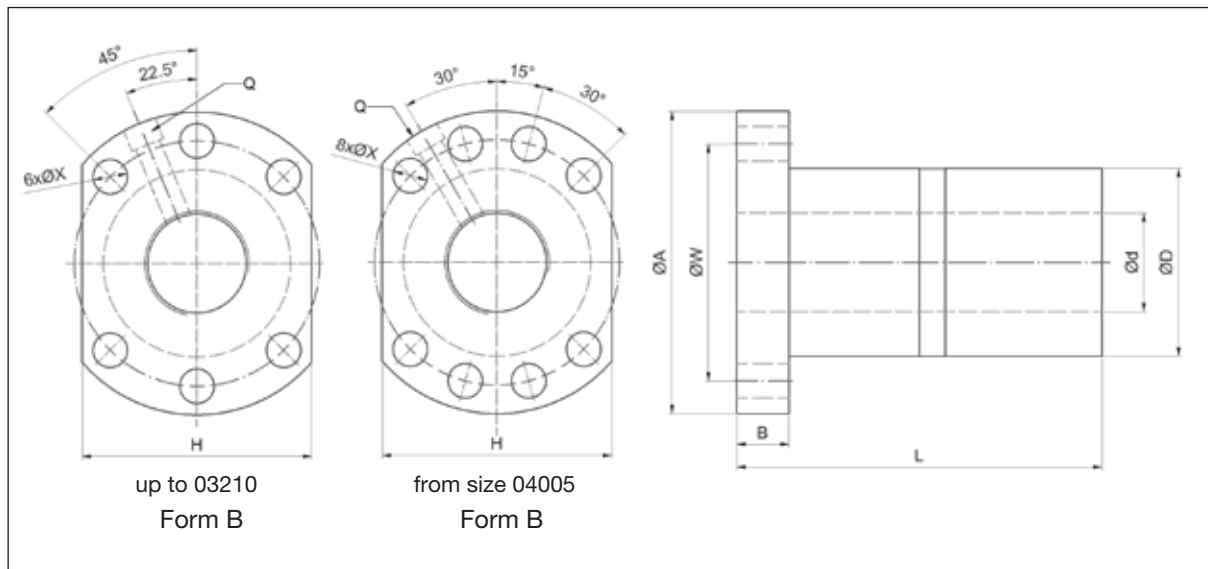


Size	Thread	Dimensions [mm]											Number of circuits	Load rating [kN]		Stiffness K [N/µm]	
		d	p*	Ball-Ø	D g6	A	B	L	W	H	X	Q		dyn. C _a	stat. C _{a0}		
01604-4	R	16	4	2,381	28	48	10	40	38	40	±0,15	5,5	M6	4	9,54	23,59	314
01605-4	R/L	16	5	3,175	28	48	10	50	38	40	±0,15	5,5	M6	4	13,53	29,93	314
01610-3	R	16	10	3,175	28	48	10	57	38	40	±0,15	5,5	M6	3	10,82	23,55	255
02004-4	R	20	4	2,381	36	58	10	42	47	44	±0,15	6,6	M6	4	10,45	29,29	372
02005-4	R/L	20	5	3,175	36	58	10	51	47	44	±0,15	6,6	M6	4	15,21	38,00	382
02504-4	R	25	4	2,381	40	62	10	42	51	48	±0,15	6,6	M6	4	11,58	37,22	421
02505-4	R/L	25	5	3,175	40	62	10	51	51	48	±0,15	6,6	M6	4	16,91	48,09	441
02510-4	R	25	10	4,762	40	62	12	85	51	48	±0,15	6,6	M6	4	28,96	71,54	490
03204-4	R	32	4	2,381	50	80	12	44	65	62	±0,15	9,0	M6	4	12,71	47,44	500
03205-4	R/L	32	5	3,175	50	80	12	52	65	62	±0,15	9,0	M6	4	18,85	62,21	529
03210-4	R/L	32	10	6,350	50	80	12	90	65	62	±0,15	9,0	M6	4	47,12	119,72	598
04005-4	R/L	40	5	3,175	63	93	14	55	78	70	±0,15	9,0	M8	4	20,69	78,34	617
04010-4	R/L	40	10	6,350	63	93	14	93	78	70	±0,15	9,0	M8	4	52,95	152,00	715
05010-4	R/L	50	10	6,350	75	110	16	93	93	85	±0,15	11,0	M8	4	58,88	192,35	833
06310-4	R	63	10	6,350	90	125	18	98	108	95	±0,15	11,0	M8	4	65,89	248,68	970
06320-4	R	63	20	9,525	95	135	20	149	115	100	±0,15	13,5	M8	4	112,23	359,44	1098
08010-4	R	80	10	6,350	105	145	20	98	125	110	±0,15	13,5	M8	4	72,04	313,36	1068
08020-4	R	80	20	9,525	125	165	25	154	145	130	±0,20	13,5	M8	4	126,61	468,24	1352

*p = Pitch

Type DU

Double flange nut to DIN 69051

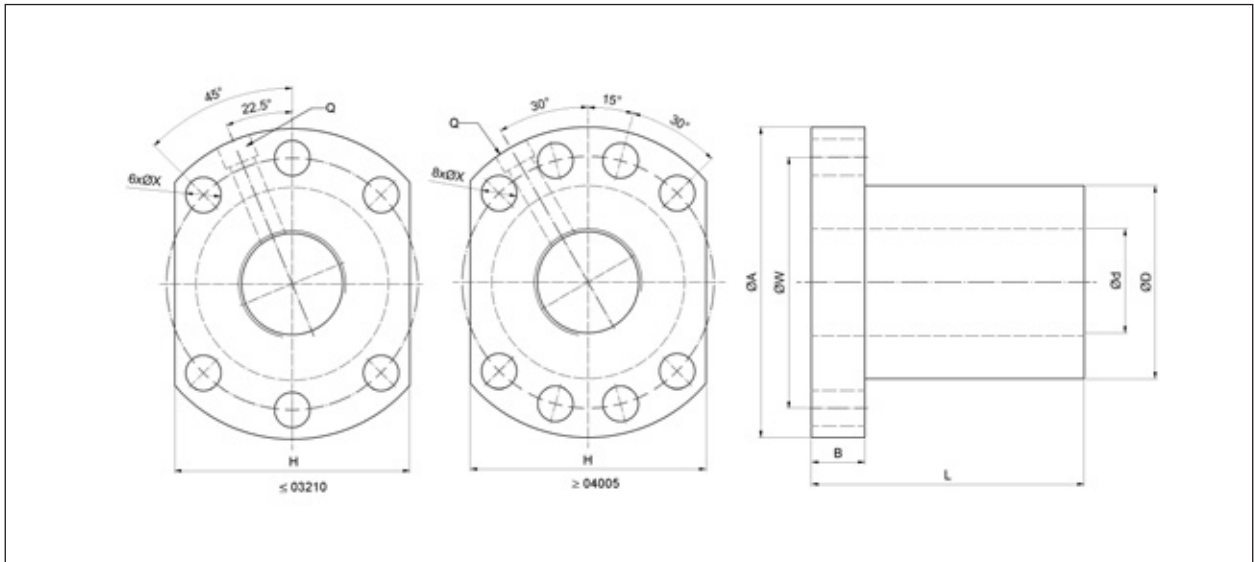


Size	Thread	Dimensions [mm]											Number of circuits	Load rating [kN]		Stiffness K [N/µm]	
		d	p*	Ball-Ø	D g6	A	B	L	W	H	X	Q		dyn. C _a	stat. C _{a0}		
01604-4	R	16	4	2,381	28	48	10	80	38	40	±0,15	5,5	M6	4	9,54	23,59	421
01605-4	R/L	16	5	3,175	28	48	10	100	38	40	±0,15	5,5	M6	4	13,53	29,93	431
01610-3	R	16	10	3,175	28	48	10	118	38	40	±0,15	5,5	M6	3	10,82	23,55	343
02004-4	R	20	4	2,381	36	58	10	80	47	44	±0,15	6,6	M6	4	10,45	29,29	500
02005-4	R/L	20	5	3,175	36	58	10	101	47	44	±0,15	6,6	M6	4	15,21	38,00	519
02504-4	R	25	4	2,381	40	62	10	80	51	48	±0,15	6,6	M6	4	11,58	37,22	588
02505-4	R/L	25	5	3,175	40	62	10	101	51	48	±0,15	6,6	M6	4	16,91	48,09	608
02510-4	R	25	10	4,762	40	62	12	145	51	48	±0,15	6,6	M6	4	28,96	71,54	657
03204-4	R	32	4	2,381	50	80	12	80	65	62	±0,15	9,0	M6	4	12,71	47,44	696
03205-4	R/L	32	5	3,175	50	80	12	102	65	62	±0,15	9,0	M6	4	18,85	62,21	725
03210-4	R/L	32	10	6,350	50	80	12	162	65	62	±0,15	9,0	M6	4	47,12	119,72	804
04005-4	R/L	40	5	3,175	63	93	14	105	78	70	±0,15	9,0	M8	4	20,69	78,34	853
04010-4	R/L	40	10	6,350	63	93	14	165	78	70	±0,15	9,0	M8	4	52,95	152,00	970
05010-4	R/L	50	10	6,350	75	110	16	171	93	85	±0,15	11,0	M8	4	58,88	192,35	1147
06310-4	R	63	10	6,350	90	125	18	182	108	95	±0,15	11,0	M8	4	65,89	248,68	1362
06320-4	R	63	20	9,525	95	135	20	290	115	100	±0,15	13,5	M8	4	112,23	359,44	1490
08010-4	R	80	10	6,350	105	145	20	182	125	110	±0,15	13,5	M8	4	72,04	313,36	1529
08020-4	R	80	20	9,525	125	165	25	295	145	130	±0,20	13,5	M8	4	126,61	468,24	1833

*p = Pitch

Type TW

With pitch offset

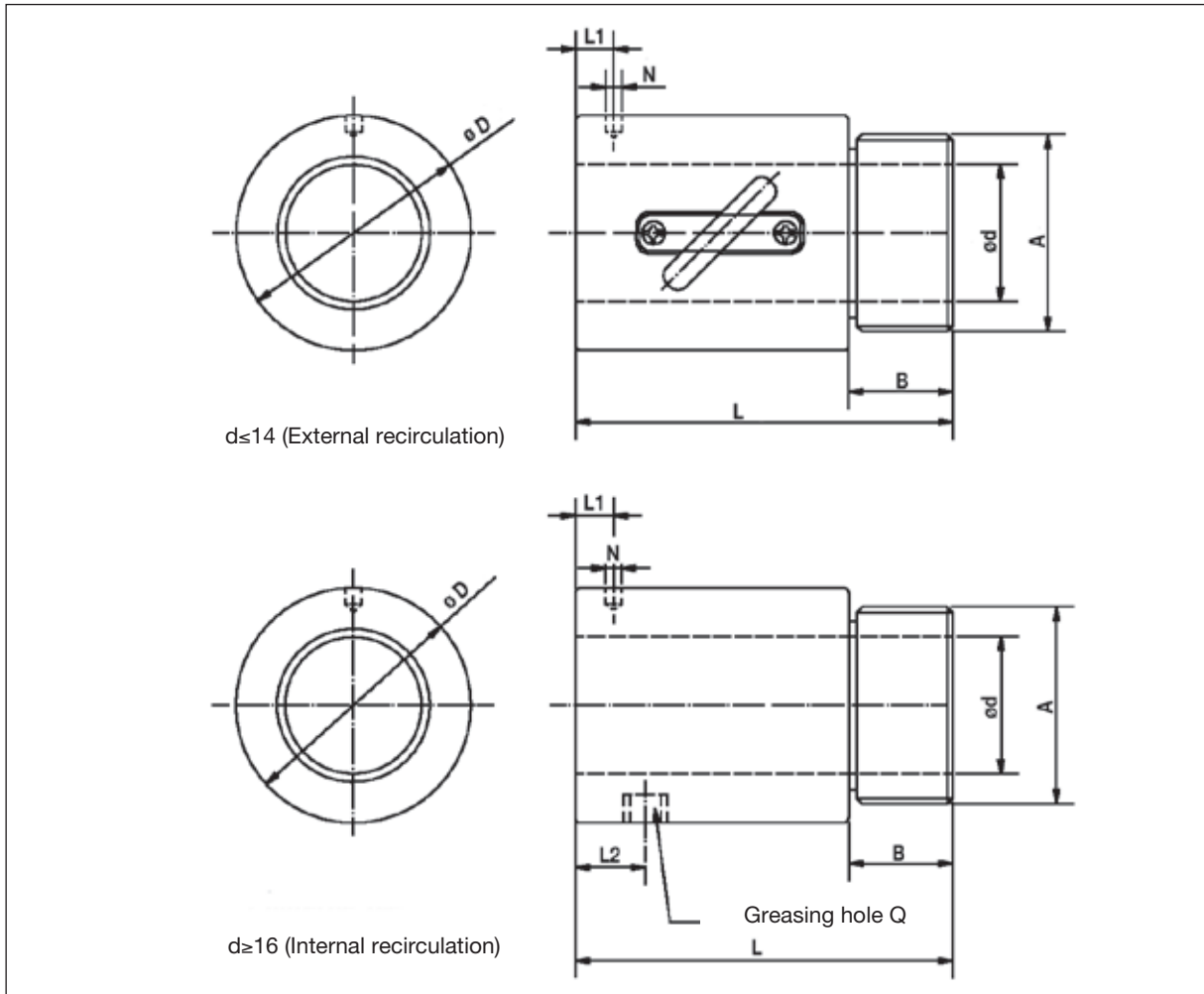


Size	Thread	Dimensions											Number of circuits	Load rating [kN]		Stiffness
		d [mm]	p* [mm]	Ball-Ø [mm]	Dg6 [mm]	A [mm]	B [mm]	L [mm]	W [mm]	H [mm]	X [mm]	Q		C _a [kN]	C _{0a} [kN]	
TW01605-4	R	16	5	3,175	28	48 ±0,15	10 ±0,10	75 ±0,15	38 ±0,15	40 ±0,15	5,5	M6	1x4	13,53	29,92	431
TW02005-4	R	20	5	3,175	36	58 ±0,15	10 ±0,10	85 ±0,15	47 ±0,15	44 ±0,15	6,6	M6	1x4	15,21	38,00	519
TW02505-4	R	25	5	3,175	40	62 ±0,15	10 ±0,10	86 ±0,15	51 ±0,15	48 ±0,15	6,6	M6	1x4	16,91	48,09	608
TW02510-4	R	25	10	4,762	40	62 ±0,15	12 ±0,10	130 ±0,15	51 ±0,15	48 ±0,15	6,6	M6	1x4	28,96	71,54	657
TW03205-4	R	32	5	3,175	50	80 ±0,15	12 ±0,10	87 ±0,15	65 ±0,15	62 ±0,15	9,0	M6	1x4	18,85	62,21	726
TW03210-4	R	32	10	6,350	50	80 ±0,15	12 ±0,10	145 ±0,15	65 ±0,15	62 ±0,15	9,0	M6	1x4	47,12	119,72	804
TW04005-4	R	40	5	3,175	63	93 ±0,15	14 ±0,10	90 ±0,15	78 ±0,15	70 ±0,15	9,0	M8	1x4	20,69	78,34	853
TW04010-4	R	40	10	6,350	63	93 ±0,15	14 ±0,10	148 ±0,15	78 ±0,15	70 ±0,15	9,0	M8	1x4	52,95	152,00	971
TW05010-4	R	50	10	6,350	75	110 ±0,15	16 ±0,10	148 ±0,15	93 ±0,15	85 ±0,15	11,0	M8	1x4	58,88	192,35	1 147
TW06310-4	R	63	10	6,350	90	125 ±0,20	18 ±0,10	153 ±0,15	108 ±0,15	95 ±0,15	11,0	M8	1x4	65,89	248,68	1 363
TW08010-4	R	80	10	6,350	105	145 ±0,20	20 ±0,10	153 ±0,15	125 ±0,20	110 ±0,15	13,5	M8	1x4	72,04	313,36	1 530

*p = Pitch

Type SH

Single threaded nose nuts



Size	Thread	Dimensions [mm]											Number of circuits	Load rating [kN]		Stiffness K [N/μm]
		d	p*	Ball-ø	D	A	B	L	L1	N	L2	Q		dyn. C_a	stat. C_{a0}	
0082.5	R	8	2,5	1,2	17,5	M15x1P	7,5	23,5 ±0,15	10	3	-	-	2,5x1	1,85	3,73	108
01002	R	10	2	1,2	19,5	M17x1P	7,5	22 ±0,15	3	3,2	-	-	3,5x1	2,72	6,51	167
01004	R		4	2	25	M20x1P	10	34 ±0,15	3	3	-	-	2,5x1	3,92	7,39	137
01204	R	12	4	2,5	25,5	M20x1P	10	34 ±0,15	13	3	-	-	3,5x1	7,88	16,16	226
01205	R		5	2,5	25,5	M20x1P	10	39 ±0,15	16,25	3	-	-	3,5x1	7,85	16,11	235
01404	R	14	4	2,381	32,1	M25x1,5P	10	35 ±0,15	13	3	-	-	3,5x1	7,88	17,67	255
01604	R	16	4	2,381	29	M22x1,5P	8	32 ±0,15	4	3,2	-	-	3x1	7,44	17,68	235
01605	R		5	3,175	32,5	M26x1,5P	12	42 ±0,15	19,25	3	-	-	3x1	10,56	22,43	245
02005	R	20	5	3,175	38	M35x1,5P	15	45 ±0,15	20,3	3	-	-	3x1	11,87	28,48	294
02505	R	25	5	3,175	43	M40x1,5P	19	69 ±0,15	32,11	3	8	M6	4x1	16,89	48,06	363

*p = Pitch

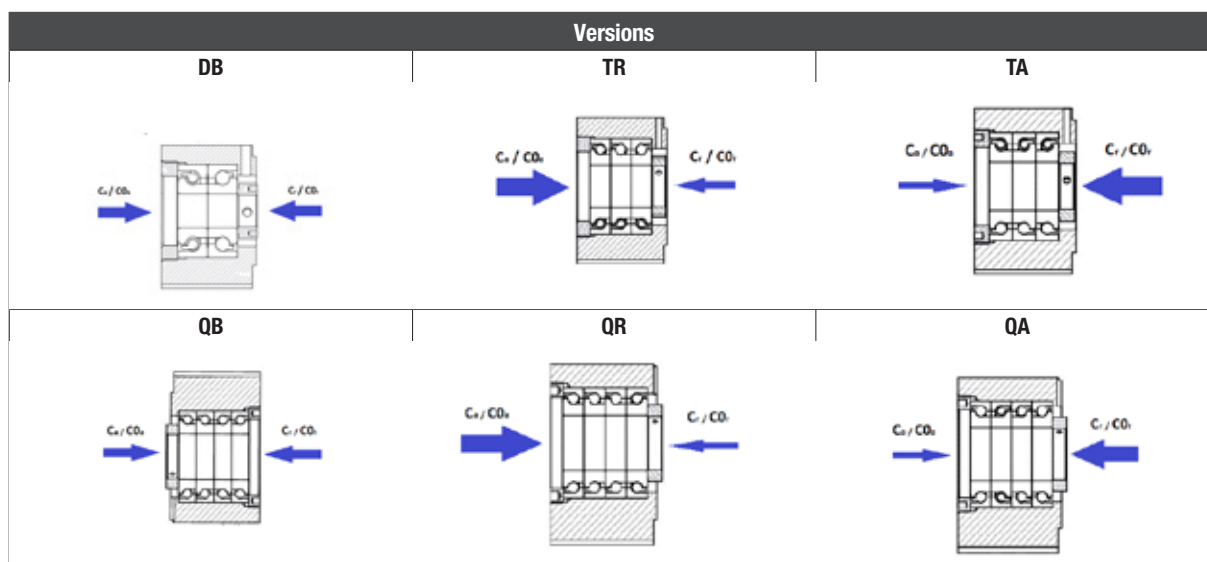
Bearing units

Fixed bearing unit **BSTK** with angular contact ball bearing

The fixed bearing units consist of:

- Pillow block housing made of steel with stop edges on both sides, direct drive adaption and lubrication option
- Double row angular contact ball bearing with a contact angle of 58°
- Slotted nut with radial clamping
- Thread ring

Suitable for standard spindle ends type F3...F6, G3...G6, H3...H6



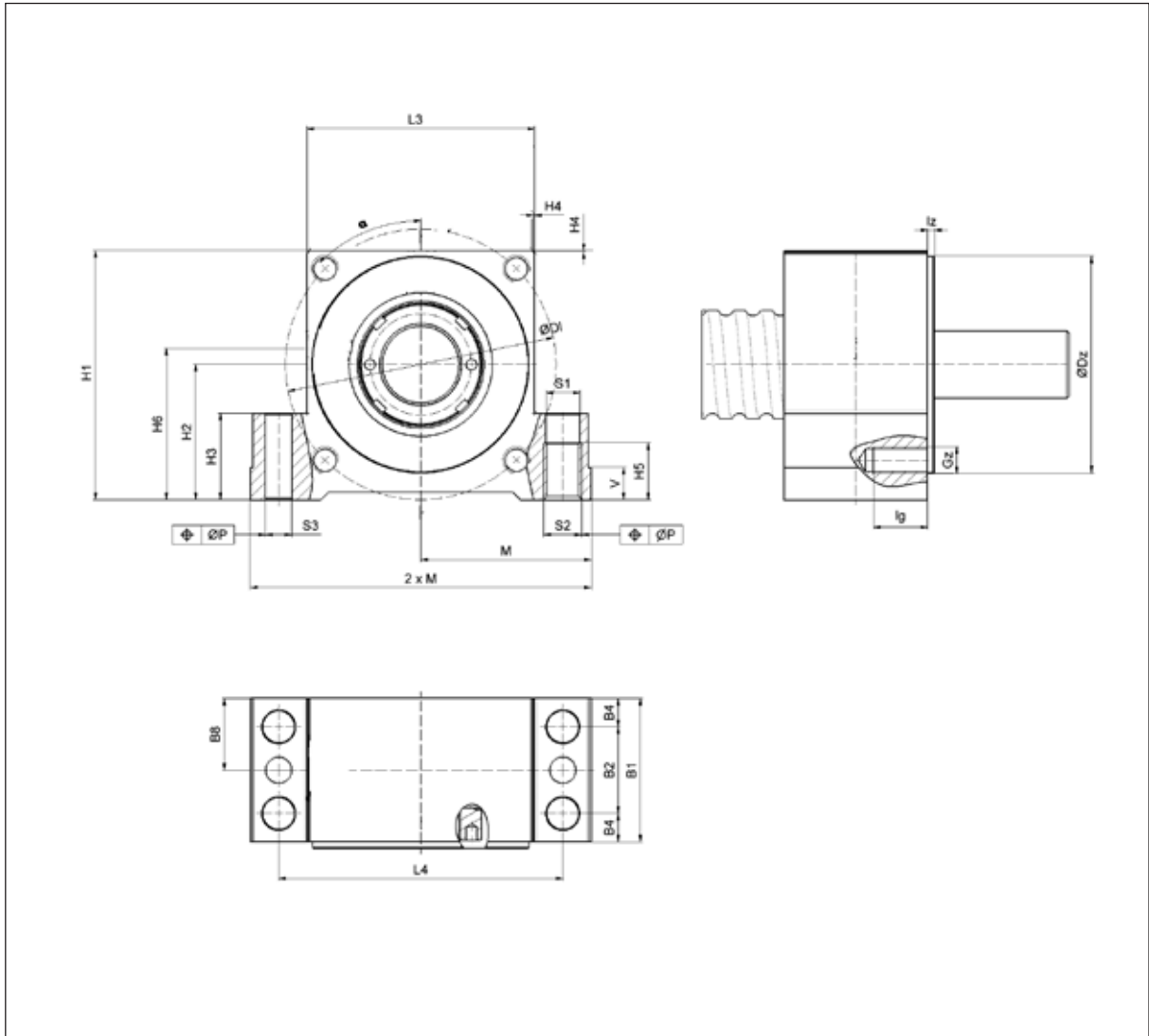
Type	Load ratings				Number of bearing	Désignation			Tightening torque		
	Ca [kN]	Cr [kN]	C0a [kN]	C0r [kN]		Bearing	Precision nut	Threaded ring	Spacer ring	Precision nut [Nm]	Set screw [Nm]
BSTK17-DB	24,3	24,3	25,7	25,7	2	BST17x47-1B LXL DB P5/588	PRS17x1	TRH50-BST		15	3
BSTK20-DB	24,3	24,3	25,7	25,7	2	BST20x47-1B LXL DB P5/588	PRS20x1	TRH50-BST		18	5
BSTK25-DB	29,2	29,2	40,0	40,0	2	BST25x62-1B LXL DB P5/588	PRS25x1	TRH65-BST		25	5
BSTK30-DB	29,2	29,2	40,0	40,0	2	BST30x62-1B LXL DB P5/588	PRS30x1,5	TRH65		32	5
BSTK30-QB	47,5	47,5	80,5	80,5	4	BST30x62-1B LXL DTBT P5/588					5
BSTK35-DB	31,0	31,0	47,5	47,5	2	BST35x72-1B LXL DB P5/588	PRS35x1,5	TRH78	35x72	40	5
BSTK35-TA	31,0	50,5	47,5	95,0	3	BST35x72-1B LXL DBT P5/588	PRS35x1,5	TRH78			
BSTK35-TR	50,5	50,5	95,0	47,5							
BSTK40-DB	58,5	58,5	88,5	88,5	2	BST40x90-1B LXL DB P5/588	PRS40x1,5	TRH95	40x90	55	5
BSTK40-TA	58,5	95,0	88,5	177,0	3	BST40x90-1B LXL DBT P5/588	PRS40x1,5	TRH95			
BSTK40-TR	95,0	58,5	177,0	88,5							
BSTK50-QB	101,0	101,0	208,0	208,0	4	BST50x100-1B LXL DTBT P5/588	PRS50x1,5	TRH110-BST		85	5
BSTK50-QA	62,0	134,0	315,0	104,0		BST50x100-1B LXL DBTT P5/588					
BSTK50-QR	134,0	62,0	104,0	315,0							

Ca..... Dynamic load rating, pressure direction

Cr..... Dynamic load rating, tension direction

C0a..... Static load rating, pressure direction

C0r..... Static load rating, tension direction



Type	Nominal diameter	Pitch	H1	H2 ±0,02	H3	H4	H5	L3	L4	B1	B2	B4	B8	M js7	V	S1	S2	S3	DZ g6	lz	Gz	DI	lg	α
[mm]										[mm]					[mm]			[mm]	[mm]	[mm]	[°]			
BSTK17-DB	25	5/10/25	72	39	27	4	18	66	88	46	29	8,5	23,0	54,0	10	10,5 H12	M 12	9,7	55	2,0	M 6	70	12	45
BSTK20-DB	32	10	77	42	27	5	18	70	92	49	29	10,0	24,5	56,0	10	10,5 H12	M 12	9,7	65	2,0	M 6	75	12	45
BSTK25-DB	32	4/5/20/32	77	42	27	5	18	71	92	49	29	10,0	24,5	56,0	10	10,5 H12	M 12	9,7	65	2,0	M 8	75	20	45
BSTK30-DB	40	5/10/25	90	50	32	3	21	80	105	53	32	10,5	26,5	63,0	12	12,5 H7	M 14	9,7	80	2,5	M 10	95	20	45
BSTK30-QB										83	58	12,5	41,5			13,0 H7	M 16							
BSTK35-DB	50	10/20	105	58	38	5	21	92	118	70	43	13,5	35,0	72,0	12	13,0 H7	M 16	9,7	90	2,5	M 10	110	17	45
BSTK35-TA																								
BSTK35-TR																								
BSTK40-DB	50	50	138	73	50	10	31	130	160	85	58	13,5	42,5	95,0	16	13,0 H7	M 16	9,7	110	3,0	M 10	130	17	45
BSTK40-TA																								
BSTK40-TR																								
BSTK50-QB																								
BSTK50-QA	63/80	10/20	165	93	50	9	31	145	175	98	58	20,0	49,0	102,5	16	17,5 H7	M 20	11,7	140	3,0	M 12	160	20	45
BSTK50-QR																								

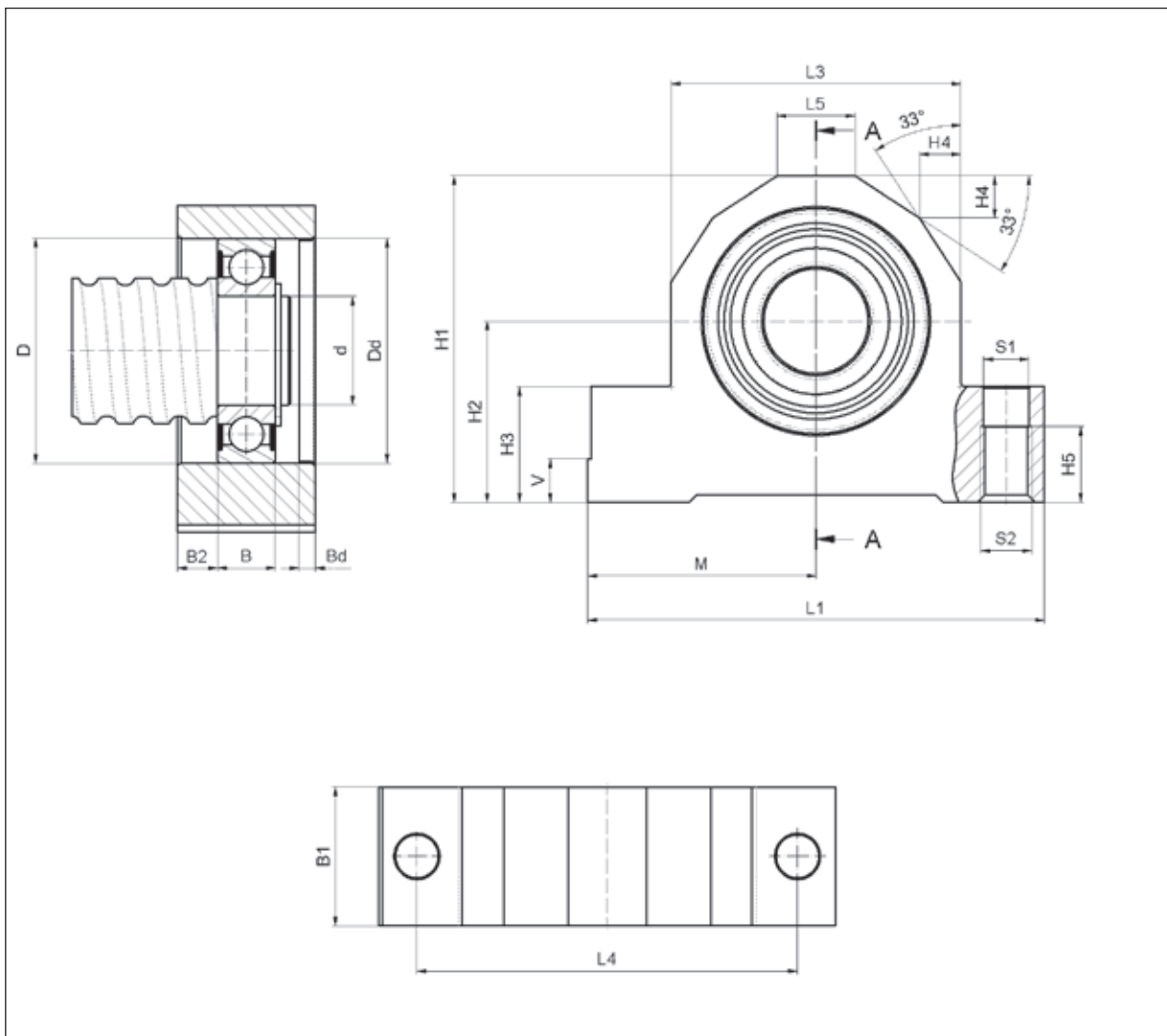
Floating bearing unit **BSTF** with deep grooved ball bearing **DIN 625**

The floating bearing unit consists of:

- Pillow block housing made of steel
- Deep grooved ball bearing DIN 62...LLU / 63...LLU
- Retaining ring DIN 471
- Cover

Suitable for standard spindle ends type S2

Type	Load rating		Désignation		Mass [kg]
	C [kN]	C0 [kN]	Bearing	Locking ring DIN471	
BSTF17	9,50	4,75	6203LLU	17x1	0,9
BSTF20	12,80	6,60	6204LLU	20x1,2	1,2
BSTF25	14,00	7,90	6205LLU	25x1,2	1,1
BSTF30	19,50	11,30	6206LLU	30x1,5	1,5
BSTF35	25,50	15,30	6207LLU	35x1,5	2,2
BSTF40	40,50	23,90	6308LLU	40x1,75	4,8
BSTF50	62,00	38,00	6310LLU	50x2	6,2



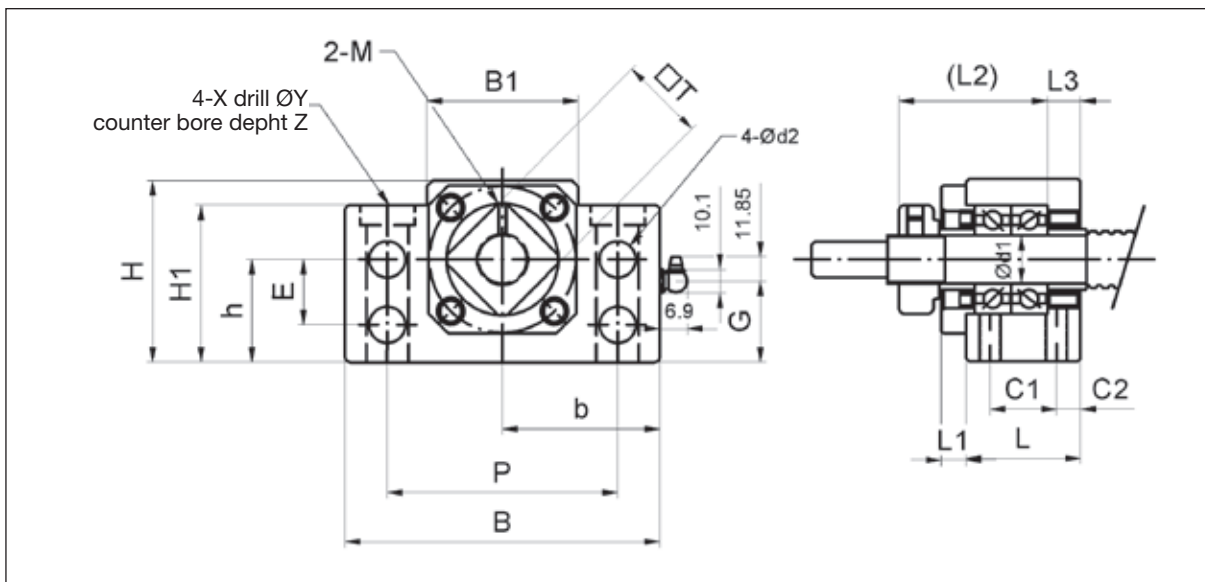
Type	Nominal diameter	Pitch	d	D	B	H1	H2 ±0,02	H3	H4	H5	L1	L3	L4	L5	B1	B2	M js7	S1 H12	S2	V	Dd J6	Bd
[mm]																						
BSTF17	25	5/10/25	17	40	12	72	39	27	5,0	18	108	66	88	41	28	8,0	54,0	10,5	M 12	10	40	3,7
BSTF20	32	10	20	47	14	77	42	27	6,0	18	112	70	92	40	34	10,0	56,0	10,5	M 12	10	47	4,8
BSTF25	32	4/5/20/32	25	52	15	77	42	27	6,0	18	112	70	92	40	34	9,5	56,0	10,5	M 12	10	52	4,8
BSTF30	40	5/10/25	30	62	16	90	50	32	5,5	21	126	80	105	52	38	11,0	63,0	12,6	M 14	12	62	4,5
BSTF35	50	10/20	35	72	17	105	58	38	7,5	22	144	92	118	54	41	12,0	72,0	12,5	M 14	12	72	5,0
BSTF40	50	50	40	90	23	138	73	50	11,0	22	190	130	160	76	46	13,0	95,0	12,5	M 14	16	90	5,0
BSTF50	63/80	10/20	50	110	27	165	93	50	11,0	36	205	145	175	91	50	14,0	102,5	17,3	M 20	16	110	6,0

Fixed bearing unit BK

The fixed bearing unit consists of:

- Pillow block housing made of black oxidized steel
- Two angular contact ball bearings
- Two seals with contact rings
- Slotted nut

Suitable for standard spindle ends type F1, F2, G1, G2, H1, H2



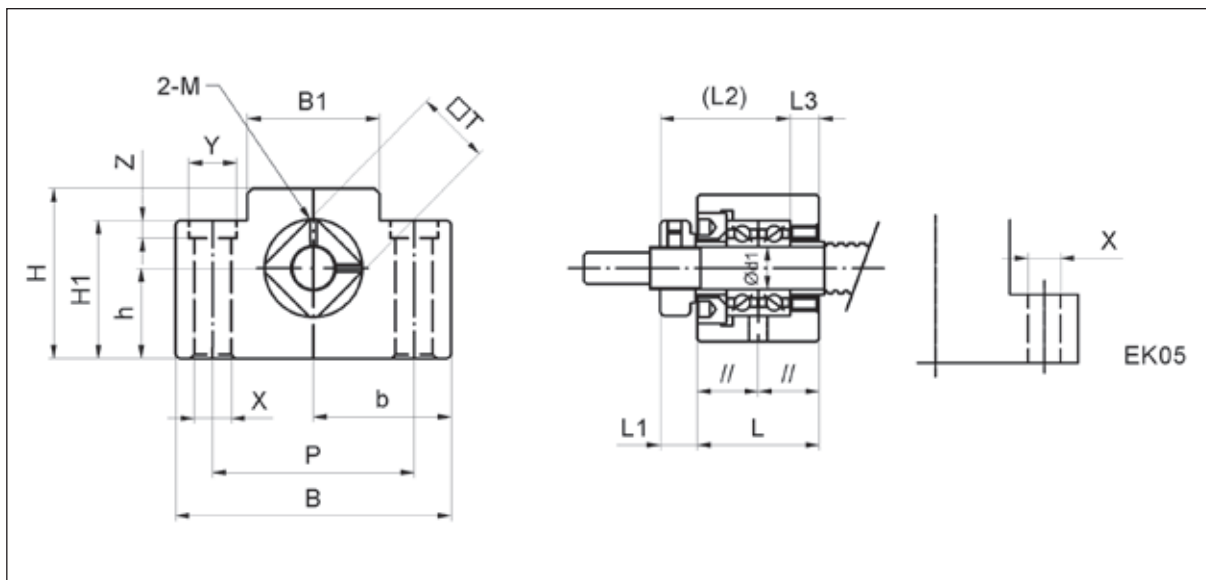
Unit	Spindle Nominal Diameter	Pitch	d1	L	L1	L2	L3	B	H	b ±0,02	h ±0,02	B1	H1	E	P	C1	C2	d2	MX	M	T	G	Q	Weight [kg]
BK10	16	4 / 5	10	25	5	29	5	60	39	30	22	34	32,5	15	46	13	6	5,5	6	M3	16	15	M6	0,4
	14	2																						
BK12	16	10/ 16	12	25	5	29	5	60	43	30	25	34	32,5	18	46	13	6	5,5	6	M4	19	18	M6	0,45
	20	4 / 5																						
BK15	20	10 / 20	15	27	6	32	6	70	48	35	28	40	38	18	54	15	6	5,5	6	M4	22	18	M6	0,69
BK17	25	5/ 10/ 25	17	35	9	44	7	86	64	43	39	50	55	28	68	19	8	6,6	8	M4	24	30	M6	1,3
BK20	32	10	20	35	8	43	8	88	60	44	34	52	50	22	70	19	8	6,6	8	M4	30	24	M6	1,3
BK25	32	4 / 5 / 20/ 32	25	42	12	54	9	106	80	53	48	64	70	33	85	22	10	9	10	M5	35	37	M6	2,4
BK30	40	5 / 10 / 40	30	45	14	61	9	128	89	64	51	76	78	33	102	23	11	11	10	M6	40	37	M6	3,4
BK35	50	10 / 20	35	50	14	67	12	140	96	70	52	88	79	35	114	26	12	11	12	M8	50	37	M6	4,4
BK40	50	50	40	61	18	76	15	160	110	80	60	100	90	37	130	33	14	14	16	M8	50	43	M6	6,8

Fixed bearing unit EK

The fixed bearing unit consists of:

- Pillow block housing made of black oxidized steel
- Two angular contact ball bearings
- Two seals with contact rings
- Slotted nut

Suitable for standard spindle ends type F1, F2



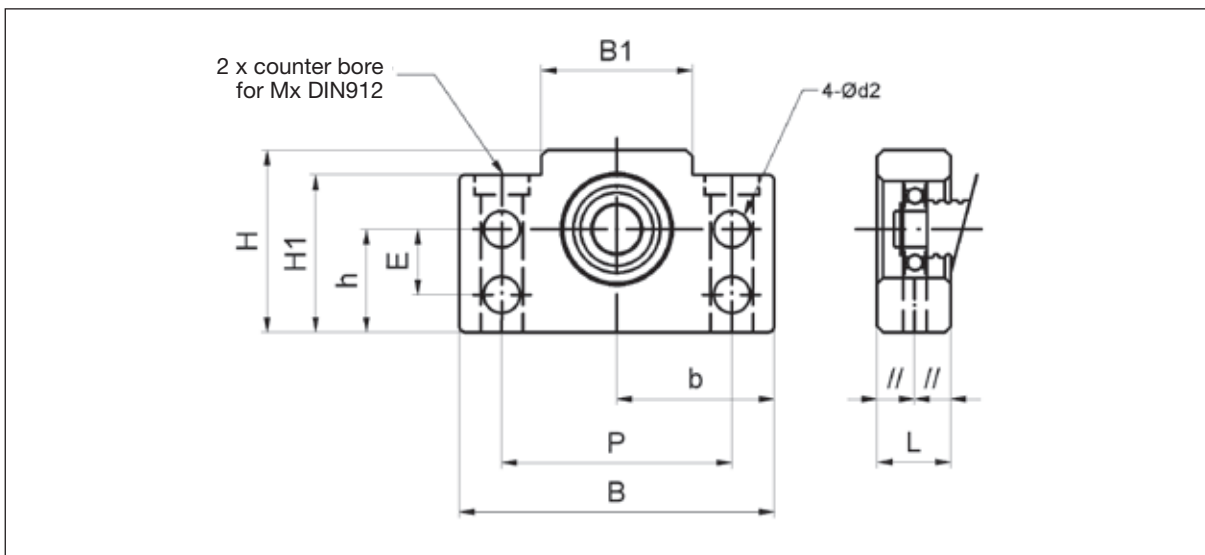
Unit	Spindle Nominal Diameter	Pas	d1	L	L1	L2	L3	B	H	b ±0,02	h ±0,02	B1	H1	P	X	Y	Z	M	T	Weight [kg]
EK05	6	1	5	16,5	5,5	18,5	3,5	36	21	18	11	20	8	28	4,5	-	-	M3	11	0,12
EK06	8	1/2/2,5	6	20	5,5	22	3,5	42	25	21	13	18	20	30	5,5	9,5	11	M3	12	0,18
EK08	10	2/4	8	23	7	26	4	52	32	26	17	25	26	38	6,6	11	12	M3	14	0,27
	12	2/4/5																		

Floating bearing unit BF, EF

The floating bearing unit consists of:

- Bearing housing made of black oxidized steel
- Deep groove ball bearing
- Retaining ring

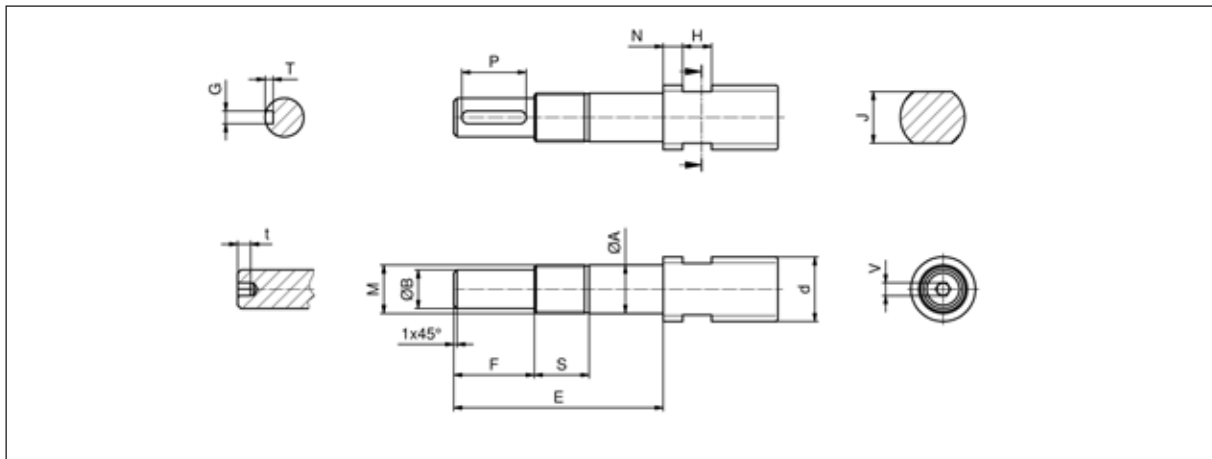
Suitable for standard spindle ends type S1



Unit	Spindle Nominal Diameter	Pas	d1	L	B	H	b ±0,02	h ±0,02	B1	H1	E	P	d2	Mx	Bearing	Safety ring DIN471	Weight [kg]
EF06	8	all	6	12	42	25	21	13	18	20	-	30	-	5	606ZZ	6x0,7	0,1
EF08	10	all	6	14	52	32	26	17	25	26	-	38	-	6	606ZZ	6x0,7	0,16
	12	all															
BF10	16	4 / 5	8	20	60	39	30	22	34	32,5	15	46	5,5	6	608ZZ	8x0,8	0,3
	14	2															
BF12	16	10 / 16	10	20	60	43	30	25	34	32,5	18	46	5,5	6	6000ZZ	10x1	0,35
	20	4 / 5															
BF15	20	10 / 20	15	20	70	48	35	28	40	38	18	54	5,5	6	6002ZZ	15x1	0,4
BF17	25	all	17	23	86	64	43	39	50	55	28	68	6,6	8	6203ZZ	17x1	0,75
BF20	32	10	20	26	88	60	44	34	52	50	22	70	6,6	8	6004ZZ	20x1,2	0,77
BF25	32	4 / 5 / 20 / 32 / 32	25	30	106	80	53	48	64	70	33	85	9	10	6205ZZ	25x1,2	1,45
BF30	40	all	30	32	128	89	64	51	76	78	33	102	11	12	6206ZZ	30x1,5	1,95
BF35	50	10 / 20	35	32	140	96	70	52	88	79	35	114	11	12	6207ZZ	35x1,5	2,25
BF40	50	50	40	37	160	110	80	60	100	90	37	130	14	16	6208ZZ	40x1,75	3,3

Standard spindle ends

Machining for fixed bearings

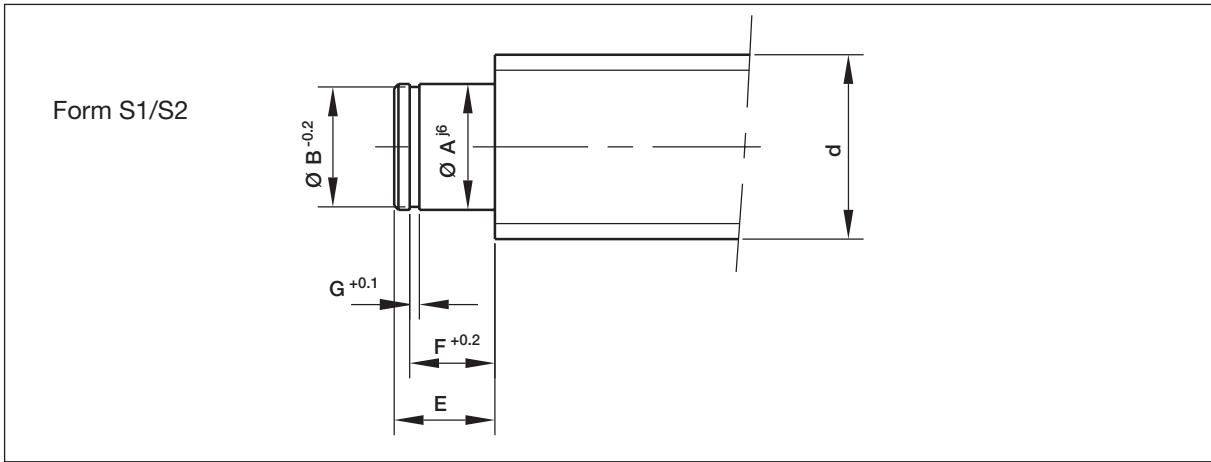


Type	Versions
F1	End machining for fixed bearing units type EK and BK without keyway
F2	End machining for fixed bearing units type EK and BK with keyway
F3, F5	End machining for fixed bearing units type BSTK without keyway
F4, F6	End machining for fixed bearing units type BSTK with keyway
H1	End machining for fixed bearing units type BK with across flat and without keyway
H2	End machining for fixed bearing units type BK with across flat and keyway
H3, H5	End machining for fixed bearing units type BSTK with across flat and without keyway
H4, H6	End machining for fixed bearing units type BSTK with across flat and keyway
G1	End machining for fixed bearing units type BK with hexagon socket and without keyway
G2	End machining for fixed bearing units type BK with hexagon socket and keyway
G3, G5	End machining for fixed bearing units type BSTK with hexagon socket and without keyway
G4, G6	End machining for fixed bearing units type BSTK with hexagon socket and keyway

d	Pitch	Type	End machining	A	B h7	E	F	M	S	[mm]								
										T	G	P	J	H	N	V	t	
6	all	EK5	F1	5 j6	4	31,0	6	M5x0,5	7,0									
8	all	EK6	F1	6 j6	4	38,0	8	M6x0,75	8,0									
10	all	EK8	F1	8 j6	6	44,0	9	M8x1	10,0									
12	all	EK8	F1	8 j6	6	44,0	9	M8x1	10,0									
14	all	BK10	F1	10 j6	8	54,0	15	M10x1	16,0									
			F2							1,2	2	11						
16	4 / 5		F1															
			F2	1,2	2	11												
16	10 / 16	BK12	F1	12 j6	10	54,0	15	M12x1	14,0									
			F2							1,8	3	12						
			H1										13	8	6			
			H2							1,8	3	12	13	8	6			
20	4 / 5		F1															
			F2	1,8	3	12												
			H1				13	8	6									
			H2	1,8	3	12	13	8	6									
20	10 / 20	BK15	F1	15 j6	12	60,0	20	M15x1	15,0									
			F2							2,5	4	16						
			H1										16	9	6			
			H2							2,5	4	16	16	9	6			
			G1													4	4	
			G2							2,5	4	16				4	4	
25	all	BK17	F1	17 j6	15	76,0	23	M17x1	20,0									
			F2							3,0	5	21						
			H1										18	10	7			
			H2							3,0	5	21	18	10	7			
			G1													4	4	
			G2							3,0	5	21				4	4	
32	10	BK20	F1	20 h6	15	72,0	30	M20x1,5	19,0									
			F2							3,0	5	21						
			H1										18	10	7			
			H2							3,0	5	21	18	10	7			
			G1													6	6	
			G2							3,0	5	21				6	6	
32	4 / 5 / 20 / 32	BK25	F1	25 j6	20	95,0	30	M25x1,5	18,0									
			F2							3,5	6	25						
			H1										27	13	9			
			H2							3,5	6	25	27	13	9			
			G1													6	6	
			G2							3,5	6	25				6	6	
40	all	BK30	F1	30 j6	25	110,0	38	M30x1,5	25,0									
			F2							4,0	8	32						
			H1										32	15	10			
			H2							4,0	8	32	32	15	10			
			G1													10	10	
			G2							4,0	8	32				10	10	
50	10 / 20	BK35	F1	35 j6	30	128,0	45	M35x1,5	28,0									
			F2							4,0	8	32						
			H1										32	15	10			
			H2							4,0	8	32	32	15	10			
			G1													10	10	
			G2							4,0	8	32				10	10	
50	50	BK40	F1	40 j6	35	148,0	50	M40x1,5	35,0									
			F2							5,0	10	45						
			H1										41	19	14			
			H2							5,0	10	45	41	19	14			
			G1													10	10	
			G2													10	10	

d	Pitch	Type	End machining	A	B h7	E	F	M	S	T	G	P	J	H	N	V	t			
				[mm]																
25	all	BSTK17-DB	F3	17 h6	15	76,5	30	M17x1	19,0											
			F4							3,0	5	21								
			H3										18	10	7					
			H4							3,0	5	21	18	10	7					
			G3																	4
			G4												4	4				
32	10	BSTK20-DB	F3	20 h6	18	79,5	30	M20x1,5	22,0											
			F4							3,0	5	21								
			H3										18	10	7					
			H4							3,0	5	21	18	10	7					
			G3																	4
			G4											4	4					
32	4 / 5 / 20 / 32	BSTK25-DB	F3	25 h6	22	85,0	35	M25x1,5	23,8											
			F4							3,5	6	25								
			H3										27	13	9					
			H4							3,5	6	25	27	13	9					
			G3																	6
			G4											6	6					
40	all	BSTK30-DB	F3	30 h6	25	92,5	38	M30x1,5	28,3											
			F4							4,0	8	32								
			H3										32	15	10					
			H4							4,0	8	32	32	15	10					
			G3																	10
					G4										10	10				
		BSTK30-QB	F5																	
			F6	4,0	8	32														
			H5				32	15	10											
			H6	4,0	8	32	32	15	10											
G5															10	10				
			G6											10	10					
50	10 / 20	BSTK35-DB	F3	35 h6	36	91,5	60	M35x1,5	25,8											
			F4							4,0	8	32								
			H3										32	15	10					
			H4							4,0	8	32	32	15	10					
			G3																	10
					G4										10	10				
		BSTK35-TA BSTK35-TR	F5																	
			F6	4,0	8	32														
			H5				32	15	10											
			H6	4,0	8	32	32	15	10											
G5															10	10				
			G6											10	10					
50	50	BSTK40-DB	F3	40 h6	30	112,0	40	M40x1,5	25,3											
			F4							5,0	10	45								
			H3										41	19	14					
			H4							5,0	10	45	41	19	14					
			G3																	10
					G4										10	10				
		BSTK40-TA BSTK40-TR	F5																	
			F6	5,0	10	45														
			H5				41	19	14											
			H6	5,0	10	45	41	19	14											
G5															10	10				
			G6											10	10					
63 / 80	all	BSTK50-QA BSTK50-QB BSTK50-QR	F3	50 h6	40	167,0	70	M50x1,5	20,8											
			F4							5,0	12	50								
			H3										55	22	16					
			H4							5,0	12	50	55	22	16					
			G3																	
			G4											17	17					

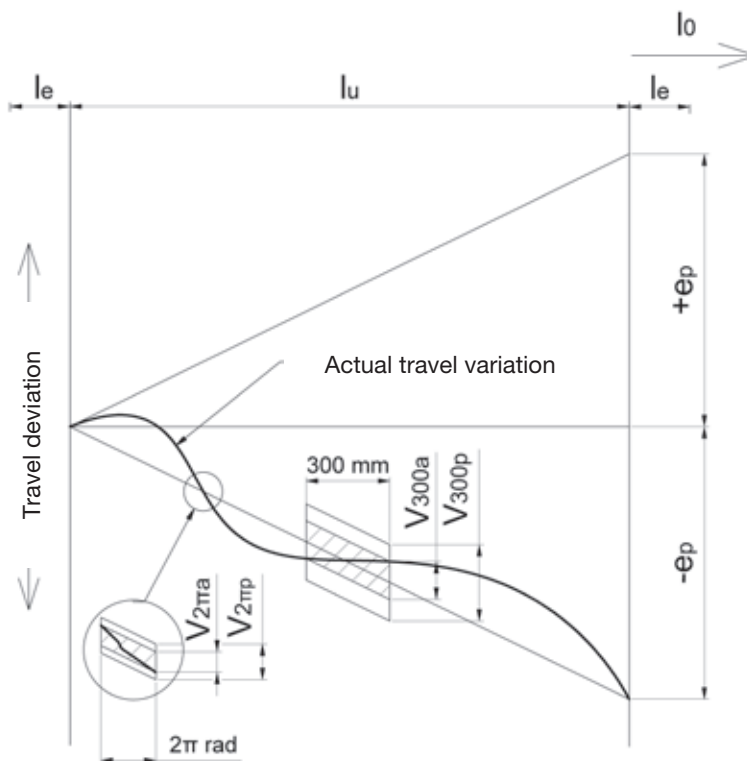
Machining for floating bearings



d [mm]	Pitch [mm]	Type	End machining	A j6	B	E [mm]	F	GH13
8	all	EF06 EF08	S1	6	8,0 h10	8	6,80	0,80
10	all							
12	all							
14	all	BF10	S1	8	7,6 h10	9	7,80	0,90
16	4 / 5							
20	10 / 16	BF12	S1	10	9,6 h11	11	9,00	1,15
	4 / 5							
25	10 / 20	BF15	S1	15	14,3 h11	13	10,00	1,15
	all							
32	all	BF17	F1	17	16,2 h11	16	13,00	1,15
	10							
40	10	BF20	S1	20	19,0 h11	16	13,20	1,35
	4 / 5 / 20 / 32							
50	all	BF25	S1	25	23,9 h11	20	16,20	1,35
	10							
63 / 80	all	BF30	S1	30	28,6 h11	21	17,50	1,75
	10 / 20							
100	all	BF35	S1	35	33,0 h11	22	18,50	1,75
	50							
125	all	BF40	S1	40	37,5 h11	24	19,75	1,95
	50							
160	all	BSTF17	S2	17	16,2 h11	16	13,00	1,15
	10							
200	all	BSTF20	S2	20	19,0 h11	18	15,20	1,35
	4 / 5 / 20 / 32							
250	all	BSTF25	S2	25	23,9 h11	20	16,20	1,35
	10							
315	all	BSTF30	S2	30	28,6 h11	21	17,50	1,75
	10 / 20							
400	all	BSTF35	S2	35	33,0 h12	22	18,50	1,60
	50							
500	all	BSTF40	S2	40	37,5 h12	28	24,75	1,85
	50							
630 / 800	all	BSTF50	S2	50	47,0 h12	27	29,00	2,15
	all							

Travel variation and travel deviation

The tolerance classes of the SNR ball screws are defined in accordance with ISO 3408. The tolerance classes T0-T5 are determined according to the mean travel variation and the tolerance of the travel deviations over the entire usable travel l_u . For tolerances T7-T10 the mean deviation over the length 300 mm is defined at anywhere over the length of thread.



- l_u The usable travel is the stroke plus length of the ball nut.
- l_e The overrun is the axial travel beyond the usable travel serving the safety purpose. The narrowed travel and hardness tolerances for the usable travel are not used.
- l_o The nominal travel is the axial travel that results from the nominal pitch multiplied with the number of turns with the rotation of the ball nut relative to the ball screw spindle.
- c Travel compensation over the usable travel. Difference between target and actual travel is defined by the user. (Standard $c=0$).
- e_p Upper and lower limit of the target travel form the tolerance fields for the mean travel.
- V_{up} Tolerance of the travel variation above the usable travel l_u .
- V_{300p} Tolerance of the travel deviation for a travel of 300 mm, anywhere over the length of thread.
- $V_{2\pi p}$ Tolerance of the travel deviation within one revolution.

Permissible variances of the intermediate travel variation and the travel fluctuation

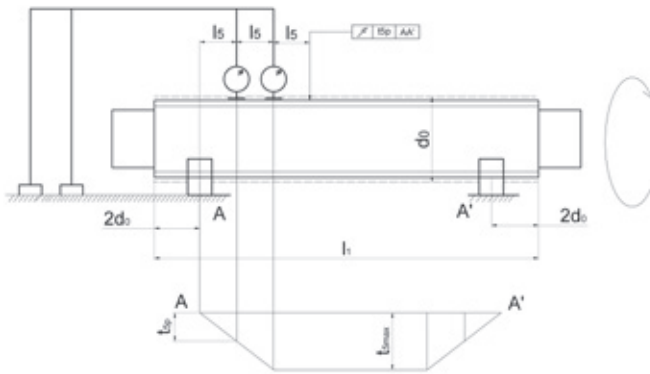
Screw length l_u , mm		Tolerance class									
		T0		T1		T3		T5		T7	T10
Above	to	e_p	v_u	e_p	v_u	e_p	v_u	e_p	v_u	e_p	v_u
0	315	4	3,5	6	6	12	12	23	23	52 μ m/300mm	210 μ m/300mm
315	400	5	3,5	7	6	13	12	25	25		
400	500	6	4	8	7	15	13	27	26		
500	630	6	4	9	7	16	14	32	29		
630	800	7	5	10	8	18	16	36	31		
800	1000	8	6	11	9	21	17	40	34		
1000	1250	9	6	13	10	24	19	47	39		
1250	1600	11	7	15	11	29	22	55	44		
1600	2000	-	-	18	13	35	25	65	51		
2000	2500	-	-	22	15	41	29	78	59		
2500	3150	-	-	26	17	50	34	96	69		
3150	4000	-	-	32	21	62	41	115	82		
4000	5000	-	-	-	-	76	49	140	99		
5000	6300	-	-	-	-	-	-	170	119		

Tolerance of the travel variation within an interval of 300 mm and a turn (international standards).

Tolerance class	T0	T1	T3	T5	T7	T10
DIN, ISO	3,5	6	12	23	52	210
JIS B 1192	3,5	5	8	18	50	210
DIN, ISO	3	4	6	8	-	-

Running and bearing test according to ISO 3408-3

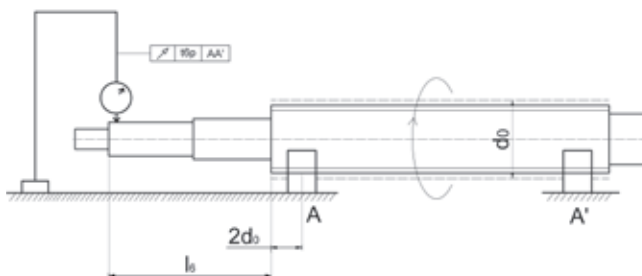
Measurement of the concentricity, t_5 of the outer diameter of the ball screw spindle over the length l_5 for determining the straightness relative to AA'



Nominal diameter d_0 en mm		l_5	t_{5p} n μm per l_5 interval per tolerance class					
Above	to		0	1	3	5	7	10
6	12	80	16	20	25	32	40	80
12	25	160						
25	50	315						
50	100	630						
100	200	1250						
Nominal diameter l_1/d_0		a	t_{5max} in μm per $l_1 > 4 \times l_5$					
Above	to		0	1	3	5	7	10
-	-	40	32	40	50	64	80	160
40	-	60	48	60	75	96	120	240
60	-	80	80	100	125	160	200	400
80	-	100	128	160	200	256	320	640

Measurement of the concentricity variation $t_{6.1}$ of the bearing seat relative to AA' over the length l_6

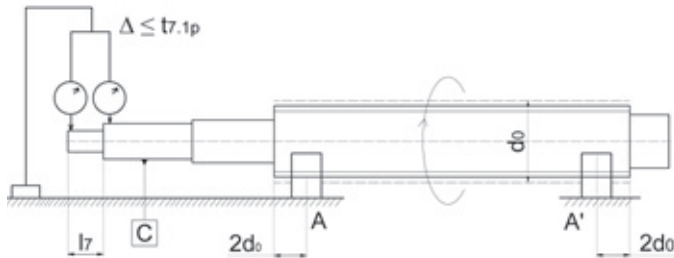
(Length $l_6 \leq l$). For length $l_6 > l$ must be applicable $t_{6.1a} \leq t_{6.1p} \frac{l_6}{l}$



Nominal diameter d_0 en mm		l in mm	$t_{6.1p}$ in μm per l per tolerance class				
Above	to		1	3	5	7	10
6	20	80	10	12	20	40	63
20	50	125	12	16	25	50	80
50	125	200	16	20	32	63	100
125	200	315	-	25	40	80	125

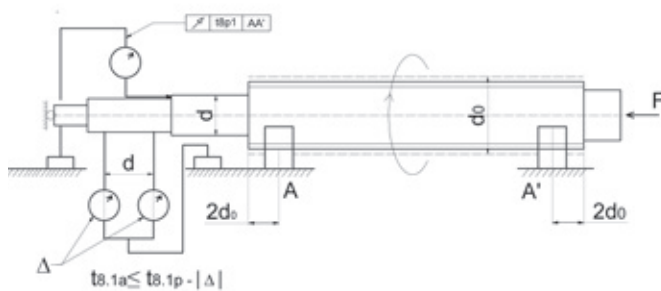
Measurement of the concentricity variation $t_{7.1}$ of the shaft-diameter relative to the bearing seat (C),

by subtraction for the length, $l_7 \leq l$. For length $l_7 > l$ must be applicable $t_{7.1a} \leq t_{7.1p} \frac{l_7}{l}$



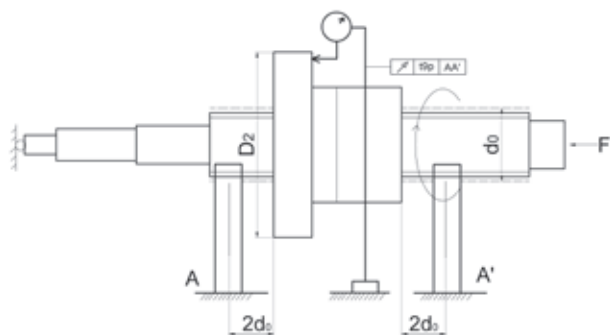
Nominal diameter d_0 in mm		l in mm	t7.1p in μm per l				
Above	to		per tolerance class				
			1	3	5	7	10
6	20	80	5	6	8	12	16
20	50	125	6	8	10	16	20
50	125	200	8	10	12	20	25
125	200	315	-	12	16	25	32

Measurement of the axial runout variation $t_{8.1}$ of the contact surface for bearing relative to AA'



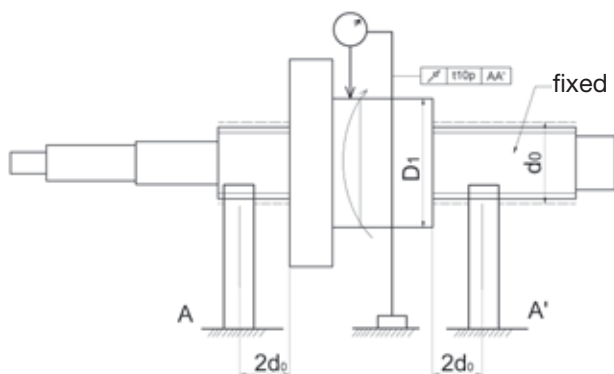
Nominal diameter d_0 in mm		t8.1p in μm per tolerance class				
Above	to	1	3	5	7	10
		3	4	5	6	10
63	125	4	5	6	8	12
125	200	-	6	8	10	16

Measurement of the axial runout variation t_9 of the contact surface of the ball nut relative to AA' (only for preloading ball nuts)



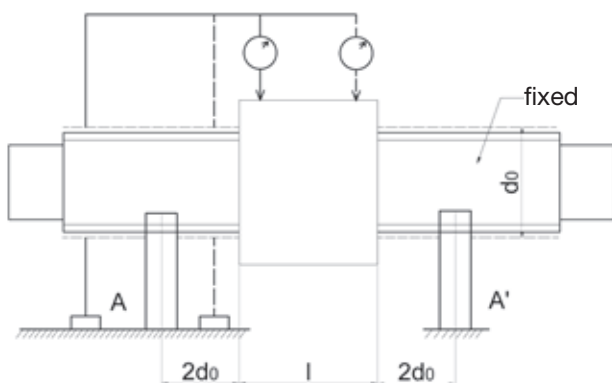
Flange diameter D2 in mm		t9p in μm per tolerance class						
Above	to	0	1	3	5	7	10	
16	32	8	10	12	16	20	-	
32	63	10	12	16	20	25		
63	125	12	16	20	25	32		
125	250	16	20	25	32	40		
250	500	-	-	32	40	50		

Measurement of the concentricity variation t_{10} of the outer diameter of the ball nut relative to AA' (only for preloading ball nuts)



Outside diameter D1 in mm		t10p in μm per tolerance class						
Above	to	0	1	3	5	7	10	
16	32	8	10	12	16	20	-	
32	63	10	12	16	20	25	-	
63	125	12	16	20	25	32	-	
125	250	16	20	25	32	40	-	
250	500	-	-	32	40	50	-	

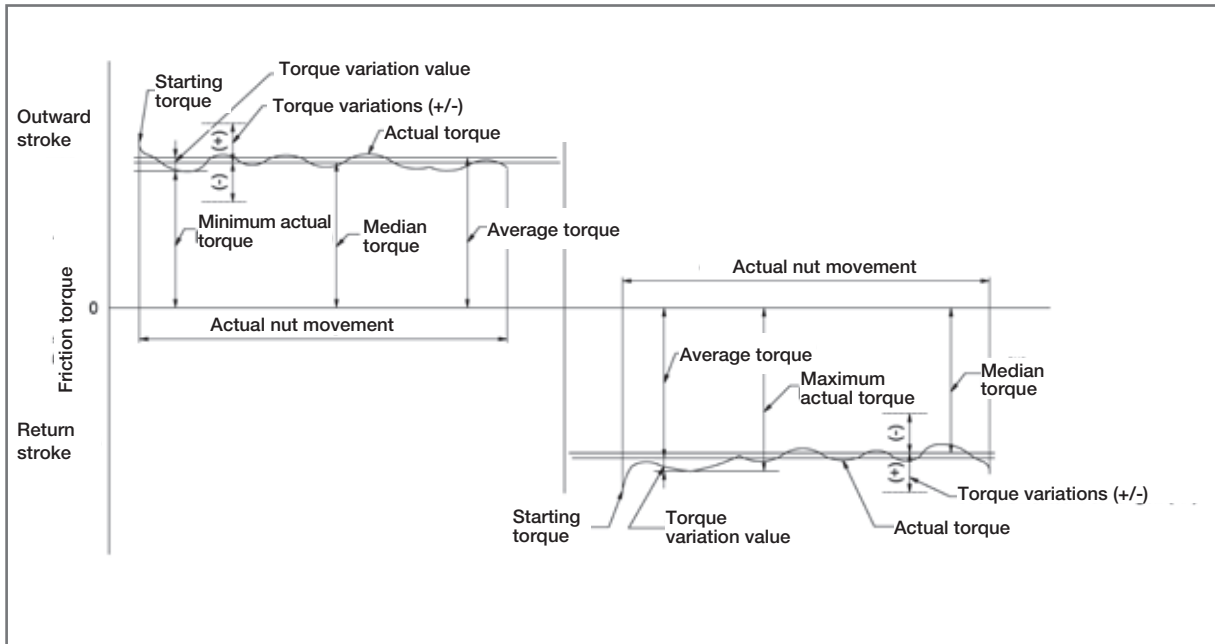
Parallelity variance t_{11} of a rectangular ball nut relative to AA' (only for pre-loaded ball nuts)



t11p in μm per 100 mm (cumulative) per tolerance class					
0	1	3	5	7	10
14	16	20	25	32	-

Functional tests according to ISO 3408-3

Measurement of the drag torque at preloading ΔT_p



Drag torque through preloading T_{pr}

The torque at the ball screw that is required to turn the ball nut against ball screw (or vice versa) without external load. Possible friction torques due to the sealing elements are not considered.

Total drag torque T_t

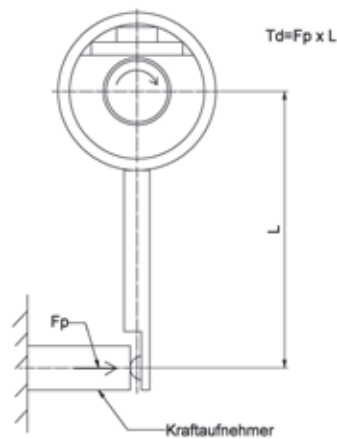
The torque that is required to turn the ball nut against ball screw (or vice versa) without external load, inclusive of the friction torques.

Torque variation

Fluctuation value of the predefined drag torque under preload. A positive or negative value relative to the mean torque.

Measuring method

Preloading generates a dynamic friction torque between the nut and the thread. This is measured by moving the threaded spindle at a constant speed, whilst the nut is held with a special locking device. The force F (F_t) measured by the force transducer is used to calculate the friction torque of the threaded spindle.



Load cell

Average torque T_{p0} [Nm]		Total length [mm]													
		Up to 4,000										From 4,000 to 10,000			
		$40 < \frac{\text{Threaded length}}{\text{Screw diamete}} \leq 60$						$\frac{\text{Threaded length}}{\text{Screw diamete}} \leq 40$				-			
		ΔT_{pp} (in % up to T_{p0}) Tolerance class						ΔT_{pp} (in % up to T_{p0}) Tolerance class				ΔT_{pp} (in % up to T_{p0}) Tolerance class			
d_e	a	0	1	3	5	7	0	1	3	5	7	3	5	7	
0,2	0,4	±30%	±35%	±40%	±50%	-	±40%	±40%	±50%	±60%	-	-	-	-	
0,4	0,6	±25%	±30%	±35%	±40%	-	±35%	±35%	±40%	±45%	-	-	-	-	
0,6	1,0	±20%	±25%	±30%	±35%	±40%	±30%	±30%	±35%	±40%	±45%	±40%	±45%	±50%	
1,0	2,5	±15%	±20%	±25%	±30%	±35%	±25%	±25%	±30%	±35%	±40%	±35%	±40%	±45%	
2,5	6,3	±10%	±15%	±20%	±25%	±30%	±20%	±20%	±25%	±30%	±35%	±30%	±35%	±40%	
6,3	10	-	-	±15%	±20%	±30%	-	-	±20%	±25%	±35%	±25%	±30%	±35%	

Axial clearance and preloading

Through the preloading the axial clearance of the ball screw is removed and the stiffness is increased. In addition the positional accuracy is also improved.

The preloading of the single nut is achieved by installing balls of selected dimensions.

The preloading of the double nut is created by tensioning two nuts against each other.

Combination of axial clearance and preloading

Symbol	Z0	Z1	Z2	Z3	Z4
Axial clearance	yes	no	no	no	no
Preloading	no	no	light	medium	high
% of dynamic load rating	-	-	~3	~5	~7

Nut type	Preload class				
	Z0	Z1	Z2	Z3	Z4
CI	S	x	(x)	-	-
DC	-	x	x	x	x
DU	-	x	x	x	x
SC	S	x	(x)	-	-
SD	S	x	(x)	-	-
SH	S	x	(x)	-	-
SK	S	x	-	-	-
SU	S	x	(x)	-	-
SW	S	x	(x)	-	-
TW	-	x	x	x	x

S Standard
 x Preload class possible
 (x) Preload class conditionally possible (on request)
 -- not available

Combination of axial clearance 0

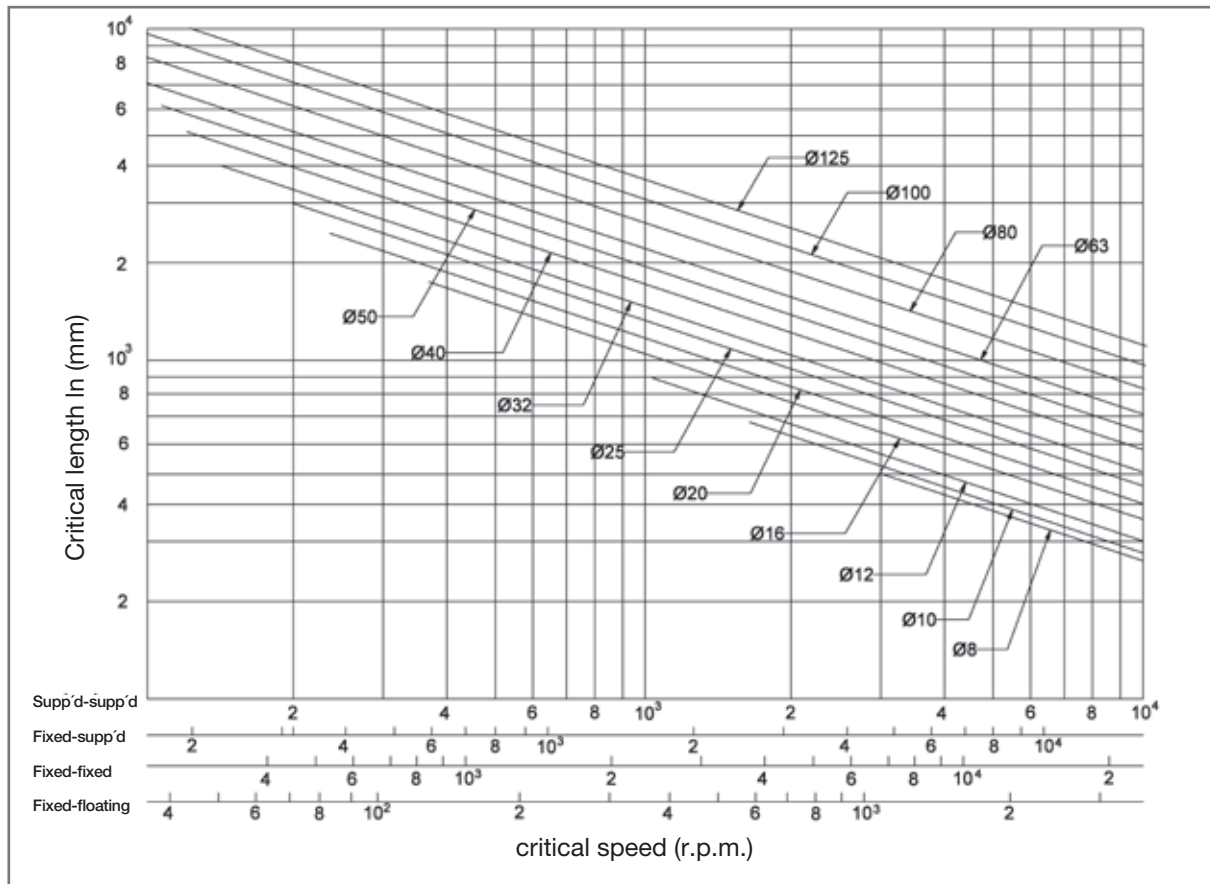
Spindle diameter [mm]	rolled ball screw axial clearance [mm]
04-14	0,05
15-40	0,08
50-100	0,12

Sealing options

Nut type	Sealing option			
	AA	LL	JJ	UU
CI	x	S	-	-
DC	x	S	-	-
DU	x	S	-	-
SC	x	S	-	-
SD	x	-	S	-
SH	S ¹	x ¹	-	-
SK	x	S	-	-
SU	x	S	-	-
SW	x	-	-	S
TW	x	-	-	S

S Standard
 x on request
 -- not available
 S¹ / x¹ ≥ 20 LL is standard

Critical speed of ball screws



As with any rotating shaft, a ball screw has a critical speed, which is a harmonic vibration. Running the ballscrew in the critical speed area consistently will shorten its operational life, and could affect the performance of a machine as the vibration passes through the machine chassis. For example: On a machine tool it could cause flaws in the surface finish as ball screw reaches its critical speed, as the vibration is transmitted to other parts of the machine. The critical speed is a function of the diameter and length of the ball screw shaft, and the mounting configuration. The axial clearance of the nut has no influence on the critical speed n_k .

The operating speed should be kept at or below 80% of the critical speed. The formula below, for calculating the admissible speed n_{kzyl} , takes account of this 0.8 safety factor.

$$n_{kzyl} = \alpha \cdot \frac{60 \cdot \lambda^2}{2 \cdot \pi \cdot l_k^2} \sqrt{\frac{E \cdot I \cdot g}{\gamma \cdot A}} = f \cdot \frac{d_2}{l_k^2} \cdot 10^7 \quad (1/\text{min})$$

- n_k critical speed (r.p.m.)
- n_{kzyl} permissible operating speed (r.p.m.)
- α safety factor (=0.8)
- E elasticity modulus ($E=2.06 \times 10^5$ N/mm²)
- I geometric moment of inertia (mm²)
- d_2 diameter at the ball screw root (mm)
- γ specific material density ($7,6 \times 10^{-5}$ N/mm³)
- g earth's gravitational constant ($9,8 \times 10^3$ mm/s²)
- A cross section of the ball screw (mm²)
- l_k unsupported length between the two housings
- f correction factor due to mounting

supported-supported	$\lambda=3,14$	$f=9,7$
fixed-supported	$\lambda=3,927$	$f=15,1$
fixed-fixed	$\lambda=4,730$	$f=21,9$
fixed-floating	$\lambda=1,875$	$f=3,4$

The maximum permissible speed of the ball screw is limited by the DN value in addition to the critical speed.

For the nuts SC, SD, DC

$$d_0 \cdot n_{kzyl} \leq 120.000$$

For the nuts SH, SU, SW, DU, TW

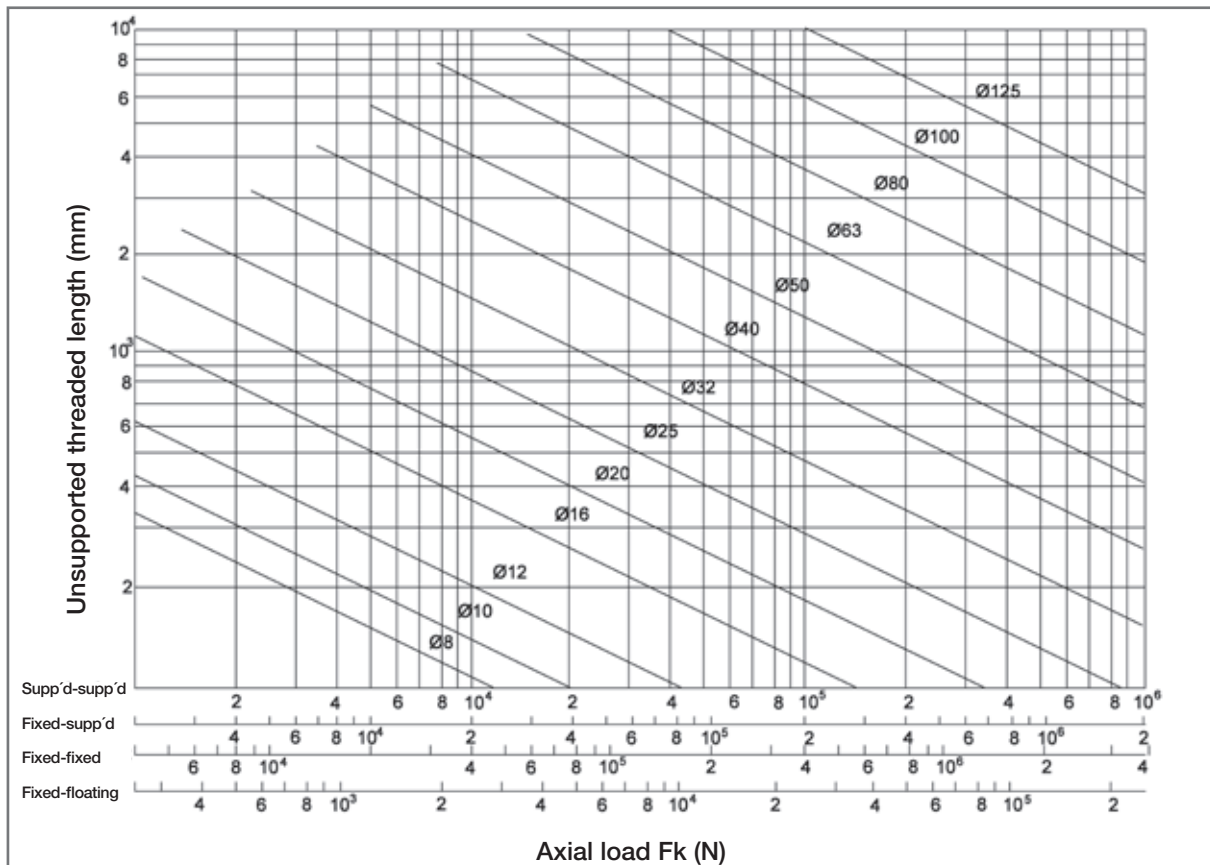
$$d_0 \cdot n_{kzyl} \leq 90.000$$

d_0 Centre diameter of the spindle, mm

Please contact our application engineers if the required speed exceeds the DN value, or the ball screw is used for higher speeds.

Permissible axial load for the screw (buckling)

Similar to any shaft, ball screws can only withstand a limited axial load. Any stress greater than the maximum defined values can lead to failure of the screw. The permissible axial compression is a function of the length, diameter and the type of mounting of the screw. The maximum axial compression load should be 50% or less of the theoretical permissible load. The calculation made using the formula below takes this safety factor into account.



F_k theoretical maximum permissible axial load (N)
 F_{kzyl} maximum permissible working axial load (N)
 α safety factor (=0,5)
 E modulus of elasticity
 $(E = 2,06 \cdot 10^5 \text{ N/mm}^2)$

$$F_{kzyl} = \alpha \cdot \frac{N \cdot \pi^2 \cdot E}{L^2} = m \cdot \frac{d_2^4}{L^2} \cdot 10^3 \text{ (N)}$$

I geometric moment of inertia

$$I = \frac{\pi}{64} \cdot d^4 \text{ (mm}^4\text{)}$$

d_2 diameter at the ball screw root (mm)

l_k unsupported length between the two housings (mm)

m, N factor linked to the

supported-supported	$m=5,1$	$N=1$
fixed-supported	$m=10,2$	$N=2$
fixed-fixed	$m=20,3$	$N=4$
fixed-floating	$m=1,3$	$N=0,25$

Calculation basis

Average speed and average load:

In the event of variable operating conditions (speed and load), the working life calculations will rely on the average values F_m and n_m

For the average speed n_m , in the case of variable speed, apply

$$n_m = \frac{q_1}{100} \cdot n_1 + \frac{q_2}{100} \cdot n_2 + \dots + \frac{q_n}{100}$$

n_m = average speed (r.p.m.)
 q = time (%)

For the average load F_m , in the case of a variable load, apply

$$F_m = \sqrt[3]{F_1^3 \cdot \frac{q_1}{100} + F_2^3 \cdot \frac{q_2}{100} + \dots + F_n^3 \cdot \frac{q_n}{100}}$$

F_m = average load (kN)
 q = movement or time at constant speed (%)

For the average load F_m , in the case of both variable load and speed, apply

$$F_m = \sqrt[3]{F_1^3 \cdot \frac{n_1}{n_m} \cdot \frac{q_1}{100} + F_2^3 \cdot \frac{n_2}{n_m} \cdot \frac{q_2}{100} + \dots + F_n^3 \cdot \frac{n_n}{n_m} \cdot \frac{q_n}{100}}$$

F_m = average load (kN)
 q = time (%)
 n_m = average speed (r.p.m.)

Nominal working life

Working life L , expressed in revolutions

$$L = \left(\frac{C_a}{F_m}\right)^3 \cdot 10^6 \Rightarrow C_{a\min} = F_m \cdot \sqrt[3]{\frac{L}{10^6}}$$

L = working life (in r.p.m.)
 F_m = average load (kN)
 C_a = dynamic load capacity (kN)

Working life, expressed in hours L_h

$$L_h = \frac{L}{n_m \cdot 60 \cdot ED}$$

L_h = working life (h)
 L = working life (in revolutions)
 n_m = average speed (r.p.m.)
 ED = operating time (%)

Motor torque and output power

Output torque M_{ta}

for the transformation of rotational movement into linear movement

$$M_{ta} = \frac{F \cdot P}{2 \cdot \pi \cdot \eta}$$

M_{ta} = output torque (Nm)

Resistive torque M_{te}

for the transformation of linear movement into rotational movement

$$M_{te} = \frac{F \cdot P \cdot \eta'}{2 \cdot \pi}$$

M_{te} = resistive torque (Nm)

F = actual load (kN)

P = pitch (mm)

η = yield (approx. 0.9)

η' = yield (approx. 0.8)

For preloaded double nuts, take no-load torque into account.

Output power P_a

$$P_a = \frac{M_{ta} \cdot n}{9550}$$

P_a = output power (kW)

M_{ta} = output torque (Nm)

n = speed of rotation (1/min)

Mounting the nut on the screw

In case of separate delivery of ball screws and ball nuts, qualified personnel must carry out the assembly of the ball screws. Ball nuts should be mounted only with the help of a fitting sleeve. The fitting sleeve delivered with the nut unit can be used. The start of the thread of the spindle must be aligned, so that the wiper and the internal single parts of the nut unit are not damaged.

As standard SNR ball screws are delivered with an installed nut unit. The nut unit and spindle should not be dismantled (especially applicable for a preloaded nut). If this is unavoidable, please contact our application engineers.

Proceed with the mounting as follows:

Remove the rubber washer from one side of the sleeve. Push on the nut with the sleeve on the end of the screw. Press the sleeve against the start of the screw thread.

Screw the nut on to the thread, using a slight axial pressure. Then screw the nut on for its entire length.

Remove the mounting sleeve only when the nut is completely threaded on to the screw. Lock the nut to prevent any unscrewing (using a rubber washer or fixing the sleeve axially).

What do I do when...

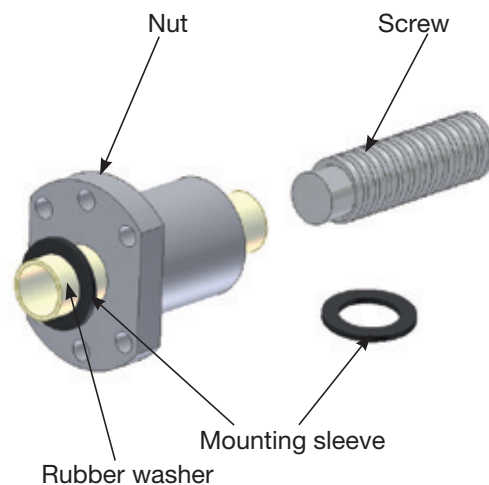
Balls escape while threading on the nut?

1. Pick up the balls (the nut is only compatible with the original balls). The load capacity is then ensured, even if two or three balls are missing.
2. Carefully clean all the components.
3. Use the sleeve as a mounting jig.
4. Replace the balls.
5. Start with the lowest circuit. Insert the balls into the nut circuit, the sleeve prevents the balls from falling inside.

Note:

Ground ball screws, with a single or double nut are always delivered with the nut assembly mounted, similarly to rolled double nut screws.

Please contact us if you absolutely must dismantle a nut assembly.



Important:

Use only the original balls!

Important:

Do not place the balls in the empty circuit located between the two deflectors!

Operating and maintenance information for the ball screws

Operating conditions

In addition to the load rating, the maximum speed, critical bending speed and the permissible buckling force should also be considered. Ball screws are conceptualised as a drive element for creating axial feed force. Radial forces and torques that have an impact on the nut, lead to the reduction of durability. When using a ball screw the ambient temperature shall not exceed 80°C.

Assembly

During assembly, parallel alignment of the guiding elements should be ensured. Special care must be taken to achieve a concentric assembly of the nut on the spindle. Here attention should be paid to the tolerance relationship between the guiding elements and layout as well as the bearing units and nut housings. By providing alignment options to the nut or to the bearing, good accuracy with lower cost can be realised.

Lubrication

For maintaining the performance of a ball screw, it must be lubricated adequately. Similar lubricants that are used for rolling bearings should be used. Lubricants containing MoS₂ or graphite should not be used. The selection of the lubricant and the type of supply can be adjusted to match the lubrication of the other components of the machine. A one off lifetime lubrication of the ball screw is not adequate based on experience, as the spindle constantly discharges small amounts of lubricant from the nut.

SNR – ball screws are supplied with the conserving oil “Contraktor Fluid H1”. “Contraktor Fluid H1” is compatible with the SNR standard lubricant “SNR LUB Heavy Duty”.

The lubrication period is dependent on many factors such as:

- Load
- Speed
- Motion sequence
- Temperature

The following factors reduce the lubrication interval:

- Greater load
- High speed
- Short stroke (stroke is smaller than three times the length of the nut)
- Lower ageing resistance of the lubricant

Grease lubrication

For operation under normal conditions, grease SNR Heavy Duty is used. Specific requirements under certain environmental conditions require the use of a suitable grease. In the food industry and clean room there are special requirements for the lubricant with regard to emission and compatibility. Basically the compatibility of the lubricants against each other should be checked. In case of special ambient conditions we will gladly assist you. Depending on the area of application the following lubricants can be used:

Description	Base oil / Type of soap	NLGI-classe DIN51818	Worked penetration DIN ISO 2137 at 25°C [0,1mm]	Basic oil viscosity DIN 51562 at 40°C [mm²/s]	Density [mg/cm³]	Propertie	Application area
SNR LUB HEAVY DUTY	Mineral oil / Lithium with EP additives	2	295	ca. 115	890	Very high protection against wear and corrosion	<ul style="list-style-type: none"> • High temperature range • High loads
SNR LUB HIGH SPEED+	Esther, SHC / Lithium, Calcium	2	-	25	900	Very good adhesion properties, Very good water resistance	<ul style="list-style-type: none"> • High velocity
SNR LUB HIGH TEMP	semi-synthetic oil / Polyurea	2	265...295	160	900	High temperature resistance, Good corrosion protection, High oxidation resistance	<ul style="list-style-type: none"> • High temperature range
SNR LUB FOOD	Paraffinic mineral oil, PAO / Aluminum complex	2	265...295	195	920	Good corrosion protection, Very good adhesion properties, High water resistance, NSF H1 registered*	<ul style="list-style-type: none"> • Food processing industry
Microlube GL261	Mineral oil / special lithium-calcium soap	1	310...340	280	890	Good wearing protection, Particularly pressure-resistant, Additive against tribocorrosion	<ul style="list-style-type: none"> • High temperature range • High loads • Short-stroke application • Vibrations
Klübersynth BEM34-32	Synthetic hydrocarbon oil / special calcium soap	2	265...295	ca. 30	890	Particularly pressure-resistant, Good wearing protection, Good ageing resistance, Low starting torque	<ul style="list-style-type: none"> • Clean room application
Klübersynth UH1 14-151	Synthetic hydrocarbon oil / ester oil Aluminum complex soap	1	310...340	ca.150	920	Good corrosion protection, Good ageing resistance, High water resistance, NSF H1 registered*	<ul style="list-style-type: none"> • Food processing industry • Pharmaceutical industry

* This grease is registered as H1 product: it has been developed for occasional, technically unavoidable contact with foodstuff. Experiences have shown that the grease can also be used for the corresponding applications in the pharmaceutical and cosmetic industry, on the conditions listed in the product information. However, there are no specific test results, for instance, on the biocompatibility, as may be required under certain circumstances in the pharmaceutical area. Therefore, before it is used in this area by equipment manufacturers and distributors, corresponding risk analyses must be performed. If necessary, measures to avoid health hazard and injuries must be taken. Source: Klüber Lubrication)

At higher speeds (speed parameter DN > 50,000) the quality K1K or KP1K should be selected. Speed parameters under 2,000 require a grease of the consistency class 3 (K3K or KP3K DIN 51825). The required lubrication period is based on the ambient conditions. In general re-lubrication should be carried out every 200-600 operating hours. The following is applicable as a reference value for the lubricant quantity: Per cm spindle diameter ≥ 1 cm³ grease for each nut. Only greases of same soap base should be used for lubrication.

Oil lubrication

As a rule, oil lubrication is used in conjunction with centralised lubrication equipment. The advantage of centralised automatic oil lubrication is a continuous lubricant supply to all the lubrication points. Lubricant oils ensure a very good dissipation of friction heat. In contrast there are higher design and assembly requirements for the lubrication lines. Depending on the area of application the following lubricant oils can be used:

Name	Type of lubricant	Kinematic viscosity DIN51562 at 40°C	Density	Temperature range	Properties	Field of application
		[mm ² /s]	[g/cm ³]	[°C]		
Klüberoil GEM 1-100N	Mineral oil	100	880	-5....+100°C	Good corrosion and wear protection	General engineering
Klüberoil 4 UH1 -68N	Polyalphaolefin	680	860	-25....+120°C	good ageing and wear protection	Food industry
					NSF H1 registered*	Pharmaceutical industry

** This grease is registered as H1 product: it has been developed for occasional, technically unavoidable contact with foodstuff. Experiences have shown that the grease can also be used for the corresponding applications in the pharmaceutical and cosmetic industry, on the conditions listed in the product information. However, there are no specific test results, for instance, on the biocompatibility, as may be required under certain circumstances in the pharmaceutical area. Therefore, before it is used in this area by equipment manufacturers and distributors, corresponding risk analyses must be performed. If necessary, measures to avoid health hazard and injuries must be taken. Source: Klüber Lubrication)*

At higher speeds (speed parameter DN > 50,000) oils of the viscosity class ISO VG 46-22 should be used. For speed parameters under 2,000 the viscosity ISO VG 150-460 should be used. If the load is above 10% of the dynamic load rating, an oil with additives is recommended for increasing the load capacity (class CLP, DIN 51517 Part 3). With oil bath lubrication the spindle must be 0.5 to 1 mm above the oil level. The oil supply with re-circulation lubrication should be 3 cm³/h for each ball circulation.

Type designation code

Ball screw:

$\frac{\text{BSC}}{1}$ $\frac{\text{O20}}{2}$ $\frac{\text{05}}{3}$ $\frac{\text{R}}{4}$ $\frac{\text{CI}}{5}$ $\frac{\text{LL}}{6}$ $\frac{\text{2}}{7}$ $\frac{\text{Z}}{8}$ $\frac{\text{T7}}{9}$ $\frac{\text{R}}{10}$ $\frac{\text{Z0}}{11}$ - $\frac{\text{1000}}{12}$ - $\frac{\text{F115}}{13}$ - $\frac{\text{S115}}{14}$ - $\frac{\text{A}}{15}$ $\frac{\text{0}}{16}$ $\frac{\text{0}}{17}$

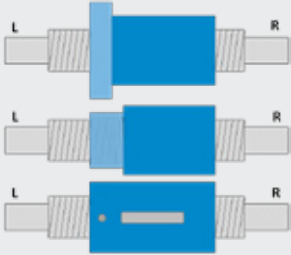
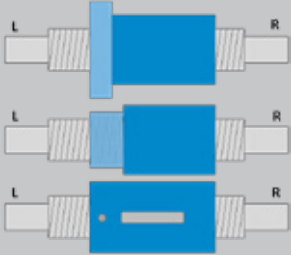
Ball screw shaft:

$\frac{\text{BSH}}{1}$ $\frac{\text{O20}}{2}$ $\frac{\text{05}}{3}$ $\frac{\text{R}}{4}$ $\frac{\text{00}}{5}$ $\frac{\text{T7}}{9}$ $\frac{\text{R}}{10}$ - $\frac{\text{1000}}{12}$ - $\frac{\text{F115}}{13}$ - $\frac{\text{S115}}{14}$ - $\frac{\text{B}}{15}$ $\frac{\text{0}}{16}$ $\frac{\text{0}}{17}$

Ball screw nut:

$\frac{\text{BNU}}{1}$ $\frac{\text{O20}}{2}$ $\frac{\text{05}}{3}$ $\frac{\text{R}}{4}$ $\frac{\text{CI}}{5}$ $\frac{\text{LL}}{6}$ $\frac{\text{2}}{7}$ $\frac{\text{Z}}{8}$ - $\frac{\text{B}}{15}$ $\frac{\text{0}}{17}$

1	BSC	Product BSC:Ball screw BSH:Ball screw shaft BNU:Ball screw nut
2	O20	Nominal diameter [mm]
3	05	Pitch [mm]
4	R	Pitch direction R:right L:left
5	CI	Nut type CI:Cylindrical single nut DC:Compact double nut with flange according DIN 69051 DU:Double nut with flange according DIN 69051 SC:Compact single nut with flange according DIN 69051 (discontinued) SD:Compact single nut with flange according DIN 69051 (replacement of SC) SH:Threaded nut SK:Miniature single nut with flange SU:Single nut with flange according DIN 69051 (discontinued) SW:Single nut with flange according DIN 69051 (replacement of SU) TW:Single nut with pitch offset and flange according DIN 69051 For ball screw shafts BSH 00:for nut type CI, DU, SH, SK, SU, SW, TW 01:for nut type DC, SC, SD
6	LL	Sealing options AA:without seals LL:Labyrinth seals JJ:Low friction seals UU:Lip seals
7	2	Number of circuits (round off decimal places)
8	Z	Nut design type A:Flange design A according DIN 69051 (round) B:Flange design B according DIN 69051 (double-side cut) C:Flange design C according DIN 69051 (one-side cut) Z:Cylindrical nut
9	T7	Precision class T3*, T5, T7, T10*: Precision classes for transport ball screws P3*, P5: Precision classes for positioning ball screws * on request
10	R	Production method R:rolled (Precision classes T7, T10) W:whirled (Precision classes T3, T5, T7, P3, P5)
11	Z0	Preload class Z0:Standard axial clearance Z1:without axial clearance Z2:light preload Z3:medium preload Z4:high preload
12	1000	Total length [mm]

13	F115	<p>Right side screw end</p> <p>F1: Standard end machining without feather key groove for BK, EK F2: Standard end machining with feather key groove for BK, EK F3, F5: Standard end machining without feather key groove for BSTK F4, F6: Standard end machining with feather key groove for BSTK G1: Standard end machining ng without feather key groove, with hexagon socket for BK G2: Standard end machining with feather key groove und hexagon socket for BK G3, G5: Standard end machining without feather key groove, with hexagon socket for BSTK G4, G6: Standard end machining with feather key groove und hexagon socket for BSTK H1: Standard end machining without feather key groove, with spanner flat for BK H2: Standard end machining with feather key groove und spanner flat for BK H3, H5: Standard end machining without feather key groove, with spanner flat for BSTK H4, H6: Standard end machining with feather key groove und spanner flat for BSTK S1: Standard end machining for Floating bearing for BF, EF S2: Standard end machining for Floating bearing for BSTF 0000: without end machining XXXX: Special end machining according drawing (maximum possible tolerance class 6) YYYY: without end machining, whirled shafts, usable thread length not until the shaft end</p>	
14	S115	<p>Left side screw end</p> <p>F1: Standard end machining without feather key groove for BK, EK F2: Standard end machining with feather key groove for BK, EK F3, F5: Standard end machining without feather key groove for BSTK F4, F6: Standard end machining with feather key groove for BSTK G1: Standard end machining ng without feather key groove, with hexagon socket for BK G2: Standard end machining with feather key groove und hexagon socket for BK G3, G5: Standard end machining without feather key groove, with hexagon socket for BSTK G4, G6: Standard end machining with feather key groove und hexagon socket for BSTK H1: Standard end machining without feather key groove, with spanner flat for BK H2: Standard end machining with feather key groove und spanner flat for BK H3, H5: Standard end machining without feather key groove, with spanner flat for BSTK H4, H6: Standard end machining with feather key groove und spanner flat for BSTK S1: Standard end machining for Floating bearing for BF, EF S2: Standard end machining for Floating bearing for BSTF 0000: without end machining XXXX: Special end machining according drawing (maximum possible tolerance class 6) YYYY: without end machining, whirled shafts, usable thread length not until the shaft end</p>	
15	A	<p>Lubricant</p> <p>A: SNR LUB HEAVY DUTY (standard) B: without grease, only with anti-corrosion oil Klüber Contakor Fluid H1 C: SNR LUB HIGH TEMP+ D: SNR LUB HIGH TEMP E: SNR LUB FOOD F: Microlube GL261 (Klüber Lubrication) G: Klübersynth BEM34-32 (Klüber Lubrication) H: Klübersynth UH1 14-151 (Klüber Lubrication) N: without grease, without anti-corrosion oil X: special grease according to customer specification</p>	
16	0	<p>Options</p> <p>0: without options 1: with drive torque protocol 2: with pitch error protocol 3: with drive torque and pitch error protocol</p>	
17	0	<p>Special version</p> <p>0: without special options A...Y: According to drawing or text description (Index (A...Z) is given from NTN-SNR) Z: Shaft only pre-straightened</p> <p>X: Marking of special specifications</p>	

Your enquiry form

Company _____
 Address _____ Contact _____
 Position _____ Telephone _____ Fax _____

Description of the application _____

<input type="checkbox"/> Isolated need	No. of pieces	<input type="checkbox"/> New construction
<input type="checkbox"/> Production need	Required delivery Weeks	<input type="checkbox"/> Technical improvement
	Pieces per year	<input type="checkbox"/> Cost reduction / Current price €
	Delivery of pieces required in Weeks	









Application parameters

Type of mounting:	<input type="checkbox"/> Horizontal	<input type="checkbox"/> Vertical	Usable stroke:	_____
Maximum usable load:	_____	kg	Additional axial load:	_____
Maximum movement speed:	_____	m/s	Maximum acceleration:	_____
Positioning accuracy:	_____	mm	Reproducibility:	_____ mm
Maximum inversion clearance:	_____	mm	Cycle time:	_____ sec
Required working life	_____ strokes or	_____ hours		
Ambient conditions of use:	_____		Special circumstances:	_____

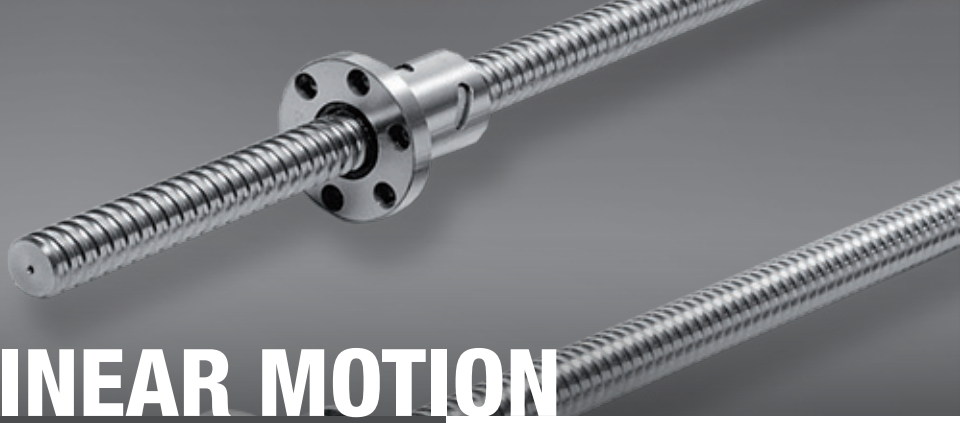
Dimensions and features, if existing application

<input type="checkbox"/> Flange nut:	_____	Maximum dimensions of the nut:	_____
<input type="checkbox"/> Cylindrical nut	_____	Nominal screw diameter:	_____ mm
<input type="checkbox"/> DIN nut	_____	Pitch:	_____ mm
		Total length:	_____ mm

Housings

fixed	supported	supported	floating	<input type="checkbox"/> With machining of the ends to drawing no.
				<input type="checkbox"/> Machining of the ends for use with SNR housings
				<input type="checkbox"/> No end machining
fixed	fixed	supported	fixed	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

The consultation of SNR WÄZLAGER GMBH is exclusive for the function of the ball screws.
 As a supplier of a component SNR accepts no liability for the function, operation or performance for the machine, system or assembly to which the ball screw is mounted. This responsibility lies with the machine designer, manufacturer, operator or other relevant parties.



SNR LINEAR MOTION BALL SCREWS



www.ntn-snr.com/ball-screws

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More information concerning our NTN-SNR products for linear motion is provided in our catalogues.



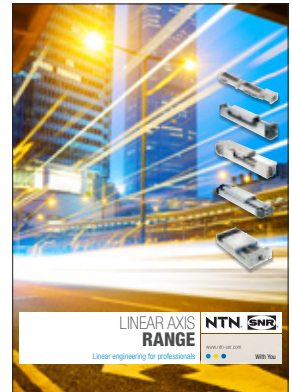
NTN-SNR Linear Motion
Linear Axis (AXE)



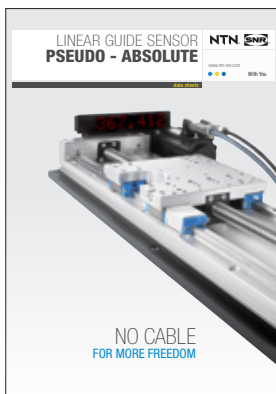
NTN-SNR Linear Motion
Linear Axis (AX)



NTN-SNR Linear Motion
Ball Splines (BSP)



NTN-SNR Linear Motion
Linear Axis Range



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Wireless Linear
Measuring System



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Range



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Ball bushings



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