



Ball screw drive KGT
Ball screw spindle KGS
Ball screw nut KGF(M)

Date: July 2012

Technical introduction

Axial clearance and preload

Schaeffler ball screw drives have a contact angle of 45° . Due to external drive forces and internal drive forces, an axial force is generated F_a that results in axial deflection as a function of the preload.

The axial clearance that results from the clear spacing between the rolling element and rolling element raceway can be eliminated by the preload force P , thus increasing the positional accuracy and rigidity of the ball screw drive.

The preload force P can be influenced by the use of a preloaded double or single nut (Figure 1 and 2, Table 1).

Double nut

The fitting of a spacer to give an O arrangement of the two nuts results in preloading of the double nut.

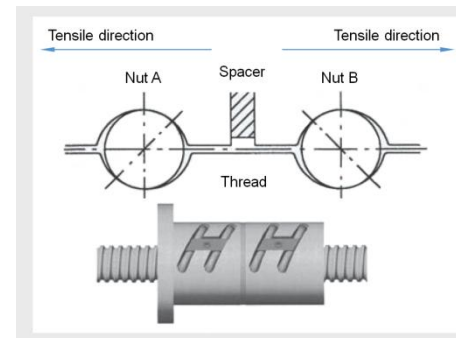


Figure 1

Single nut

The fitting of oversize rolling elements results in the preloading of the single nut.

This gives four contact points per rolling element.

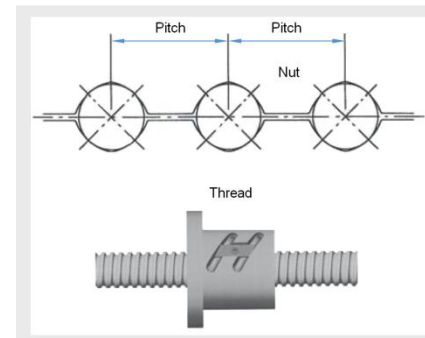


Figure 2

Technical introduction

Preload

Preload classes of Schaeffler ball screw drives according to the table

Spindle diameter d_w	V0 Standard Max. axial clearance mm	V1 Clearance-free mm	V2 Preloaded mm
06	0.05	0	Approx. 3% x C
08			
10			
12			
14			
16	0.08		
20			
25			
32			
40	0.12		
50			
63			
80			

Table 1

Technical introduction

Accuracy

Depending on the operating parameters and application, different requirements are placed on the accuracy of ball screw drives.

Schaeffler ball screw drives are available as standard in the accuracy class T7.

Optionally, the class T5 is available by agreement.

Accuracy class of rolled ball screw drives

	T5	T7 (standard)
Variation over 300mm axial travel	23 μm	52μm

Other tolerances in accordance with DIN 69051 Part 3

Technical introduction

Operating temperature

Ball screw drives from Schaeffler can be used at operating temperatures from -10°C to +80°C.

For short periods, a maximum operating temperature of 100°C is possible, measured on the outside surface of the screw nut.

Sealing

The screw nuts in Schaeffler ball screw drives are protected against contamination by a gap seal or labyrinth seal (depending on the screw nut design, see table). (Exceptions: see table in appendix)

Contact seals are – for some designs - available as an option.

If there is a risk that dust or foreign matter could enter the screw nut, additional sealing measures must be implemented for protection.

Lubrication

Schaeffler ball screw drives must be lubricated.

Whether lubrication is carried out using oil or grease is determined by technical, economic and ecological factors.

The screw nut is pregreased as standard with a high quality lubricant.

Grease lubrication:

For relubrication, lithium soap or lithium complex soap greases with a mineral oil base are recommended.

The base oil viscosity should be between ISO-VG 68 and ISO-VG 100.

Oil lubrication:

If Schaeffler ball screw drives are to be lubricated using oil, please consult Schaeffler first.

Technical introduction

Ordering example

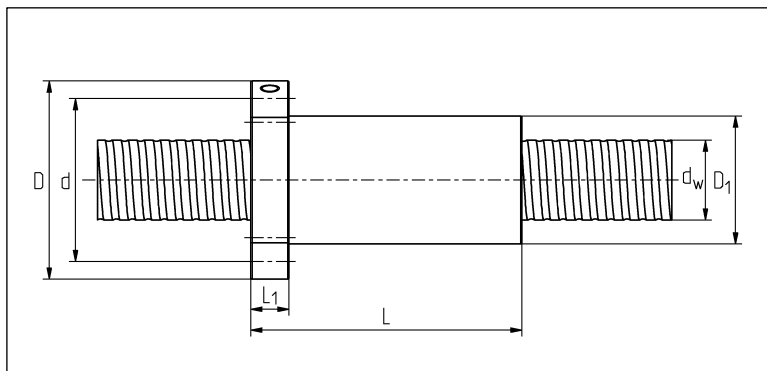
Ball screw drive KGT: **(KGT80x20-RH-2A3-00-T7-V0-1720-MTO-MTO-1-0-1)**

Ball screw drive	KGT
Size (nominal thread diameter)	80
Pitch of threaded spindle	20
Right hand thread	RH
Screw nut design (flanged nut)	2A3
Sealing (no seals left and right)	00
Type (transport ball screw drive)	T
Accuracy	7
Preload (with clearance)	V0
Length of screw spindle	1720
Spindle ends according to customer drawing	
- left	MTO
- right	MTO
Lubrication (standard)	1
Coating (none)	0
Documentation (according to drawing)	1

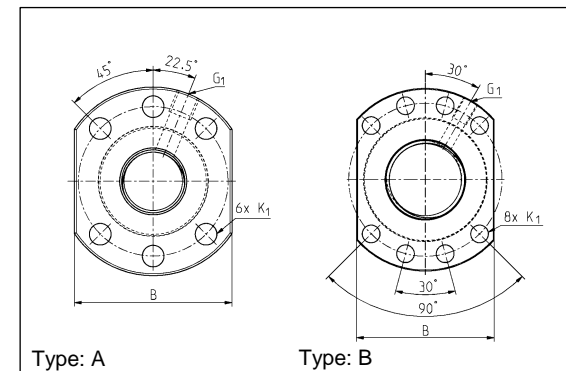
Ball screw drive

With flanged nut

KGF-2A



KGF...-2A



Type: A

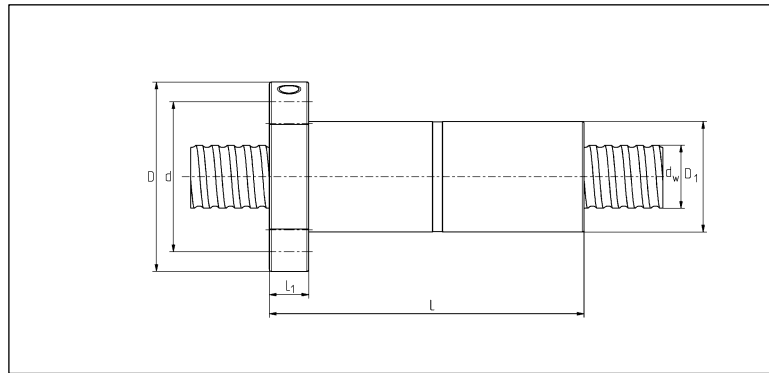
Type: B

KGF...-2A

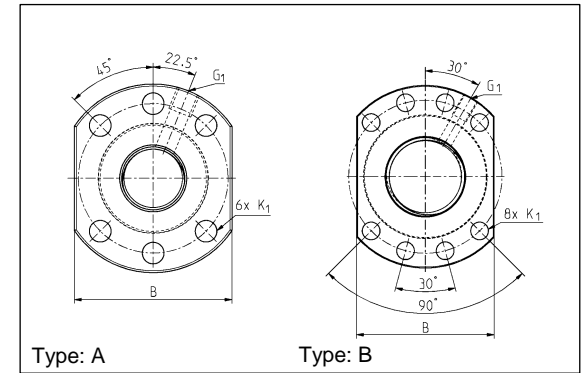
Dimension table · Dimensions in mm													
Designation	Pitch P	Type	Dimensions			Mounting dimensions				Location		Basic load ratings	
			d _w	D	L	B	D ₁	L ₁	d	K ₁	G ₁	dyn. C _a kN	stat. C ₀ kN
KGF16x05-RH-2A3	5	A	16	48	42	40	28	10	38	5.5	M6	9.14	17.04
KGF16x05-RH-2A4	5	A			50							11.84	22.73
KGF16x10-RH-2A3	10	A			65							12	9.19
KGF20x05-RH-2A4	5	A	20	58	53	44	36	10	47	6.6	M6	13.00	28.15
KGF20x10-RH-2A3	10	A			68							13.80	27.10
KGF25x04-RH-2A4	4	A	25	62	46	48	40	11	51	6.6	M6	9.64	26.00
KGF25x05-RH-2A4	5	A			53			10				14.30	34.91
KGF25x10-RH-2A4	10	A			85			12				25.02	53.34
KGF32x05-RH-2A4	5	A	32	80	53	62	50	12	65	9	M6	15.90	44.40
KGF32x10-RH-2A3	10	A			77.5			16				31.82	68.20
KGF32x10-RH-2A4	10	A			90			16				41.23	90.93
KGF40x05-RH-2A4	5	B	40	93	56	70	63	16	78	9	M8	17.50	55.25
KGF40x06-RH-2A4	6	B			60			14				23.75	69.38
KGF40x10-RH-2A4	10	B			93			18				45.29	112.57
KGF50x10-RH-2A4	10	B	50	110	93	85	75	18	93	11	M8	49.80	139.66
KGF63x10-RH-2A4	10	B	63	125	98	95	90	18	108	11	M8	54.98	174.90
KGF63x20-RH-2A3	20	B		135	138	100	95	20	115	13.5		74.11	199.52
KGF80x10-RH-2A4	10	B		80	145	98	110	105	20	125	13.5	M8	60.95
KGF80x20-RH-2A3	20	B	165		143	130	125	25	145	82.02			251.25

Ball screw drive

With flanged double nut
KGF-2B



KGF...-2B



Type: A

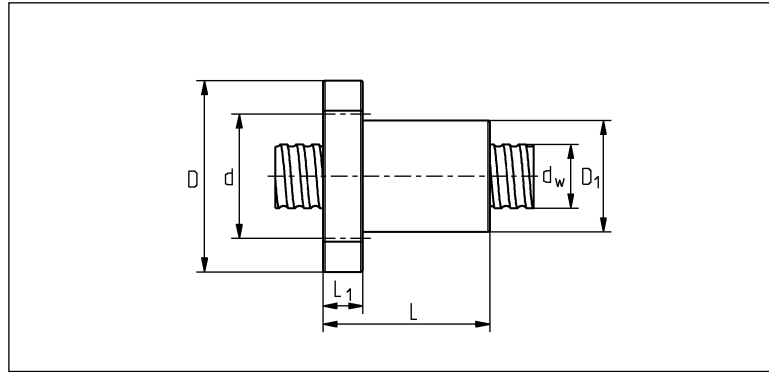
Type: B

KGF...-2B

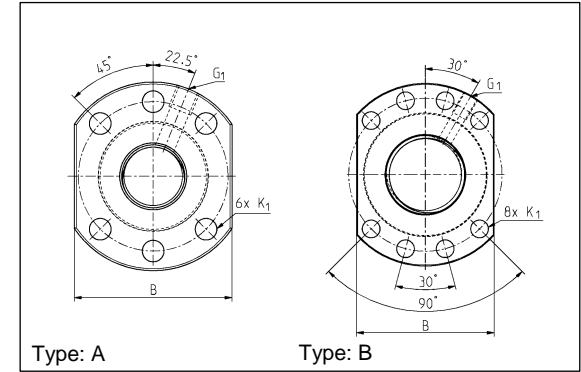
Dimension table · Dimensions in mm													
Designation	Pitch P	Type	Dimensions			Mounting dimensions				Location		Basic load ratings	
			d _w	D	L	B	D ₁	L ₁	d	K ₁	G ₁	dyn. C _a kN	stat. C ₀ kN
KGF16x05-RH-2B3	5	A	16	28	80	40	28	10	38	5,5	M6	9,14	17,04
KGF20x05-RH-2B4	5	A	20	36	92	44	36	12	47	6,6	M6	13,00	28,15
KGF25x05-RH-2B4	5	A	25	40	92	48	40	12	51	6,6	M6	14,30	34,91
KGF25x10-RH-2B4	10	A			153							25,02	53,34
KGF32x05-RH-2B4	5	A	32	50	92	62	50	12	65	9	M6	15,90	44,40
KGF32x10-RH-2B4	10	A			160			16				41,23	90,93
KGF40x05-RH-2B4	5	B	40	63	96	70	63	15	78	9	M8	17,50	55,25
KGF40x10-RH-2B4	10	B			162			18				45,29	112,57
KGF50x10-RH-2B4	10	B	50	75	162	85	75	16	93	11	M8	49,80	139,66
KGF63x10-RH-2B4	10	B	63	90	182	95	90	18	108	11	M8	54,98	174,90
KGF63x20-RH-2B3	20	B		95	253	100	95	20	115	13,5		74,11	199,52
KGF80x10-RH-2B4	10	B	80	105	182	110	105	20	125	13,5	M8	60,95	221,02
KGF80x20-RH-2B3	20	B		125	253	130	125	25	145			82,02	251,25

Ball screw drive

With flanged nut
KGF-2C



KGF..-2C



Type: A

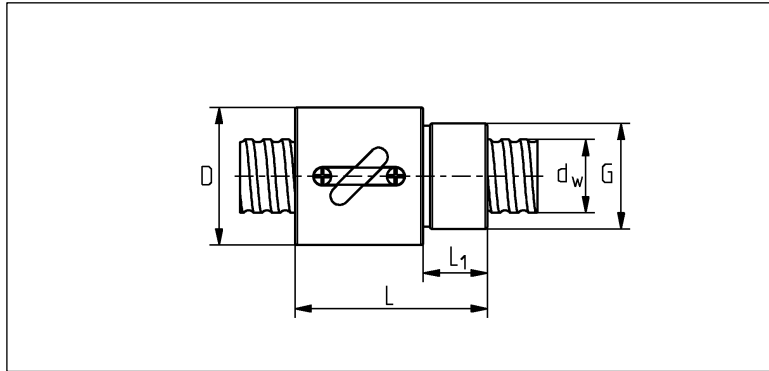
Type: B

KGF..-2C

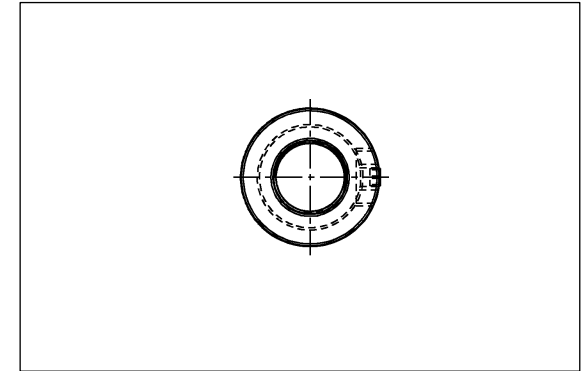
Dimension table · Dimensions in mm													
Designation	Pitch P	Type	Dimensions			Mounting dimensions				Location		Basic load ratings	
			d_w	D	L	B	D_1	L_1	d	K_1	G_1	dyn. C_a kN	stat. C_0 kN
KGF16x16-RH-2C3	16	A	16	48	61	40	28	12	38	5.5	M6	9.31	17.75
KGF20x20-RH-2C4	20	A	20	58	55	44	36	10	47	6.6	M6	13.25	29.36
KGF25x25-RH-2C4	25	A	25	74	67	56	47	12	60	6.6	M6	19.80	45.88
KGF32x20-RH-2C3	20	A	32	80	78	62	50	13	65	9	M6	16.79	42.57
KGF32x32-RH-2C4	32	A		92	82	68	58	15	74			28.25	70.32
KGF40x20-RH-2C3	20	B	40	93	83	70	63	15	78	9	M8	29.21	74.23
KGF40x40-RH-2C4	40	B		95	100	72	65	18	80			46.14	117.44
KGF50x20-RH-2C5	20	B	50	110	121	85	75	18	93	11	M8	61.03	175.58

Ball screw drive

With cylindrical nut
KGM-2E



KGM..-2E

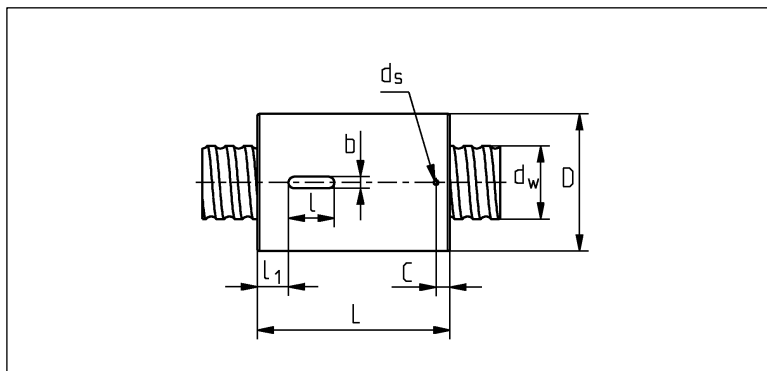


KGM..-2E

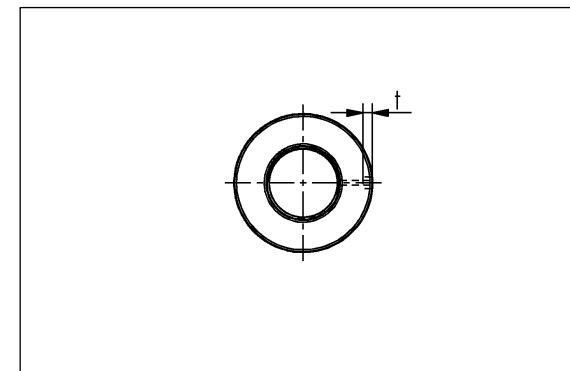
Dimension table · Dimensions in mm								
Designation	Pitch P	Dimensions			Mounting dimensions		Basic load ratings	
		d _w	D h10	L	L ₁	G	dyn. C _a kN	stat. C ₀ kN
KGM08x2.5-RH-2E2.5	2.5	8	17.5	23.5	7.5	M15x1	1.52	2.66
KGM10x3-RH-2E2.5	3	10	21	29	9	M18x1	2.91	5.01
KGM12x5-RH-2E3.5	5	12	25.5	39	10	M20x1	4.93	9.38
KGM16x5-RH-2E2.5	5	16	32.5	42	12	M26x1,5	7.76	14.21

Ball screw drive

With cylindrical nut
KGM-2D



KGM..-2D

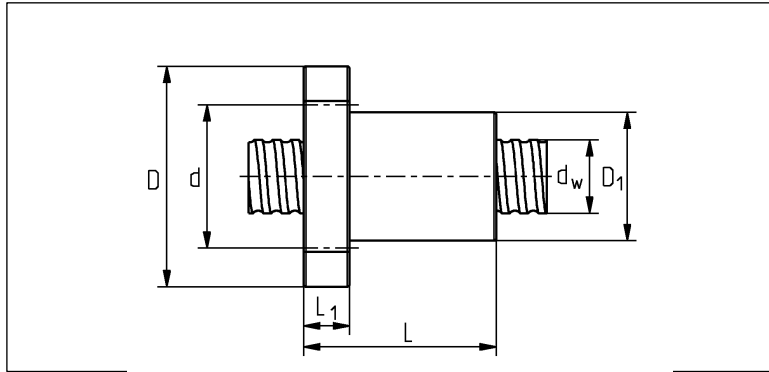


KGM..-2D

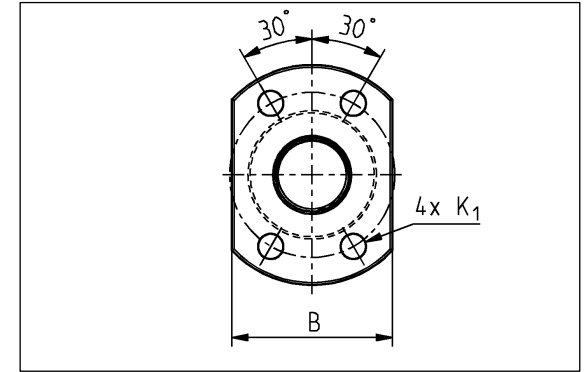
Dimension table · Dimensions in mm													
Designation	Pitch P	Dimensions				Mounting dimensions						Basic load ratings	
		d _w	D	L	C	b	l	l ₁	t	d _s	dyn. C _a kN	stat. C ₀ kN	
KGM16x05-RH-2D4	5	16	28	50	7	5	17	16.5	2	3	11.84	22.73	
KGM20x05-RH-2D4	5	20	36	53	7	5	17	18	2	3	13.00	28.15	
KGM25x05-RH-2D4	5	25	40	53	7	5	17	18	2	3	14.30	34.91	
KGM25x10-RH-2D3	10			54			20				12.5	29.11	
KGM32x05-RH-2D4	5	32	50	53	7	6	30	11.5	2.5	3	15.90	44.40	
KGM32x10-RH-2D3	10			70	8			15			31.82	68.20	
KGM32x20-RH-2D3	20			78	7			24			16.79	42.57	
KGM40x05-RH-2D4	5	40	63	56	6	6	30	13	2.5	3	17.50	55.25	
KGM40x10-RH-2D3	10			80	8			15			34.96	84.43	
KGM40x20-RH-2D3	20			83	9			20			29.21	74.23	
KGM50x10-RH-2D3	10	50	75	82	8	6	36	23	2.5	3	38.44	104.74	
KGM63x10-RH-2D4	10	60	85	90	14	6	32	29	3.5	3	54.98	174.90	

Ball screw drive

With flanged nut
KGF-2F



KGF...-2F

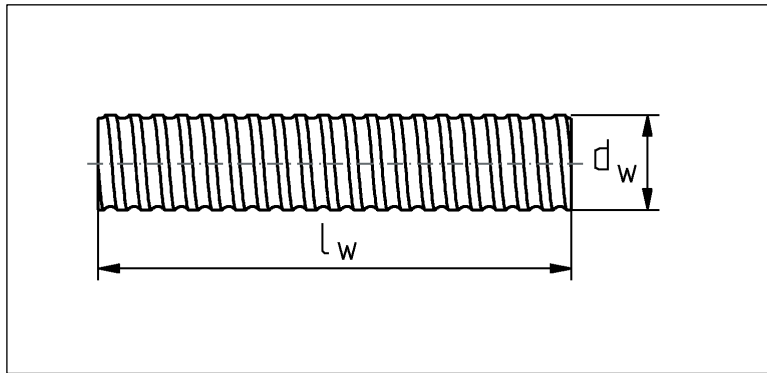


KGF...-2F

Dimension table · Dimensions in mm												
Designation	Pitch P	Type	Dimensions			Mounting dimensions				Location	Basic load ratings	
			d _w	D	L	B	D ₁	L ₁	d	K ₁	dyn. C _a kN	stat. C ₀ kN
KGF06x01-RH-2F3	1	A	6	24	15	16	12	3.5	18	3.4	0.90	1.59
KGF08x01-RH-2F4	1	A	8	27	16	18	14	4	21	3.4	1.02	2.10
KGF08x02-RH-2F3	2	A		29		20	16		23		1.24	2.13
KGF08x2.5-RH-2F3	2.5	A		26	16	1.78	3.19					
KGF10x02-RH-2F3	2	A	10	35	28	22	18	5	27	4.5	1.96	3.95
KGF10x04-RH-2F3	4	A		46	34	28	26	10	36		3.97	6.74
KGF12x02-RH-2F4	2	A	12	37	28	24	20	5	29	4.5	2.75	6.30
KGF14x02-RH-2F3	2	A	14	40	23	26	21	6	31	5.5	2.27	5.49

Ball screw spindle

KGS



KGS..

Dimension table · Dimensions in mm															
Designation	Dimensions		Pitch P ¹⁾												
	d_w	l_w max.	1	2	2.5	3	4	5	6	10	16	20	25	32	40
KGS..	06	900	○												
	08	1200	○	○	○										
	10	1200		○		○	○								
	12	3000		○				○							
	14	3000		○											
	16	3000						○ X		○	○				
	20	3000						○ X				○			
	25	6000					○	○ X		○			○		
	32	6000						○ X		○	○	○		○	
	40	6000						○ X	○	○	○	○			○
	50	6000								○		○			
	63	7200								○		○			
80	7600								○		○				

¹⁾ ○ = right hand thread

X = optionally with left hand thread

Sealing

Sealing variants: 0 = without seal, 1 = gap seal, 2 = abrasive seal

Designation spindle KGS	Pitch P	screw nut																	
		KGF 2A						KGM 2D						KGF 2F					
		0	1	2	0	1	2	0	1	2	0	1	2	0	1	2			
KGS06	1																	●	■
KGS08	1																	●	■
	2																	●	■
	2,5																●	■	
KGS10	2																	●	■
	3																	●	■
	4																	●	■
KGS12	2																	●	■
	5																	●	■
KGS14	2																	●	■
KGS16	5	■	●	■	■	●	■				■	●	■	●					
	10	■		●	■														
	16							■		●									
KGS20	5	■	●				●				■	●	■						
	10	■	●																
	20							■		●									
KGS25	4	■	●																
	5	■	●	■							■	●	■						
	10	■	●	■	■	●	■				■	●							
	25							■		●									
KGS32	5	■	●	■	■	●	■				■		●						
	10	■	●	■	■	●	■												
	20							■		●	■		●						
	32							■		●									
KGS40	5	■	●	■	■	●	■				■		●						
	6	■		●															
	10	■	●	■	■	●	■				■	●	■						
	20							■		●	■		●						
	40							■		●									
KGS50	10	■	●	■	■	●	■				■	●	■						
	20							■		●									
KGS63	10	■	●		■	●					■	●							
	20	■	●		■	●													
KGS80	10	■	●		■	●													
	20	■	●		■	●													

● = standard
■ = optional

Ordering designation

Design	Ball screw drive	Short designation and suffix KGT																																						
Size	Size		06	08		10			12	14	16		20			25			32				40			50		63		80										
Spindle	Pitch	P	1	1	2	2.5	2	3	4	2	5	2	5	10	16	5	10	20	4	5	10	25	5	10	20	32	5	6	10	20	40	10	20	10	20	10	20			
Thread direction	Right hand thread	RH	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		
	Left hand thread	LH											■			■					■						■													
Screw nut	Design	Flanged nut	2A											●	●		●	●	●	●	●	●		●	●			●	●	●			●	●	●	●	●			
		Flanged double nut	2B												●			●			●			●	●			●	●			●	●			●	●	●		
		Flanged nut	2C														●			●				●			●	●				●	●							
		Cylindrical nut	2E				●		●						●																									
		Cylindrical nut	2D												●			●						●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●
Flanged nut	2F	●	●	●	●	●			●	●																														
Rolling element turns in screw nut	Number		2, 5, 3 or 4, depending on the type and length of screw nut																																					
Sealing	Without seals	0	See table Sealing variants																																					
	Gap seals	1																																						
	Contact seals	2																																						
Type	Transport ball screw drive		T																																					
Accuracy			T7 = standard (T5 optional)																																					
Preload	Clearance	V0	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			
	Clearance-free	V1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
	Preloaded	V2	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
Lengths	Total length of screw spindle		Value in mm																																					
Special lubrication			By agreement																																					
Coating			By agreement																																					
Documentation			By agreement																																					

● = standard
■ = optional