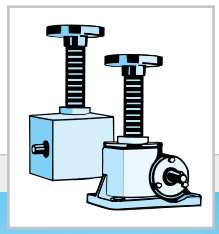


3.3 Technical information

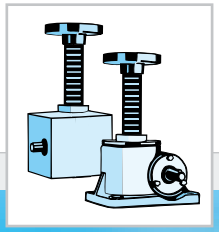
3.3.1.3 High performance worm gear screw jacks HSE

Size		31	36	50	63	80	100	125	140	200
Max. lifting force	[kN]	5	10	25	50	100	200	350	500	1000
Max. tension load	[kN]	5	10	25	50	100	178	350	500	1000
Spindle Tr[1)]		18x4	22x5	40x8	50x9	60x12	70x12	100x16	120x16	160x20
Ratio N		4:1	5:1	6:1	7:1	8:1	8:1	10 2/3:1	10 2/3:1	13 1/3:1
Amount of lift per revolution for ratio N	[mm/per rev.]	1,0	1,0	1,33	1,28	1,5	1,5	1,5	1,5	1,5
Ratio L		16:1	20:1	24:1	28:1	32:1	32:1	32:1	32:1	40:1
Amount of lift per revolution for ratio L	[mm/per rev.]	0,25	0,25	0,33	0,32	0,375	0,375	0,5	0,5	0,5
Max. drive capacity [2)] at 20°C Ambient temp. and 20 % ED/hr	[kW]	0,60	0,90	1,5	2,3	3,6	4,8	7,7	10,2	17,9
Max. drive capacity [2)] at 20°C Ambient temp. and 10 % ED/hr	[kW]	1,0	1,5	2,6	4,0	6,3	8,4	13,5	17,9	31
Overall efficiency of ratio N	[%]	see efficiency ratings tables 3.3.5.3								
Overall efficiency of ratio L	[%]									
Spindle efficiency rating	[%]	42,5	43	40	36,5	39,5	35,5	34	30	28,5
Torque, capacity, turning-speed at 20 % ED/hr and 20°C		see performance tables 3.3.3.3								
Spindle torque at max. lifting power	[Nm]	7,4	18,4	80	190	478	1060	2600	4235	11115
Max. permitted drive-shaft torque	[Nm]	12,6	29,4	48,7	168	398	705	975	1640	4260
Max. permitted spindle length with compression load	[mm]	see bend diagrams 3.3.2								
Housing material		AlSi 12		GGG 50						
Weight without screw jack and protection tube	[kg]	2,0	4,0	13	25	47	74	145	335	870
Spindle weight per 100 mm of lift	[kg]	0,16	0,23	0,82	1,3	1,79	2,52	5,2	7,7	13,82
Amounts of lubricant in transmission	[kg]	0,07	0,15	0,4	0,9	1,5	2,1	5,0	10	15,5
Mass moment of inertia [3)] N-ratio Type 1	[kg cm^2]	0,237	0,466	1,247	3,100	11,97	30,11	60,76	95,51	
Mass moment of inertia [3)] N-ratio Type 2	[kg cm^2]	0,270	0,513	1,364	3,378	13,05	32,21	65,76	106,2	
Mass moment of inertia [3)] L-ratio Type 1	[kg cm^2]	0,150	0,204	0,638	1,804	8,13	20,91	44,88	64,93	
Mass moment of inertia [3)] L-ratio Type 2	[kg cm^2]	0,153	0,207	0,645	1,822	8,20	21,04	45,43	66,12	

[1)] Also applies to Ku spindle, see section 3.3.7

[2)] Max. permitted values for type 1 and Tr spindle.
Higher values are possible when using type 2 or Ku spindles.

[3)] referring to 100 mm spindle length



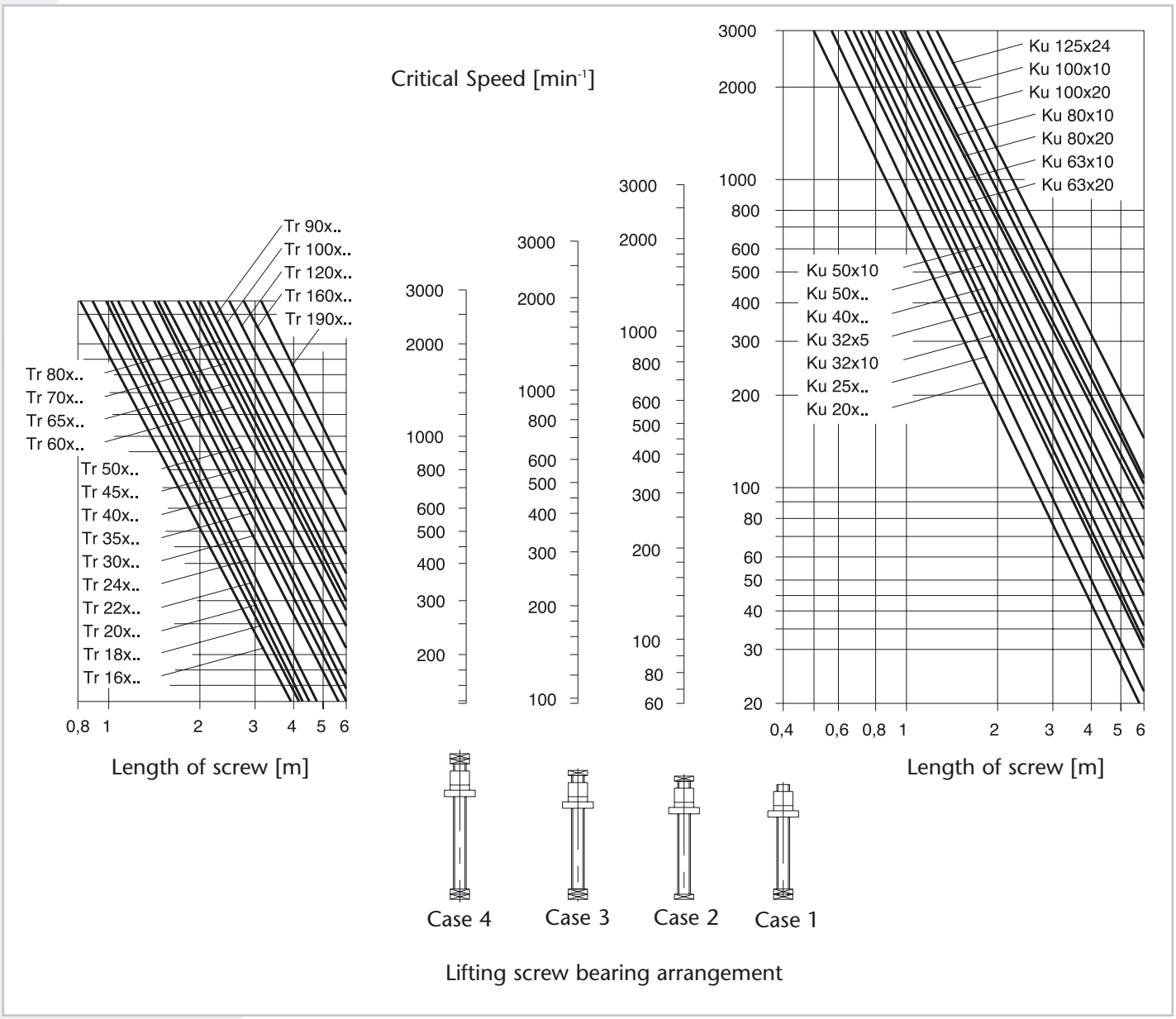
3.3 Technical information

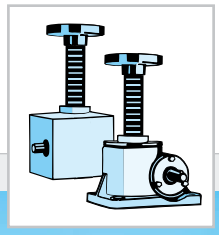
3.3.5.4 Spindle efficiency ratings η_{Sp} (steel/bronze lubricated)

Tr spindle	14x4	18x6	18x4	20x4	22x5	26x6,28	30x6	35x8	40x7
Spindle efficiency rating[%]	49	54	42,5	40	43	45	40	43	36,5
Tr spindle	40x8	50x9	58x12	60x12	60x9	65x12	70x10	70x12	80x10
Spindle efficiency rating[%]	40	37	40,5	39,5	32,5	37,5	31,6	35,5	29
Tr spindle	90x16	100x10	100x16	120x14	120x16	140x20	160x20	190x24	220x28
Spindle efficiency rating[%]	36,5	24	34	28	30	31,6	28,5	28,8	29

3.3.6 Critical spindle turning speed

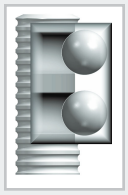
The critical turning speed (only configuration type 2) is dependent on the spindle diameter, the spindle length and the spindle bearing (see case 1-4).





3.3 Technical information

3.3.7 Ball screw spindle Ku



Standard dimensions and load capacities for configuration type 1. Other pitches and load capacities on request. Reinforced spindles with other pitches and higher load capacities can be used with configuration type 2.

SHE range

Size	Ku spindle	C_{dyn} [kN]	C_{stat} [kN]
2,5	25 x 5	24,1	49,9
	25 x 10	14,8	27,2
5	32 x 5	27,0	75,1
	32 x 10	16,6	42,4
10	50 x 5	111,5	326,8
	50 x 24	44,2	72,9
15	50 x 5	111,5	326,8
	50 x 24	44,2	72,9
20	50 x 5	111,5	326,8
	50 x 24	44,2	72,9
25	80 x 10	134,6	575,4
	63 x 20	92,1	288,8
35	100 x 10	145,9	735,5
	80 x 20	145,9	735,5
50	125 x 10	157,6	931,5
	100 x 20	304,4	1041
75	on request	on request	on request
100	160 x 20	172,9	1216
	125 x 24	328,1	1601

Merkur range

Size	Ku spindle	C_{dyn} [kN]	C_{stat} [kN]
M 0			
M 1	16 x 5	7	12,7
M 2	20 x 5	8	17
M 3	25 x 5	9,5	22,7
M 4	40 x 5	19	63,5
	40 x 10	30	70
M 5	50 x 10	55	153
M 6	80 x 10	69	260
M 7			
M 8			

$\eta_{sp} \approx 0,9$

HSE range

Size	Ku spindle	C_{dyn} [kN]	C_{stat} [kN]
36	20 x 5	19,3	23,1
	20 x 10	11,19	14,5
50	32 x 5	27,0	75,1
	32 x 10	27,0	75,1
63	40 x 10	78,7	170,5
	40 x 24	48,4	85,2
80	63 x 10	136	511
	50 x 24	158	247,3
100	80 x 10	134,6	575,4
	63 x 20	92,1	288,8
125	100 x 20	304,4	1041
	80 x 20	280,5	798,3
140	125 x 10	157,6	931,5
	100 x 20	304,4	1041
200	160 x 20	172,9	1216
	125 x 24	328,1	1601

SHG range

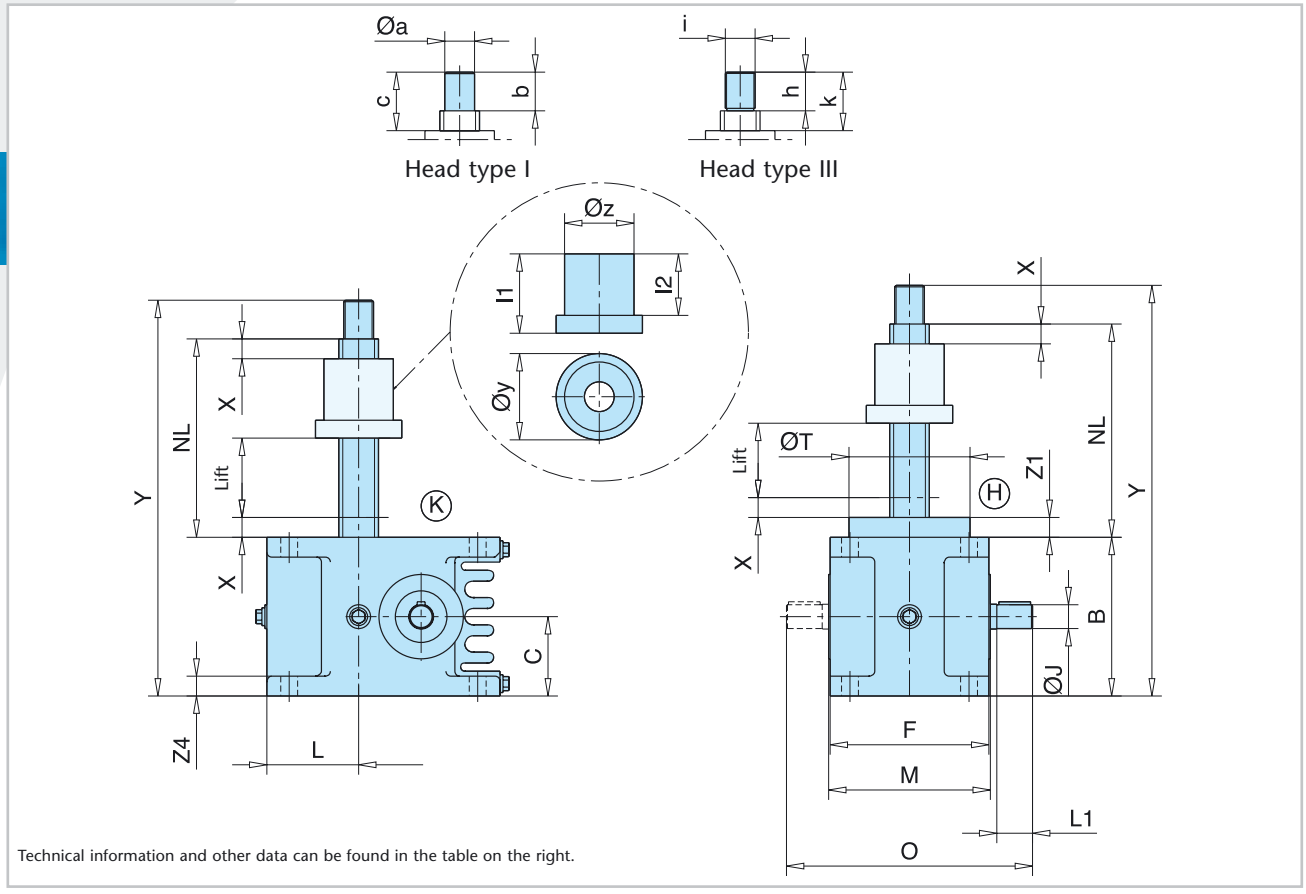
Size	Ku spindle	C_{dyn} [kN]	C_{stat} [kN]
G 15	25 x 5	9,5	22,4
G 25	25 x 5	24,1	49,9
	25 x 10	19,7	40,8
G 40	40 x 5	19	63,5
	32 x 10	25,7	56
G 90	63 x 10	60	200

Further Ku spindles on request.
Please ask for a copy!

3.6 HSE range dimension plans

3.6.2 Type 2

3.6.2.1 Standard

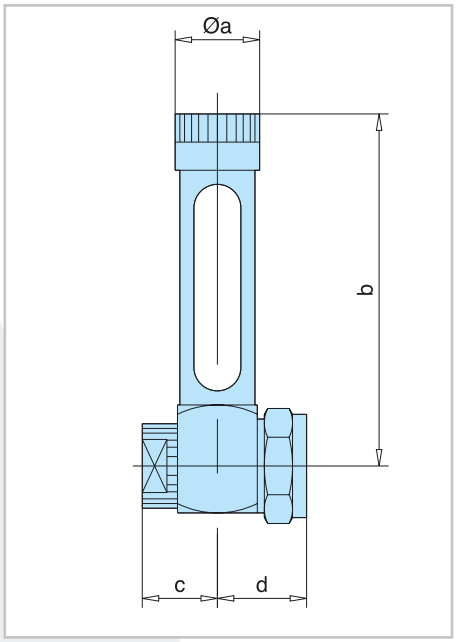


Technical information and other data can be found in the table on the right.

Possible configurations:

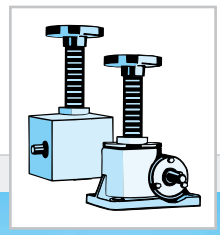
K _____ Short cover

H _____ High cover



Dimension table for oil gauge type 1 and type 2

Size	31	36	50	63	80	100	125	140	200
Øa	These sizes are equipped with oil sight-glasses				18	18	18	18	18
b					80	100	125	150	200
c					19	19	22	22	22
d					18	18	18	18	18



3.6 HSE range dimension plans

Size	31	36	50	63	80	100	125	140	200
Spindle	Tr 18x4	Tr 22x5	Tr 40x8	Tr 50x9	Tr 60x12	Tr 70x12	Tr100x16	Tr 120x16	Tr 160x20
B	80	105	130	160	200	230	300	350	450
C	40	52,5	65	80	100	115	150	175	225
F	80	105	130	160	200	230	300	350	460
ØJ $_{k6}$	10	14	16	24	32	38	42	50	70
L	42	54	67,5	92,5	102,5	117,5	150	180	250
L1	15	18	28	36	58	58	82	82	105
M	83	108	133	163	204	235	305	355	470
NI config. "K"	lift+85	lift+95	lift+120	lift+140	lift+170	lift+170	lift+200	lift+220	lift+260
NI config. "H"	lift+100	lift+111	lift+138	lift+160	lift+195	lift+200	lift+235	lift+260	lift+310
O	116	148	192	238	322	356	474	524	682
Q	3x3x12	5x5x16	5x5x25	8x7x32	10x8x50	10x8x50	12x8x70	14x9x70	20x12x100
ØT	62	72	92	122	152	182	222	262	352
Safety X	20	20	20	20	20	20	20	20	20
Y	NL+97	NL+129	NL+169	NL+199	NL+249	NL+284	Nl+379	NL+449	NL+569
Z1	15	16	18	20	25	30	35	40	50
Z4	10	12	15	20	25	28	35	45	60
Travelling nut									
l1	45	55	80	100	130	130	160	180	220
l2	35	43	62	78	105	100	115	130	140
Øy	50	65	87	105	110	120	190	225	260
Øz h9	40	45	70	80	90	90	150	160	200
Head I									
Ø a k6	12	15	30	40	40	50	80	95	130
b	17	24	39	49	49	54	79	99	119
c	37	44	59	69	69	74	99	119	139
Head III									
h	17	24	39	49	49	54	79	99	119
i	M 12x1,5	M 16x1,5	M 30x2	M 42x3	M 42x3	M 56x3	M 80x3	M 100x4	M 140x4
k	37	44	59	69	69	74	99	119	139

3.6.2.2 HSE type 2 – short safety nut

Takes up the axial strain if the main nut breaks. This considerably increases the operating safety of the drive elements. The safety nut can also be used to carry out a precise check for wear on the main nut, as the clearance between these two nuts changes according to the amount of wear. In the case of worm gear screw jacks with short safety nut, the direction of main stress (tension and compression force) and the installation point should be taken into account, as only a correctly fitted safety nut is capable of taking up the load.

HSE type 2, compression and tension force

Size	a[1)]	b	Øc	NL	
				config. K	config. H
31	5	25	40	lift+110	lift+125
36	10	35	45	lift+130	lift+146
50	10	50	70	lift+170	lift+188
63	10	60	80	lift+200	lift+220
80	10	70	90	lift+240	lift+265
100	10	70	100	lift+240	lift+270
125	15	95	150	lift+295	lift+330
140	15	95	160	lift+315	lift+355
200	15	115	200	lift+375	lift+425

[1)] When new; repair of supporting and safety nut required