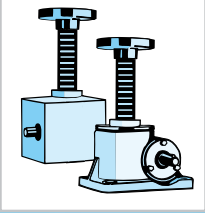


# Worm gear screw jacks



## 3.3 Technical information

### 3.3.1.3 High performance worm gear screw jacks HSE

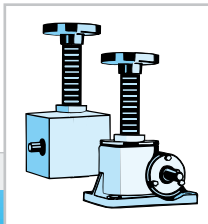
Size		31	36	50	63	80	100	125	140	200	
Max. lifting force	[kN]	5	10	25	50	100	200	350	500	1000	
Max. tension load	[kN]	5	10	25	50	100	178	350	500	1000	
Spindle Tr <sup>1)</sup>		18x4	22x5	40x8	50x9	60x12	70x12	100x16	120x16	160x20	
Ratio N		4:1	5:1	6:1	7:1	8:1	8:1	10 2/3:1	10 2/3:1	13 1/3:1	
Amount of 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 <sup>2)</sup> at 20°C	[kW]	0,60	0,90	1,5	2,3	3,6	4,8	7,7	10,2	17,9	
Ambient temp. and 20 % ED/hr											
Max. drive capacity <sup>2)</sup> at 20°C	[kW]	1,0	1,5	2,6	4,0	6,3	8,4	13,5	17,9	31	
Ambient temp. and 10 % ED/hr											
Overall efficiency of ratio N	[%]	see efficiency ratings tables 3.3.5.3									
Overall efficiency of ratio L	[%]	see efficiency ratings tables 3.3.5.3									
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 <sup>3)</sup>											
N-ratio Type 1	[kg cm <sup>2</sup> ]	0,237	0,466	1,247	3,100	11,97	30,11	60,76	95,51		
Mass moment of inertia <sup>3)</sup>											
N-ratio Type 2	[kg cm <sup>2</sup> ]	0,270	0,513	1,364	3,378	13,05	32,21	65,76	106,2		
Mass moment of inertia <sup>3)</sup>											
L-ratio Type 1	[kg cm <sup>2</sup> ]	0,150	0,204	0,638	1,804	8,13	20,91	44,88	64,93		
Mass moment of inertia <sup>3)</sup>											
L-ratio Type 2	[kg cm <sup>2</sup> ]	0,153	0,207	0,645	1,822	8,20	21,04	45,43	66,12		

<sup>1)</sup> Also applies to Ku spindle, see section 3.3.7

<sup>2)</sup> Max. permitted values for type 1 and Tr spindle.

**Higher values are possible when using type 2 or Ku spindles.**

<sup>3)</sup> referring to 100 mm spindle length



# Worm gear screw jacks

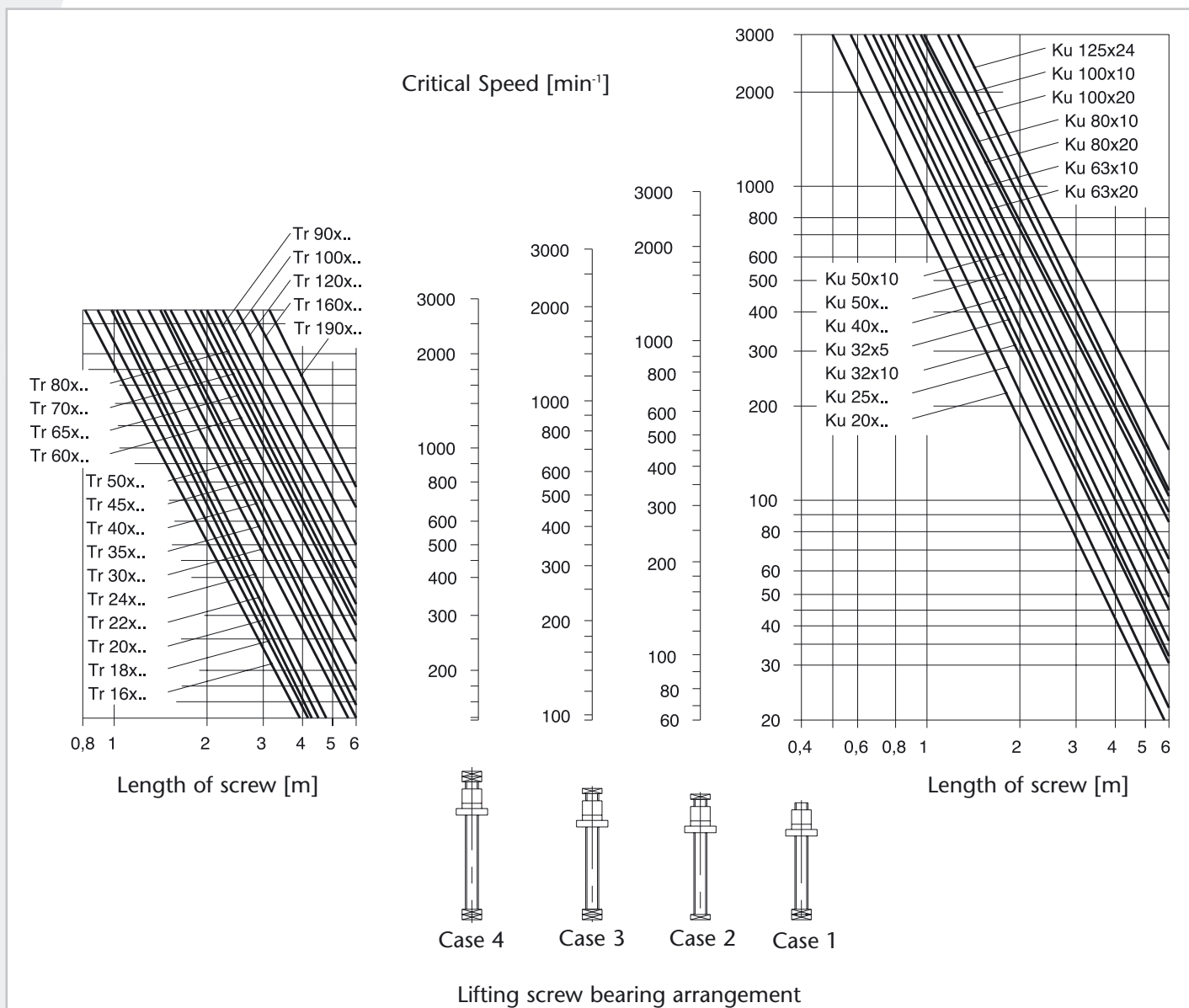
## 3.3 Technical information

### 3.3.5.4 Spindle efficiency ratings $\eta_{sp}$ (steel/bronze lubricated)

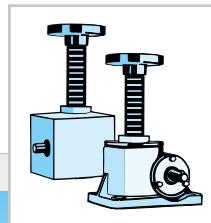
Tr spindle	14x4	18x6	18x4	20x4	22x5	26x6,28	30x6	35x8	40x7
Spindle efficiency rating[%]	49	54	42,5	40	43	45	40	43	36,5
Tr spindle	40x8	50x9	58x12	60x12	60x9	65x12	70x10	70x12	80x10
Spindle efficiency rating[%]	40	37	40,5	39,5	32,5	37,5	31,6	35,5	29
Tr spindle	90x16	100x10	100x16	120x14	120x16	140x20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



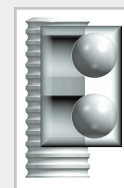
# Worm gear screw jacks



## 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 <sub>dyn</sub> [kN]	C <sub>stat</sub> [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

#### HSE range

Size	Ku spindle	C <sub>dyn</sub> [kN]	C <sub>stat</sub> [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

#### Merkur range

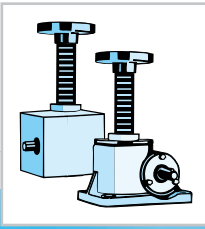
Size	Ku spindle	C <sub>dyn</sub> [kN]	C <sub>stat</sub> [kN]
M 0			
M 1	16 x 5	7	12,7
M 2	20 x 5	8	17
M 3	25 x 5	9,5	22,7
M 4	40 x 5	19	63,5
	40 x 10	30	70
M 5	50 x 10	55	153
M 6	80 x 10	69	260
M 7			
M 8			

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

#### SHG range

Size	Ku spindle	C <sub>dyn</sub> [kN]	C <sub>stat</sub> [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!



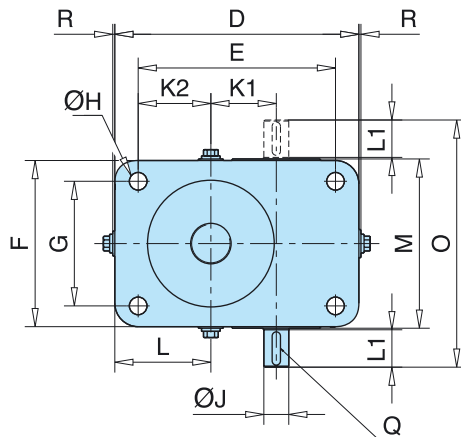
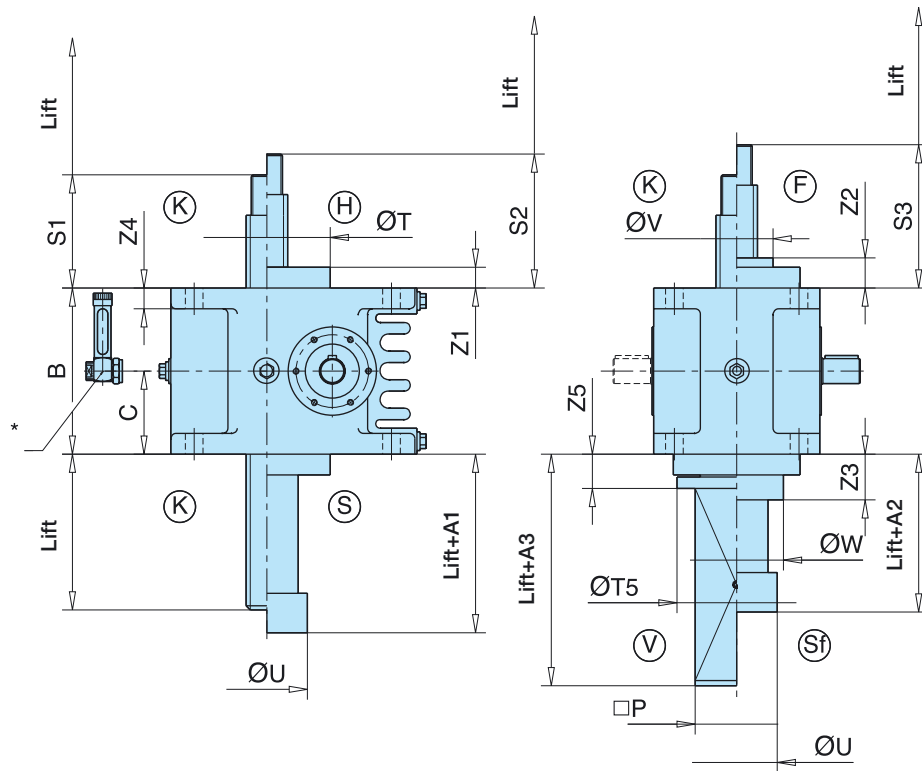
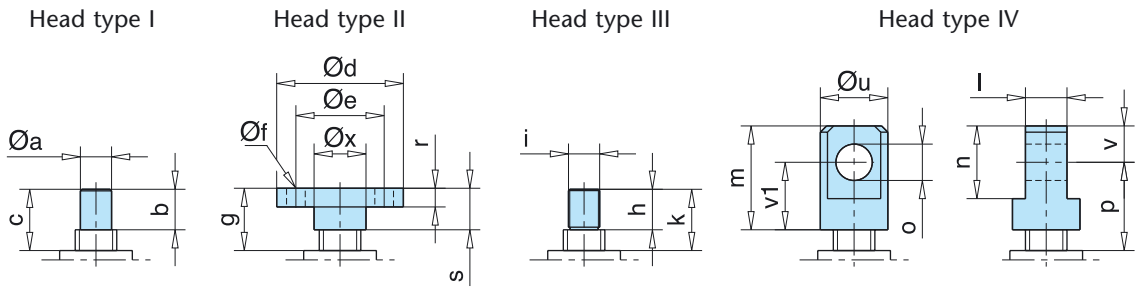
# Worm gear screw jacks

## 3.6 HSE range dimension plans

### 3.6.1 Type 1

#### 3.6.1.1 Standard

3

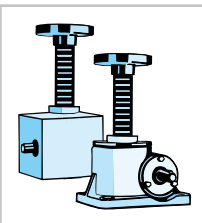


**Versions possibles:**

- K — Short cover
- H — High cover
- F — Guide ring
- S — protection tube
- Sf — protection tube with guide ring
- V — Anti-turn device

\* Oil gauge dimension plan see section 3.6.2 (HSE type 2)

# Worm gear screw jacks



## 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
A 1	22	22	22	22	22	22	22	22	22
A 2	39	44	46	52	61	71	76	86	101
A 3	98	104	117	123	136	152	154	179	199
B	80	105	130	160	200	230	300	350	450
C	40	52,5	65	80	100	115	150	175	225
D	117	138	175	235	275	330	410	490	680
E	95	110	140	190	220	270	330	390	550
F	80	105	130	160	200	230	300	350	460
G	62	80	100	120	150	175	230	260	330
Ø H	9	9	13	17	21	28	39	46	66
Ø J <sub>k6</sub>	10	14	16	24	32	38	42	50	70
K 1	31	36	50	63	80	100	125	140	200
K 2	31	40	50	70	75	87,5	110	130	185
L	42	54	67,5	92,5	102,5	117,5	150	180	250
L 1	15	18	28	36	58	58	82	82	105
M	83	108	133	163	204	235	305	355	470
N	86	112	136	166	206	240	310	360	472
O	116	148	192	238	322	356	474	524	682
P	30	40	70	80	80	100	140	180	220
Q	3x3x12	5x5x16	5x5x25	8x7x32	10x8x50	10x8x50	12x8x70	14x9x70	20x12x100
R	3	2	2	2	2	2	5	5	5
S 1	43	45	50	60	70	75	100	120	140
S 2	58	61	68	80	95	105	135	160	190
S 3	66	69	76	89	109	124	154	184	219
Ø T f7	62	72	92	122	152	182	222	262	352
Ø T5	50	-	100	115	130	-	200	260	310
Ø U	28	37	66	82	78	92	136	143	198
Ø V	35	40	60	70	100	125	160	195	240
Ø W	45	50	80	100	120	150	180	220	290
Z 1	15	16	18	20	25	30	35	40	50
Z 2	23	24	26	29	39	49	54	64	79
Z 3	29	34	39	44	54	64	74	84	109
Z 4	10	12	15	20	25	28	35	45	60
Z 5	27	-	28	33	40	-	54	63	73
<b>Head I</b>									
Ø a <sub>k6</sub>	12	15	20	30	40	50	80	95	130
b	17	24	29	39	49	54	79	99	119
c	37	44	49	59	69	74	99	119	139
<b>Head II</b>									
Ø d	62	72	92	122	150	182	222	262	352
Ø e	45	50	65	85	105	135	170	205	270
Ø f	4xØ 6,6	4xØ 9	4xØ 14	4xØ 18	4xØ 22	6xØ 26	8xØ 30	8xØ 33	8xØ 45
g	43	45	50	60	70	75	100	120	140
r	8	10	12	18	20	25	30	35	50
s	18	25	30	40	50	55	80	100	120
Ø x	20	30	35	50	65	85	115	140	185
<b>Head III</b>									
h	17	24	29	39	49	54	79	99	119
i	M 12x1,5	M 16x1,5	M 20x1,5	M 30x2	M 42x3	M 56x3	M 80x3	M 100x4	M 140x4
k	37	44	49	59	69	74	99	119	139
<b>Head IV</b>									
l - 0,2	20	25	30	40	60	75	100	120	160
m	50	60	70	100	130	150	230	300	360
n	30	40	50	70	100	120	160	200	280
Ø o <sup>H8</sup>	15	20	25	35	50	60	80	100	140
p	55	60	65	85	100	110	170	220	240
Ø u	30	40	50	65	90	110	140	170	220
v	15	20	25	35	50	60	80	100	140
v <sub>1</sub>	35	40	45	65	80	90	150	200	220