

Worm gear screw jacks

3.3 Technical information

3.3.1 Table of settings

3.3.1.1 Worm gear screw jacks SHE

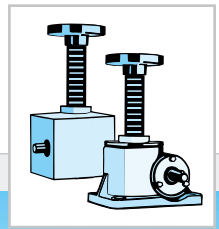
Size		0,5	1	2	2,5	5	10	15	
Max. lifting force	[kN]	5	10	20	25	50	100	150	
Max. tension load	[kN]	5	10	19	25	50	99	99	
Spindle Tr ¹⁾		18x6	22x5	26x6,28	30x6	40x7	58x12	60x12	
Ratio N		10:1	5:1	6:1	6:1	6:1	7 2/3:1	7 2/3:1	
Amount of lift per revolution for ratio N	[mm/per rev.]	0,60	1,0	1,047	1,0	1,167	1,565	1,50	
Ratio L		20:1	20:1	24:1	24:1	24:1	24:1	24:1	
Amount of lift per revolution for ratio L	[mm/per rev.]	0,30	0,25	0,262	0,25	0,292	0,50	0,50	
Max. drive capacity ²⁾ at 20°C									
Ambient temp. and 20 % ED/hr	[kW]	0,17	0,35	0,5	0,65	1,15	2,7	2,7	
Max. drive capacity ²⁾ at 20°C									
Ambient temp. and 10 % ED/hr	[kW]	0,25	0,55	0,75	0,9	1,65	3,85	3,85	
Overall efficiency of ratio L	[%]	31	29	31	27	24	27	27	
Rendement total Rapport L	[%]	24	20	18	19	16	17	17	
Spindle efficiency rating	[%]	54	43	45	40	36,5	40,5	39,5	
Torque, capacity, turning-speed at 20 % ED/hr and 20°C		See performance tables 3.3.3.1							
Spindle torque at max. lifting power	[Nm]	8,8	18,4	44	60	153	468	702	
Max. permitted drive-shaft torque	[Nm]	12	29,4	36	46,5	92	195	195	
Max. permitted spindle length with compression load		see bend diagrams 3.3.2							
Housing material	[mm]	G-ALSiCu4			GGG 60				
Weight without screw jack and protection tube	[kg]	1,2	2,5	7,3	7,3	16,2	25	25	
Spindle weight per 100 mm of lift	[kg]	0,14	0,23	0,32	0,45	0,82	1,67	1,79	
Amounts of lubricant in transmission	[kg]	0,05	0,1	0,15	0,2	0,35	0,9	0,9	
Mass moment of inertia ³⁾									
N-ratio Type 1	[kg cm ²]	0,095	0,383	0,651	0,780	2,234	5,256	5,256	
Mass moment of inertia ³⁾									
N-ratio Type 2	[kg cm ²]	0,100	0,390	0,657	0,792	2,273	5,356	5,356	
Mass moment of inertia ³⁾									
L-ratio Type 1	[kg cm ²]	0,089	0,269	0,459	0,558	1,696	4,081	4,081	
Mass moment of inertia ³⁾									
L-ratio Type 2	[kg cm ²]	0,089	0,275	0,460	0,558	1,699	4,091	4,091	

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

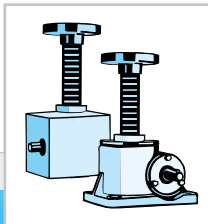
Worm gear screw jacks



3.3 Technical information

3

20	25	35	50	75	100	150	200	Size
200	250	350	500	750	1000	1500	2000	Max. lifting force
166	250	350	500	750	1000	1500	-	Max. tension load
65x12	90x16	100x16	120x16	140x20	160x20	190x24	220x28	Spindle Tr ¹⁾
8:1	10 2/3:1	10 2/3:1	10 2/3:1	12:1	12:1	19:1	17,5:1	Ratio N
1,50	1,50	1,50	1,50	1,667	1,667	1,263	1,60	Amount of lift per revolution for ratio N
24:1	32:1	32:1	32:1	36:1	36:1	-	-	Ratio L
0,5	0,5	0,5	0,5	0,556	0,556	-	-	Amount of lift per revolution for ratio L
3,8	5,0	6,0	7,4	9,0	12,5	18,5	on request	Max. drive capacity ²⁾ at 20°C Ambient temp. and 20 % ED/hr
5,4	7,2	8,6	10,4	12,6	17,5	26	on request	Max. drive capacity ²⁾ at 20°C Ambient temp. and 10 % ED/hr
24	22	21	15	18	15	15	17,5	Overall efficiency of ratio N
17	15	14	10	12	9	-	-	Overall efficiency of ratio L
37,5	36,5	34	30	31,6	28,5	28,8	29	Spindle efficiency rating
See performance tables 3.3.3.1								Torque, capacity, turning-speed at 20 % ED/hr and 20°C
1009	1725	2600	4235	7550	11115	19850	30700	Spindle torque at max. lifting power
280	480	705	840	2660	2660	4260	on request	Max. permitted drive-shaft torque
see bend diagrams 3.3.2								Max. permitted spindle length with compression load
GGG 60			GS 52	GGG 60	GS 52			Housing material
36	70,5	87	176	ca. 350	538	850	ca. 1000	Weight without screw jack and protection tube
2,15	4,15	5,2	7,7	10,0	13,82	19,6	26,2	Spindle weight per 100 mm of lift
2	1,3	2,5	4,0		10,0	10,0	on request	Amounts of lubricant in transmission
11,93	23,42	55,80	108,8	318,0	428,5	on request	on request	Mass moment of inertia ³⁾ N-ratio Type 1
12,08	23,74	56,30	109,9	325,2	431,3	on request	on request	Mass moment of inertia ³⁾ N-ratio Type 2
9,427	19,59	44,08	88,37	275,6	346,0	sur demande	sur demande	Mass moment of inertia ³⁾ L-ratio Type 1
9,444	19,62	44,13	88,49	279,4	346,3	on request	on request	Mass moment of inertia ³⁾ L-ratio Type 2



Worm gear screw jacks

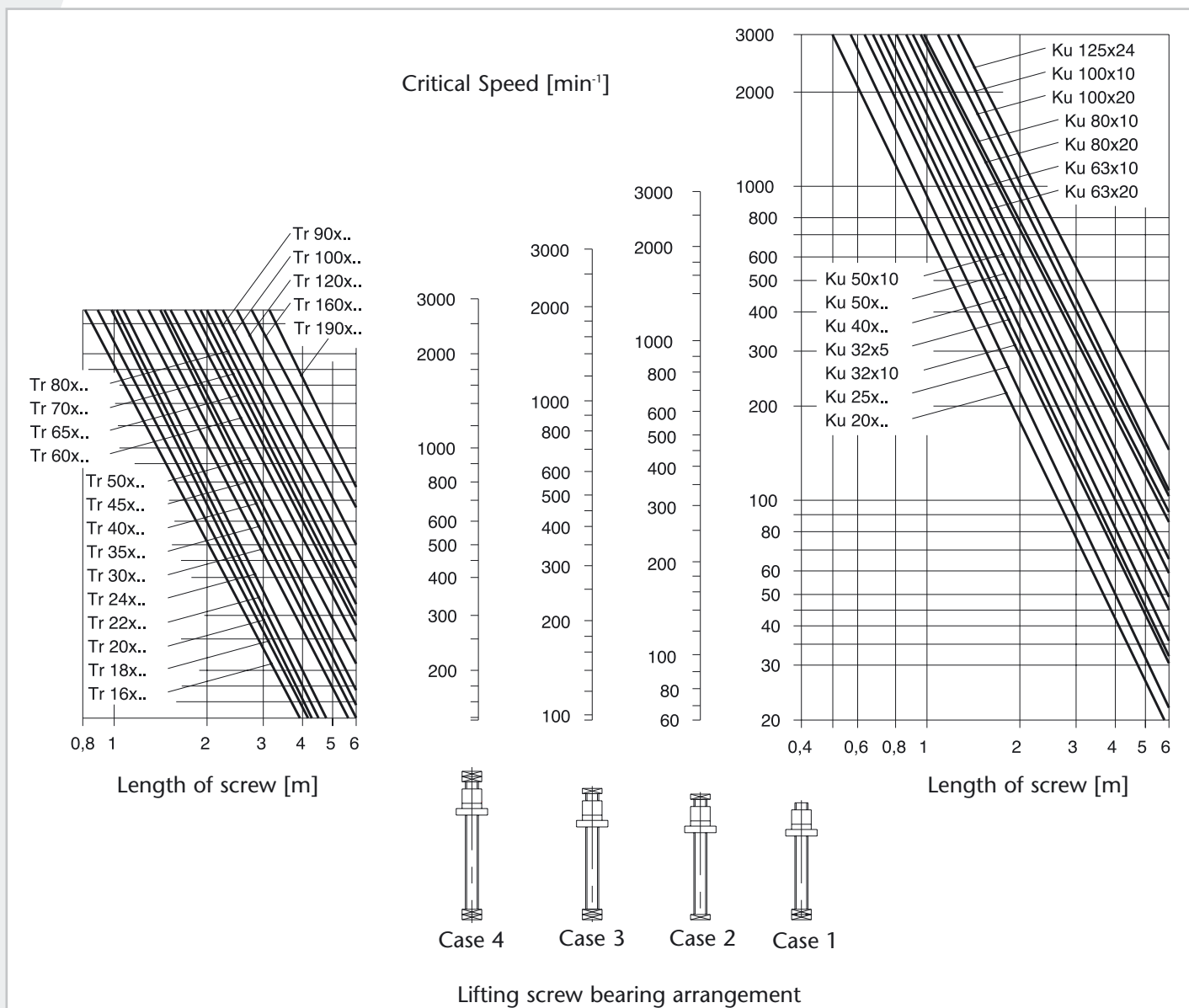
3.3 Technical information

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

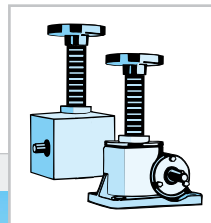
Tr spindle	14x4	18x6	18x4	20x4	22x5	26x6,28	30x6	35x8	40x7
Spindle efficiency rating[%]	49	54	42,5	40	43	45	40	43	36,5
Tr spindle	40x8	50x9	58x12	60x12	60x9	65x12	70x10	70x12	80x10
Spindle efficiency rating[%]	40	37	40,5	39,5	32,5	37,5	31,6	35,5	29
Tr spindle	90x16	100x10	100x16	120x14	120x16	140x20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



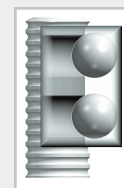
Worm gear screw jacks



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 _{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

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

Merkur range

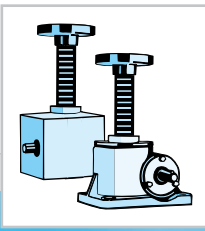
Size	Ku spindle	C _{dyn} [kN]	C _{stat} [kN]
M 0			
M 1	16 x 5	7	12,7
M 2	20 x 5	8	17
M 3	25 x 5	9,5	22,7
M 4	40 x 5	19	63,5
	40 x 10	30	70
M 5	50 x 10	55	153
M 6	80 x 10	69	260
M 7			
M 8			

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

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!



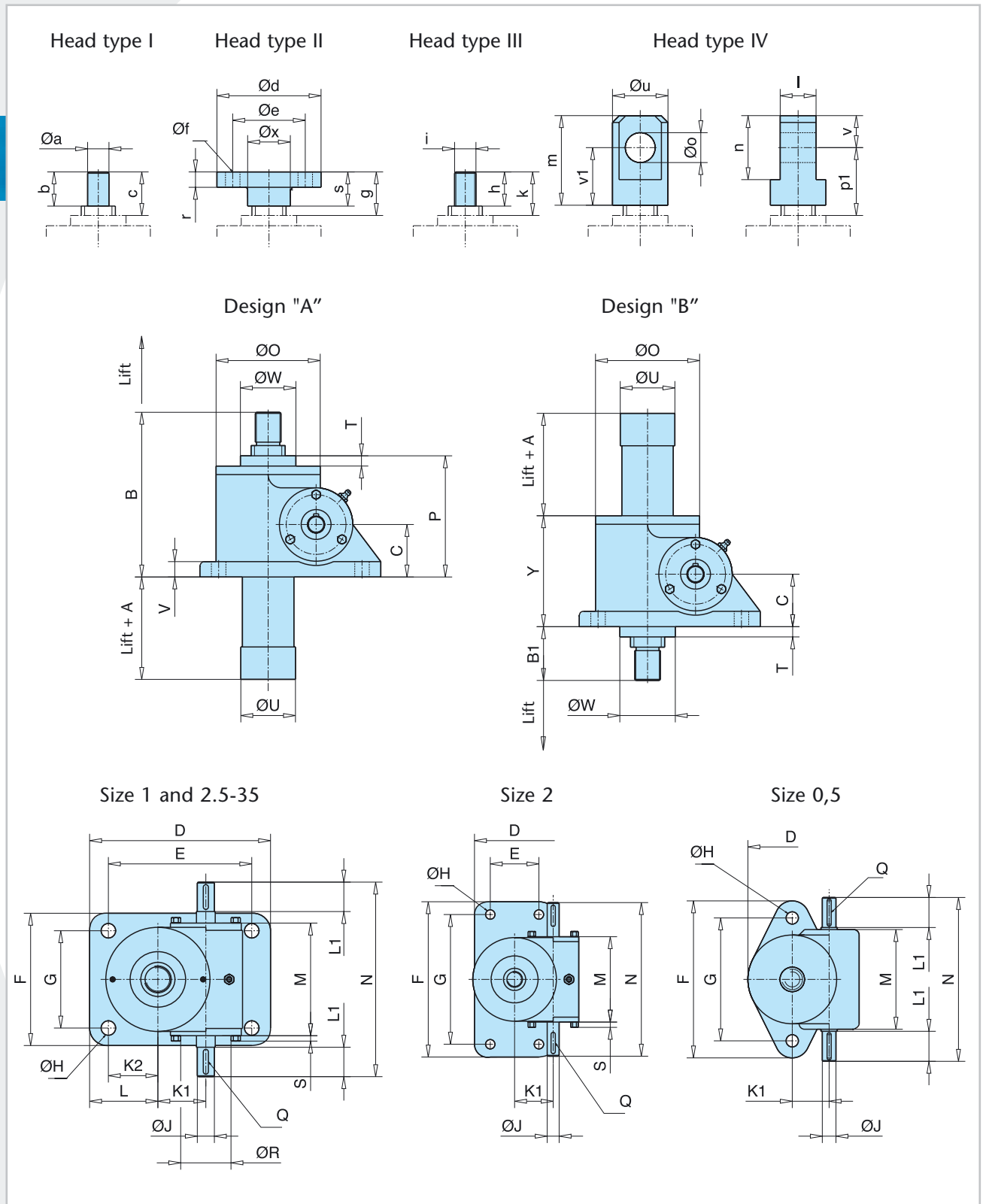
Worm gear screw jacks

3.4 SHE range dimension plans

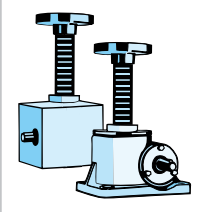
3.4.1 Configuration type 1

3.4.1.1 Standard

3

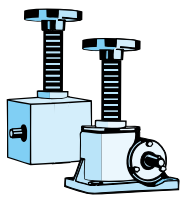


Worm gear screw jacks



3.4 SHE range dimension plans

Size	0,5	1	2	2,5	5	10	15	20	25	35
Tr spindle	Tr 18x6	Tr 22x5	Tr 26x6,28	Tr 30x6	Tr 40x7	Tr 58x12	Tr 60x12	Tr 65x12	Tr 90x16	Tr 100x16
A	20	-	20	20	20	20	20	20	20	20
B	105,5	124	147,5	150,5	193	230	230	262	317	350
B1	35,5	54	54,5	53,5	63	80	80	86	100	110
C	32	35	44	45	61,5	70	70	87	102	115
D	81,5	150	94	165	212	235	235	295	350	430
E	-	130	57	135	168	190	190	240	280	360
F	115	100	182	120	155	200	200	215	260	280
G	90	80	152	90	114	155	155	160	190	210
Ø H	9	8,5	11	14	17	21	21	28	35	35
Ø J _{k6}	10	14	14	16	20	25	25	28	34	38
K 1	27	36	45,2	45,2	56,2	66,8	66,8	72,5	97	120
K 2	-	58	28,5	50	58	63,5	63,5	95	95	135
L	32,5	68	47	65	80	86	86	122,5	130	170
L 1	22	18	-	-	-	52	52	52	60	60
M	73	100	100	110,5	132	172	172	213,5	221	265
N	120	140	180	190	228	280	280	322	355	430
Ø O	65	Vkt 100	98	98	122	150	150	185	205	260
P	75,5	79	101,5	105,5	142	156,5	156,5	182	225	250
Q	3x3x20	5x5x16	5x5x25	5x5x32	6x6x32	8x7x45	8x7x45	8x7x45	10x8x50	10x8x70
Ø R	-	-	41	38	55	55	55	72	80	100
S	-	-	6	5,5	6	7	7	6	10	10
T	5,5	9	8,5	8,5	12	6,5	6,5	6	8	10
V	10	10	14	12	18	16	16	20	25	30
Ø W	36	60	48	48	65	80	80	100	130	150
Ø U	29	40	49	49	64	80	80	87	120	139
Y	70	70	93	97	130	150	150	176	217	240
Head type I										
Ø a _{k6}	18h9	15	18	20	25	40	40	50	70	80
b	20	24	30	30	40	50	50	60	63	80
c	30	44	46	45	51	73,5	73,5	80	92	100
Head type II										
Ø d	65	72	98	98	122	150	150	185	205	260
Ø e	45	50	75	75	85	105	105	140	155	200
Ø f	4xØ7	4xØ9	4xØ11	4xØ14	4xØ17	4xØ21	4xØ21	4xØ26	4xØ27	4xØ33
r	8	10	12	12	18	20	20	20	25	30
s	20	25	30	30	40	50	50	60	63	80
Ø x	18	30	40	40	50	65	65	90	100	130
g	30	45	46	45	51	73,5	73,5	80	92	100
Head type III										
h	15	24	30	30	39	50	50	60	63	80
i	M 18x1,5	M 16x1,5	M 18x1,5	M 22x1,5	M 30x2	M 40x3	M 40x3	M 50x3	M 70x3	M 80x3
k	30	44	46	45	51	73,5	73,5	80	92	100
Head type IV										
l _{-0,2}	20	25	30	30	42	60	60	75	90	105
m	50	60	70	70	105	130	130	150	175	220
n	30	40	50	50	75	100	100	120	140	160
Ø o ^{H8}	15	20	20	25	35	50	50	60	70	80
p1	50	60	61	60	79,5	103,5	103,5	110	134	160
Ø u	30	40	48	50	65	90	90	110	130	150
v1	35	40	45	45	67,5	80	80	90	105	140
v	15	20	25	25	37,5	50	50	60	70	80

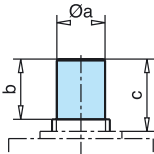


Worm gear screw jacks

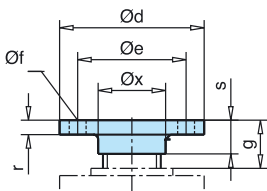
3.4 SHE range dimension plans

3

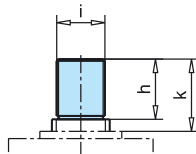
Head type I



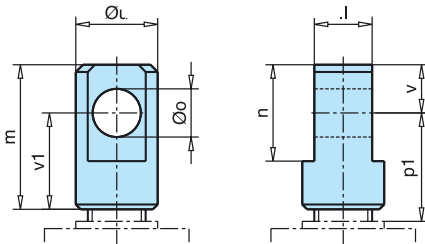
Head type II



Head type III



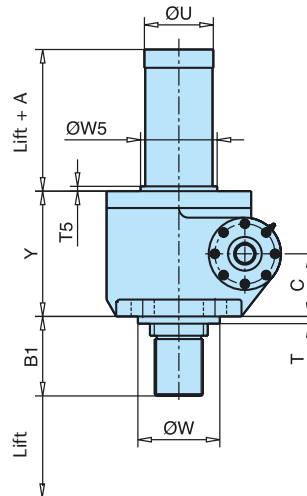
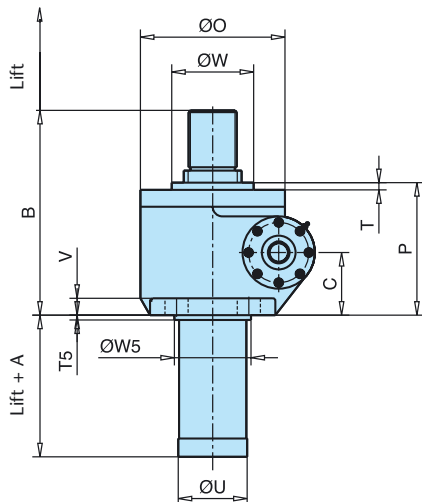
Head type IV



Design "A"

SHE Size 50-75

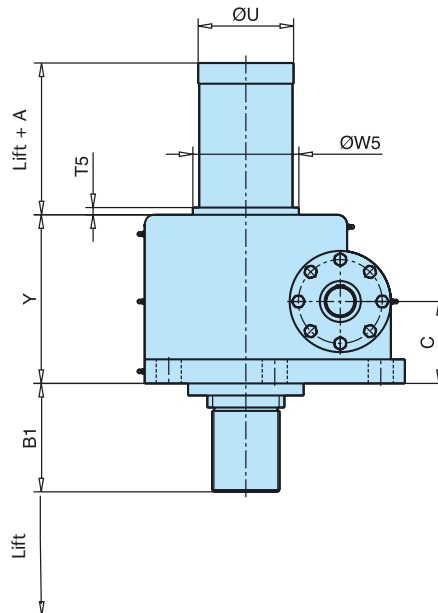
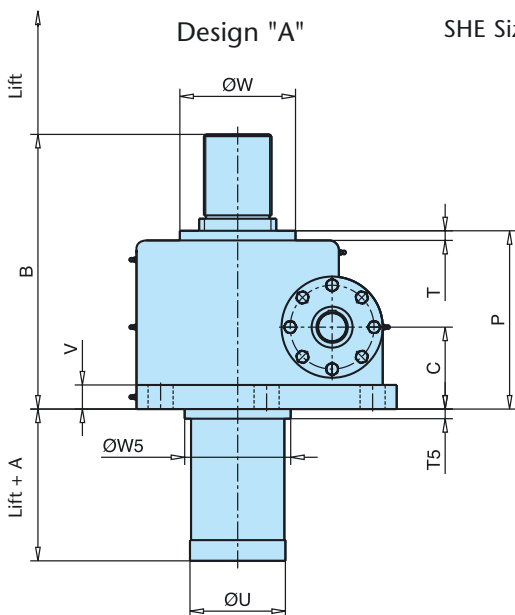
Design "B"



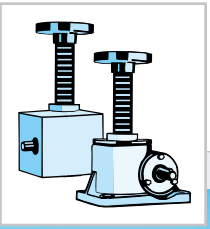
Design "A"

SHE Size 100-200

Design "B"

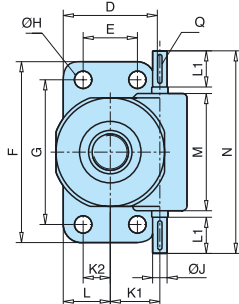


Worm gear screw jacks

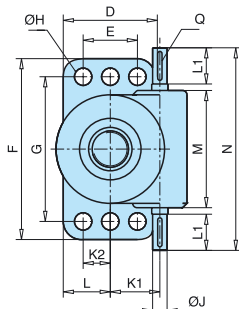


3.4 SHE range dimension plans

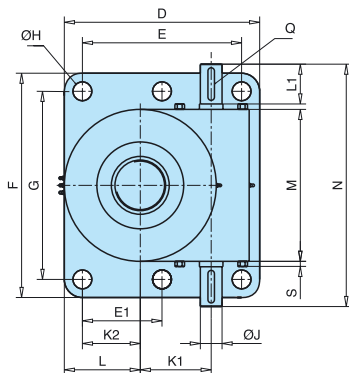
SHE Size 50



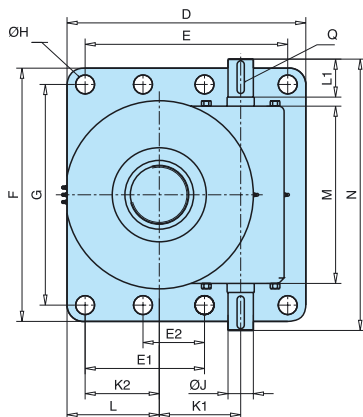
SHE Size 75



SHE Size 100



SHE Size 100 and 200



Size	50	75	100	150	200*
Tr spindle	Tr 120x16	Tr140x20	Tr 160x20	Tr 190x24	Tr220x28
A	20	70	65	80	
B	375	445	520	625	
B1	115	135	170	180	
C	130	155	170	194	
D	260	330	540	660	
E	150	225	440	560	
E1	-	-	220	330	
E2	-	-	-	170	
F	500	540	620	700	
G	400	450	520	610	
Ø H	4xØ48	6xØ42	6xØ52	8xØ52	
Ø J	40k6	60 m6	60 m6	70 m6	
K 1	137	160	196	225	
K 2	75	112,5	160	210	
L	130	-	210	255	
L 1	100	110	110	110	
M	324	360	420	490	
N	560	600	670	710	
Ø O	300	375	440	510	
P	275	335	370	445	
Q	12x8x80	18x11x100	18x11x90	20x12x90	
S	15	-	14	-	
T	15	25	25	20	
TS	10	25	20	20	
V	35	40	50	60	
Ø W	170	250	240	300	
Ø W5	159	250	220	245	
Ø U	143	181	198	220	
Y	260	310	350	424	
Head type I					
Ø a k6	100	110	140	160	
b	125	90	175	200	
c	150	110	200	230	
Head type II					
Ø d	300	330	370	400	
Ø e	225	270	280	310	
Ø f	4xØ35	6xØ42	6xØ52	8xØ52	
r	30	40	75	90	
s	70	90	127	150	
Ø x	140	200	200	220	
g	100	110	150	180	
Head type III					
h	125	90	175	200	
i	M 100x5	M 110x6	M 140x6	M 160x6	
k	150	110	200	230	
Head type IV					
l	120-0,2	140-0,2	160-0,3	180-0,3	
m	300	340	360	400	
n	200	220	280	320	
Ø o H8	100	120	140	160	
p1	225	260	245	270	
Ø u	170	200	220	260	
v1	200	240	220	240	