

Worm gear screw jacks

3.3 Technical information

3.3.1 Table of settings

3.3.1.1 Worm gear screw jacks SHE

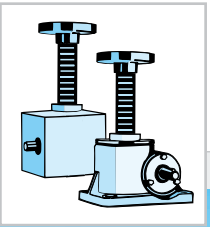
Size		0,5	1	2	2,5	5	10	15	
Max. lifting force	[kN]	5	10	20	25	50	100	150	
Max. tension load	[kN]	5	10	19	25	50	99	99	
Spindle Tr ¹⁾		18x6	22x5	26x6,28	30x6	40x7	58x12	60x12	
Ratio N		10:1	5:1	6:1	6:1	6:1	7 2/3:1	7 2/3:1	
Amount of lift per revolution for ratio N	[mm/per rev.]	0,60	1,0	1,047	1,0	1,167	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

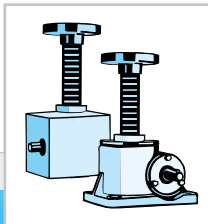
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20	25	35	50	75	100	150	200	Size
200	250	350	500	750	1000	1500	2000	Max. lifting force
166	250	350	500	750	1000	1500	-	Max. tension load
65x12	90x16	100x16	120x16	140x20	160x20	190x24	220x28	Spindle Tr ¹⁾
8:1	10 2/3:1	10 2/3:1	10 2/3:1	12:1	12:1	19:1	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



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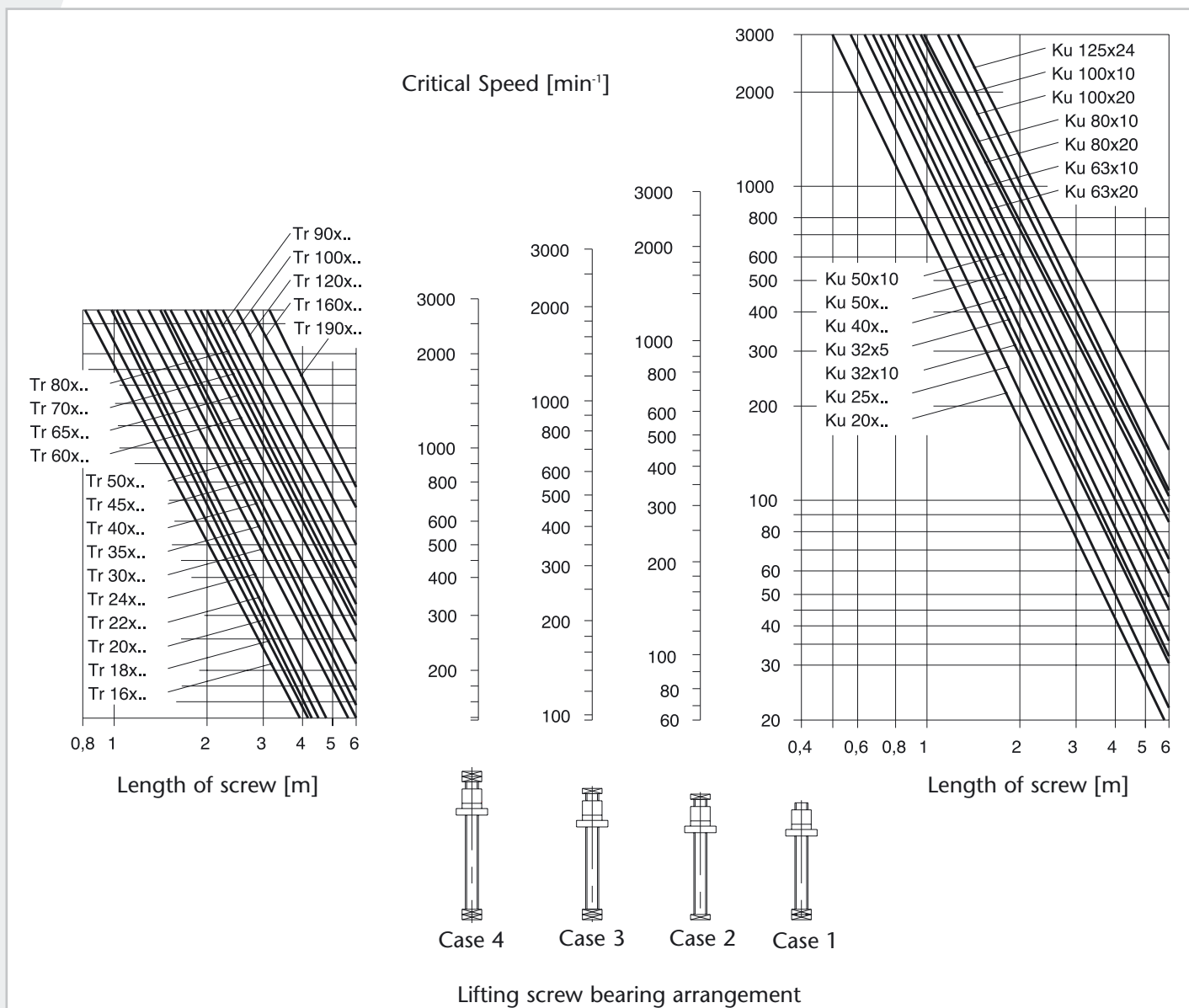
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3.3.5.4 Spindle efficiency ratings η_{sp} (steel/bronze lubricated)

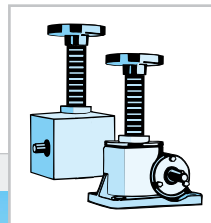
Tr spindle	14x4	18x6	18x4	20x4	22x5	26x6,28	30x6	35x8	40x7
Spindle efficiency rating[%]	49	54	42,5	40	43	45	40	43	36,5
Tr spindle	40x8	50x9	58x12	60x12	60x9	65x12	70x10	70x12	80x10
Spindle efficiency rating[%]	40	37	40,5	39,5	32,5	37,5	31,6	35,5	29
Tr spindle	90x16	100x10	100x16	120x14	120x16	140x20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



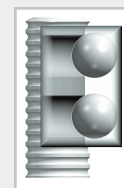
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3.3.7 Ball screw spindle Ku

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			

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

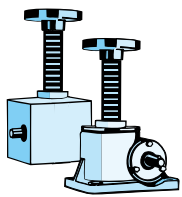
HSE range

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!



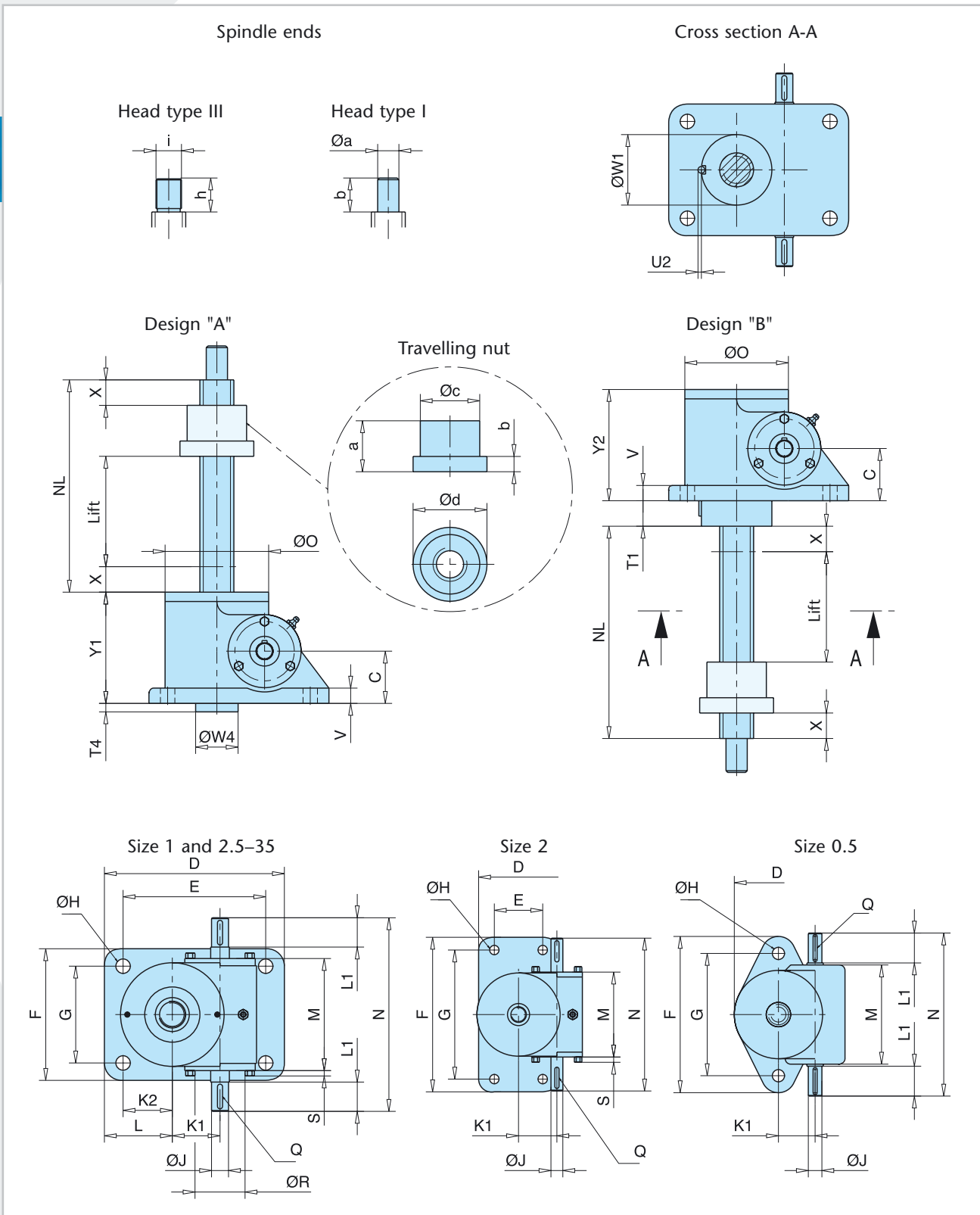
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3.4 SHE range dimension plans

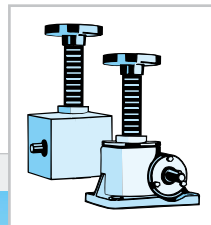
3.4.2 Configuration type 2

3.4.2.1 Standard

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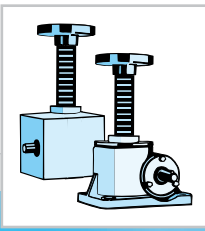
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3.4 SHE range dimension plans

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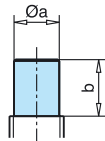
Size	0,5	1	2	2,5	5	10	15	20	25	35
Spindle	Tr 18x6	Tr 22x5	Tr 26x6,28	Tr 30x6	Tr 40x7	Tr 58x12	Tr 60x12	Tr 65x12	Tr 90x16	Tr 100x16
C	32	35	44	45	61,5	70	70	87	102	115
D	81,5	150	94	165	212	235	235	295	350	430
E	-	130	57	135	168	190	190	240	280	360
F	115	100	182	120	155	200	200	215	260	280
G	90	80	152	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	80
M	73	100	100	110,5	132	172	172	213,5	221	265
N	120	140	180	190	228	280	280	322	355	430
NL	lift+72	lift+80	lift+80	lift+85	lift+100	lift+125	lift+125	lift+150	lift+170	lift+205
ø O	65	Vkt 100	98	98	122	150	150	185	205	260
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 1	18,5	9	24	26,5	30	34	34	39	52	45
T 4	0	9	0	0	0	0	0	0	0	15
U 2	2,5	0	2	3	3	1	1	3	3	4
V	10	10	14	12	18	16	16	20	25	30
ø W 1	45	60	60	68	83	110	110	140	160	180
ø W 4	0	60	0	0	0	0	0	0	0	150
Safety X	20	20	20	20	20	25	25	25	25	30
Y 1	74	79	95	100	131	160	160	194	226	250
Y 2	70	79	93	97	131	150	150	181	211	250
Travelling nut										
a	32	40	40	45	60	75	75	100	120	145
b	10	12	18	15	18	25	25	30	35	35
ø c _{h9}	40	45	50	50	70	90	90	90	130	150
ø d	50	65	76	80	87	110	110	120	155	190
Head I										
ø a _{k6}	10	15	18	20	25	40	40	50	70	80
b	20	24	30	30	40	50	50	60	80	80
Head III										
h	20	24	30	30	39	50	50	60	80	80
i	M 10	M 16x1,5	M 18x1,5	M 22x1,5	M 30x2	M 40x3	M 40x3	M 50x3	M 70x3	M 80x3



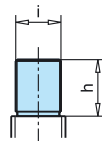
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3.4 SHE range dimension plans

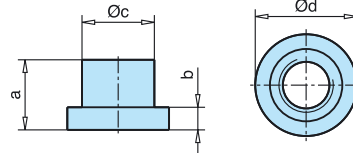
Head type I



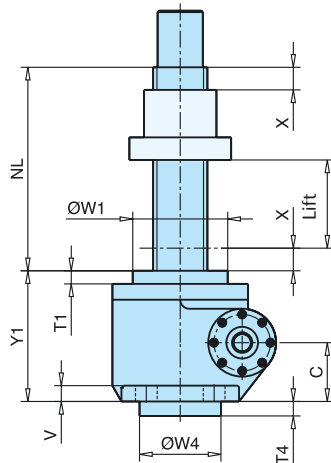
Head type III



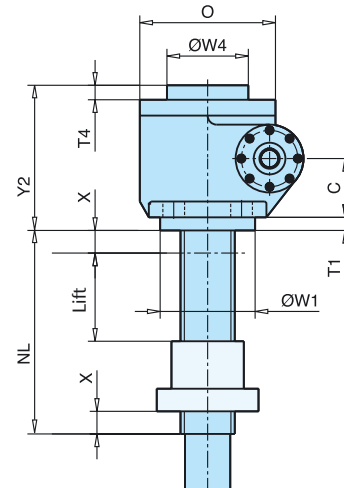
Travelling nut



Design "A"
SHE Size 50



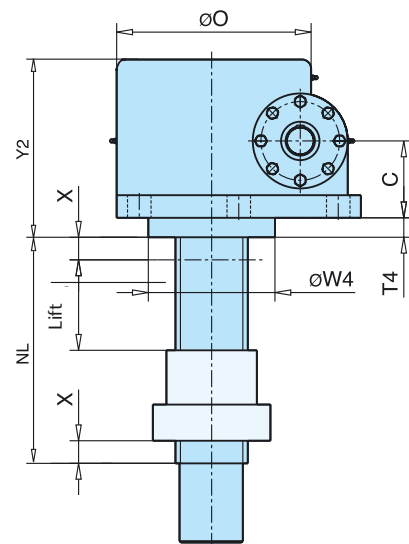
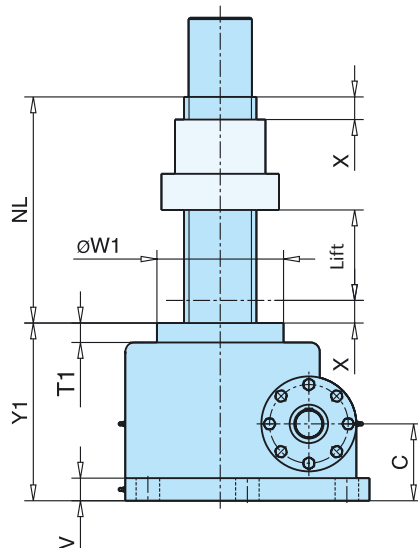
Design "B"
SHE Size 75



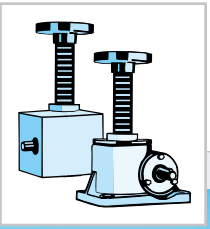
Design "A"

SHE Size 100-200

Design "B"

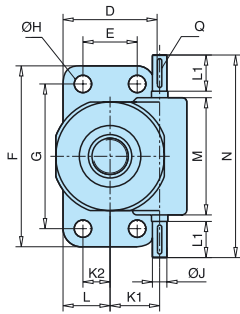


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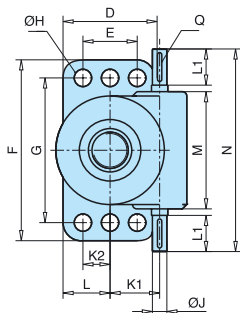


3.4 SHE range dimension plans

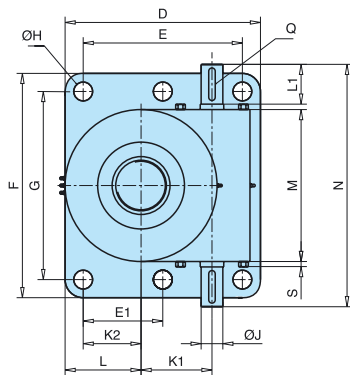
SHE Size 50



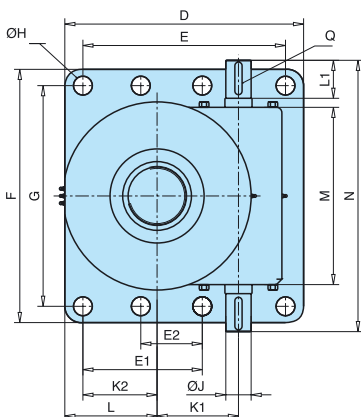
SHE Size 75



SHE Size 100



SHE Size 150 and 200



Size	50	75*	100	150	200*
Spindle	Tr 120x16	Tr 140x20	Tr 160x20	Tr 190x24	Tr 220x28
C	130		170	194	
D	260		540	660	
E	150		440	560	
E1			220	330	
E2			-	170	
F	500		620	700	
G	400		520	610	
ø H	48		52	52	
ø J _{k6}	40		60	70	
K 1	137		196	225	
K 2	75		160	210	
L	130		210	255	
L 1	100		110	110	
M	324		420	490	
N	560		670	710	
NL	lift+255		lift+300	lift+340	
Vkt O	300				
ØO			420	510	
Q	12x8x80		18x11x90	20x12x90	
Ø R	-				
S	-		14	-	
T 1	29		33	40	
T 4	32		43	50	
V	35		50	60	
Ø W 1	210		280	340	
Ø W 4	180		-	-	
Safety X	50		50	50	
Y 1	289		383	465	
Y 2	289		393	475	
Travelling nut					
a	155		200	240	
b	50		80	90	
ø c _{h9}	160		200	240	
ø d	225		260	300	
Head I					
ø a _{k6}	100		140	160	
b	125		175	200	
Head III					
h	125		175	200	
i	M 100x5		M 140x6	M 160x6	

* Dimension plan available on request