



**ENZFELDER** GmbH

Power transmission  
and  
lifting engineering

**High performances  
Spindle gears  
Type HSG**

# History

**1969** Mr. Enzfelder established a job shop in Vienna. Equipped with some machinery, the Enzfelder Company manufactured machine parts according to drawings.

Within one year the number of employees rose to 3. The Enzfelder company started manufacturing threaded spindles and nuts according to drawings. Then the range of manufacturing was enlarged by toothed wheels, screw wheels and endless screws according to drawings.

**1974** The company including the complete manufacture was relocated to Enzesfeld.

**1975** The manufacture of spindle gears was launched. The company's experience in the manufacture of trapezoid-threaded spindles, nuts, worm gear pairs and casings was a valuable basis for the construction. After many tests, the serial production of spindle gears was launched one year later. The result was a product characterized by a first-rate price-performance ratio. The product was distributed by dealers all over Europe.

**1981** The planning and construction of small hydropower plants was launched to replace diesel generators. Environmental protection was not really a topic at that time, however, and the production was stopped in 1986.

**1989** The Enzfelder GesmbH company replaced the Franz Enzfelder Company.

**1990** Scissor-type lifting platforms and cable winches were added to the delivery program.

**1991** Resilient spacer shafts were tested and added to the production range. At the same time, the telescopic spindle gear was developed. A patent for this principle was applied for and issued.

**1993** The sale of spindle gears under their own name was launched and presented for the first time at the Hannover industrial fair. We have been approached with a variety of tasks and have provided solutions according to the customers' needs ever since.

**1994** In cooperation with our customers we produced the first bevel gears to specification.

**1995** Spindle bearing arrangements were designed and included in the standard program.

**1996** The Enzfelder company produced planet gear to specification for the first time.

**1998-1999** The standard programs were enlarged. Additionally, bevel gears are manufactured in a standard design.

**2000** The development of electric cylinders in standard design for very high loads (5-1000kN) was started. At the same time the telescopic spindle gears were refined to save the customer the guiding and locking devices. Since that time we have been able to offer telescopic cylinders, too.

**2001** The development of electric cylinders was completed, and these cylinders were added to the standard program.

At the same time the development and fabrication of cubic spindle gears for lifting loads between 2.5 and 150kN was started. These gears were added to the standard program as well.

**2002** were extended and optimized the series of the electric cylinders. Further we provide an electronic 2D-3D product catalogue of the spindle gears, it makes it possible to integrate our products into your system.

**2002-2003** We putted our new assembling and packaging hall, beside the manufacturing hall, in operation

**2003** We increased our machinery by buying a CNC machine tool with 7 axes, brand AXA. That new CNC machine allows a precise machining of the screw jack housings in only two clamping.

**2003-2004** The engineering started to use new 3-D CAD software, Solid Edge. That software enables our customers to integrate easily our drawings.

**2004** We opened a sales office in France.

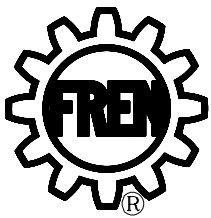
**2004-2005** We started to design the high performance screw jacks HSG and we created a range of 10 different sizes.

**2005** First participation to an exhibition in France: INDUSTRIE 2005 at Lyon.

**2005-2006** We started to design a new range of telescopic screw jacks TSGLR. Today, these new telescopic screw jacks, with a more compact design, are used in the stage industry, in the aircraft industry, on train lifting equipments and in machine building.

**2008** We replaced the tread grinding machine by a new CNC thread grinding machine, brand Mikromat.

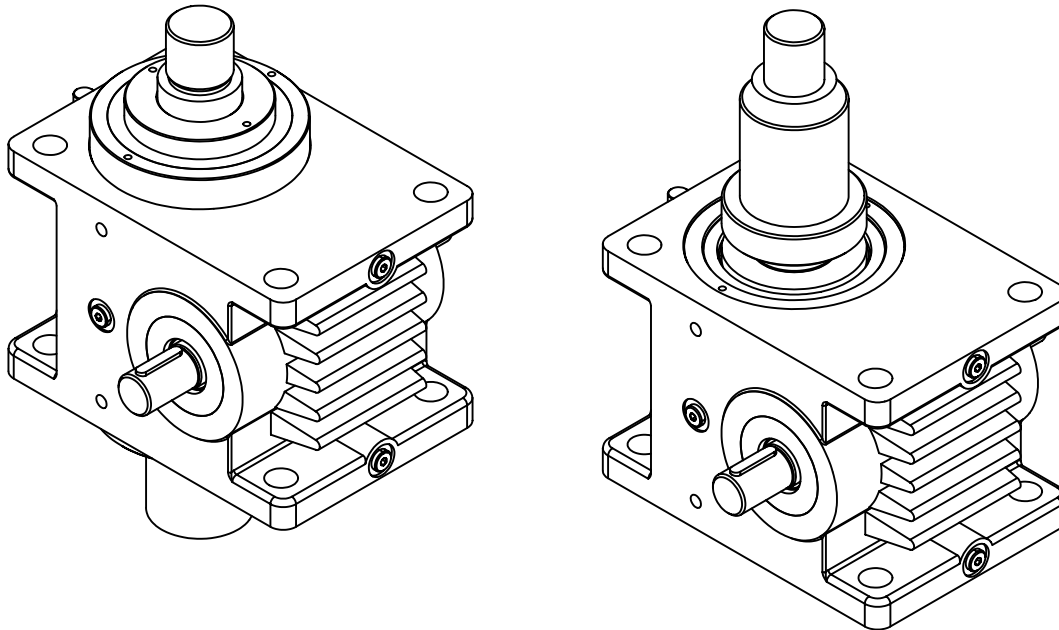
In the past years we solved problems of motive power engineering and lifting for our customers. We searched and found the optimal solution for each case and manufactured at the best possible price/performance ratio.



# Technical Data

**ENZFELDER** GMBH  
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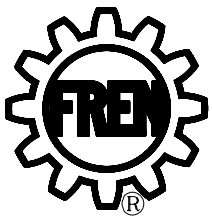


FREN high performances screw jacks are strong worm gear reducers driving a trapezoidal lifting screw. The reducer cases are made of nodular cast iron GGG40 for high loads and meeting high safety standards.

The worm hardened and ground is running on angular ball bearings. The worm wheel is made of high strength material which is particularly abrasion resistant. It is running on thrust ball bearings.

The sizes HSG 31 (force 5kN) to HSG 200 (force 1000kN) are filled with oil on delivery. The trapezoidal lifting screw can be delivered on standard as a single- start spindle or as a multi- start spindle. For higher demands on regards to lifting speed or duty cycle we use ball screws (KHS) or planetary roller spindle drives (PHSG).

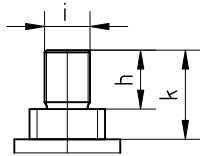
Type		31	36	50	63	80	100	125	140	180	200
Max. capacity	kN	5	10	25	50	100	200	350	500	750	1000
Max. tensile force	kN	5	10	25	50	100	200	350	500	750	1000
Lifting screw		Tr 18x4	Tr 22x5	Tr 40x8	Tr 50x9	Tr 60x12	Tr 70x12	Tr 100x16	Tr 120x16	Tr 140x20	Tr 160x20
Ratio N		4:1	5:1	6:1	7:1	8:1	8:1	10 2/3:1	10 2/3:1	13 1/3:1	13 1/3:1
Raise per revolution N	mm/r	1,0	1,0	1,33	1,28	1,5	1,5	1,5	1,5	1,50	1,5
Ratio L		16:1	20:1	24:1	28:1	32:1	32:1	32:1	32:1	40:1	40:1
Raise per revolution L	mm/r	0,25	0,25	0,33	0,32	0,375	0,375	0,5	0,5	0,5	0,5
Max. input power at 20% ED/ hour	kW	0,6	0,9	1,5	2,3	3,6	4,8	7,7	10,2	12,2	17,9
Max. input power at 10% ED/ hour	kW	1	1,5	2,6	4	6,3	8,4	13,5	18	21	31
Efficiency at ratio N	%										
Efficiency at ratio L	%	on request if needed									
Lifting screw efficiency	%	42,5	43	40	36,5	39,5	35,5	34	30	32	28,5
Torque on lifting screw at max load	Nm	7,5	18,5	80	190	478	1060	2600	4235	-	1115
Max. permissible torque on input shaft	Nm	13	29,5	49	168	398	705	975	1640	-	4260
case material		Al alloy	Al alloy	GGG 40	GGG 40	GGG 40	GGG 40	GGG 40	GGG 40	GGG 40	GGG 40
Weight without spindle or protection tube	kg	2	4	13	25	47	74	145	335	-	870
Weight for each 100mm stroke	kg	0,16	0,23	0,82	1,3	1,79	2,52	5,2	7,7	10,87	13,82



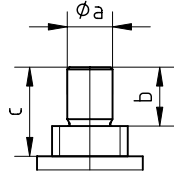
# HSG dimensions translating screw version

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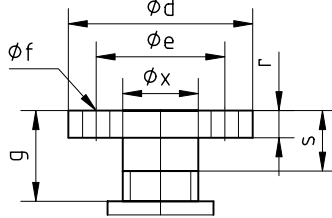
Spindle nose 1



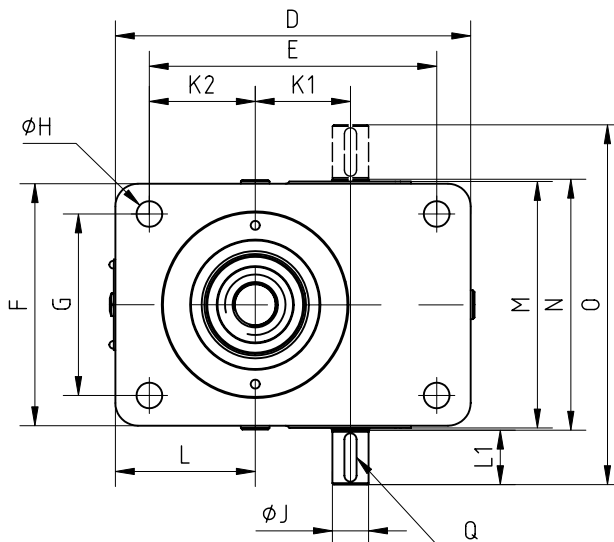
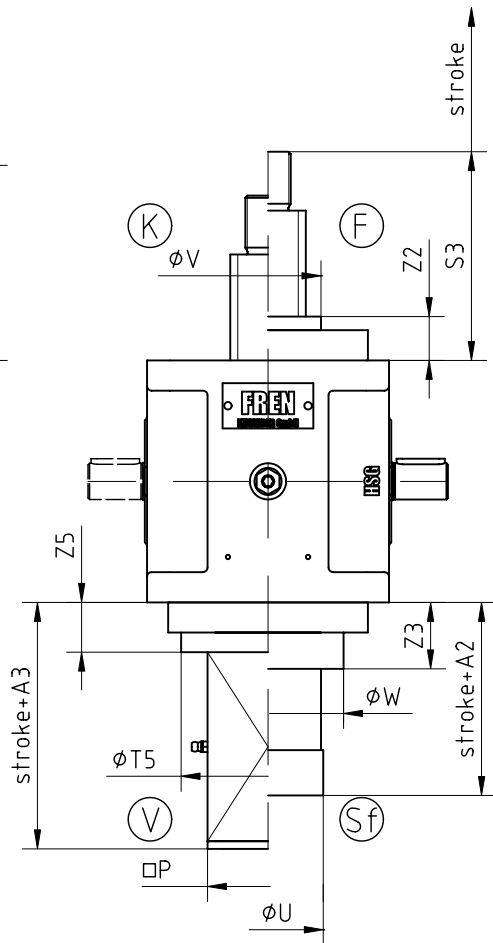
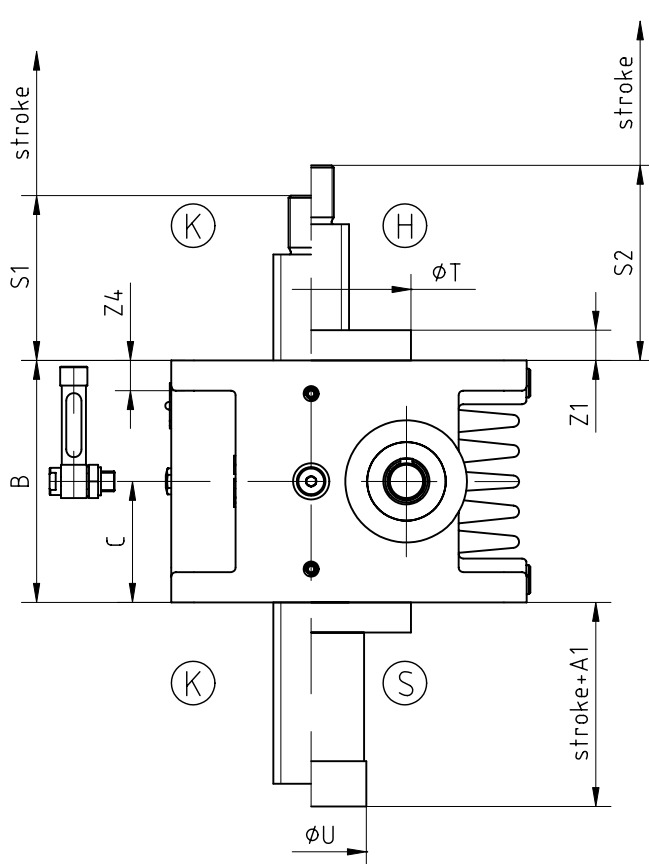
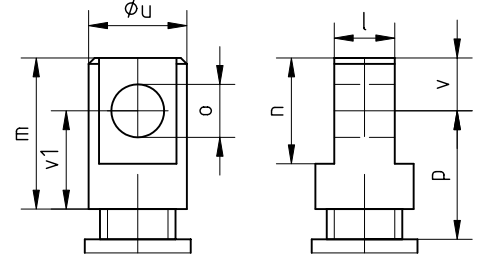
Spindle nose 2



Spindle nose 3

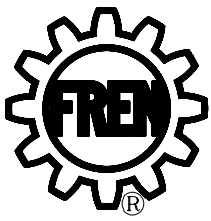


Spindle nose 4



**Possible executions:**

- K\_\_\_\_ Short cover
- H\_\_\_\_ high cover
- F\_\_\_\_ Guide
- S\_\_\_\_ Protection tube
- Sf\_\_\_\_ protection tube with guide
- V\_\_\_\_ locked against rotation



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Type	31	36	50	63	80	100	125	140	180	200
Lifting screw	Tr 18x4	Tr 22x5	Tr 40x8	Tr 50x9	Tr 60x12	Tr 70x12	Tr 100x16	Tr 120x16	Tr 140x20	Tr 160x20
A 1	22	22	22	22	22	22	22	22	22	22
A 2	39	44	46	52	61	71	76	86	96	101
A 3	98	104	117	123	136	152	154	179	189	199
B	80	105	130	160	200	230	300	350	400	450
C	40	52,5	65	80	100	15	150	175	200	225
D	117	138	175	235	275	330	410	490	595	680
E	95	110	140	190	220	270	330	390	500	550
F	80	105	130	160	200	230	300	350	420	460
G	62	80	100	120	150	175	230	260	320	330
ø H	9	9	13	17	21	28	39	46	52	66
ø J k6	10	14	16	24	32	38	42	50	60	70
K 1	31	36	50	63	80	100	125	140	180	200
K 2	31	40	50	70	75	87,5	110	130	172,5	185
L	42	54	67,5	92,5	102,5	117,5	150	180	222,5	250
L 1	15	18	28	36	58	58	82	82	95	105
M	83	108	133	163	204	235	305	355	430	470
N	86	112	136	166	206	240	310	360	432	472
O	116	148	192	238	322	356	474	524	622	682
Square P	30	40	70	80	80	100	140	180	200	220
Q	3x3x12	5x5x16	5x5x25	8x7x32	10x8x50	10x8x50	12x8x70	14x9x70	18x11x80	20x12x100
S 1	43	45	50	60	70	75	100	120	130	140
S 2	58	61	68	80	95	105	135	160	175	190
S 3	66	69	76	89	109	124	154	184	204	219
ø T f7	62	72	92	122	152	182	222	262	332	352
ø T 5	50	-	100	115	130	-	200	260	285	310
ø U	28	37	66	82	78	92	136	143	175	198
ø V	35	40	60	70	100	125	160	195	220	240
ø W	45	50	80	100	120	150	180	220	270	290
Z 1	15	16	18	20	25	30	35	40	45	50
Z 2	23	24	26	29	39	49	54	64	74	79
Z 3	29	34	39	44	54	64	74	84	94	109
Z 4	10	12	15	20	25	28	35	45	55	60
Z 5	27	-	28	33	40	-	54	63	68	73

#### Spindel end 1

h	17	24	29	39	49	54	79	99	109	119
i	M 12x1,5	M 16x1,5	M 20x1,5	M 30x2	M 42x3	M 56x3	M 80x3	M 100x4	M 120x4	M 140x4
k	37	44	49	59	69	74	99	119	129	139

#### Spindle end 2

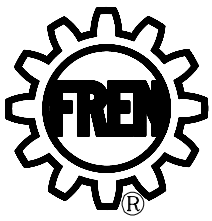
ø a k6	12	15	20	30	40	50	80	95	110	130
b	17	24	29	39	49	54	79	99	109	119
c	37	44	49	59	69	74	99	119	129	139

#### Spindle end 3

ø d	62	72	92	122	150	182	222	262	332	352
ø e	45	50	65	85	105	135	170	205	250	270
ø f	4x ø6,6	4x ø9	4x ø14	4x ø18	4x ø22	6x ø26	8x ø30	8x ø33	8x ø39	8x ø45
g	43	45	50	60	70	75	100	120	130	140
r	8	10	12	18	20	25	30	35	45	50
s	48	25	30	40	50	55	80	100	110	120
ø x	20	30	35	50	65	85	115	140	165	185

#### Spindle end 4

l -0,2	20	25	30	40	60	75	100	120	140	160
m	50	60	70	100	130	150	230	300	330	360
n	30	40	50	70	100	120	160	200	240	280
ø o H8	15	20	25	35	50	60	80	100	120	140
p	55	60	65	85	100	110	170	220	230	240
ø u	30	40	50	65	90	110	140	170	200	220
v	15	20	25	35	50	60	80	100	120	140
v1	35	40	45	65	80	90	150	200	210	220

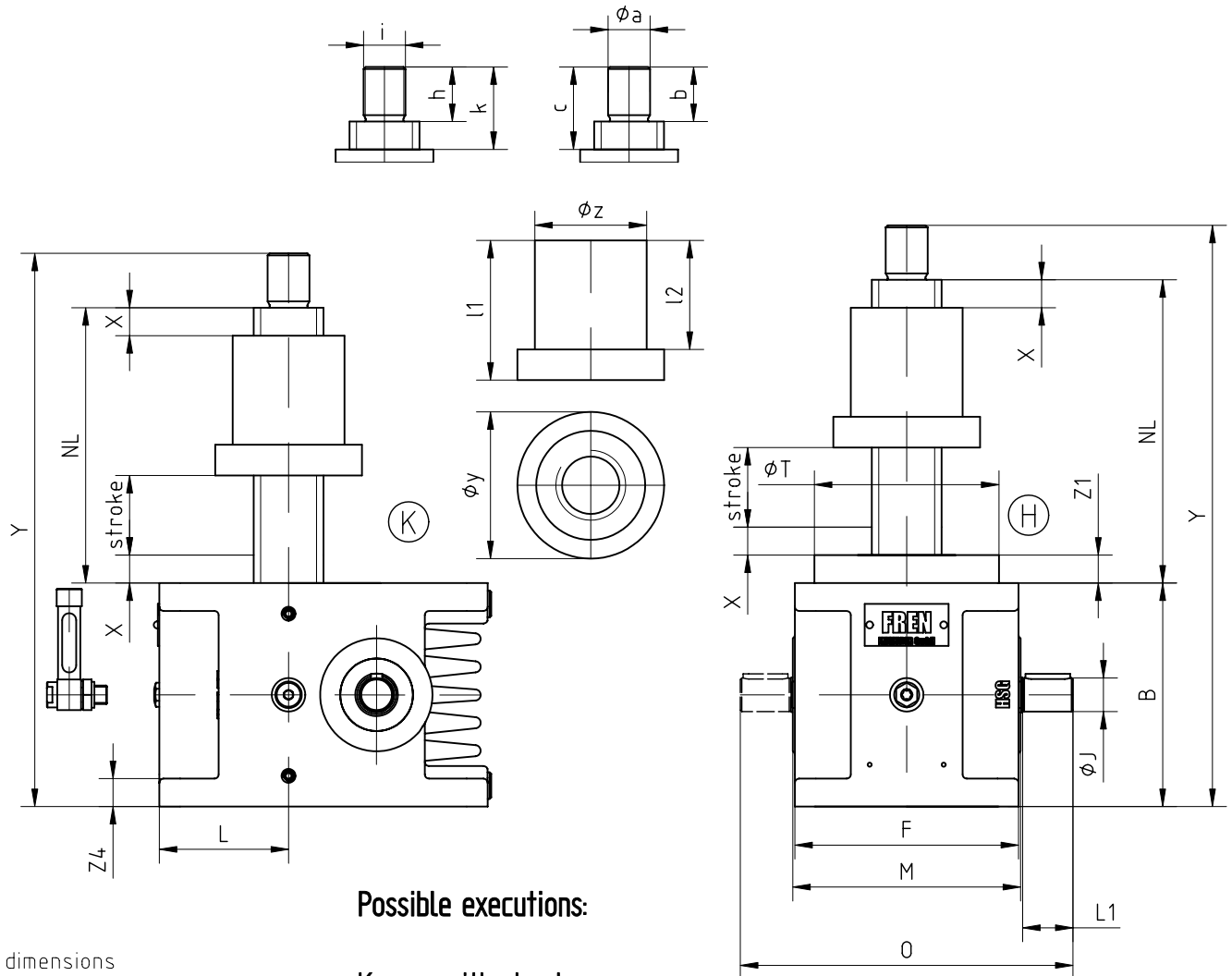


# HSG dimensions Traveling nut version

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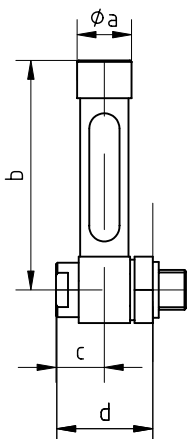
Spindle nose 1 Spindle nose 2



Possible executions:

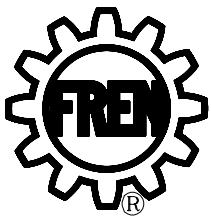
K\_\_\_\_with short cover  
H\_\_\_\_with high cover

Missing dimensions  
See version with translating screw



## Oil gauges dimensions

Size	31	36	50	63	80	100	125	140	180	200
ø a	For these sizes we use an oil sight glass				18	18	18	18	18	18
b					80	100	125	150	200	200
c					16	16	16	16	16	16
d					33	33	33	33	33	33



# HSG dimensions

## Traveling nut version

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Type	31	36	50	63	80	100	125	140	180	200
Lifting screw	Tr 18x4	Tr 22x5	Tr 40x8	Tr 50x9	Tr 60x12	Tr 70x12	Tr 100x16	Tr 120x16	Tr 140x20	Tr 160x20
B	80	105	130	160	200	230	300	350	400	450
C	40	52,5	65	80	100	15	150	175	200	225
F	80	105	130	160	200	230	300	350	420	460
ø J k6	10	14	16	24	32	38	42	50	60	70
L	42	54	67,5	92,5	102,5	117,5	150	180	222,5	250
L 1	15	18	28	36	58	58	82	82	95	105
M	83	108	133	163	204	235	305	355	430	470
NL version "K"	stroke + 85	stroke + 95	stroke + 120	stroke + 140	stroke + 170	stroke + 170	stroke + 200	stroke + 220	stroke + 240	stroke + 260
NL version "H"	stroke + 100	stroke + 111	stroke + 138	stroke + 160	stroke + 195	stroke + 200	stroke + 235	stroke + 260	stroke + 285	stroke + 310
O	116	148	192	238	322	356	474	524	622	682
Q	3x3x12	5x5x16	5x5x25	8x7x32	10x8x50	10x8x50	12x8x70	14x9x70	18x11x80	20x12x100
ø T f7	62	72	92	122	152	182	222	262	332	352
Safety X	20	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 + 509	NL + 569
Z 1	15	16	18	20	25	30	35	40	45	50
Z 4	10	12	15	20	25	28	35	45	55	60

### Lifting nut

l 1	45	55	80	100	130	130	160	180	200	220
l 2	35	43	62	78	105	100	115	130	135	140
ø y	50	65	87	105	110	120	190	225	240	260
ø z h9	40	45	70	80	90	90	150	160	180	200

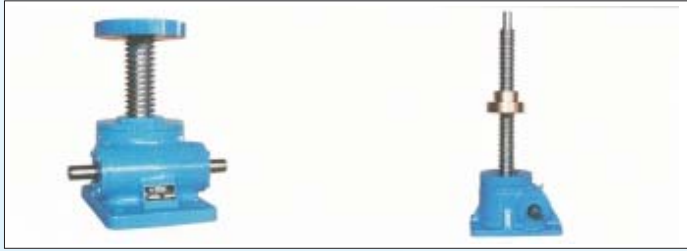
### Spindel end 1

h	17	24	29	39	49	54	79	99	109	119
i	M 12x1,5	M 16x1,5	M 20x1,5	M 30x2	M 42x3	M 56x3	M 80x3	M 100x4	M120x4	M140x4
k	37	44	49	59	69	74	99	119	129	139

### Spindel end 2

ø a k6	12	15	20	30	40	50	80	95	110	130
b	17	24	29	39	49	54	79	99	109	119
c	37	44	49	59	69	74	99	119	129	139

# Delivery programm



FREN Spindle gear for lifting, lowering, pulling, pushing, sluing, or rotating  
Forces up to 3000kN  
Lifts up to 10000mm

FREN Electric cylinders for lifting, lowering, pulling, pushing, sluing, or rotation  
Forces up to 1000kN  
Lifts up to 2500mm



FREN Bevel gears 'K' and Bevel gears cubic 'H' for deflecting input shafts  
Speeds up to 6500U/min  
Torques up to 5200Nm

FREN Resilient cardan shafts for transmitting torques with assembling inaccuracies  
Angles up to 3°  
Torques up to 500Nm



FREN Telescopic gears and telescopic cylinders for lifting, lowering, pulling, pushing  
Forces up to 1000kN  
Lifts up to 10000mm

FREN Planet gears in special designs for reducing speeds and increasing torques  
Gear reduction 1,5:1 up to 1500:1  
Torques up to 1000Nm



FREN Scissor-type lifting platforms for lifting and lowering including a wide range of accessories  
Forces up to 500kN  
Lifts up to 5000mm

FREN Cable winches for lifting, lowering, pulling or sluing  
Forces up to 300kN  
Lifts up to 100000mm

