haacon

Worm gear screw jacks

with trapezoidal screw or ball screw

Competence in lifting technology

haacon 07/2015 - 1000 - gb

Program

Design and calculation criteria

Layout

DMSZ
Zertifiziert nach
ISO 9001
QM 00414

haacon hebetechnik gmbh
Josef-Haamann-Str. 6
D-97896 Freudenberg/Main

Tel: + 49 (0) 93 75/84-0
Fax: + 49 (0) 93 75/84-86
e-mail: hebetechnik@haacon.de
Internet: http://www.haacon.com

Contents

haacon is a company in the mechanical lifting field with comprehensive experience in manufacturing and marketing of **spindle jacks**.

With these catalogue we have made it easy to select a screw jack or screw jack system suitable for your application. You can also consult our Technical Sales department. They will help you with computer calculations and suggestions, for both standard and special applications.

Being an international company, we are able, through our own subsidiaries and active agents, to give the optimum solution, on a local basis.

HN/HQ and HNL/HQL

Mechanical worm gear screw jack with trapezoidal lifting screw available with translating lifting screw or lifting nut.

16 standard types available within short delivery time

Capacities up to 1000 kN (100 tonne)

1500 kN (150 tonne) on request.

Lifting speed up to 2,4 m/min (40 mm/s).

Double speed with two-start lifting screw.

Standard lifting screw length up to 4 m.
Longer on request.

Self locking for standard single start lifting screw in the majority of non vibrating operating condtions. Consult your Application Engineer for further details.

Small side loads accepted only on type HN/HQ, consult your Application Engineer.

HK and HKL

Mechanical worm gear ball screw jack, available with translating lifting screw or lifting nut.

Capacities up to 125 kN (12,5 tonne).

200 kN (20 tonne) with ball screw available on request.

Lifting speeds up 5,4 m/min (90 mm/s).

Faster on request.

Standard lifting screw length up to 5,5 m.

Not self locking, must be combined with a brake arrangement.

Standard Executions

Standard Executions

Screw jack with Translating Lifting Screw

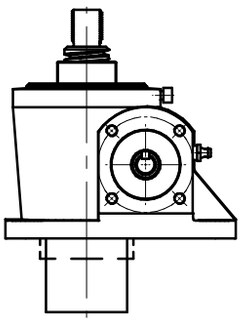


Fig. 1

Screw jack with Lifting nut

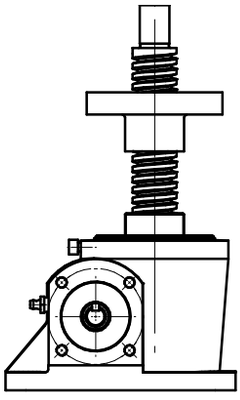


Fig. 2

Screw jack with PVC Bellow

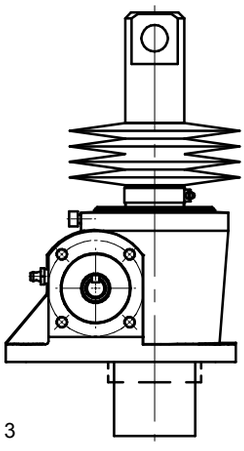


Fig. 3

Screw Jack with Motor Flange

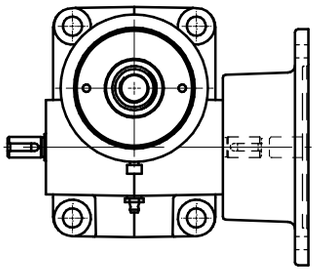


Fig. 4

Screw jack with Stop nut SM

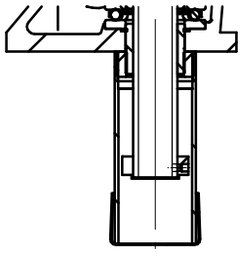


Fig. 5

Ball Screw jack with Translating Lifting Screw

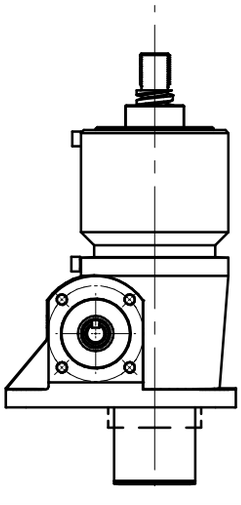


Fig. 6

Ball Screw Jack with Lifting nut

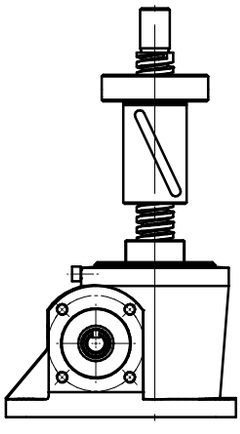


Fig. 7

Variant Executions

LR Locked against rotation

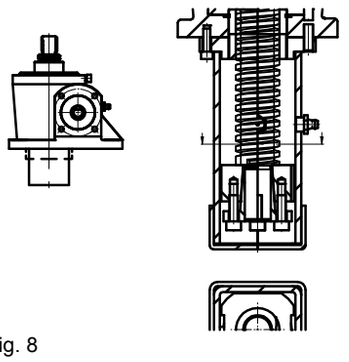


Fig. 8

LRK Locked against rotation with key

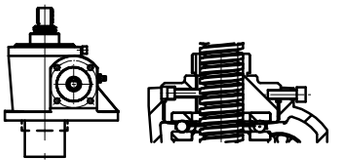


Fig. 9

ABL Antibacklash

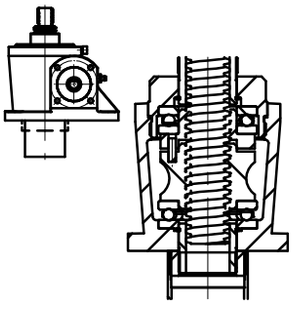


Fig. 10

LS Limit switches
Tele mecanique

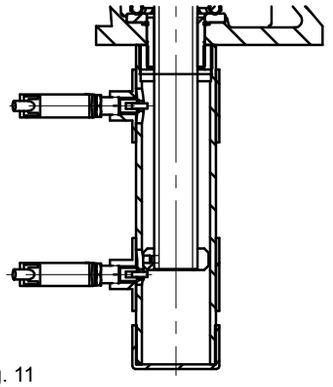


Fig. 11

MLS Magnetic Limit switches

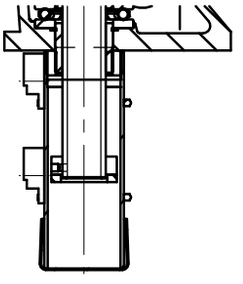


Fig. 12

SHM Safety nut

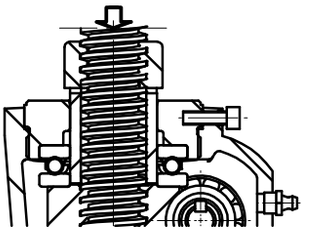


Fig. 13

Special Executions

Double Clevis Ends
(with Reinforced Projection Tube)

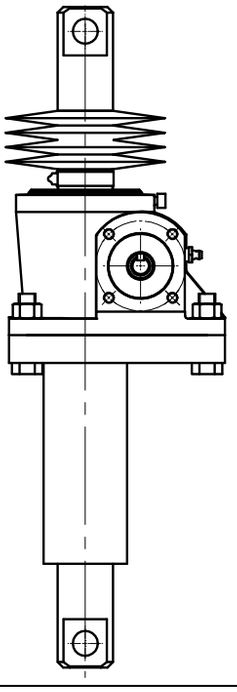


Fig. 14

Screw Jack with worm gear motor

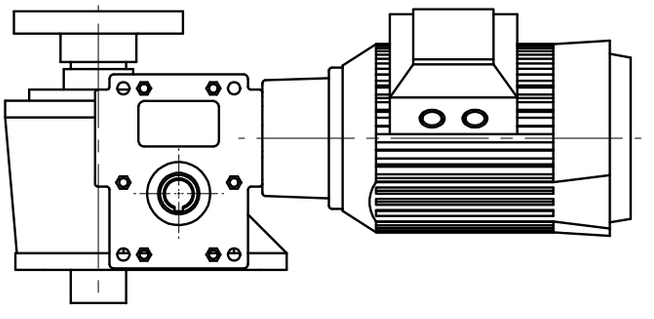


Fig. 15

Selection Guide

Company: .....

Address: .....

Phone/Fax: .....

Contact: ..... Position .....

Installation: .....

.....

.....

.....

Quantity of jacks: .....

Total load .....

LOAD SPECIFICATION

Normal dynamic load per jack (kN): .....

Max. dynamic load per jack (kN): .....

Max. statische Last pro Hubgetriebe (kN): .....

Loading condition: unguided (Euler I) ☐ guided (Euler II) ☐ guided (Euler III) ☐

Vibrations? yes ☐ no ☐

Shock loads? yes ☐ no ☐

OPERATING CYCLE

Cycle / hour: .....

Hours / day: .....

Days / year: .....

ENVIRONMENT

Ambient temperature (°C): .....

Environment: ☐ dusty ☐ humid ☐ corrosive

Others (specify): .....

.....

.....

LIFTING SCREW

Axial lifting spindle ☐ Lifting nut ☐

Stroke (mm): .....

Lifting speed (mm/min): .....

Mounting position of screw: horizontal ☐
upwords ☐ inverted ☐

Screw end: Thread ☐ Top plate ☐ Clevis ☐

Spindle protection: Bellow yes ☐ no ☐

Tube on reverse side: yes ☐ no ☐

Spindle material: Steel ☐ Stainless steel ☐ .....

OPTIONS

Safety nut: yes ☐ no ☐
(Mandatory, if people stay under suspended load)

.....

Stop nut: yes ☐ no ☐

Anti backlash: yes ☐ no ☐

Limit switch: top ☐ bottom ☐

Stainless steel case: yes ☐ no ☐

MOTOR DATA

Voltage [V] ..... 50-60 Hz

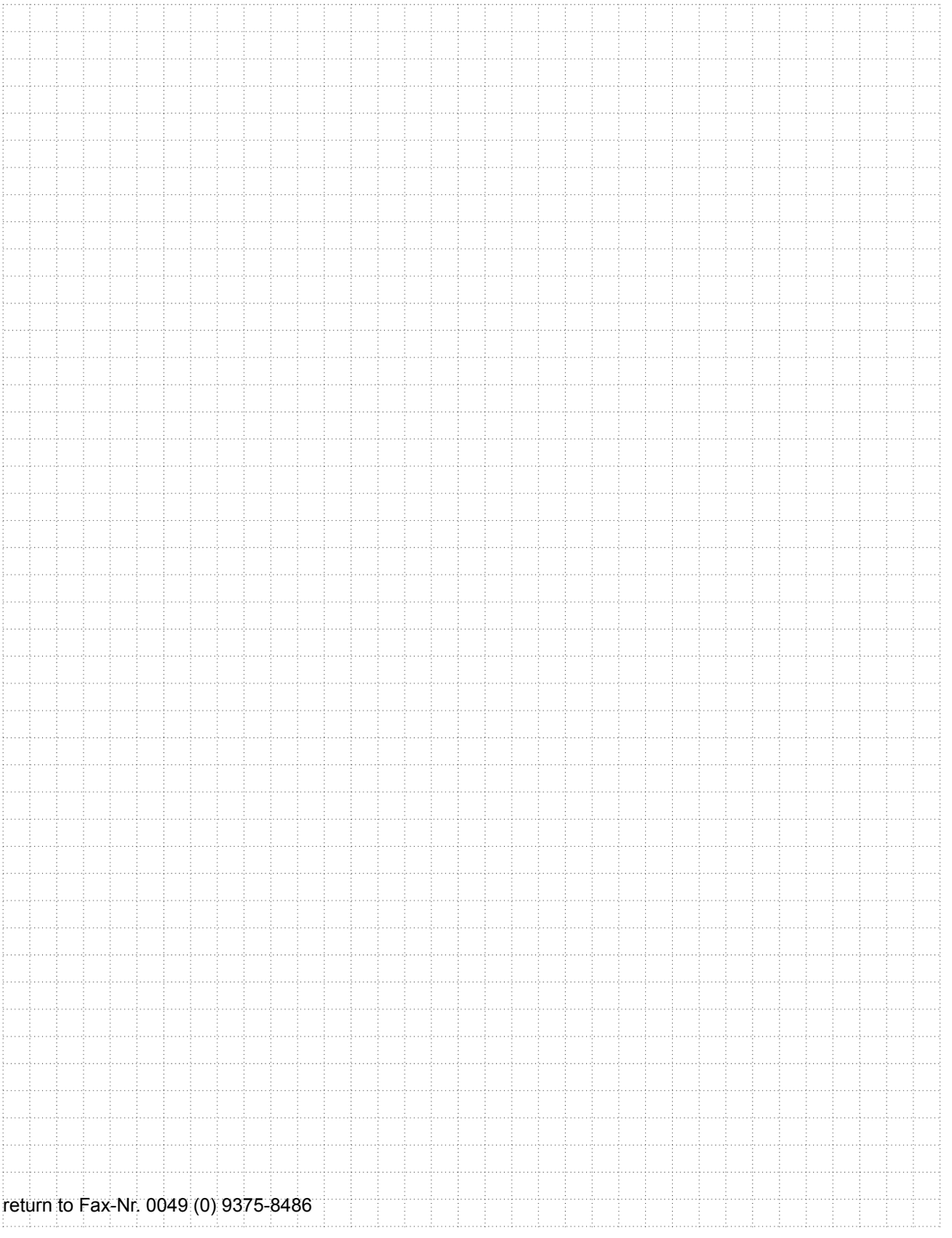
Protection class: IP 54 ☐ IP 65 ☐

Control: yes ☐ no ☐

Please call back ☐

.....

Please add sketch:



return to Fax-Nr. 0049 (0) 9375-8486

Screw jack

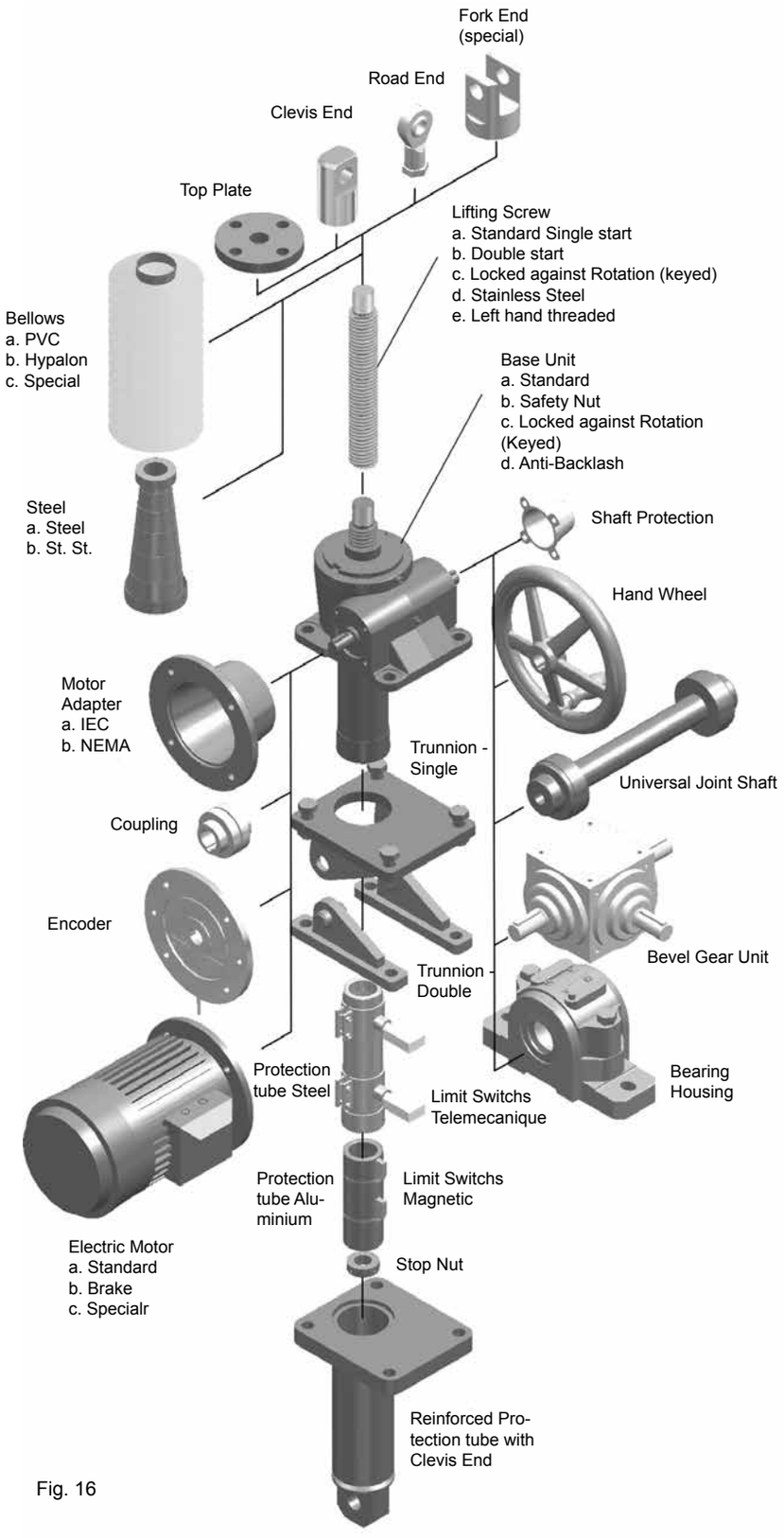


Fig. 16

SHM Safety nut

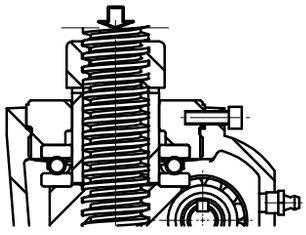


Fig. 17

LR Locked against rotation

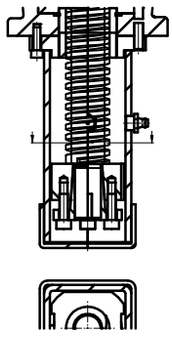


Fig. 18

LRK Locked against Rotation with Key

Fig. 19

ABL Antibacklash

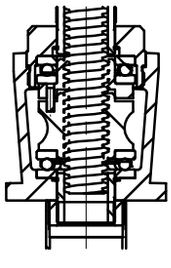


Fig. 20

Direction of rotation

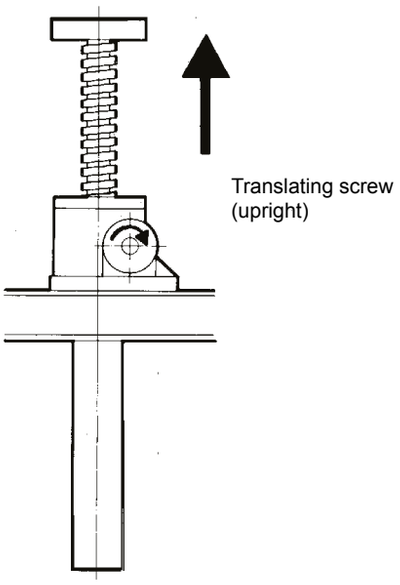


Fig. 21

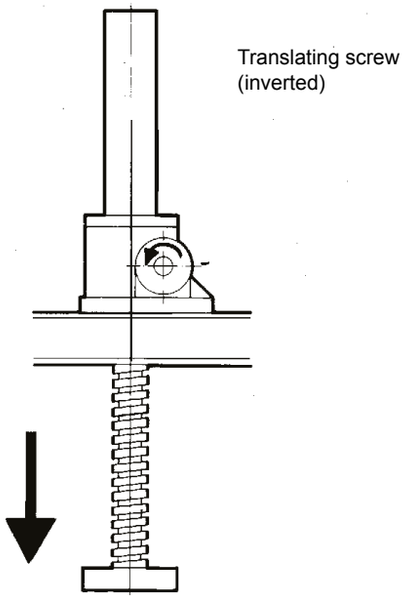


Fig. 22

Note: For types HN/HQ and HK spindle must be held to prevent rotation.

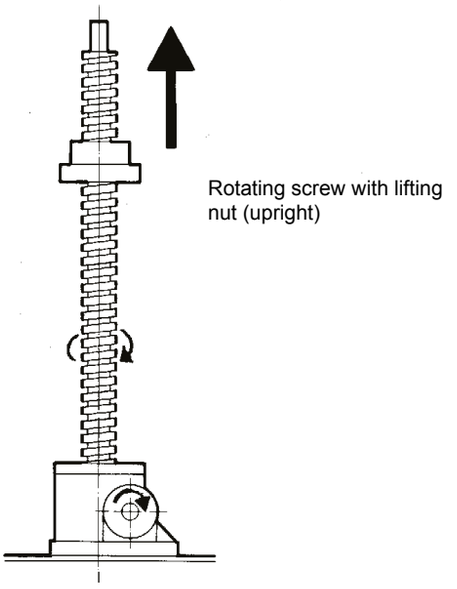


Fig. 23

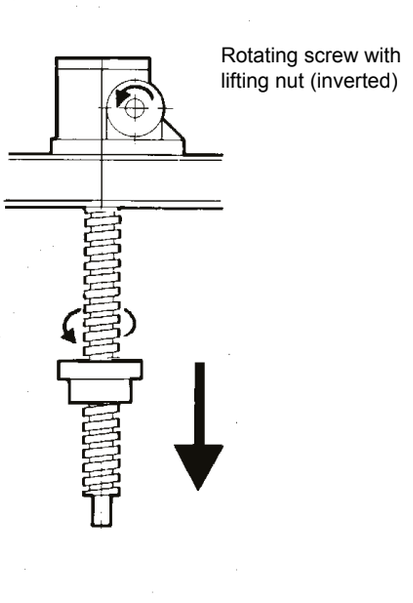


Fig. 24

For types HNL/HQL and HKL lifting nut must be held to prevent rotation.

Selection of jacks

Symbols used:

F = Force (N) (1 tonne = 10 000 N)
v = Lifting speed (mm/min)
s = Pitch of lifting screw (mm)
n = input speed (rpm)
i = Ratio of worm gear set
ED = Intermittence factor (%)
P_d = Running power of screw jack (kW)
P_s = Starting power of screw jack (kW)
P_{ED} = Thermal power (kW)
P_{Mnom} = Nominal motor power (kW)
P_{Mst} = Starting power of motor (kW)
P_{Max} = Max allowable input power of screw jack (kW)
η_d = Running efficiency of screw jack
η_s = Starting efficiency of screw jack

To calculate a screw jack you must at least know the force (F) to be moved and the lifting speed (v).

There are two types of standard format mechanical jacks.

I. HN/HQ and HNL/HQL
Screw jack with single and double start trapezoidal lifting screw available in 16 sizes, as standard.
The single start spindle is the most frequently used screw jack, suitable for low lifting speeds (up to 2400 mm/min), competitively priced.
Screw jack with double start can be obtained with higher lifting speeds and increased efficiency.
A brake must be included in the system, as they are not self sustaining.

The screw jacks are available in variants with low ratio (quick) and high ratio (slow).

II HK/HKL
Screw jack with ball screw lifting screw, available in 4 sizes as variants.
This type is suitable for high lifting speeds.
Owing to the higher overall efficiency, it is suited for applications with high degree of utilization required. (High ED).
Brake must be included in the system, as they are not self sustaining.

1. Select a screw jack where the nominal force is larger than the required force. (See “Technical data”).
2. By compression load check stroke length for bending according to Euler I, II or III (See compression load tables)
3. Check in Power rating tables that the max allowable power or torque is not exceeded.
4. Selection of one screw jack.
Calculate the running power (P_d) and starting power (P_s). P_d is stated in tables, see note 3 or calculate as follows:

$$P_d = \frac{F \times v}{\eta_d \times 6 \times 10^7}$$

$$P_s = \frac{F \times v}{\eta_s \times 6 \times 10^7}$$

η_d = running efficiency (see “Power rating tables”)
η_s = starting efficiency (see “Technical data”)

5. State the intermittence factor ED in %/hour
Example: 12 min/hour = 20%
6. If ED is other than 20% check Figure 32 or 59 that the thermal power P_{ED} is not exceeded.
The selection of jack is correct if $P_{ED} > P_d$ (P_d see note 4).
7. When selecting screw jack type HNL and HKL check critical spindle speed, see Figure 33 or 60.
8. Only screw jacks type HN/HQ can permit side forces (see Figure 34).
9. Selection of motor:
   I. Check that
   Nominal motor power $P_{Mnom} > P_d$ (P_d, see note 4)
   II Check that
   Starting power of motor $P_{Mst} > P_s$ (P_s, see note 4)

To determine the starting power of motor, following formula is used in most cases:

$$P_{Mst} = \frac{Mst}{M} \times P_{Mnom}$$

$\frac{Mst}{M}$ = factor stated in motor catalogue

Note: For three phase motor the factor $\frac{Mst}{M}$ is normally 1.8 - 2.5.

For further information consult our Application Engineers

10. Calculate the required input speed

$$n = \frac{V \times i}{s} \quad \text{(rpm)}$$

(i and s, see Technical data)

Calculation of multi jack arrangement

To calculate a screw jack arrangement is described in a simplified way below. For a more detailed calculation consult our Application Engineers.

1) Calculate the power consumption of each single jack in the arrangement as under “4” for single Jacks.
2) Add the power consumption of each single jack to get the total power consumption, P_x.
3) Attention must be paid to the efficiency of the connecting shaft system and other components in the arrangement such as: Worm Gears, Bevel Gears, Helical Gears, Couplings, Bearings and normal misalignment when mounting the arrangement.
If this is not possible use the following arrangement efficiency:

Number of jacks	η_{arr}
2	0.95
3	0.90
4	0.85
6-8	0.80

$$P_{arr} = \frac{P_x}{\eta_{arr}}$$

P_{arr} = Total power consumption of the arrangement
Px = The sum of the power consumption each single jack
η_{arr} = The efficiency of the arrangement acc to table

4) After calculating design motor power required, care should be taken to choose a larger motor with a safe working margin of excess power.
5) By high lifting speeds and high speed in connecting shaft system, the mass moment of inertia must be taken into consideration.

Guide to select single screw jack arrangements

Single screw jack

Load:	30 kN compression	Stroke:	500 mm
Loadcase:	Euler II	Intermittence factor:	15 min/hour
Lifting speed:	415 mm/min	Ambient temperature:	25° C

1. Select a screw jack where the nominal force is larger than the required force from table below:
Load 30kN -> HQ 50: Max capacity for HQ 50 is 50 kN > 30 kN.

Type / max capacity (kN)	**25**	**50**	**150**
Lifting screw	Tr30x6	Tr40x7	Tr55x9
Ratio (HQ)	7:1	6.75:1	7:1
Raise per revolution (mm)	0.857	1.037	1.285
Starting torque at max load (Nm)	23	55	210
Max running power at 20 % ED (kW)	0.55	0.9	1.5
Starting efficiency η_s	0.15	0.14	0.14
Ratio (HN)			
Raise per revolution (mm)			
Starting torque at max load (Nm)			
Max running power at 20 % ED (kW)			
Starting efficiency η_s			
Starting torque on lifting screw at max load	77	199	810
Running efficiency η_d	0.28	0.28	0.27
Weight without spindle or protection tube HN/HNL (kg)	7/8	14/16.5	22/25
Weight of lifting screw 100 mm (kg)	0.45	0.82	1.6
Normal axial backlash (mm)	0.1 - 0.30	0.1 - 0.35	0.1 - 0.40

2. By compression load, check stroke length for bending according to Euler I, II, III. In this case stroke 500 mm and Euler II.

For screw jack with load of 50kN the bending has no effect until free spindle length is below 900 mm.

Type 50	Free spindle length (mm)	100	200	300	400	500	600	700	800	900	1000
	Max capacity (kN)	50	50	50	50	50	50	50	50	44	33

3. Selection of one screw jack.
Calculate the running power (P_d) and starting power (P_s).
These are stated in tables or can be calculated as follows:
$P_d = (F \times v)/(\eta_d \times 6 \times 10^7) = (30 \times 10^3 \times 415)/(0.28 \times 6 \times 10^7) = 0.74$ kW
$P_s = (F \times v)/(\eta_s \times 6 \times 10^7) = (30 \times 10^3 \times 415)/(0.14 \times 6 \times 10^7) = 1.48$ kW
Acc. to Power Rating tables: P_d = 0.73 kW which is close to the calculated value.

4. Calculate intermittence factor in percent.
15 min/hour = 15/60 = 25%

5. If intermittence factor is > 20% check that the thermal power P_{ED} is not exceeded. Thermal power $P_{ED} > P_d$.
It can be read in table “Intermittence factor (ED)” or can be calulated as follows: According to table: ED = 0.8 -> $P_{ED} = 0.8 \times 0.9 = 0.72$ kW, or
$P_{ED} = 20\%/ED\% \times P_{max} = 20/25 \times 0.9 = 0.72$ kW
-> P_{ED} (0.72 kW) < P_{max} (0.74 kW)
-> Select HQ 150 then do a new calculation.

6. For HQ 150 running and starting power are: $P_d = (F \times v)/(\eta_d \times 6 \times 10^7) = (30 \times 10^3 \times 415)/(0.27 \times 6 \times 10^7) = 0.77$ kW
$P_s = (F \times v)/(\eta_s \times 6 \times 10^7) = (30 \times 10^3 \times 415)/(0.14 \times 6 \times 10^7) = 1.48$ kW

7. Check allowable side force Fr at the spindle acc. to diagram at the bottom.
HQ 150: Fa = 30 kN and stroke 500 mm -> Max side force Fr = ~2 kN.

8. Selection of motor:
Check that nominal motor power, P_{Mnom} > running power P_d (= 0.77 kW)
Check that starting motor power, P_{Mst} > starting power P_s (= 1.48 kW)

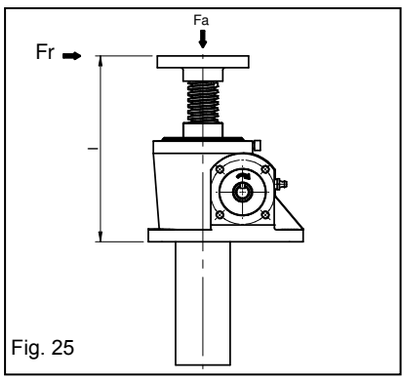


Fig. 25

To determine the starting power of motor, following formula is used in most cases:
$P_{Mst} = P_{Mnom} \times (Mst/M)$
Mst = Starting torque motor
M = nominal torque motor
Mst/M = factor stated in motor catalogue.
For three phase motor the factor Mst/M is normally 1.8 - 2.5.
Calculate the required input speed:
n = (v x i)/s = (415 x 7)/9 = 323 rpm
v = lifting speed (mm/min)
i = ratio of worm gear
s = pitch of lifting screw. For HQ 150 TR 55x9.

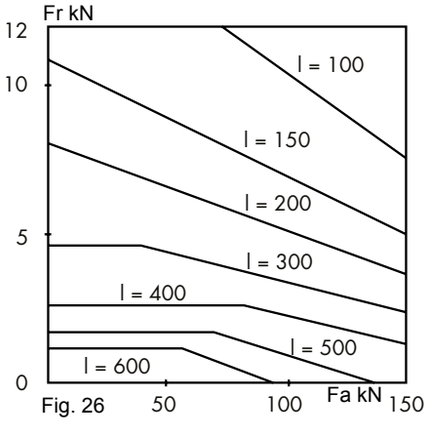


Fig. 26

Guide to select multiple screw jack arrangements

Screw jack arrangements

1. Running power consummation for each screw jack = 0.77 kW according to calculation above.
Starting power consummation for each screw jack = 1.48 kW according to calculation above.

2. Add the power- and starting consummation for each screw jack to get the total power- and starting consummation power P_x and P_{xst}.
For arrangement with 4 screw jacks:
$P_x = 4 \times 0.77 = 3.08$ kW
$P_{xst} = 4 \times 1.48 = 5.92$ kW

3. Take consideration to the efficiency to the connection shaft system and other components such as Worm Gear, Bevel Gears, Helical Gears, Couplings, Bearings etc.
If this is not possible, use the following arrangement efficiency:

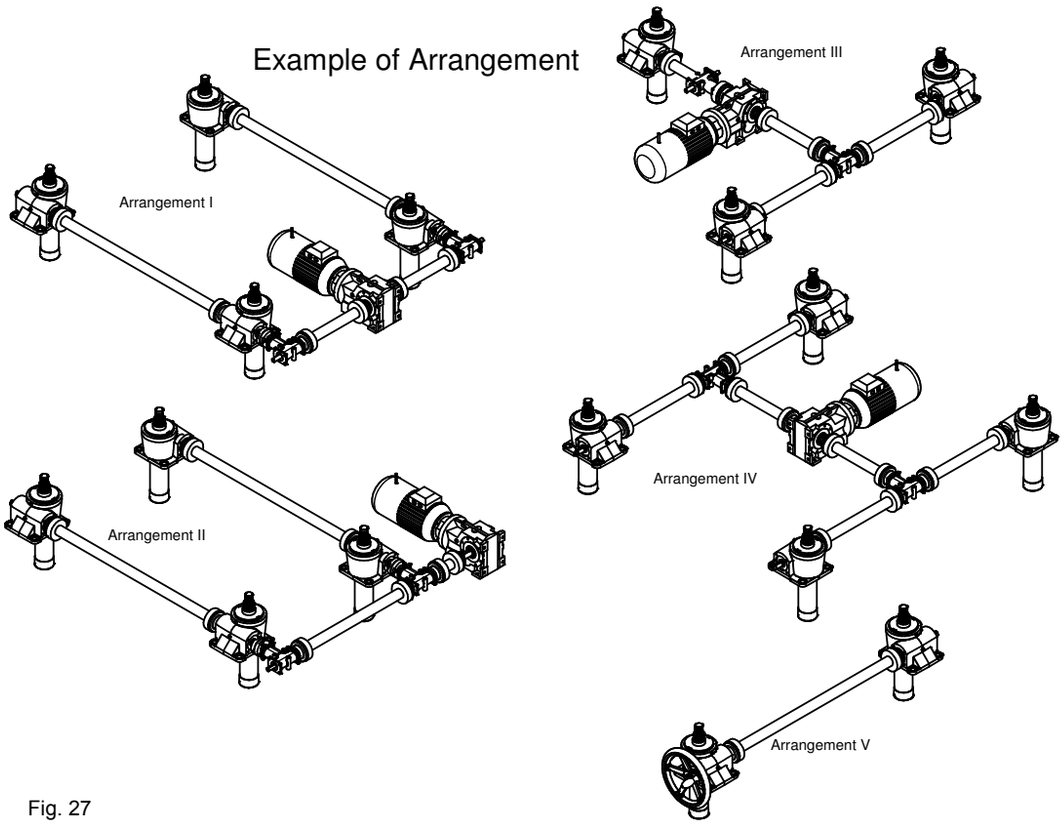


Fig. 27

Number of screw jacks	η_{arr}
2	0.95
3	0.90
4	0.85
6-8	0.80

$P_{arr} = P_x/\eta_{arr}$
$P_{arrst} = P_{xst}/\eta_{arr}$

P_{arr} = Total running power of consumption of the arrangement
P_x = The sum of the running power consumption for each single jack
P_{arrst} = Total starting power of consumption of the arrangement
P_{xst} = The sum of the starting power consumption for each single jack
η_{arr} = The efficiency of the arrangement acc. to table above

For 4 screw jacks total running- and starting power for the arrangement is
$P_{arr} = P_x/\eta_{arr} = 3.08/0.85 = 3.59$ kW
$P_{arrst} = P_{xst}/\eta_{arr} = 5.92/0.85 = 6.96$ kW

4. After calculation, design motor power required at same way as for each screw jack. Care should be taken to choose a larger motor with a safe working margin of excess power.
Check that total nominal motor power, $P_{Mnom\ arr}$ > running power P_{arr} (= 3.59 kW)
Check that total starting motor power, $P_{Mst\ arr}$ > starting power P_{arrst} (= 6.96 kW)

5. By high lifting speeds and high speed in connection shaft system, the mass moment of inertia must be taken into consideration.

Description of trapezoidal lifting screw

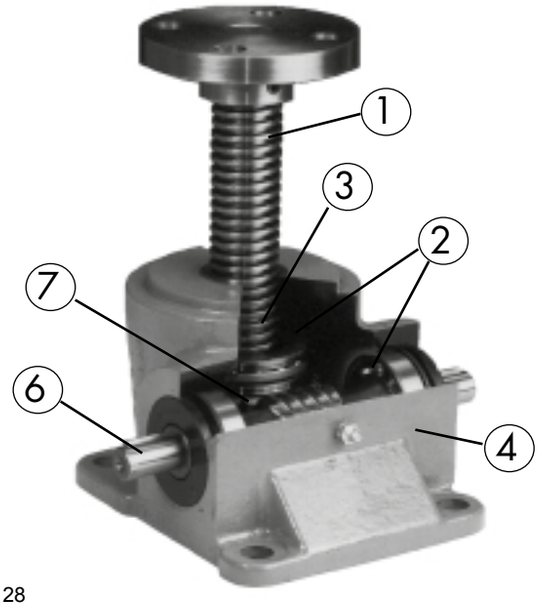


Fig. 28

1. Trapezoidal lifting screw
2. Thrust and radial bearings
3. Grease of EP-quality
4. Housing of nodular cast iron
5. Alkyd paint 85 micron thick in RAL 1234
6. Worm screw hardended and ground
7. Worm wheel of centrifugally cast tin bronze
8. Bellows in PVC, steel or other materials (without fig.)

Mechanical jacks have a allowable working temperature range from -30° C to +100° C. At full load the degree of utilization (ED) must not normally exceed 40% per 10 minutes, still not more than 20% per hour totally, in valid at ambient temperature +25° C.

For other conditions consult our Application Engineers.

Technical data, Type 8-150

Type / max capacity (kN)	**8**	**10***	**20**	**25***	**40**	**50***	**120**	**150***
Lifting screw	Tr20x8	Tr20x4	Tr30x12	Tr30x6	Tr40x14	Tr40x7	Tr55x18	Tr55x9
Ratio (HQ)	9:1	9:1	7:1	7:1	6.75:1	6.75:1	7:1	7:1
Raise per revolution (mm)	0.888	0.444	1.714	0.857	2.074	1.037	2.571	1.285
Starting torque at max load (Nm)	6	6	23	23	55	55	210	210
Max running power at 20% ED (kW)	0.25	0.2	0.7	0.55	1.1	0.9	1.9	1.5
Starting efficiency η_s	0.18	0.12	0.23	0.15	0.23	0.14	0.22	0.14
Ratio (HN)	27:1	27:1	30:1	30:1	27:1	27:1	28:1	28:1
Raise per revolution (mm)	0.296	0.148	0.400	0.200	0.518	0.259	0.642	0.321
Starting torque at max load (Nm)	4.8	5	10.1	10	32.5	32	117	115
Max running power at 20% ED (kW)	0.20	0.15	0.60	0.5	1.0	0.8	1.6	1.3
Starting efficiency η_s	0.07	0.05	0.12	0.08	0.10	0.06	0.10	0.06
Starting torque on lifting screw at max load	22	21	82	77	206	199	648	810
Running efficiency η_d	See “Power ratings trapezoidal lifting screw“							
** Holding Torque Nm	0.35	-	1.8	-	5.5	-	16	-
Weight without spindle or protection tube HN/HNL (kg)	2/2.4	2/2.4	7/8	7/8	14/16.5	14/16.5	22/25	22/25
Weight of lifting screw 100 mm (kg)	0.2	0.2	0.45	0.45	0.82	0.82	1.6	1.6
Normal axial backlash (mm)	0.1 - 0.25	0.1 - 0.25	0.1 - 0.30	0.1 - 0.30	0.1 - 0.30	0.1 - 0.30	0.1 - 0.35	0.1 - 0.35

(Antibacklash see Options)

* Prefer selection of single start spindle.
** The holding torque is the torque on the input shaft which is required to prevent the load from being lowered.

Technical data

Technical data, Type 160-1000

Typ / max capacity (kN)	160	200*	240	300*	400	500*	800	1000*
Lifting screw	Tr65x20	Tr65x10	Tr90x24	Tr90x12	Tr120x28	Tr120x14	Tr160x32	Tr160x16
Ratio (HQ)	7:1	7:1	7:1	7:1	7.5:1	7.5:1	12:1	12:1
Raise per revolution (mm)	2.857	1.428	3.428	1.714	3.733	1.866	2.667	1.333
Starting torque at max load (Nm)	320	320	640	640	1280	1280	2120	2235
Max running power at 20% ED (kW)	3.6	2.9	4.7	3.7	6.4	5.1	16.0	12.5
Starting efficiency η_s	0.22	0.14	0.20	0.12	0.19	0.11	0.16	0.09
Ratio (HN)	28:1	28:1	28:1	28:1	30:1	30:1	36:1	36:1
Raise per revolution (mm)	0.714	0.357	0.856	0.428	0.932	0.466	0.889	0.444
Starting torque at max load (Nm)	164	160	323	320	624	640	1265	1335
Max running power at 20% ED (kW)	3.2	2.6	4.1	3.3	5.6	4.5	15.0	12
Starting efficiency η_s	0.11	0.07	0.10	0.06	0.09	0.05	0.08	0.05
Starting torque on lifting screw at max load	1276	1261	2518	2548	5358	5535	13660	14425
Running efficiency η_d	See “Power ratings trapezoidal lifting screw“							
** Holding Torque Nm	24	-	44	-	80	-	115	-
Weight without spindle or protection tube HN/HNL (kg)	41/49	41/49	73/85	73/85	134/162	134/162	450	450
Weight of lifting screw 100 mm (kg)	2.2	2.2	4.4	4.4	7.9	7.9	14	14
Normal axial backlash (mm)	0.1 - 0.40	0.1 - 0.40	0.1 - 0.40	0.1 - 0.40	0.1 - 0.40	0.1 - 0.40	0.1 - 0.45	0.1 - 0.45

* Prefer selection of single start spindle.
** The holding torque is the torque on the input shaft which is required to prevent the load from being lowered.

Technical data, static load

Maximum allowed static load (kN) (at tension loads in lifting screw)

Type	8/10	20/25	40/50	120/150	160/200	240/300	400/500	800/1000
Dynamic Capacity	10	25	50	150	200	300	500	1000
HN/HQ, static	19.5	52.5	117.5	180	255	474	900	1320
HNL/HQL, static	17.5	41	88	180	240	300	500	1000

Above values can be allowed when the load is still. Under movement or when vibrations can occur are the dynamic values valid. At all cases with compression load must not the values in the “compression load table trapezoidal lifting screw“ be exceeded.

Compression load table trapezoidal lifting screw Euler I

Max capacity, compression load (kN) for different lengths of stroke at three-fold safety factor against breaking (Euler I)

Free load

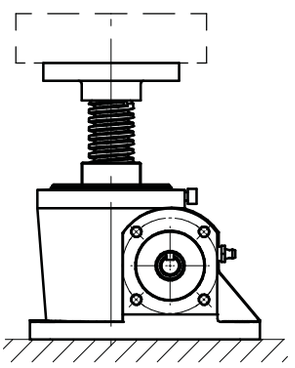


Fig. 29

Max capacity (kN)		8/10	20/25	40/50	120/150	160/200	240/300	400/500	800/1000
Free spindle length (m)	0.2								
	0.3	5.4							
	0.4	(3.1)	15						
	0.5		9.5	36	139				
	0.6		(6.6)	25	96				
	0.7		(4.8)	18	71	147			
	0.8			14	54	112			
	0.9			(11)	43	89			
	1.0			(8.9)	35	72	298		
	1.25				(22)	46	190		
	1.5					(32)	132	440	
	1.75						97	323	
	2.0						(74)	248	860
	2.25						(59)	196	680
	2.5							158	551
	2.75							(131)	455
	3.0							(110)	382
	3.25							(94)	326
	3.5								281
	3.75								(245)
	4.0								(215)
	4.25								(191)
	4.5								
	4.75								
	5.0								
	5.5								
	6.0								
	6.5								
	7.0								
	7.5								
	8.0								

The values given in brackets must only be used at low lifting speed and concentric load on the lifting screws.

Compression load table trapezoidal lifting screw Euler II

Max capacity, compression load (kN) for different lengths of stroke at three-fold safety factor against breaking (Euler II)

Guided load

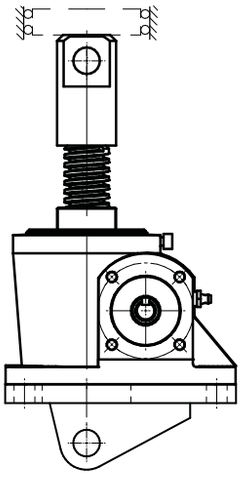


Fig. 30

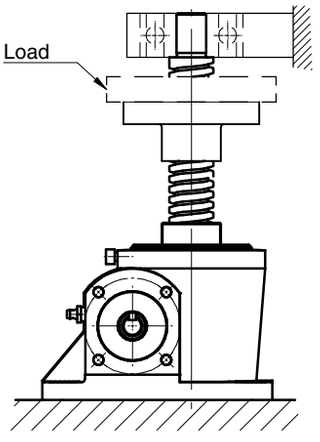
Max capacity (kN)		8/10	20/25	40/50	120/150	160/200	240/300	400/500	800/1000
Free spindle length (m)	0.2								
	0.3								
	0.4								
	0.5	7.8							
	0.6	5.4							
	0.7	4.0	19						
	0.8	(3.1)	15						
	0.9	(2.4)	12	44					
	1.0		9.5	36	139				
	1.25		(6.1)	23	89	184			
	1.5			16	62	128			
	1.75			(12)	45	94			
	2.0				35	72	298		
	2.25				27	57	235		
	2.5				(22)	46	190		
	2.75				(18)	(38)	157		
	3.0					(32)	132	440	
	3.25					(27)	113	375	
	3.5						97	323	
	3.75						85	282	979
	4.0						(74)	248	860
	4.25						(66)	219	762
	4.5						(59)	196	680
	4.75							176	610
	5.0							158	551
	5.5							(131)	455
	6.0							(110)	382
	6.5							(94)	326
	7.0								281
	7.5								(245)
	8.0								(215)

The values given in brackets must only be used at low lifting speed and concentric load on the lifting screws.

Compression load table trapezoidal lifting screw Euler III

Max capacity, compression load (kN) for different lengths of stroke at three-fold safety factor against breaking (Euler III)

Supported spindle



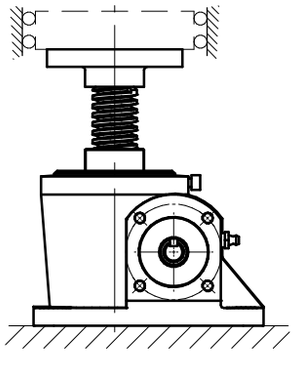


Fig. 31

Max capacity (kN)		8/10	20/25	40/50	120/150	160/200	240/300	400/500	800/1000
Free spindle length (m)	0.2								
	0.3								
	0.4								
	0.5								
	0.6								
	0.7	8.0							
	0.8	6.1							
	0.9	4.8	23						
	1.0	3.9	19						
	1.25	(2.5)	12	45					
	1.5		8.4	32	123				
	1.75		(6.2)	23	91	188			
	2.0		(4.7)	18	69	144			
	2.25			14	55	114			
	2.5			(11)	44	92			
	2.75			(9.4)	37	76			
	3.0				31	64	265		
	3.25				(26)	55	225		
	3.5				(23)	47	194		
	3.75				(20)	(41)	169		
	4.0				(17)	(36)	149	495	
	4.25					(32)	132	439	
	4.5					(28)	118	391	
	4.75					(25)	105	351	
	5.0						95	317	
	5.5						79	262	910
	6.0						(66)	220	765
	6.5						(56)	188	652
	7.0							162	562
	7.5							(141)	490
	8.0							(124)	430

The values given in brackets must only be used at low lifting speed and concentric load on the lifting screws.

Power ratings trapezoidal lifting screw

Power ratings for screw jacks with single & double start spindle at 40 % ED/10 min or max 20 % ED/ hour at ambient temperatur +25° C.

n = input speed (rpm)
v = lifting speed (mm/min)
η_d = running efficiency
Q = quick (low ratio)
N = slow (high ratio)
T = input torque (Nm)
P = input power (kW)
i = ratio of worm gear set

Note: Power ratings indicate running power. Additional power will be required on start. See “Selection of jacks“.

Mechanical and Thermal capacities:

A) Mechanical capacity = all stated values non blank areas in tables.

B) Mechanical capacity with stainles worm screw = Grey areas in tables.

C) Thermal capacity
The figures above the line in italic style can only be used at ED lower than 20%. Thermal power must be checked. See “Intermittence factor (ED) trapezoidal lifting screw“.

Type 8kN Q (i = 9) N (i = 27) TR 20x8 (Double start)

n	v		η_d		8 kN				6 kN				4 kN				2 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
2900	2578	859	.41	.26			***1.4***	***.43***	***2.0***	***.61***	***1.1***	***.34***	***1.4***	***.43***	***.82***	***.25***	.83	.25	.53	.16
1750	1556	519	.40	.24	2.8	.51	***1.5***	***.28***	***2.2***	***.39***	***1.2***	***.22***	***1.5***	***.28***	.87	.16	.88	.16	.56	.10
1500	1333	444	.39	.23	2.8	.45	***1.6***	***.25***	***2.2***	***.35***	1.3	.20	1.5	.24	.92	.14	.88	.14	.58	.09
1000	889	296	.37	.22	3.0	.31	1.7	.18	2.3	.24	1.3	.14	1.6	.17	.97	.10	.93	.10	.61	.06
750	667	222	.36	.21	3.1	.25	1.8	.14	2.4	.19	1.4	.11	1.7	.13	1.0	0.8	.96	.08	.63	.05
500	444	148	.34	.19	3.3	.17	1.9	.10	2.5	.13	1.5	.08	1.8	.09	1.1	0.6	1.0	.05	.66	.05
400	356	119	.33	.18	3.4	.14	2.0	.08	2.6	.11	1.6	.06	1.8	.08	1.1	.05	1.0	.05	.68	.05
300	267	89	.31	.17	3.6	.11			2.8	.08	1.6	.05	1.9	.06	1.2	.05	1.1	.05	.71	.05
200	178	59	.30	.16	3.8	.08			2.9	.06	1.8	.05	2.0	.05	1.3	.05	1.1	.05	.76	.05
100	89	30	.27	.14					3.1	.05	2.0	.05	2.2	.05	1.4	.05	1.2	.05	.83	.05
50	44	15	.25	.12					3.4	.05	2.3	.05	2.3	.05	1.6	.05	1.3	.05	.93	.05

n	v		η_d		1 kN			
rpm	mm/min				T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW
2900	2578	859	.41	.26	.53	.16	.39	.12
1750	1556	519	.40	.24	.56	.10	.40	.07
1500	1333	444	.39	.23	.56	.09	.41	.06
1000	889	296	.37	.22	.59	.06	.42	.05
750	667	222	.36	.21	.60	.05	.44	.05
500	444	148	.34	.19	.62	.05	.45	.05
400	356	119	.33	.18	.64	.05	.46	.05
300	267	89	.31	.17	.66	.05	.47	.05
200	178	59	.30	.16	.69	.05	.50	.05
100	89	30	.27	.14	.72	.05	.54	.05
50	44	15	.25	.12	.76	.05	.59	.05

Power ratings trapezoidal lifting screw

Type 10kN Q (i = 9) N (i = 27) TR 20x4 (Single start)

n rpm	v mm/min Q	v mm/min N	η_d Q	η_d N	10 kN T Q P Nm	10 kN T Q P kW	10 kN T N P Nm	10 kN T N P kW	8 kN T Q P Nm	8 kN T Q P kW	8 kN T N P Nm	8 kN T N P kW	6 kN T Q P Nm	6 kN T Q P kW	6 kN T N P Nm	6 kN T N P kW	4 kN T Q P Nm	4 kN T Q P kW	4 kN T N P Nm	4 kN T N P kW
2900	*1289*	*430*	*.31*	*.18*	*2.2*	*.68*	*1.3*	*.38*	*1.8*	*.56*	*1.1*	*.32*	*1.4*	*.44*	*.88*	*.26*	*1.0*	*.32*	*.66*	*.20*
1750	*778*	*259*	*.29*	*.16*	*2.4*	*.44*	*1.4*	*.25*	*2.0*	*.36*	*1.2*	*.21*	*1.5*	*.28*	*.94*	*.17*	1.1	.20	.70	.13
1500	*667*	*222*	*.28*	*.16*	*2.5*	*.39*	*1.4*	*.22*	*2.0*	*.32*	*1.2*	*.18*	*1.6*	*.25*	.94	.15	1.1	.18	.70	.11
1000	*444*	*148*	*.26*	*.15*	*2.7*	*.28*	*1.5*	*.16*	*2.2*	*.23*	1.2	.13	1.7	.18	1.0	.11	1.2	.13	.74	.08
750	*333*	*111*	*.25*	*.14*	*2.8*	*.22*	1.6	.13	2.3	.18	1.3	.11	1.8	.14	1.1	.09	1.3	.10	.78	.06
500	222	74	.23	.13	3.0	.16	1.8	.09	2.4	.13	1.5	.07	1.9	.10	1.2	.06	1.3	.07	.86	.05
400	178	59	.22	.12	3.1	.13	1.9	.08	2.5	.11	1.6	.07	2.0	.08	1.2	.05	1.4	.06	.90	.05
300	133	44	.21	.11	3.2	.10	2.0	.06	2.6	.08	1.6	.05	2.0	.06	1.3	.05	1.4	.05	.94	.05
200	89	30	.20	.10	3.4	.07	2.2	.05	2.8	.06	1.8	.05	2.1	.05	1.4	.05	1.5	.05	1.0	.05
100	44	15	.18	.09	3.8	.05			3.1	.05	2.0	.05	2.4	.05	1.6	.05	1.7	.05	1.1	.05
50	22	7	.17	.08					3.3	.05	2.3	.05	2.6	.05	1.8	.05	1.8	.05	1.3	.05

n rpm	v mm/min Q	v mm/min N	η_d Q	η_d N	2 kN T Q P Nm	2 kN T Q P kW	2 kN T N P Nm	2 kN T N P kW	1 kN T Q P Nm	1 kN T Q P kW	1 kN T N P Nm	1 kN T N P kW
2900	1289	430	.31	.18	.63	.19	.45	.13	.44	.13	.35	.10
1750	778	259	.29	.16	.67	.12	.47	.09	.46	.08	.36	.06
1500	667	222	.28	.16	.69	.11	.47	.07	.47	.07	.36	.06
1000	444	148	.26	.15	.73	.08	.49	.05	.49	.05	.37	.05
750	333	111	.25	.14	.75	.06	.51	.05	.50	.05	.38	.05
500	222	74	.23	.15	.79	.05	.55	.05	.52	.05	.40	.05
400	178	59	.22	.12	.81	.05	.57	.05	.55	.05	.41	.05
300	133	44	.21	.11	.85	.05	.59	.05	.54	.05	.42	.05
200	89	30	.20	.10	.87	.05	.63	.05	.56	.05	.44	.05
100	44	15	.18	.09	.95	.05	.69	.05	.60	.05	.47	.05
50	22	7	.17	.08	1.0	.05	.75	.05	.63	.05	.50	.05

Type 20kN Q (i = 7) N (i = 30) TR 30x12 (Double start)

n rpm	v mm/min Q	v mm/min N	η_d Q	η_d N	20 kN T Q P Nm	20 kN T Q P kW	20 kN T N P Nm	20 kN T N P kW	15 kN T Q P Nm	15 kN T Q P kW	15 kN T N P Nm	15 kN T N P kW	10 kN T Q P Nm	10 kN T Q P kW	10 kN T N P Nm	10 kN T N P kW	7.5 kN T Q P Nm	7.5 kN T Q P kW	7.5 kN T N P Nm	7.5 kN T N P kW
2600	4457	1040	.51	.34	***11***	***2.9***	***3.7***	***1.0***	***8.1***	***2.2***	***2.9***	***.77***	***5.5***	***1.5***	2.0	.55	***4.2***	***1.1***	1.6	.43
1750	3000	700	.48	.32	***11***	***2.0***	***3.9***	***.72***	***8.4***	***1.5***	3.0	.56	***5.7***	***1.0***	2.1	.39	***4.4***	***.79***	1.7	.31
1500	2571	600	.48	.31	***11***	***1.8***	***4.0***	***.63***	***8.6***	***1.4***	3.1	.49	***5.9***	***.93***	2.2	.34	***4.5***	***.71***	1.7	.27
1000	1714	400	.45	.29	***12***	***1.3***	4.3	.45	***9.0***	***.98***	3.3	.35	6.1	.67	2.3	.24	4.7	.51	1.8	.19
750	1286	300	.44	.28	***12***	***.97***	4.5	.35	***9.4***	***.73***	3.5	.27	6.4	.50	2.4	.19	4.9	.38	1.9	.15
500	857	200	.41	.26	13	.68	4.8	.25	9.9	.51	3.7	.19	6.7	.35	2.6	.13	5.1	.27	2.0	.11
400	686	160	.40	.25	14	.56	5.0	.21	10	.42	3.8	.16	6.9	.29	2.7	.11	5.3	.22	2.1	.09
300	514	120	.38	.24	14	.44	5.2	.16	11	.33	4.0	.12	7.2	.23	2.8	.09	5.5	.17	2.2	.07
200	343	80	.36	.22	15	.31	5.6	.12	11	.23	4.3	.09	7.6	.16	3.0	.06	5.8	.12	2.3	.05
100	171	40	.33	.20	16	.17	6.3	.07	12	.13	4.8	.05	8.2	.09	3.3	.05	6.3	.07	2.6	.05
50	86	20	.31	.18	17	.09	6.9	.05	13	.07	5.3	.05	8.9	.05	3.6	.05	6.7	.05	2.8	.05

n rpm	v mm/min Q	v mm/min N	η_d Q	η_d N	5 kN T Q P Nm	5 kN T Q P kW	5 kN T N P Nm	5 kN T N P kW	2.5 kN T Q P Nm	2.5 kN T Q P kW	2.5 kN T N P Nm	2.5 kN T N P kW
2600	4457	1040	.51	.34	2.9	.80	1.2	.32	1.6	.44	.76	.21
1750	3000	700	.48	.32	3.0	.55	1.2	.23	1.7	.31	.79	.15
1500	2571	600	.48	.31	3.1	.49	1.3	.20	1.7	.27	.80	.13
1000	1714	400	.45	.29	3.2	.35	1.3	.14	1.8	.19	.84	.09
750	1286	300	.44	.28	3.4	.26	1.4	.11	1.9	.14	.86	.07
500	857	200	.41	.26	3.5	.18	1.5	.08	1.9	.10	.90	.05
400	686	160	.40	.25	3.6	.15	1.5	.06	2.0	.08	.93	.05
300	514	120	.38	.24	3.8	.12	1.6	.05	2.1	.06	.95	.05
200	343	80	.36	.22	4.0	.08	1.7	.05	2.2	.05	1.0	.05
100	171	40	.33	.20	4.3	.05	1.8	.05	2.3	.05	1.1	.05
50	86	20	.31	.18	4.6	.05	2.0	.05	2.5	.05	1.2	.05

Power ratings trapezoidal lifting screw

Type 25kN Q (i = 7) N (i = 30) TR 30x6 (Single start)

n	v		η_d		25 kN				20 kN				15 kN				10 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
2600	2229		.38		*8.9*	*2.4*			*7.2*	*1.9*			*5.5*	*1.5*			*3.8*	*1.0*		
1750	1500	350	.36	.22	*9.4*	*1.7*	*3.5*	*.64*	*7.6*	*1.4*	***2.9***	***.52***	*5.8*	*1.0*	2.2	.41	*4.0*	*.72*	1.6	.29
1500	1286	300	.35	.22	*9.6*	*1.5*	***3.6***	***.56***	*7.7*	*1.2*	2.9	.46	*5.9*	*.92*	2.3	.36	***4.0***	***.63***	1.6	.26
1000	857	200	.33	.20	*10*	*1.1*	3.9	.40	*8.3*	*.89*	3.2	.33	***6.3***	***.67***	2.5	.25	4.3	.46	1.8	.18
750	643	150	.31	.19	*11*	*.84*	4.1	.32	***8.7***	***6.8***	3.3	.26	6.6	.51	2.6	.20	4.5	.35	1.8	.14
500	429	100	.29	.18	***12***	***.60***	4.4	.23	9.3	.48	3.6	.19	7.0	.37	2.8	.15	4.8	.25	2.0	0.1
400	343	80	.28	.17	12	.50	4.6	.19	9.6	.40	3.7	.15	7.3	.31	2.9	.12	5.0	.21	2.0	.08
300	257	60	.27	.16	13	.39	4.8	.15	10	.31	3.9	.12	7.6	.24	3.0	.09	5.2	.16	2.1	.07
200	171	40	.25	.15	13	.28	5.2	.11	11	.23	4.2	.09	8.1	.17	3.3	.07	5.5	.12	2.3	.05
100	86	20	.23	.13	15	.15	5.8	.06	12	.12	4.7	.05	9.0	.09	3.6	.05	6.1	.06	2.5	.05
50	43	10	.21	.12	16	.08	6.5	.05	12	.06	5.3	.05	9.8	.05	4.0	.05	6.6	.05	2.8	.05

n	v		η_d		7.5 kN				5 kN				2.5 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
2600	2229		.38	.24	***2.9***	***.79***			2.1	.55			1.2	.32		
1750	1500	350	.36	.22	3.1	.55	1.3	.24	2.2	.39	.98	.18	1.2	.23	.66	.12
1500	1286	300	.35	.22	3.1	.49	1.3	.21	2.2	.34	1.0	.16	1.3	.20	.67	.10
1000	857	200	.33	.20	3.3	.36	1.4	.15	2.3	.25	1.1	.11	1.3	.14	.70	.07
750	643	150	.31	.19	3.5	.27	1.5	.11	2.4	.19	1.1	.09	1.4	.11	.72	.06
500	429	100	.29	.18	3.7	.19	1.6	.08	2.6	.13	1.2	.06	1.5	.08	.75	.05
400	343	80	.28	.17	3.8	.16	1.6	.07	2.7	.11	1.2	.05	1.5	.06	.77	.05
300	257	60	.27	.16	4.0	.12	1.7	.05	2.8	.09	1.2	.05	1.6	.05	.79	.05
200	171	40	25	.15	4.2	.09	1.8	.05	2.9	.06	1.3	.05	1.6	.05	.83	.05
100	86	20	.23	.13	4.7	.05	2.0	.05	3.2	.05	1.4	.05	1.8	.05	.89	.05
50	43	10	.21	.12	5.1	.05	2.2	.05	3.5	.05	1.6	.05	1.9	.05	.96	.05

Type 40kN Q (i = 6.75) N (i = 27) TR 40x14 (Double start)

n	v		η_d		40 kN				30 kN				25 kN				20 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
2000	4148	1037	.50	.33	**26**	**5.5**	**9.8**	**2.1**	**20**	**4.2**	**7.5**	**1.6**	**17**	**3.5**	**6.3**	**1.4**	**13**	**2.8**	**5.2**	**1.1**
1750	3630	907	.49	.32	**27**	**4.9**	**10**	**1.8**	**20**	**3.7**	**7.7**	**1.4**	**17**	**3.1**	**6.5**	**1.2**	**14**	**2.5**	5.3	.95
1500	3111	778	.48	.31	**27**	**4.2**	**10**	**1.6**	**20**	**3.2**	**7.9**	**1.2**	**17**	**2.7**	6.6	1.0	**14**	**2.1**	5.4	.84
1000	2074	519	.46	.29	**28**	**3.0**	**11**	**1.2**	**21**	**2.3**	8.5	.91	**18**	**1.9**	7.1	.77	**14**	**1.5**	5.8	.63
750	1556	389	.44	.28	**29**	**2.3**	12	.92	**22**	**1.7**	8.9	.70	**19**	**1.5**	7.5	.59	**15**	**1.2**	6.1	.48
500	1037	259	.42	.26	**31**	**1.6**	13	.66	**23**	**1.2**	9.6	.50	20	1.0	8.1	.42	16	.81	6.6	.34
400	830	207	.41	.25	**32**	**1.3**	13	.55	24	.98	10	.42	20	.82	8.4	.35	16	.66	6.8	.29
300	622	156	.39	.23	33	1.0	14	.44	25	.75	11	.33	21	.63	8.9	.28	17	.51	7.2	.23
200	415	104	.37	.21	35	.74	15	.31	26	.56	11	.24	22	.47	9.6	.20	18	.38	7.8	.16
100	207	52	.34	.19	38	.40	17	.18	29	.30	13	.14	24	.25	11	.11	19	.20	8.8	.09
50	104	26	.31	.17	42	.22	19	.10	31	.17	15	.08	26	.14	12	.06	21	.11	10	.05

n	v		η_d		15 kN				10 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW
2000	4148	1037	.50	.33	**10**	**2.1**	4.0	.86	**6.9**	**1.5**	2.8	.61
1750	3630	907	.49	.32	**10**	**1.9**	4.1	.73	**7.0**	**1.3**	2.9	.52
1500	3111	778	.48	.31	**10**	**1.6**	4.2	.65	7.1	1.1	3.0	.46
1000	2074	519	.46	.29	**11**	**1.2**	4.5	.48	7.5	.79	3.2	.34
750	1556	389	.44	.28	11	.89	4.7	.37	7.7	.61	3.3	.26
500	1037	259	.42	.26	12	.62	5.0	.26	8.1	.42	3.5	.19
400	830	207	.41	.25	12	.50	5.2	.22	8.4	.34	3.7	.15
300	622	156	.39	.23	13	.39	5.5	.18	8.7	.26	3.9	.12
200	415	104	.37	.21	13	.28	5.9	.12	9.2	.19	4.1	.09
100	207	52	.34	.19	15	.15	6.7	.07	10	.10	4.7	.05
50	104	26	.31	.17	16	.08	7.6	.05	11	.06	5.2	.05

Power ratings trapezoidal lifting screw

Type 50kN Q (i = 6.75) N (i = 27) TR 40x7 (Single start)

n rpm	v mm/min Q	v mm/min N	ηd Q	ηd N	50 kN T Q P Nm	50 kN T Q P kW	50 kN T N P Nm	50 kN T N P kW	40 kN T Q P Nm	40 kN T Q P kW	40 kN T N P Nm	40 kN T N P kW	30 kN T Q P Nm	30 kN T Q P kW	30 kN T N P Nm	30 kN T N P kW	25 kN T Q P Nm	25 kN T Q P kW	25 kN T N P Nm	25 kN T N P kW
2000	2074		.36	.21									***14***	***2.8***			**11**	**2.4**		
1750	1815	454	.35	.22			***9.0***	***1.7***			***7.3***	***1.4***	***14***	***2.5***	***5.6***	***1.1***	**12**	**2.1**	***4.8***	***.90***
1500	1556	389	.35	.22			***9.3***	***1.5***			***7.5***	***1.2***	***14***	***2.2***	***5.8***	***.93***	**12**	**1.8**	4.9	.79
1000	1037	259	.33	.20			***10***	***1.1***	***20***	***2.1***	***8.2***	***.89***	***15***	***1.6***	6.3	.68	**13**	**1.3**	5.3	.58
750	778	194	.31	.19			***11***	***.84***	***21***	***1.6***	8.7	.68	***16***	***1.2***	6.6	.53	**13**	**1.0**	5.6	.44
500	519	130	.29	.17	***28***	***1.5***	12	.61	***22***	***1.2***	9.5	.49	***17***	***.91***	7.2	.38	14	.76	6.1	.32
400	415	104	.28	.16	***29***	***1.2***	12	.51	***23***	***.96***	9.9	.41	17	.73	7.5	.31	15	.61	6.4	.27
300	311	78	.27	.15	***30***	***.95***	13	.41	24	.76	11	.33	18	.58	8.0	.25	15	.48	6.8	.21
200	207	52	.25	.14	32	.67	14	.30	26	.54	11	.24	19	.41	8.7	.18	16	.34	7.4	.16
100	104	26	.23	.12	36	.37	16	.17	29	.30	13	.14	22	.22	10	.10	18	.19	8.4	.09
50	52	13	.21	.11	39	.21	19	.10	31	.17	15	.08	24	.13	11	.06	20	.11	9.5	.05

n rpm	v mm/min Q	v mm/min N	ηd Q	ηd N	20 kN T Q P Nm	20 kN T Q P kW	20 kN T N P Nm	20 kN T N P kW	15 kN T Q P Nm	15 kN T Q P kW	15 kN T N P Nm	15 kN T N P kW	10 kN T Q P Nm	10 kN T Q P kW	10 kN T N P Nm	10 kN T N P kW
2000	2074		.36	.21	***9.2***	***1.9***			***7.0***	***1.5***			***4.8***	***1.0***		
1750	1815	454	.35	.22	***9.4***	***1.7***	3.9	.74	***7.2***	***1.3***	3.1	.58	4.9	.90	2.2	.42
1500	1556	389	.35	.22	***9.6***	***1.5***	4.0	.65	***7.3***	***1.1***	3.2	.51	5.0	.79	2.3	.36
1000	1037	259	.33	.20	***10***	***1.1***	4.3	.47	7.7	.82	3.4	.37	5.3	.57	2.4	.26
750	778	194	.31	.19	11	.82	4.6	.36	8.1	.63	3.6	.28	5.6	.43	2.6	.20
500	519	130	.29	.17	11	.62	5.0	.26	8.6	.47	3.9	.20	5.9	.32	2.8	.14
400	415	104	.28	.16	12	.49	5.2	.22	9.0	.38	4.0	.17	6.2	.26	2.9	.12
300	311	78	.27	.15	12	.39	5.5	.17	9.4	.30	4.3	.13	6.4	.20	3.0	.09
200	207	52	.25	.14	13	.27	6.0	.13	10	.21	4.6	.10	6.8	.14	3.3	.07
100	104	26	.23	.12	15	.15	6.8	.07	11	.11	5.3	.05	7.6	.08	3.7	.05
50	52	13	.21	.11	16	.09	7.7	.05	12	.06	5.9	.05	8.3	.05	4.1	.05

Type 120kN Q (i = 7) N (i = 28) TR 55x18 (Double start)

n rpm	v mm/min Q	v mm/min N	ηd Q	ηd N	120 kN T Q P Nm	120 kN T Q P kW	120 kN T N P Nm	120 kN T N P kW	100 kN T Q P Nm	100 kN T Q P kW	100 kN T N P Nm	100 kN T N P kW	75 kN T Q P Nm	75 kN T Q P kW	75 kN T N P Nm	75 kN T N P kW	50 kN T Q P Nm	50 kN T Q P kW	50 kN T N P Nm	50 kN T N P kW
1750	4500	1125	.50	.33													***41***	***7.5***	***15***	***2.8***
1500	3857	964	.49	.33													***41***	***6.5***	***16***	***2.4***
1000	2571	643	.47	.30													***43***	***4.6***	***17***	***1.7***
750	1929	482	.45	.29									***67***	***5.3***			***45***	***3.5***	18	1.4
500	1286	321	.43	.27									***71***	***3.7***	28	1.5	***48***	***2.5***	19	1.0
300	771	193	.40	.24									***76***	***2.4***	31	.98	51	1.6	21	.66
250	643	161	.39	.23					***104***	***2.7***			***78***	***2.0***	32	.84	52	1.4	22	.57
200	514	129	.38	.22					***108***	***2.3***			81	1.7	34	.70	54	1.2	23	.47
150	386	96	.36	.21					112	1.8			84	1.4	36	.56	56	.90	24	.38
125	321	80	.35	.20					115	1.5	49	.64	86	1.1	37	.48	58	.75	25	.32
100	257	64	.34	.20	142	1.5			118	1.3	51	.53	89	.94	38	.40	59	.63	26	.27
50	129	32	.31	.17	154	.81	69	.36	129	.68	58	.30	97	.51	43	.23	65	.34	29	.15

n rpm	v mm/min Q	v mm/min N	ηd Q	ηd N	25 kN T Q P Nm	25 kN T Q P kW	25 kN T N P Nm	25 kN T N P kW	20 kN T Q P Nm	20 kN T Q P kW	20 kN T N P Nm	20 kN T N P kW	10 kN T Q P Nm	10 kN T Q P kW	10 kN T N P Nm	10 kN T N P kW
1750	4500	1125	.50	.33	***21***	***3.8***	7.9	1.5	***17***	***3.1***	6.4	1.2	8.6	1.6	3.5	.65
1500	3857	964	.49	.33	***21***	***3.3***	8.1	1.2	***17***	***2.7***	6.6	1.0	8.8	1.4	3.6	.56
1000	2571	643	.47	.30	***22***	***2.3***	8.6	.88	18	1.9	7.0	.72	9.2	.97	3.8	.39
750	1929	482	.45	.29	23	1.8	9.1	.72	18	1.4	7.4	.59	9.5	.75	4.0	.32
500	1286	321	.43	.27	24	1.3	9.8	.52	19	1.0	7.9	.42	10	.52	4.3	.23
300	771	193	.40	.24	26	.81	11	.34	21	.65	8.7	.28	11	.34	4.7	.15
250	643	161	.39	.23	27	.69	11	.29	21	.55	9.0	.24	11	.28	4.8	.13
200	514	129	.38	.22	27	.58	12	.24	22	.47	9.4	.20	11	.24	5.0	.10
150	386	96	.36	.21	28	.46	12	.19	23	.37	9.9	.16	12	.19	5.3	.08
125	321	80	.35	.20	29	.38	13	.17	23	.31	10	.13	12	.16	5.4	.07
100	257	64	.34	.20	30	.32	13	.14	24	.26	11	.11	12	.13	5.7	.06
50	129	32	.31	.17	33	.17	15	.08	26	.14	12	.06	13	.07	6.3	.05

Power ratings trapezoidal lifting screw

Type 150kN Q (i = 7) N (i = 28) TR 55x9 (Single start)

n	v				150 kN				125 kN				100 kN				75 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1750	2250	563	.36	.23															***16***	***3.0***
1500	1929	482	.35	.23															***17***	***2.6***
1000	1286	321	.33	.21															***18***	***1.9***
750	964	241	.32	.19													***48***	***3.7***	***19***	***1.5***
500	643	161	.31	.18											***28***	***1.5***	***51***	***2.7***	21	1.1
300	386	96	.27	.16									***74***	***2.3***	31	.98	***56***	***1.7***	24	.74
250	321	80	.26	.15									***76***	***2.0***	32	.85	57	1.5	24	.64
200	257	64	.25	.15									***79***	***1.7***	34	.71	60	1.3	26	.54
150	193	48	.24	.14					***104***	***1.6***	45	.71	83	1.3	36	.57	62	.96	27	.43
125	161	40	.23	.13					107	1.4	47	.61	85	1.1	37	.49	64	.84	28	.37
100	129	32	.23	.13	133	1.4			111	1.2	49	.51	89	.94	39	.41	67	.70	30	.31
50	64	16	.20	.11	146	.77	67	.35	122	.64	56	.29	98	.51	45	.23	73	.39	34	.18

n	v				50 kN				25 kN				20 kN				10 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1750	2250	563	.36	.23	***28***	***5.1***	***11***	***2.0***	***14***	***2.6***	5.8	1.1	***12***	***2.1***	4.8	.88	6.1	1.1	2.7	.50
1500	1929	482	.35	.23	***29***	***4.5***	***11***	***1.8***	***15***	***2.3***	6.0	.93	***12***	***1.9***	4.9	.76	6.2	.98	2.7	.43
1000	1286	321	.33	.21	***30***	***3.2***	12	1.3	***16***	***1.6***	6.4	.68	13	1.3	5.3	.55	6.6	.69	2.9	.31
750	964	241	.32	.19	***32***	***2.5***	13	1.0	16	1.3	6.8	.53	13	1.0	5.6	.43	6.9	.54	3.1	.24
500	643	161	.31	.18	***34***	***1.8***	14	.77	17	.92	7.4	.40	14	.74	6.1	.33	7.3	.38	3.3	.17
300	386	96	.27	.16	37	1.2	16	.50	19	.59	8.3	.26	15	.48	6.7	.21	7.9	.25	3.7	.11
250	321	80	.26	.15	38	1.0	17	.43	20	.51	8.6	.22	16	.41	7.0	.18	8.2	.21	3.8	.10
200	257	64	.25	.15	40	.86	17	.36	20	.43	9.0	.19	16	.35	7.3	.15	8.5	.18	3.9	.08
150	193	48	.24	.14	42	.65	18	.29	21	.33	9.5	.15	17	.26	7.7	.12	8.8	.14	4.2	.07
125	161	40	.23	.13	43	.56	19	.25	22	.29	9.8	.13	18	.23	8.0	.10	9.1	.12	4.3	.06
100	129	32	.23	.13	45	.47	20	.21	23	.24	10	.11	18	.19	8.3	.09	9.4	.10	4.5	.05
50	64	16	.20	.11	49	.26	23	.12	25	.13	12	.06	20	.11	9.4	.05	10	.05	5.0	.05

Type 160kN Q (i = 7) N (i = 28) TR 65x20 (Double start)

n	v				160 kN				120 kN				100 kN				75 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	4286	1071	.49	.34									***91***	***14***	***33***	***5.2***	***69***	***11***	***25***	***3.9***
1000	2857	714	.47	.32					***114***	***12***	***42***	***4.4***	***96***	***10***	***35***	***3.7***	***72***	***7.5***	27	2.8
750	2143	536	.45	.30					***119***	***9.3***	***44***	***3.5***	***99***	***7.8***	37	2.9	***75***	***5.8***	28	2.2
500	1429	357	.43	.28					***125***	***6.6***	48	2.5	***105***	***5.5***	40	2.1	***79***	***4.1***	30	1.6
300	857	214	.40	.26	***179***	***5.6***	70	2.2	***135***	***4.2***	53	1.7	112	3.5	44	1.4	84	2.6	33	1.0
250	714	179	.39	.25	***184***	***4.8***	72	1.9	138	3.6	54	1.4	115	3.0	46	1.2	87	2.3	34	.90
200	571	143	.38	.24	***190***	***4.0***	75	1.6	142	3.0	57	1.2	119	2.5	48	1.0	89	1.9	36	.76
150	429	107	.36	.22	197	3.1	80	1.3	148	2.3	60	.98	124	1.9	50	.82	93	1.5	38	.62
125	357	89	.35	.22	202	2.7	82	1.1	152	2.0	62	.83	127	1.7	52	.69	95	1.3	39	.52
100	286	71	.34	.21	209	2.2	86	.90	157	1.7	65	.68	131	1.4	54	.57	98	1.0	41	.43
50	143	36	.31	.18	228	1.2	97	.51	171	.90	73	.38	143	.75	61	.32	107	.56	46	.24

n	v				50 kN				25 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	4286	1071	.49	.34	***46***	***7.1***	17	2.7	23	3.6	8.8	1.4
1000	2857	714	.47	.32	***48***	***5.1***	18	1.9	25	2.6	9.4	.99
750	2143	536	.45	.30	***50***	***3.9***	19	1.5	25	2.0	9.9	.78
500	1429	357	.43	.28	53	2.8	20	1.1	27	1.4	11	.56
300	857	214	.40	.26	57	1.8	22	.71	29	.90	12	.37
250	714	179	.39	.25	58	1.5	23	.61	29	.77	12	.32
200	571	143	.38	.24	60	1.3	24	.51	30	.64	13	.27
150	429	107	.36	.22	62	.98	25	.42	32	.50	13	.21
125	357	89	.35	.22	64	.85	26	.35	32	.43	14	.18
100	286	71	.34	.21	66	.69	27	.29	33	.35	14	.15
50	143	36	.31	.18	72	.38	31	.16	36	.19	16	.08

Power ratings trapezoidal lifting screw

Type 200kN Q (i = 7) N (i = 28) TR 65x10 (Single start)

n	v		η_d		200 kN				160 kN				120 kN				100 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	2143	536	.35	.23											***29***	***4.5***			***24***	***3.8***
1000	1429	357	.33	.22							***41***	***4.3***			***31***	***3.2***	***67***	***7.0***	***26***	***2.7***
750	1071	268	.32	.20							***44***	***3.4***	***84***	***6.6***	33	2.6	***70***	***5.5***	28	2.2
500	714	179	.30	.19							48	2.5	***90***	***4.7***	36	1.9	***75***	***3.9***	30	1.6
300	429	107	.27	.17			66	2.1	***131***	***4.1***	53	1.7	***98***	***3.1***	40	1.3	82	2.6	34	1.1
250	357	89	.26	.16			69	1.8	***135***	***3.5***	55	1.4	102	2.6	42	1.1	85	2.2	35	.91
200	286	71	.25	.15			72	1.5	141	2.9	58	1.2	106	2.2	44	.91	88	1.8	36	.76
150	214	54	.24	.14	184	2.9	76	1.2	147	2.3	61	.96	111	1.7	46	.73	92	1.5	39	.61
125	179	45	.23	.14	190	2.5	79	1.0	152	2.0	64	.80	114	1.5	48	.60	95	1.3	40	.51
100	143	36	.23	.13	197	2.1	83	.87	157	1.7	67	.70	118	1.3	50	.53	99	1.1	42	.44
50	71	18	.20	.12	218	1.1	94	.49	174	.88	76	.39	131	.66	57	.30	109	.55	48	.25

n	v		η_d		75 kN				50 kN				25 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1500	2143	536	.35	.23	***47***	***7.5***	***18***	***2.9***	***32***	***5.0***	12	2.0	16	2.6	6.7	1.0
1000	1429	357	.33	.22	***50***	***5.3***	20	2.1	***34***	***3.5***	13	1.4	17	1.8	7.2	.75
750	1071	268	.32	.20	***53***	***4.2***	21	1.6	36	2.8	14	1.1	18	1.4	7.6	.59
500	714	179	.30	.19	***57***	***3.0***	23	1.2	38	2.0	15	.81	19	1.0	8.2	.43
300	429	107	.27	.17	62	1.9	25	.80	42	1.3	17	.55	21	.66	9.0	.29
250	357	89	.26	.16	64	1.7	26	.69	43	1.1	18	.47	22	.57	9.3	.24
200	286	71	.25	.15	66	1.4	28	.57	44	.92	19	.39	23	.47	9.8	.20
150	214	54	.24	.14	70	1.1	29	.46	47	.74	20	.31	24	.37	10	.16
125	179	45	.23	.14	72	.94	30	.38	48	.63	20	.26	24	.32	11	.13
100	143	36	.23	.13	74	.79	32	.33	50	.53	21	.22	25	.27	11	.12
50	71	18	.20	.12	82	.42	36	.19	55	.28	24	.13	28	.14	13	.07

Type 240kN Q (i = 7) N (i = 28) TR 90x24 (Double start)

n	v		η_d		240 kN				200 kN				150 kN				100 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	3429	857	.46	.31													*118*	*12*	***43***	***4.6***
750	2571	643	.44	.30									***183***	***14***	***68***	***5.4***	*122*	*9.4*	46	3.6
500	1714	429	.42	.27									***193***	***10***	74	3.9	*129*	*6.7*	49	2.6
300	1029	257	.39	.25					***277***	***8.7***			***208***	***6.5***	82	2.6	139	4.4	55	1.7
250	857	214	.38	.24					***285***	***7.5***			***214***	***5.6***	85	2.2	143	3.8	57	1.5
200	686	171	.37	.23					***294***	***6.2***	118	2.5	221	4.7	89	1.9	148	3.1	59	1.3
150	514	129	.35	.21	***369***	***5.8***			***307***	***4.8***	125	2.0	231	3.6	94	1.5	154	2.4	63	1.0
125	429	107	.34	.21	***379***	***5.0***			316	4.2	129	1.7	237	3.1	97	1.3	158	2.1	65	.86
100	343	86	.33	.20	391	4.1			326	3.4	135	1.4	245	2.6	102	1.1	164	1.7	68	.71
50	171	43	.30	.17	431	2.3	184	.96	359	1.9	154	.80	270	1.4	115	.60	180	.96	77	.40

n	v		η_d		75 kN				50 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	3429	857	.46	.31	***89***	***9.0***	33	3.5	***59***	***6.1***	22	2.4
750	2571	643	.44	.30	***92***	***7.0***	35	2.7	62	4.7	23	1.9
500	1714	429	.42	.27	***97***	***5.0***	37	2.0	65	3.4	25	1.3
300	1029	257	.39	.25	105	3.3	41	1.3	70	2.2	28	8.9
250	857	214	.38	.24	107	2.8	43	1.1	72	1.9	29	.75
200	686	171	.37	.23	111	2.3	45	.95	74	1.6	30	.64
150	514	129	.35	.21	116	1.8	47	.76	78	1.2	32	.51
125	429	107	.34	.21	119	1.6	49	.65	80	1.1	33	.44
100	343	86	.33	.20	123	1.3	51	.53	82	.86	35	.36
50	171	43	.30	.17	135	.72	58	.30	91	.48	39	.20

Power ratings trapezoidal lifting screw

Type 300kN Q (i = 7) N (i = 28) TR 90x12 (Single start)

n	v				300 kN				250 kN				200 kN				150 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1714	429	.32	.21													***125***	***13***	***49***	***5.1***
750	1286	321	.31	.19											***69***	***5.4***	***131***	***10***	***52***	***4.1***
500	857	214	.29	.18									***187***	***9.8***	***75***	***3.9***	***141***	***7.4***	56	2.9
300	514	129	.26	.16									***206***	***6.5***	84	2.6	***155***	***4.9***	63	2.0
250	429	107	.25	.15					***266***	***7.0***	109	2.9	***213***	***5.6***	87	2.3	***160***	***4.2***	66	1.8
200	343	86	.24	.14					***277***	***5.8***	115	2.4	***222***	***4.6***	92	1.9	166	3.5	69	1.4
150	257	64	.23	.13	***350***	***5.5***			***291***	***4.6***	122	1.9	233	3.7	98	1.5	175	2.8	74	1.1
125	214	54	.22	.13	***361***	***4.7***			***301***	***3.9***	127	1.7	241	3.1	102	1.4	181	2.4	77	1.0
100	171	43	.21	.12	***375***	***3.9***			313	3.3	133	1.4	250	2.6	107	1.1	188	2.0	80	.84
50	86	21	.19	.11	420	2.2	183	.96	350	1.8	153	.80	280	1.5	122	.64	210	1.1	92	.48

n	v				100 kN				75 kN				50 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1714	429	.32	.21	***84***	***8.7***	***33***	***3.4***	***63***	***6.6***	25	2.6	***42***	***4.4***	17	1.8
750	1286	321	.31	.19	***88***	***6.7***	35	2.7	***66***	***5.0***	26	2.1	44	3.4	18	1.4
500	857	214	.29	.18	***94***	***4.9***	38	2.0	71	3.7	29	1.5	48	2.5	20	1.0
300	514	129	.26	.16	103	3.3	43	1.3	78	2.5	32	1.0	52	1.6	22	.67
250	429	107	.25	.15	107	2.8	44	1.2	80	2.1	33	.89	54	1.4	23	.60
200	343	86	.24	.14	111	2.3	47	.97	84	1.8	35	.74	56	1.2	24	.50
150	257	64	.23	.13	117	1.8	49	.77	88	1.4	37	.58	59	.93	25	.39
125	214	54	.22	.13	121	1.6	51	.69	91	1.2	39	.52	61	.79	26	.35
100	171	43	.21	.12	126	1.3	54	.57	95	.98	41	.43	63	.66	27	.29
50	86	21	.19	.11	141	.74	62	.32	106	.55	47	.24	71	.37	31	.16

Type 400kN Q (i = 7.5) N (i = 28) TR 120x28 (Double start)

n	v				400 kN				300 kN				250 kN				200 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	3733	933	.45	.30													***264***	***28***	***96***	***10***
750	2800	700	.43	.29									***342***	***27***			***274***	***22***	***102***	***8.0***
500	1867	467	.41	.27									***362***	***19***	***137***	***7.2***	***290***	***15***	***110***	***5.8***
300	1120	280	.38	.24					***469***	***15***			***391***	***13***	152	4.8	***313***	***10***	122	3.8
250	933	233	.36	.23					***482***	***13***			***402***	***11***	158	4.1	***322***	***8.7***	127	3.3
200	747	187	.35	.22					***499***	***11***	198	4.2	***416***	***9.2***	165	3.5	***333***	***7.3***	133	2.8
150	560	140	.34	.21					***522***	***8.2***	210	3.3	***436***	***6.8***	175	2.8	349	5.5	141	2.2
125	467	117	.33	.20					***538***	***7.0***	218	2.8	448	5.8	182	2.3	359	4.7	146	1.9
100	373	93	.32	.19	***741***	***7.8***			556	5.9	228	2.4	464	4.9	190	2.0	371	3.9	153	1.6
50	187	47	.28	.17	821	4.3			616	3.2	261	1.4	514	2.7	216	1.2	411	2.2	174	.94

n	v				150 kN				100 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	3733	933	.45	.30	***198***	***21***	***73***	***7.5***	***133***	***14***	50	5.1
750	2800	700	.43	.29	***206***	***16***	***77***	***6.0***	***138***	***11***	52	4.1
500	1867	467	.41	.27	***218***	***11***	83	4.4	***146***	***7.6***	56	2.9
300	1120	280	.38	.24	***235***	***7.5***	92	2.9	157	5.0	62	1.9
250	933	233	.36	.23	***242***	***6.5***	95	2.5	162	4.4	64	1.7
200	747	187	.35	.22	250	5.5	100	2.1	167	3.7	67	1.4
150	560	140	.34	.21	262	4.1	106	1.7	175	2.7	71	1.1
125	467	117	.33	.20	270	3.5	110	1.4	180	2.3	74	.95
100	373	93	.32	.19	279	2.9	115	1.2	186	2.0	77	.81
50	187	47	.28	.17	309	1.6	131	.70	206	1.1	88	.47

Power ratings trapezoidal lifting screw

Type 500kN Q (i = 7.5) N (i = 28) TR 120x14 (Single start)

n	v		η_d		500 kN				400 kN				300 kN				250 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1867	467	.31	.20															***91***	***9.6***
750	1400	350	.29	.19											***117***	***9.2***	***249***	***20.0***	***97***	***7.7***
500	933	233	.27	.17									***321***	***17***	***128***	***6.7***	***268***	***14.0***	***107***	***5.6***
300	560	140	.25	.15									***354***	***11***	144	4.5	***295***	***9.2***	120	3.8
250	467	117	.24	.14									***366***	***9.6***	150	3.9	***305***	***8.0***	125	3.3
200	373	93	.23	.14					***509***	***11***			***382***	***8.3***	158	3.3	***318***	***6.9***	131	2.8
150	280	70	.22	.13					***537***	***8.4***	224	3.5	***403***	***6.3***	168	2.6	***336***	***5.3***	140	2.2
125	233	58	.21	.12					***556***	***7.3***	233	3.1	***417***	***5.5***	175	2.3	348	4.6	145	1.9
100	187	47	.20	.12	***723***	***7.6***			***579***	***6.1***	244	2.6	435	4.6	184	2.0	362	3.8	153	1.6
50	93	23	.18	.10	815	4.3			652	3.4	281	1.5	489	2.6	211	1.1	408	2.2	176	.94

n	v		η_d		200 kN				150 kN				100 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1000	1867	467	.31	.20	***190***	***20***	***73***	***7.7***	***143***	***15***	***55***	***5.8***	***96***	***10***	37	3.9
750	1400	350	.29	.19	***200***	***16***	***78***	***6.2***	***150***	***12***	***59***	***4.7***	***101***	***8.1***	40	3.1
500	933	233	.27	.17	***215***	***11***	86	4.5	***161***	***8.5***	65	3.4	***108***	***5.7***	44	2.3
300	560	140	.25	.15	***236***	***7.3***	96	3.0	***177***	***5.5***	73	2.3	119	3.7	49	1.5
250	467	117	.24	.14	***244***	***6.4***	100	2.6	184	4.8	76	2.0	123	3.2	51	1.3
200	373	93	.23	.14	***265***	***5.5***	105	2.2	192	4.1	79	1.7	128	2.8	53	1.1
150	280	70	.22	.13	269	4.2	112	1.8	202	3.2	85	1.3	135	2.1	57	.89
125	233	58	.21	.12	279	3.7	117	1.6	209	2.7	88	1.2	140	1.8	59	.79
100	187	47	.20	.12	290	3.0	123	1.3	218	2.3	92	.98	146	1.5	62	.66
50	93	23	.18	.10	327	1.7	141	.75	245	1.3	106	.57	164	.87	71	.38

Type 800kN Q (i = 12) N (i = 36) TR 160x32 (Double start)

n	v		η_d		800 kN				700 kN				600 kN				500 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
850	2267	756	.39	.29					***748***	***67***			***641***	***57***	***293***	***26***	***535***	***48***	***244***	***22***
750	2000	667	.39	.28					***761***	***60***			***653***	***51***	***300***	***24***	***545***	***43***	***250***	***20***
500	1333	444	.36	.26	***925***	***49***			***810***	***43***	***378***	***20***	***695***	***37***	***324***	***17***	***579***	***31***	271	14
300	800	267	.33	.23	***1005***	***32***	477	15	***880***	***28***	418	13	***754***	***24***	359	11	***629***	***20***	299	9.4
250	667	222	.32	.22	***1036***	***27***	495	13	***906***	***24***	434	11	***777***	***20***	372	9.8	***648***	***17***	311	8.2
200	533	178	.31	.21	***1075***	***23***	518	11	***941***	***20***	454	9.6	***807***	***17***	389	8.3	673	14	325	6.9
150	400	133	.30	.20	***1127***	***18***	549	8.6	987	16	481	7.5	846	14	412	6.5	706	11	344	5.4
125	333	111	.29	.19	1162	15	569	7.5	1017	13	498	6.6	872	11	428	5.6	727	9.4	357	4.7
100	267	89	.28	.19	1204	13	595	6.2	1054	11	521	5.4	904	9.8	447	4.7	754	8.1	373	3.9
50	133	44	.25	.16	1341	7.0	679	3.6	1174	6.1	595	3.2	1007	5.3	510	2.7	839	4.4	426	2.3

n	v		η_d		400 kN				300 kN				200 kN			
rpm	mm/min				T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
850	2267	756	.39	.29	***429***	***38***	***196***	***17***	***322***	***29***	148	13	***216***	***19***	100	8.9
750	2000	667	.39	.28	***436***	***34***	***201***	***16***	***328***	***26***	151	12	***220***	***17***	102	8.2
500	1333	444	.36	.26	***464***	***25***	217	11	***349***	***18***	164	8.7	234	12	110	5.8
300	800	267	.33	.23	504	16	240	7.5	379	12	181	5.7	254	8.1	122	3.8
250	667	222	.32	.22	519	14	249	6.5	390	10	188	4.9	261	6.8	126	3.3
200	533	178	.31	.21	539	12	260	5.5	405	8.7	196	4.2	271	5.8	132	2.8
150	400	133	.30	.20	565	9.0	276	4.3	425	6.8	208	3.3	284	4.5	140	2.2
125	333	111	.29	.19	582	7.5	286	3.8	437	5.7	215	2.8	293	3.8	145	1.9
100	267	89	.28	.19	604	6.5	299	3.1	454	4.9	225	2.3	303	3.3	151	1.6
50	133	44	.25	.16	672	3.5	341	1.8	505	2.6	257	1.4	338	1.8	172	.91

Power ratings trapezoidal lifting screw

Type 1000kN Q (i = 12) N (i = 36) TR 160x16 (Single start)

n	v				1000 kN				800 kN				700 kN				600 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
850	1133	378	.26	.18							***304***	***27***	***561***	***50***	***267***	***24***	***481***	***43***	***229***	***20***
750	1000	333	.25	.18							***313***	***25***	***574***	***45***	***274***	***22***	***493***	***39***	***255***	***19***
500	667	222	.23	.16					***708***	***37***	***342***	***18***	***620***	***32***	***300***	***16***	***532***	***28***	***258***	***14***
300	400	133	.21	.14	***978***	***31***	***480***	***15***	***783***	***25***	384	12	***686***	***22***	337	11	***588***	***19***	289	9.0
250	333	111	.20	.14	***1014***	***27***	***500***	***13***	***812***	***22***	400	10	***711***	***19***	351	9.1	***610***	***16***	301	7.8
200	267	89	.20	.13	***1060***	***22***	525	11	***848***	***18***	421	8.8	***743***	***15***	368	7.7	***637***	***13***	316	6.6
150	200	67	.18	.12	***1121***	***18***	560	8.8	***897***	***14***	448	7.0	***785***	***13***	393	6.2	674	11	337	5.3
100	133	44	.17	.11	***1210***	***13***	611	6.4	969	10	489	5.1	848	9.1	428	4.5	727	7.8	368	3.9
50	67	22	.15	.10	1368	7.2	704	3.7	1095	5.8	563	3.0	958	5.0	493	2.6	822	4.3	423	2.2

n	v				500 kN				400 kN				300 kN				200 kN			
rpm	mm/min		η_d		T Q P		T N P		T Q P		T N P		T Q P		T N P		T Q P		T N P	
	Q	N	Q	N	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
850	1133	378	.26	.18	***402***	***36***	***191***	***17***	***322***	***29***	***154***	***14***	***242***	***22***	116	10	***163***	***14***	78	7.0
750	1000	333	.25	.18	***411***	***32***	***197***	***16***	***329***	***26***	***158***	***13***	***248***	***19***	119	9.5	***166***	***13***	80	6.4
500	667	222	.23	.16	***444***	***23***	215	11	***356***	***19***	173	9.1	***268***	***14***	130	6.9	179	9.4	88	4.6
300	400	133	.21	.14	***491***	***16***	241	7.5	393	12	194	6.1	296	9.4	146	4.6	198	6.3	98	3.1
250	333	111	.20	.14	***508***	***14***	251	6.5	407	11	202	5.2	306	8.2	152	4.0	205	5.5	102	2.7
200	267	89	.20	.13	531	11	264	5.5	426	8.8	212	4.4	320	6.6	160	3.3	214	4.5	107	2.3
150	200	67	.18	.12	562	9.0	281	4.4	450	7.2	226	3.5	338	5.4	170	2.7	227	3.6	114	1.8
100	133	44	.17	.11	607	6.5	307	3.2	486	5.2	246	2.6	365	3.9	185	1.9	245	2.6	125	1.3
50	67	22	.15	.10	685	3.6	353	1.9	549	2.9	283	1.5	412	2.2	213	1.1	276	1.5	143	.75

Power ratings for screw jacks with single & double start spindle at 40 % ED/10 min or max 20 % ED/ hour at ambient temperatur +25° C.

n = input speed (rpm)
v = lifting speed (mm/min)
η_d = running efficiency
Q = quick (low ratio)
N = slow (high ratio)
T = input torque (Nm)
P = input power (kW)
i = ratio of worm gear set

Note: Power ratings indicate running power. Additional power will be required on start. See “Selection of jacks“.

Mechanical and Thermal capacities:

A) Mechanical capacity = all stated values non blank areas in tables.

B) Mechanical capacity with stainles worm screw = Grey areas in tables.

C) Thermal capacity
The figures above the line in italic style can only be used at ED lower than 20%. Thermal power must be checked. See “Intermittence factor (ED) trapezoidal lifting screw“.

Intermittence factor (ED) trapezoidal lifting screw

Intermittence factor, if the ED is other than 20% / hour the running power (P_d) must be adjusted according to diagram which is calculated by following formula:

$$P_{ED} = \frac{20\ \%}{ED\ \%} \times P_{max}$$

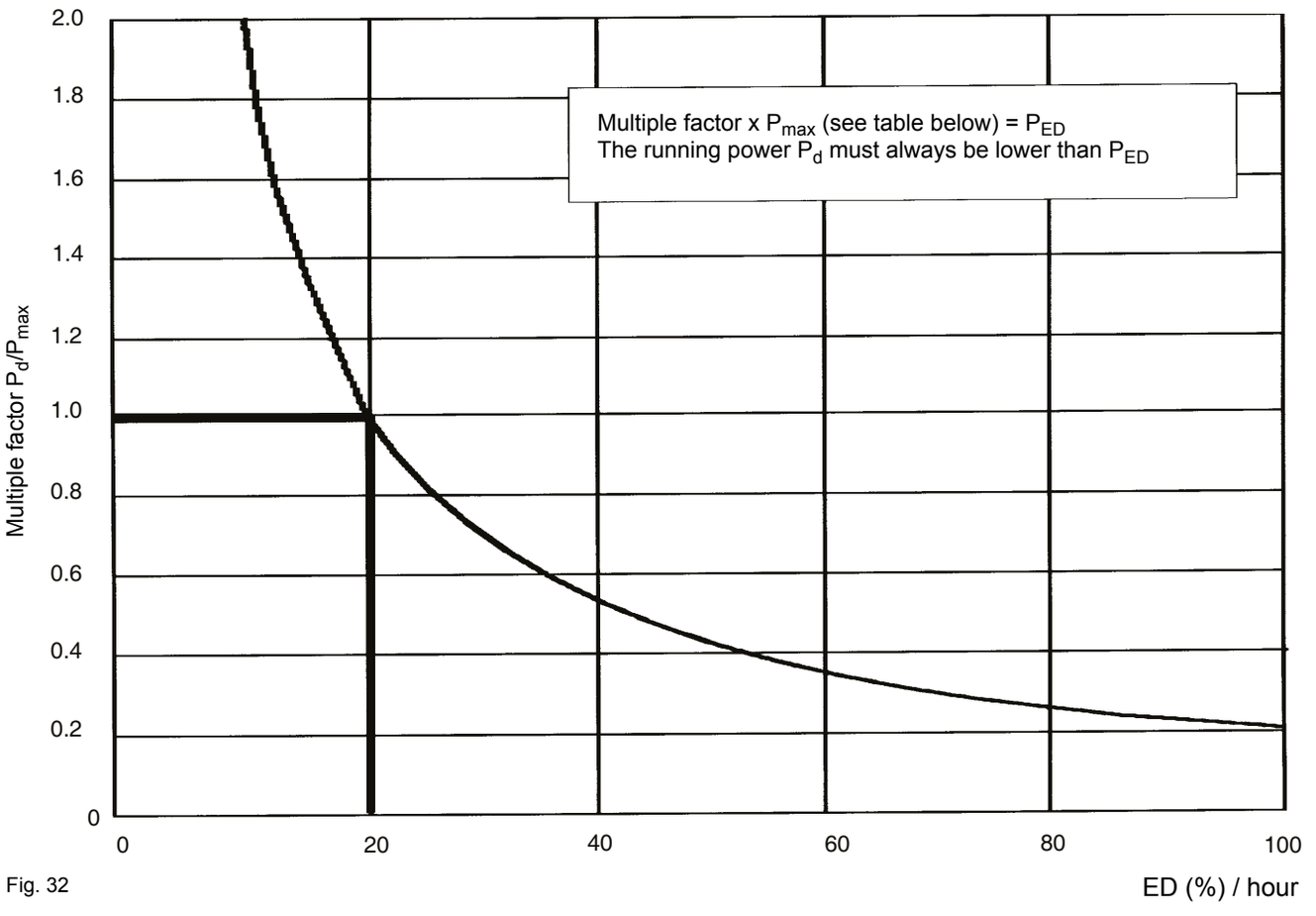


Fig. 32

Thermal rating at 20% ED (Single start spindle)

Type / capacity kN		10	25	50	150	200	300	500	1000
P_{max} kW	Q	0.2	0.55	0.9	1.5	2.9	3.7	5.1	12.5
	N	0.15	0.5	0.8	1.3	2.6	3.3	4.5	12.0

Thermal rating at 20% ED (Double start spindle)

Type / capacity kN		8	20	40	120	160	240	400	800
P_{max} kW	Q	0.25	0.7	1.1	1.9	3.6	4.7	6.4	16.0
	N	0.20	0.6	1.0	1.6	3.2	4.1	5.6	15.0

Critical travelling nut speed

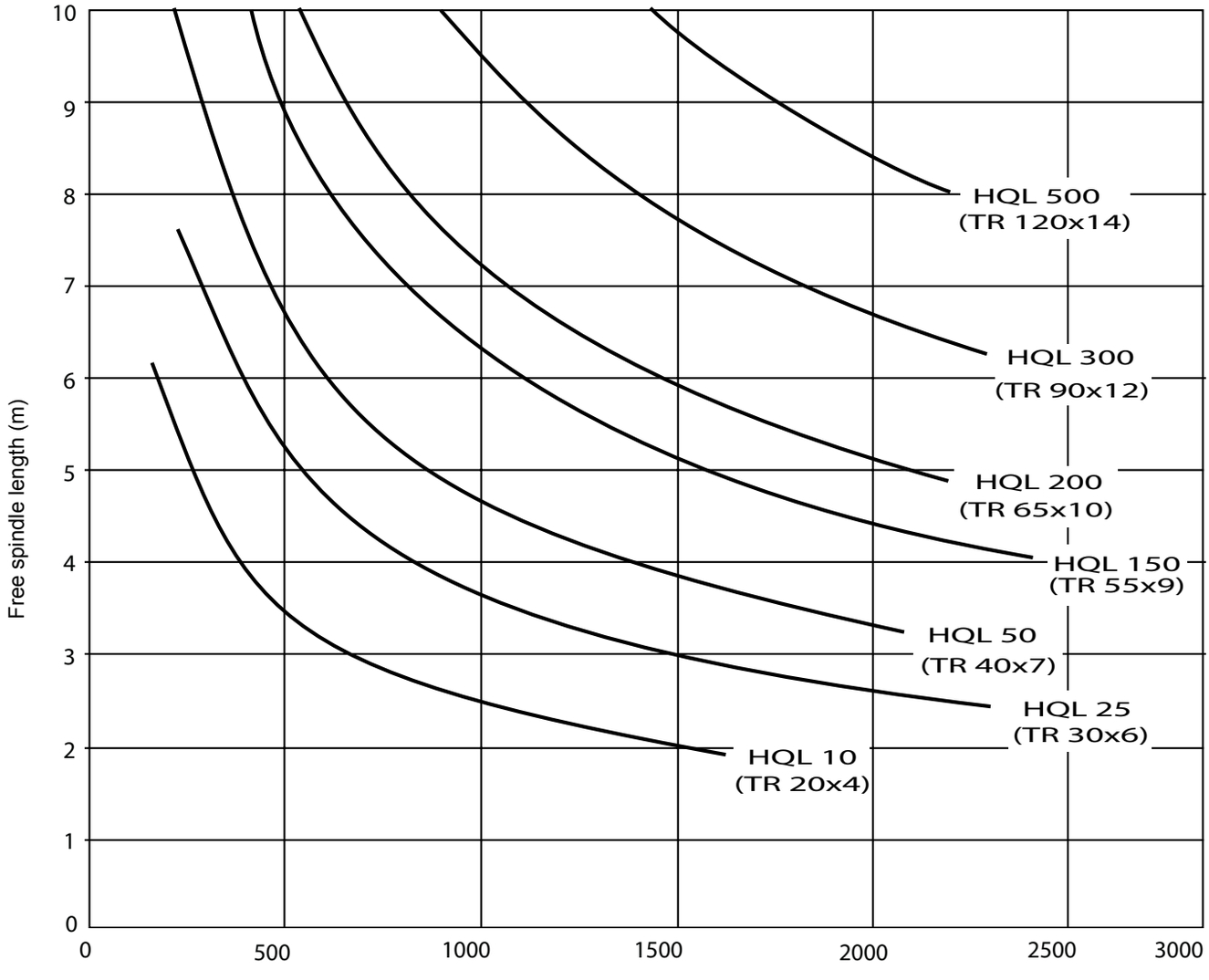


Fig. 33

Max permissible speed V mm/min with grease lubrication

Type / Capacity (kN)	Ratio		Type / Capacity (kN)	Ratio
Single start	Q	N	**Double start**	Q
10	1600	500	**8**	3200
25	2300	500	**20**	4600
50	2100	500	**40**	4200
150	2400	600	**120**	4800
200	2200	550	**160**	4400
300	2300	550	**240**	4600
500	2200	550	**400**	4400
1000	1180	410	**800**	2360

Allowable side force on the spindle HN/HQ

Fa = thrust load on spindle (kN)
Fr = side force on the spindle (kN)
l = length of stroke (mm)

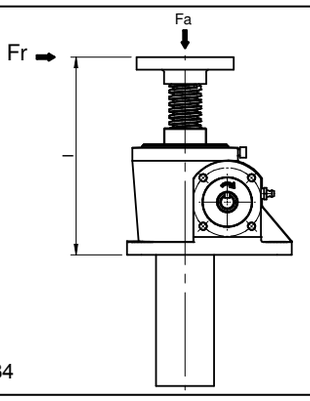
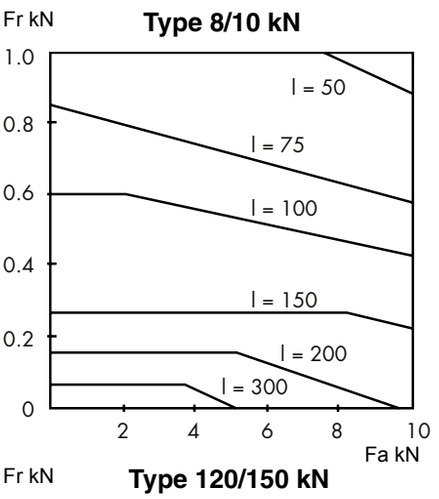
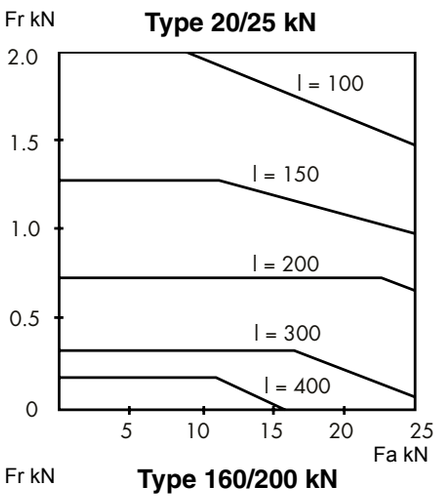
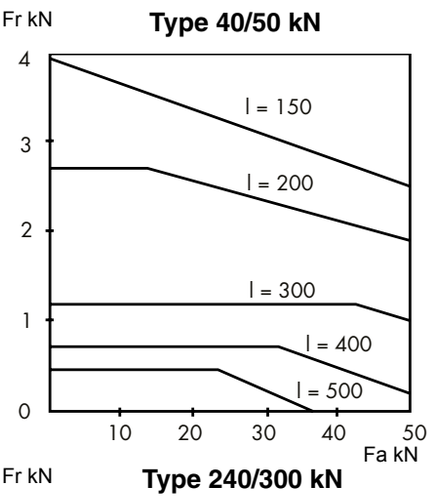
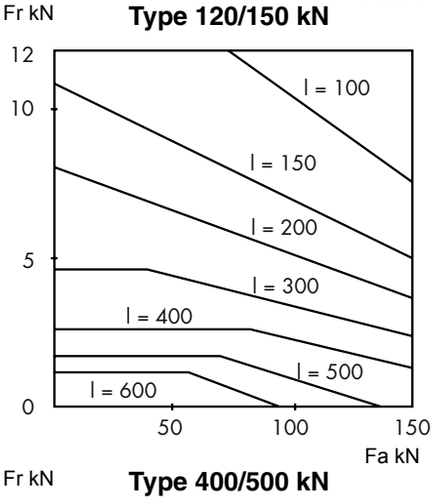


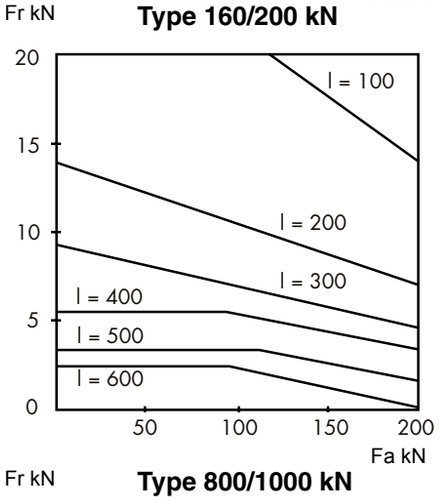
Fig. 34

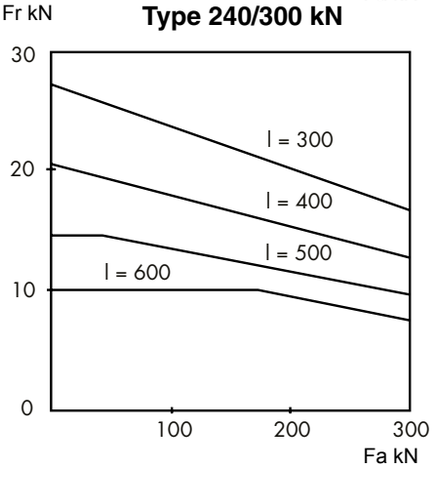


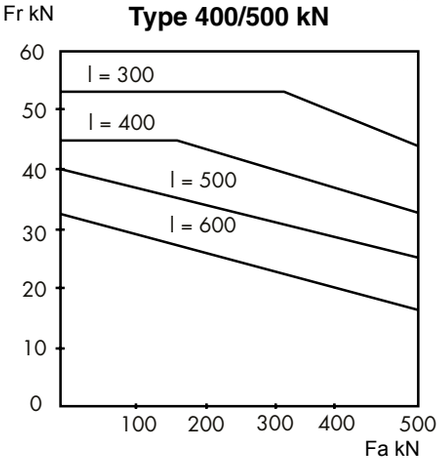


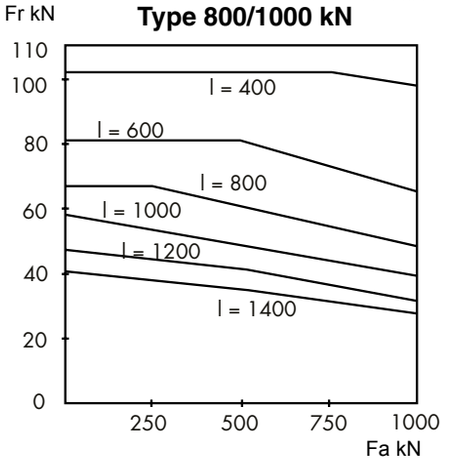












Dimensions HN/HQ 10-1000

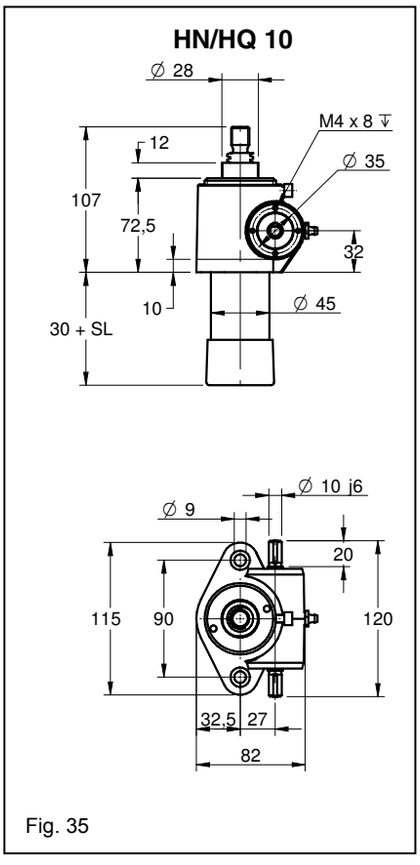


Fig. 35

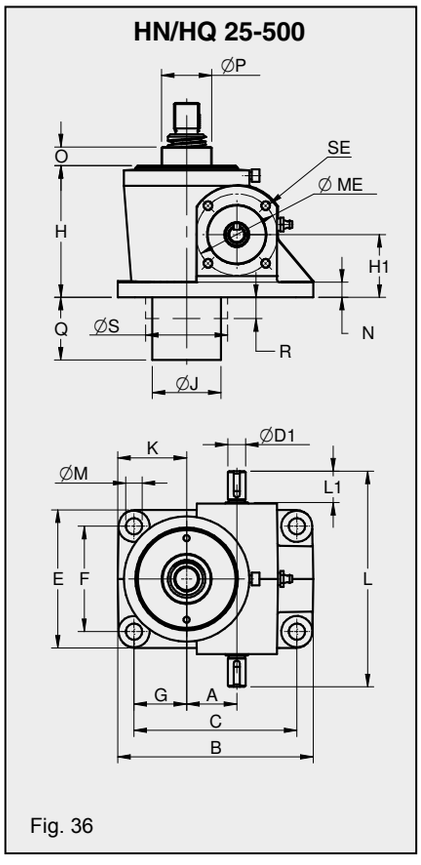


Fig. 36

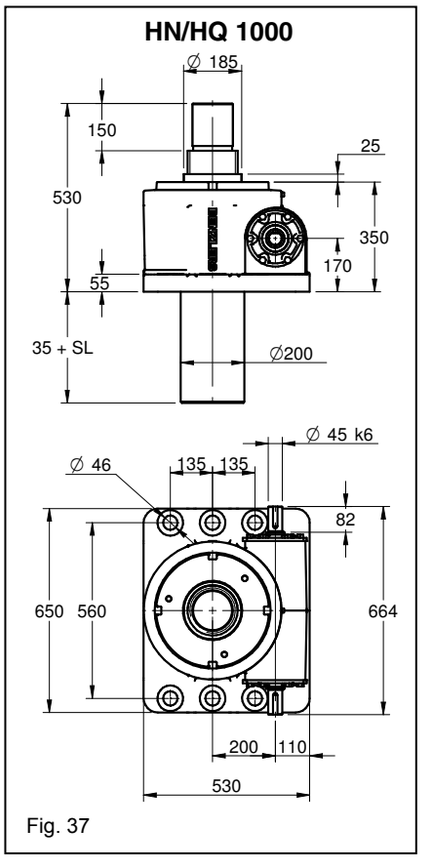


Fig. 37

Type	25	50	150	200	300	500
A	40	58	66	86	100	125
B	156	196	222	300	350	460
C	130	158	178	250	280	380
Ø D1j6	14	19	24	30	35	38
E	110	170	190	220	260	300
F	84	134	146	170	190	220
G	42	40	51	85	95	140
H	105	130	157	182	225	275
H1	50	55	68	80	102	125
Ø J	45	55	75	90	120	150
K	55	60	73	110	130	180
L	172	237	268	318	356	486
L1	25	35	40	47	58	58
Ø M	13	18	21	26	35	42
N	12	12	16	20	25	35
O	15	15	15	20	20	25
Ø P	40	50	70	80	110	140
Q	25+Stroke	25+Stroke	25+Stroke	45+Stroke	45+Stroke	55+Stroke
R	-	-	-	-	45	55
Ø S	-	-	-	-	132	160
SE	M8x12	M8x12	M8x12	M10x15	M10x15	-
ME	65	80	80	88	96	-

Dimensions HN/HQ 10-1000 End Executions 1, 2, 3

Execution 1 (Road End)

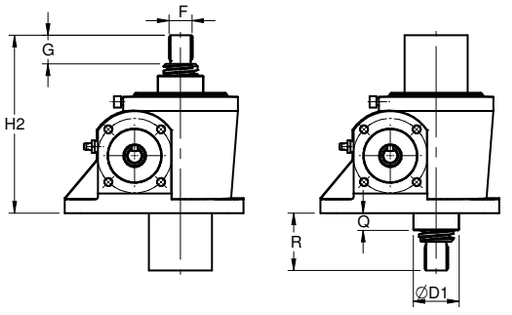


Fig. 38

Execution 2 (Top Plate)

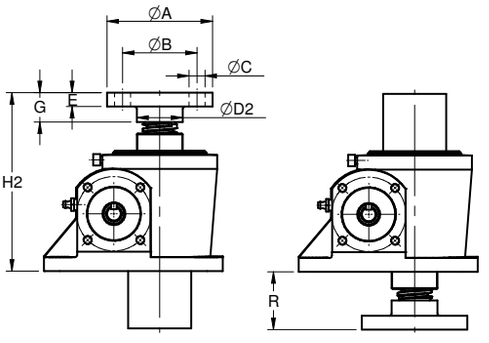
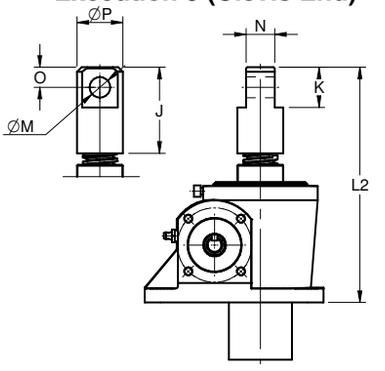


Fig. 39

Execution 3 (Clevis End)



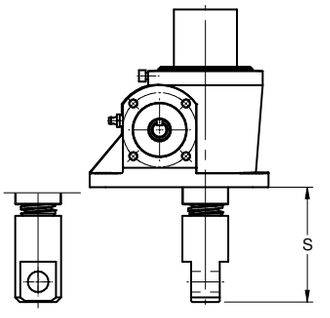


Fig. 40

Type	10	25	50	150	200	300	500	1000
Ø A	65	92	122	150	185	215	285	380
Ø B	50	65	90	110	140	170	220	290
Ø C	4x7	4x14	4x18	4x21	4x26	6x26	6x33	6x48
Ø D1	28	40	50	70	80	110	140	185
Ø D2	30	40	55	70	90	120	150	200
E	8	12	16	20	25	25	32	60
F	M14x2	M20x1.5	M30x2	M40x3	M50x3	M70x4	M90x4	M130x4
G	20	25	36	50	60	85	110	150
H2	107	150	186	227	267	335	415	530
J	55	75	100	125	160	200	265	360
K	25	35	50	60	80	100	130	180
L2	142	200	250	302	367	450	570	740
Ø M H11	12	18	25	30	40	50	65	90
N	20	25	35	45	60	80	100	140
O	12.5	17.5	25	30	40	50	65	90
Ø P	30	40	55	70	90	120	150	200
Q	12	15	15	15	20	20	25	25
R	37	45	56	70	85	110	140	180
S	72	95	120	145	185	225	295	390

Dimensions HNL 10-1000

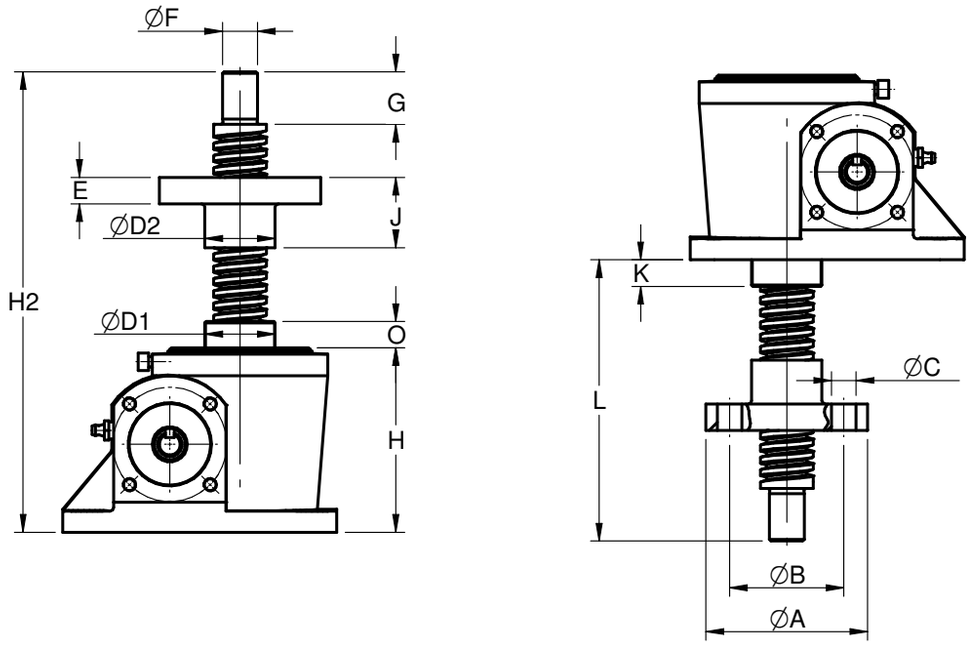


Fig. 41

Type	10	25	50	150	200	300	500	1000
Ø A	65	92	122	150	185	215	285	380
Ø B	50	65	90	110	140	170	220	290
Ø C	4x7	4x14	4x18	4x21	4x26	6x26	6x33	6x48
Ø D1	28	40	50	70	80	110	140	185
Ø D2	30	40	55	70	90	120	150	200
E	10	15	20	25	30	35	50	90
ØF h7	12	20	30	40	50	70	100	140
G	20	30	40	60	60	90	120	160
H	70	105	130	157	182	225	275	350
H2	148+Stroke	215+Stroke	265+Stroke	332+Stroke	365+Stroke	465+Stroke	580+Stroke	770+Stroke
J	25	40	55	75	85	110	140	200
K	12	15	15	15	20	20	25	25
L	84+Stroke	115+Stroke	155+Stroke	196+Stroke	205+Stroke	261+Stroke	330+Stroke	430+Stroke
O	12	15	15	15	8	10	10	25

Dimensions with bellows Types 10-500

HN/HQ 10-500 **HNL/HQL 10-500**

Execution 1 (Road End)

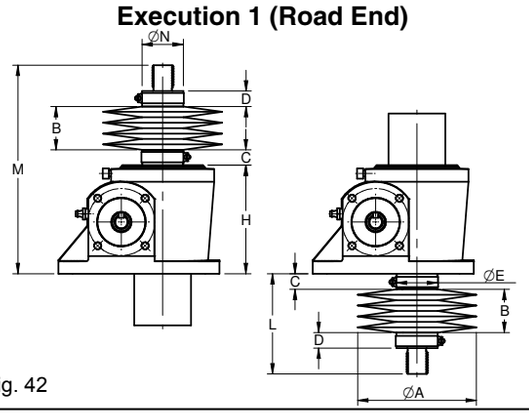


Fig. 42

Execution 2 (Top Plate)

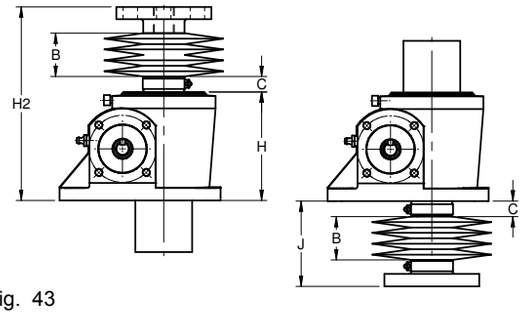


Fig. 43

Execution 3 (Clevis End)

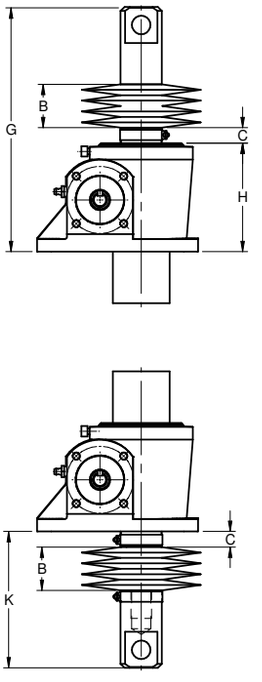


Fig. 44

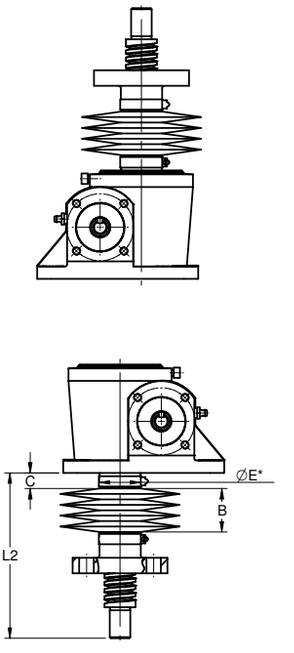


Fig. 45

Type	10	25	50	150	200	300	500
Ø A	95	115	130	150	190	225	270
B min	5	5	5	5	5	5	5
B max	0.05xStroke	0.05xStroke	0.05xStroke	0.05xStroke	0.05xStroke	0.05xStroke	0.05xStroke
C	12	15	15	15	20	20	25
D	15	15	15	15	15	15	15
Ø E*	28	40	50	70	80	110	140
F	102+B	145+B	181+B	222+B	262+B	330+B	410+B
G	137+B	195+B	245+B	297+B	362+B	445+B	565+B
H	70	105	130	157	182	225	275
H2	148+1.05xStroke	215+1.05xStroke	265+1.05xStroke	332+1.05xStroke	365+1.05xStroke	465+1.05xStroke	580+1.05xStroke
J	32+B	40+B	51+B	65+B	80+B	105+B	135+B
K	67+B	90+B	115+B	140+B	180+B	220+B	290+B
L	47+B	55+B	66+B	80+B	95+B	120+B	150+B
L2	L+0.05xStroke						
M	117+B	160+B	196+B	237+B	277+B	345+B	425+B
Ø N	30	40	55	70	90	120	150

* Hole for hose clamp ØE + 30

Typ 1000 kN contact application engineers.

Options

STOP NUT (SM)

Stop nuts can be fitted to all screw jacks, both above and below the jackhousing.

These must be included when there is an inherent risk of over travel resulting in the spindle becoming disengaged from the worm thread.

1 Stop nut
2 Protection tube
3 Tube sleeve

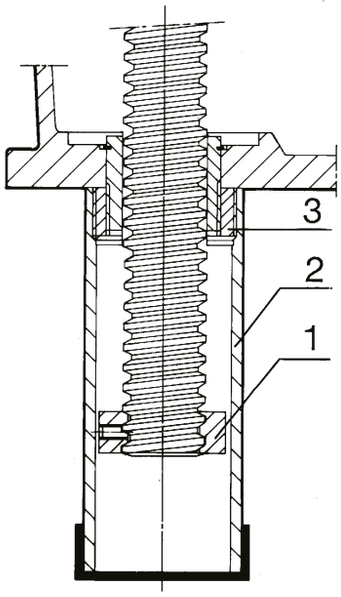


Fig. 46

STOP NUT (SM) + LIMIT SWITCH (LS)

All jacks can be supplied with limit switches to suit most applications. Standard is two limit switches and one stop nut.

Upper/lower limits can be mounted on the protection tube. Adjustable limits are also available on request.

1 Stop nut
2 Carrier
3 Limit switch

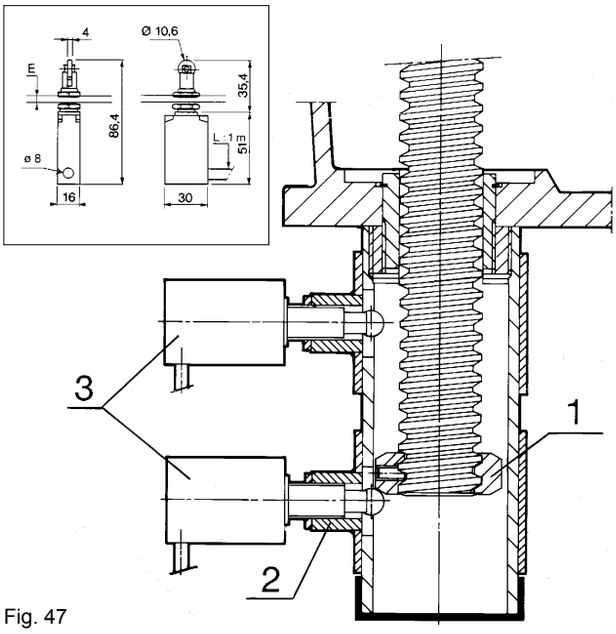


Fig. 47

SAFETY NUT (SHM)

In certain applications the addition of a safety nut may be required. The object of the above is to prevent the load collapsing in the event of the lifting nut thread failing.

Monitoring of the safety gap (= S) between the lifting and safety nut gives an indication of the intermediate wear. When the safety gap reaches zero the lifting nut has reached its wear limit and requires changing. In applications where the safety nut is inaccessibe, electro/mechanical switches are available to indicate maximum wear.

1 Safety nut
2 Spacer
3 Worm wheel

Load direction important!

Combinations with other options are restricted. Consult our application engineers for more information.

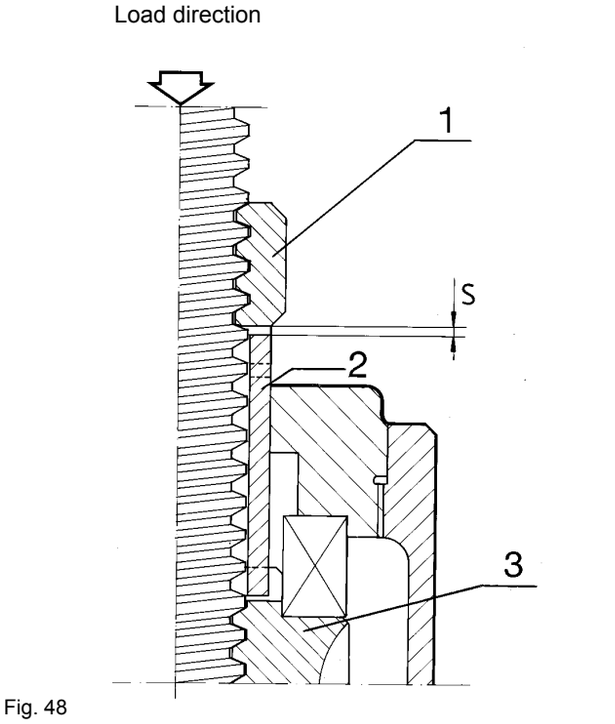


Fig. 48

LOCKED AGAINST ROTATION

For applications where a load is to be raised/lowered and permanent fixing i.e. top plate/clevis, is not practical, the spindle must be prevented from rotating.

Two options are available:

I) LR - Locked Against Rotation (LR)

Protection tube manufactured in box section mild steel. Spindle end complete with nut (sized to suit box section).

1 Jack housing
2 Locking nut
3 Locking assembly (size dependent variant 1)
4 Tube
5 Pin (size dependent variant 2)

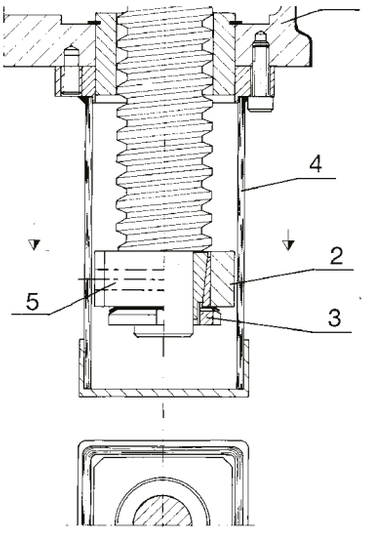


Fig. 49

II) LRK - Locked Against Rotation (LRK)

Jack internals are modified to incorporate a rectangular key which engages in a precision keyway cut into the spindle length. Primarily used in precision applications requiring minimal radial movement.

1 Jack cover
2 Lifting screwl
3 Key

Combination with other options are restricted.

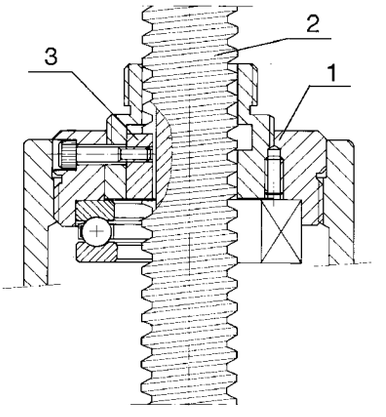


Fig. 50

ANTIBACKLASH (ABL)

Where the loading on a screw jack can be in both tension and compression and the spindle backlash is critical, units can be supplied with a Backlash Eliminator comprising of a modified worm wheel fitted with a secondary nut, allowing contact on both face and flank of driving thread.

Backlash 0.01-0.05 mm - During operation excessive backlash can be removed by adjustment of the top cover. The nuts are separated by a pre-determined gap to eliminate the adjustment of the backlash eliminator when drive thread width has been reduced by 25%.

1 Worm wheel
2 Dowel pin
3 Adjusting nut
4 Jack cover

Combinations with other options are restricted. For more information consult our application engineers.

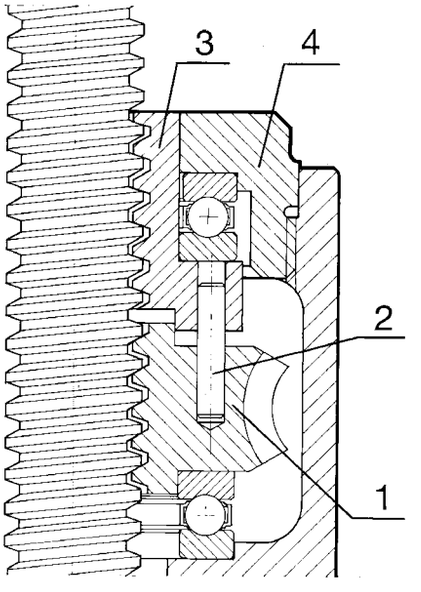
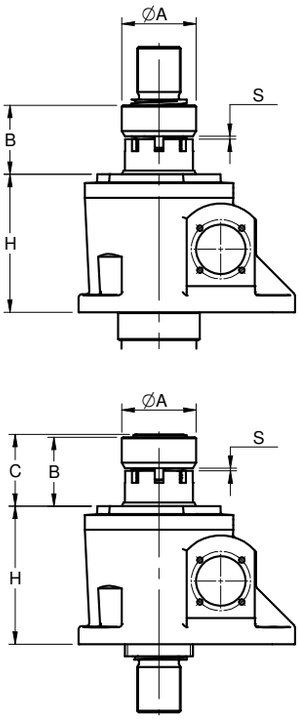


Fig. 51

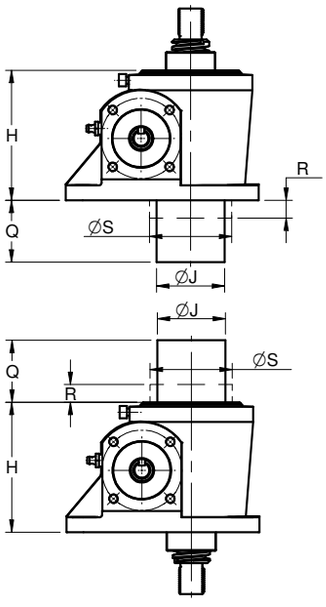
Dimensions SHM - SM - LR - LRK - ABL - MLS

Dimensions for Type 1000kN consult our application engineers.

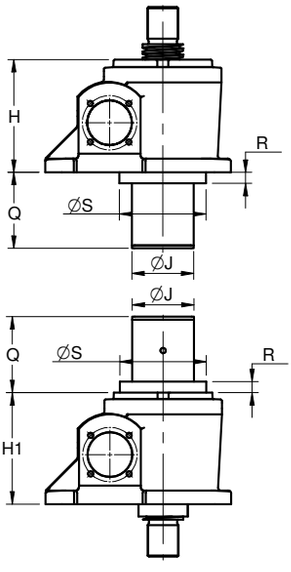
SHM 10 - 500kN



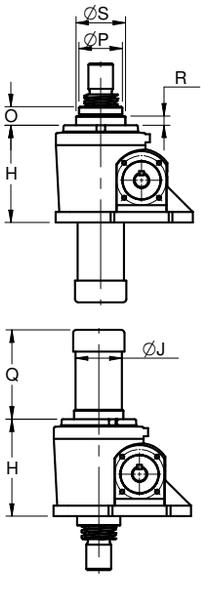
SM 10 - 500kN



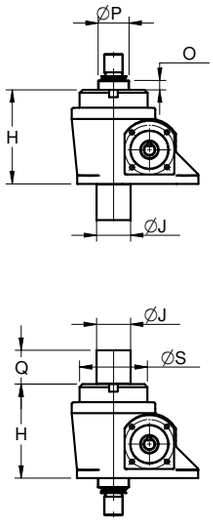
LR 10 - 500kN



LRK 10 - 500kN



ABL 10 - 500kN



MLS 10 - 500kN

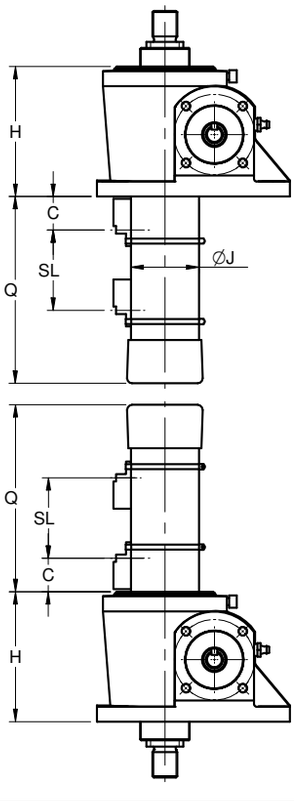


Fig. 52 Explanations see p. 34f.

Dimensions SHM - SM - LR - LRK - ABL - MLS

Variant	SHM						
Type	**10**	**25**	**50**	**150**	**200**	**300**	**500**
Ø A	30	45	55	75	90	120	170
B	17.5	27	36	53	68	111.5	118
C	22.5+SL	32+SL	41+SL	58+SL	73+SL	116.5+SL	123+SL
H	72.5	105	129	156	180	223	273
S	1.0 - 1.5	1.5 - 2.2	1.8 - 2.5	2.3 - 3.3	2.5 - 3.7	3 - 4.44	3.5 - 5.18

Variant	SM						
Type	**10**	**25**	**50**	**150**	**200**	**300**	**500**
H	72.5	105	130	157	182	225	275
Ø J	45	55	70	88	125	150	171
Q	89+SL	91+SL	98+SL	106+SL	121+SL	100+SL	120+SL
R	-	-	-	-	-	50	55
Ø S	-	-	-	-	-	160	190

Variant	LR						
Type	**10**	**25**	**50**	**150**	**200**	**300**	**500**
H	72.5	105	130	157	182	225	275
H1	72.5	103	128	155	180	223	273
Ø J	40x40	60x60	70x70	80x80	100x100	120x120	150x150
Q	66+SL	77+SL	86+SL	120+SL	123+SL	155+SL	185+SL
R	8	10	10	15	18	18	30
Ø S	55	80	100	110	140	180	215

Variant	LRK						
Type	**10**	**25**	**50**	**150**	**200**	**300**	**500**
H	70	105	130	157	182	225	275
Ø J	45	55	70	88	125	120	150
O	10	20	15	30	20	46	25
Ø P	-	40	50	70	90	110	150
Q	30+SL	30+SL	47+SL	47+SL	45+SL	71+SL	55+SL
R	-	5	-	15	-	26	-
Ø S	-	50	-	80	-	132	-

Variant	ABL						
Type	**10**	**25**	**50**	**150**	**200**	**300**	**500**
H	83	120	152	190	235	288	350
Ø J	45	55	70	88	125	120	150
O	12	15	15	15	20	20	25
Ø P	28	40	50	70	80	110	140
Q	30+SL	30+SL	47+SL	47+SL	45+SL	45+SL	55+SL
Ø S	55	80	110	120	160	200	240

Variant	MLS				
Type	**10**	**25**	**50**	**150**	**200**
C	41	43	48	63	73
H	72.5	105	130	157	182
Ø J	45	55	70	88	125
Q	89+SL	91+SL	98+SL	106+SL	121+SL

SL - Stroke Length

Dimensions SHM - SM - LR - LRK - ABL - MLS

Dimensions for Type 1000kN consult our application engineers.

Without bellow

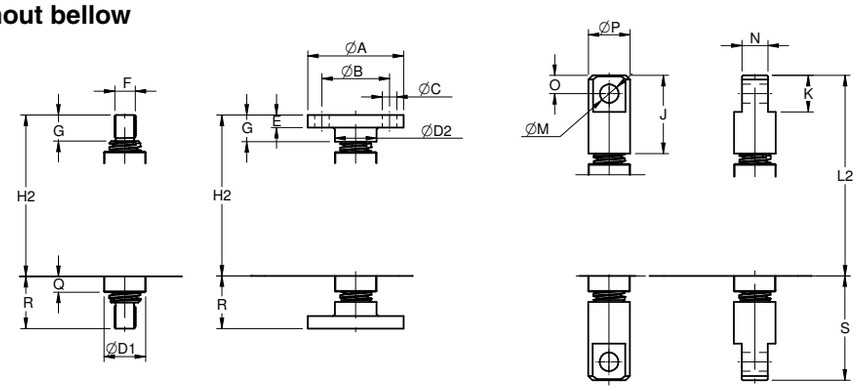


Fig. 53

Type	10	25	50	150	200	300	500
Ø A	65	92	122	150	185	215	285
Ø B	50	65	90	110	140	170	220
Ø C	4x7	4x14	4x18	4x21	4x26	6x26	6x33
Ø D1	28	40	50	70	80	110	140
Ø D2	30	40	55	70	90	120	150
E	8	12	16	20	25	25	32
F	M14x2	M20x1.5	M30x2	M40x3	M50x3	M70x4	M90x4
G	20	25	36	50	60	85	110
SHM	120+SL	167+SL	210+SL	269+SL	318+SL	429+SL	511+SL
SM	107+SL	150+SL	186+SL	227+SL	267+SL	335+SL	415+SL
LR H2	107+SL	150+SL	186+SL	227+SL	267+SL	335+SL	415+SL
LRK	117+SL	155+SL	186+SL	242+SL	267+SL	361+SL	415+SL
ABL	119+SL	165+SL	207+SL	260+SL	320+SL	398+SL	490+SL
MLS	107+SL	150+SL	186+SL	227+SL	267+SL	-	-
J	55	75	100	125	160	200	265
K	25	35	50	60	80	100	130
SHM	155+SL	217+SL	274+SL	344+SL	418+SL	544+SL	666+SL
SM	142+SL	200+SL	250+SL	302+SL	367+SL	450+SL	570+SL
LR L2	142+SL	200+SL	250+SL	302+SL	367+SL	450+SL	570+SL
LRK	152+SL	205+SL	250+SL	317+SL	367+SL	476+SL	570+SL
ABL	154+SL	215+SL	271+SL	335+SL	420+SL	513+SL	645+SL
MLS	142+SL	200+SL	250+SL	302+SL	367+SL	-	-
Ø M H11	12	18	25	30	40	50	65
N	20	25	35	45	60	80	100
0	12.5	17.5	25	30	40	50	65
Ø P	30	40	55	70	90	120	150
Ø Q	12	15	15	15	20	20	25
SHM *	37+SL/50+SL	45+SL/62+SL	56+SL/80+SL	70+SL/112+SL	85+SL/**	110+SL/**	140+SL/**
SM	37+SL	45+SL	56+SL	70+SL	85+SL	110+SL	140+SL
LR R	37+SL	45+SL	56+SL	70+SL	85+SL	110+SL	140+SL
LRK	37+SL	45+SL	56+SL	70+SL	85+SL	110+SL	140+SL
ABL	37+SL	45+SL	56+SL	70+SL	85+SL	110+SL	140+SL
MLS	37+SL	45+SL	56+SL	70+SL	85+SL	-	-
SHM *	72+SL/85+SL	95+SL/112+SL	120+SL/144+SL	145+SL/187+SL	185+SL/**	225+SL/**	295+SL/**
SM	72+SL	95+SL	120+SL	145+SL	185+SL	225+SL	295+SL
LR S	72+SL	95+SL	120+SL	145+SL	185+SL	225+SL	295+SL
LRK	72+SL	95+SL	120+SL	145+SL	185+SL	225+SL	295+SL
ABL	72+SL	95+SL	120+SL	145+SL	185+SL	225+SL	295+SL
MLS	72+SL	95+SL	120+SL	145+SL	185+SL	-	-

SL - Stroke Length
* Alternative depend on placement of SHM
** Consult Application Engineering

Dimensions SHM - SM - LR - LRK - ABL - MLS

Dimensions for Type 1000kN consult our application engineers.

With bellow

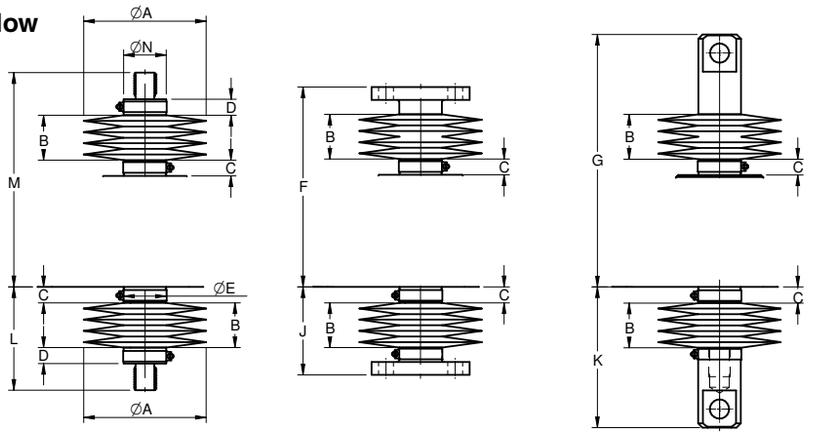


Fig. 54

Type	10	25	50	150	200	300	500
Ø A	95	115	130	150	190	225	270
B Min	5	5	5	5	5	5	5
B Max	0.05xSL	0.05xSL	0.05xSL	0.05xSL	0.05xSL	0.05xSL	0.05xSL
C	12	15	15	15	20	20	25
D	15	15	15	15	15	15	15
Ø E*	28	40	50	70	80	110	140
SHM	-	-	-	-	-	-	-
SM	102+B	145+B	181+B	222+B	262+B	330+B	410+B
LR F	102+B	145+B	181+B	222+B	262+B	330+B	410+B
LRK	112+B	150+B	181+B	237+B	262+B	356+B	410+B
ABL	114+B	160+B	203+B	255+B	315+B	393+B	485+B
MLS	102+B	145+B	181+B	222+B	262+B	-	-
SHM	-	-	-	-	-	-	-
SM	137+B	195+B	245+B	297+B	362+B	445+B	565+B
LR G	137+B	195+B	245+B	297+B	362+B	445+B	565+B
LRK	147+B	200+B	245+B	312+B	362+B	471+B	565+B
ABL	149+B	210+B	267+B	330+B	415+B	508+B	640+B
MLS	137+B	195+B	245+B	297+B	362+B	-	-
SHM	32+B	40+B	51+B	65+B	80+B	105+B	135+B
SM	32+B	40+B	51+B	65+B	80+B	105+B	135+B
LR J	32+B	40+B	51+B	65+B	80+B	105+B	135+B
LRK	32+B	40+B	51+B	65+B	80+B	105+B	135+B
ABL	32+B	40+B	51+B	65+B	80+B	105+B	135+B
MLS	32+B	40+B	51+B	65+B	80+B	-	-
SHM	67+B	90+B	115+B	140+B	180+B	220+B	290+B
SM	67+B	90+B	115+B	140+B	180+B	220+B	290+B
LR K	67+B	90+B	115+B	140+B	180+B	220+B	290+B
LRK	67+B	90+B	115+B	140+B	180+B	220+B	290+B
ABL	67+B	90+B	115+B	140+B	180+B	220+B	290+B
MLS	67+B	90+B	115+B	140+B	180+B	-	-
SHM	47+B	55+B	66+B	80+B	95+B	120+B	150+B
SM	47+B	55+B	66+B	80+B	95+B	120+B	150+B
LR L	47+B	55+B	66+B	80+B	95+B	120+B	150+B
LRK	47+B	55+B	66+B	80+B	95+B	120+B	150+B
ABL	47+B	55+B	66+B	80+B	95+B	120+B	150+B
MLS	47+B	55+B	66+B	80+B	95+B	-	-
SHM	-	-	-	-	-	-	-
SM	117+B	160+B	196+B	237+B	277+B	345+B	425+B
LR M	117+B	160+B	196+B	237+B	277+B	345+B	425+B
LRK	127+B	165+B	196+B	252+B	277+B	371+B	425+B
ABL	129+B	175+B	218+B	270+B	330+B	408+B	500+B
MLS	117+B	160+B	196+B	237+B	277+B	-	-
N	30	40	55	70	90	120	150

* Hole for hose clamp

Description of ball screw jack

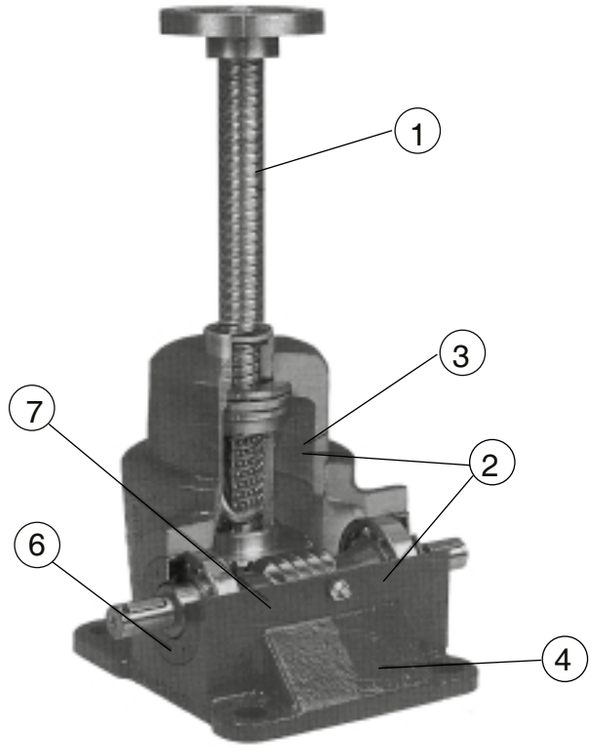


Fig. 55

1. Ball screw
2. Thrust and radial bearings
3. Grease of EP-quality
4. Housing of nodular cast iron
5. Alkyd paint 85 micron thick in RAL 1234
6. Worm screw hardended and ground
7. Worm wheel of centrifugally cast tin bronze
8. Bellows in PVC, steel or other materials. (without fig.)

Ball screw jacks HK and HKL are at full load designed for 60 % utilization (ED) per 10 minutes still not more than 30 % per hour totally at ambient temperature +25 °C. Ball screw jacks are filled with grease in EP-quality at delivery. The lifting screw should be lubricated with same type of grease. Allowable working temperature range is from -30 °C to +100 °C.

For other conditions consult our application engineers. Other types on request.

Technical data of HK - HKL

Other capacities and screw sizes available on request.

Type / Max capacity (kN)	**8**	**25**	**50**	**125**
Lifting screw	20x5	25x10	40x10	50x10
Ratio	9:1	7:1	6.75:1	7:1
Raise per revolution (mm)	0.555	1.428	1.481	1.428
Starting torque at max load (Nm)	2.5	16.0	32	76
Max running power at 30% ED (kW)	0.25	0.77	2.0	2.9
Starting efficiency η_s	0.28	0.35	0.39	0.37
Starting torque on lifting screw at max load (Nm)	9	56	114	292
Running efficiency η_d	See “Power ratings ball screw jack“			
* Holding torque (Nm)	0.35	2.5	6.0	14.0
Weight with 100 mm stroke HK/HKL (kg)	4/3.5	11/10	26/20	40/34
Weight of lifting screw, 100 mm (kg)	0.2	0.32	0.84	1.36

* The holding torque is the torque on the input shaft which is required to prevent the load from being lowered.

Compression load table ball screw jack Euler I & II

Compression load table HK - HKL Euler I

Max capacity, compression load (kN) for different lengths of stroke at threefold safetyfactor againgst breaking (Euler I)

Free load

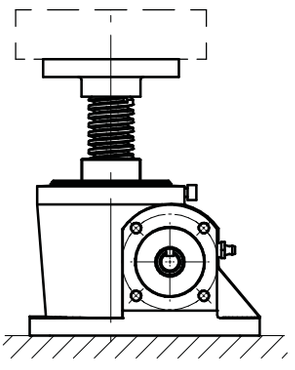


Fig. 56

Max capacity (kN)	Free spindle length (m)	8	25	50	125
	0.2				
	0.3	6.6	18		
	0.4	3.7	10		
	0.5	(2.4)	6.6	40	119
	0.6		(4.6)	28	83
	0.7			20	61
	0.8			16	46
	0.9			(12)	37
	1.0			(10)	30
	1.25				(19)
	1.50				
	1.75				
	2.00				
	2.25				
	2.50				

Compression load table HK - HKL Euler II

Max capacity, compression load (kN) for different lengths of stroke at threefold safetyfactor againgst breaking (Euler II)

Guided load

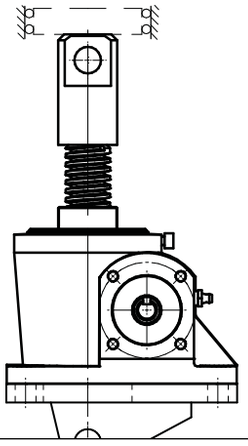


Fig. 57

Max capacity (kN)	Free spindle length (m)	8	25	50	125
	0.2				
	0.3				
	0.4				
	0.5				
	0.6	6.6	18		
	0.7	4.9	13		
	0.8	3.7	10		
	0.9	(3.0)	8.1		
	1.0	(2.4)	6.6	40	119
	1.25		(4.2)	26	76
	1.50			18	53
	1.75			(13)	39
	2.00			(10)	30
	2.25				(24)
	2.50				(19)

The values given in brackets must only be used at low lifting speed and concentric load on the lifting screws.

Compression load table ball screw jack Euler III

Compression load table HK - HKL Euler III

Max capacity (kN)		8	25	50	125
Max capacity, compression load (kN) for different lengths of stroke at threefold safetyfactor against breaking (Euler III)	0.2				
	0.3				
	0.4				
	0.5				
	0.6				
	0.7				
	0.8	7.7	21		
	0.9	5.9	16		
	1.0	4.8	13		
	1.25	(3.0)	8.4		
	1.50		5.8	36	106
	1.75		(4.3)	26	78
	2.00			20	60
	2.25			16	47
	2.50			(13)	38
	3.00				26
	3.50				(19)

Free spindle length (m)

Supported Spindle

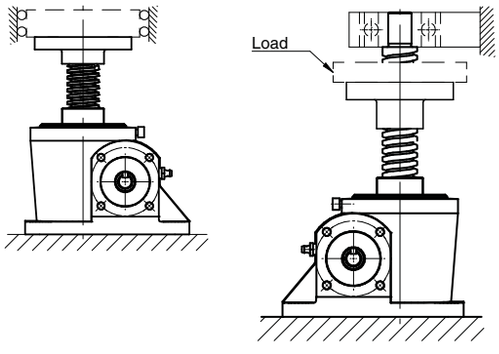


Abb. 58

The values given in brackets must only be used at low lifting speed and concentric load on the lifting screws.

Power ratings ball screw jack

Power ratings for HK - HKL at 60% ED/10 min or max 30% ED/hour at ambient temperature +25°C.

Note: Power ratings indicate running power. Additional power will be required on start. See “Selection of jacks“.

n = input speed (rpm)
v = lifting speed (mm/min)
η_d = running efficiency
Q = quick (low ratio)
T = input torque (Nm)
P = input power (kW)
i = ratio of worm gear set

HK 8 Q (i = 9) 20x5

n rpm	v mm/min	η_d	8 kN		6 kN		4 kN		2 kN		1 kN	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
2900	1611	.46	1.5	.46	1.2	.36	.87	.27	.56	.17	.40	.12
1750	972	.45	1.5	.28	1.2	.22	.87	.16	.56	.10	.40	.07
1500	833	.45	1.6	.25	1.3	.20	.92	.14	.58	.09	.41	.06
1000	556	.44	1.6	.17	1.3	.13	.92	.10	.58	.06	.41	.05
750	417	.43	1.6	.13	1.3	.10	.92	.07	.58	.05	.41	.05
500	278	.42	1.7	.09	1.3	.07	.97	.05	.61	.05	.42	.05
400	222	.41	1.7	.07	1.3	.06	.97	.05	.61	.05	.42	.05
300	167	.40	1.7	.05	1.3	.05	.97	.05	.61	.05	.42	.05
200	111	.39	1.8	.05	1.4	.05	1.0	.05	.63	.05	.44	.05
100	56	.37	1.9	.05	1.5	.05	1.1	.05	.66	.05	.45	.05
50	28	.35	2.0	.05	1.6	.05	1.1	.05	.68	.05	.46	.05

Power ratings ball screw jack

HK 25 Q (i = 7) 25x10

n rpm	v mm/min	η_d	25 kN		20 kN		15 kN		10 kN		7.5 kN		5 kN		2.5 kN	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
2700	3857	.56					6.0	1.7	4.1	1.2	3.2	.90	2.2	.63	1.3	.36
1750	2500	.55					6.1	1.1	4.2	.75	3.2	.58	2.3	.41	1.3	.24
1500	2143	.55					6.1	.96	4.2	.66	3.2	.51	2.3	.36	1.3	.20
1000	1429	.52			8.6	.90	6.5	.68	4.5	.47	3.4	.36	2.4	.25	1.4	.14
750	1071	.52			8.7	.69	6.6	.52	4.5	.36	3.5	.28	2.4	.19	1.4	.11
500	714	.51	11	.58	8.9	.47	6.8	.36	4.6	.24	3.6	.19	2.5	.13	1.4	.07
400	571	.50	11	.47	9.1	.38	6.9	.29	4.7	.20	3.6	.15	2.5	.11	1.4	.06
300	429	.49	12	.36	9.3	.29	7.0	.22	4.8	.15	3.7	.12	2.6	.08	1.5	.05
200	286	.48	12	.25	9.5	.20	7.2	.15	4.9	.10	3.8	.08	2.6	.06	1.5	.05
100	143	.46	12	.13	9.9	.10	7.5	.08	5.1	.05	3.9	.05	2.7	.05	1.5	.05
50	71	.44	13	.07	10	.06	7.9	.05	5.4	.05	4.1	.05	2.9	.05	1.6	.05

HK 50 Q (i = 6.75) 40x10

n rpm	v mm/min	η_d	50 kN		40 kN		30 kN		25 kN		20 kN		15 kN		10 kN	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
2000	2963	.58					12	2.5	10	2.1	8.2	1.7	6.3	1.3	4.4	.91
1750	2593	.58					12	2.2	10	1.8	8.2	1.5	6.3	1.1	4.4	.80
1500	2222	.58					12	1.9	10	1.6	8.3	1.3	6.4	.99	4.4	.69
1000	1481	.55			17	1.8	13	1.4	11	1.1	8.7	.93	6.7	.71	4.6	.49
750	1111	.55			17	1.3	13	.99	11	.83	8.8	.67	6.7	.51	4.7	.36
500	741	.52	23	1.2	18	.97	14	.73	12	.61	9.3	.50	7.1	.38	4.9	.26
400	593	.51	23	.95	18	.76	14	.58	12	.49	9.4	.39	7.2	.30	5.0	.21
300	444	.51	23	.72	19	.58	14	.44	12	.37	9.5	.30	7.3	.23	5.0	.16
200	296	.49	24	.49	19	.39	14	.30	12	.25	9.7	.20	7.4	.15	5.1	.11
100	148	.48	25	.26	20	.21	15	.16	13	.13	10	.11	7.7	.08	5.3	.06
50	74	.46	26	.13	21	.10	16	.08	13	.07	11	.05	8.0	.05	5.5	.05

HK 125 Q (i = 7) 50x10

n rpm	v mm/min	η_d	125 kN		100 kN		75 kN		50 kN		25 kN		20 kN		10 kN	
			Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW	Nm	kW
1750	2500	.56							20	3.7	10	1.9	8.4	1.5	4.5	.83
1500	2143	.56							20	3.2	10	1.6	8.4	1.3	4.5	.72
1000	1429	.55							21	2.1	11	1.1	8.6	.88	4.6	.47
750	1071	.52					32	2.5	22	1.7	11	.86	9.1	.70	4.8	.37
500	714	.51					33	1.7	22	1.1	11	.59	9.2	.48	4.9	.25
300	429	.50			45	1.4	34	1.1	23	.71	12	.36	9.4	.30	5.0	.16
250	357	.50			45	1.2	34	.90	23	.61	12	.31	9.5	.25	5.0	.13
200	286	.49			46	.95	34	.72	23	.48	12	.25	9.6	.20	5.1	.11
150	214	.49	58	.91	46	.73	35	.55	23	.37	12	.19	9.7	.15	5.2	.08
125	179	.48	58	.76	47	.61	35	.46	24	.31	12	.16	9.8	.13	5.2	.07
100	143	.48	59	.62	47	.50	36	.37	24	.25	12	.13	10	.10	5.3	.06
50	71	.46	62	.32	49	.26	37	.19	25	.13	13	.07	10	.05	5.5	.05

Intermittence factor (ED) ball screw jack

Intermittence factor, if the ED is other than 30%/hour the running power (P_d) must be adjusted according to diagram which is calculated by following formula:

$$P_{ED} = \frac{30\%}{ED\%} \times P_{max}$$

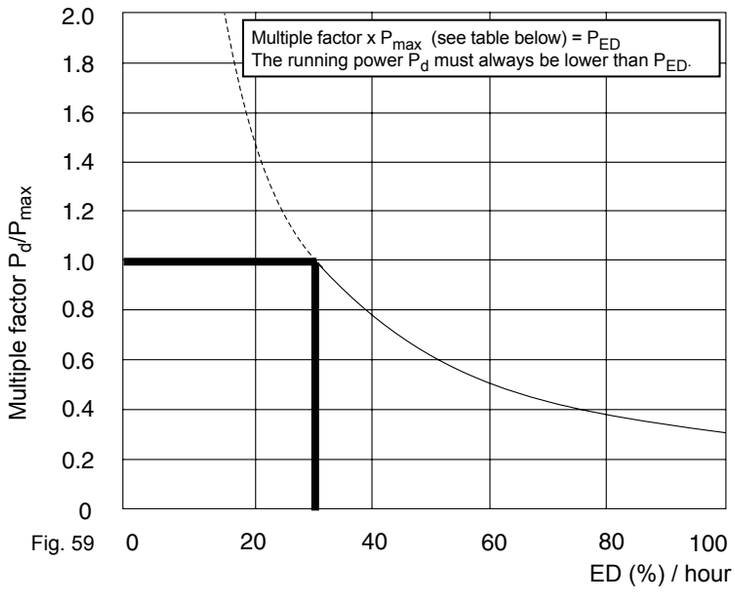


Fig. 59

Critical Travelling Nut Speed

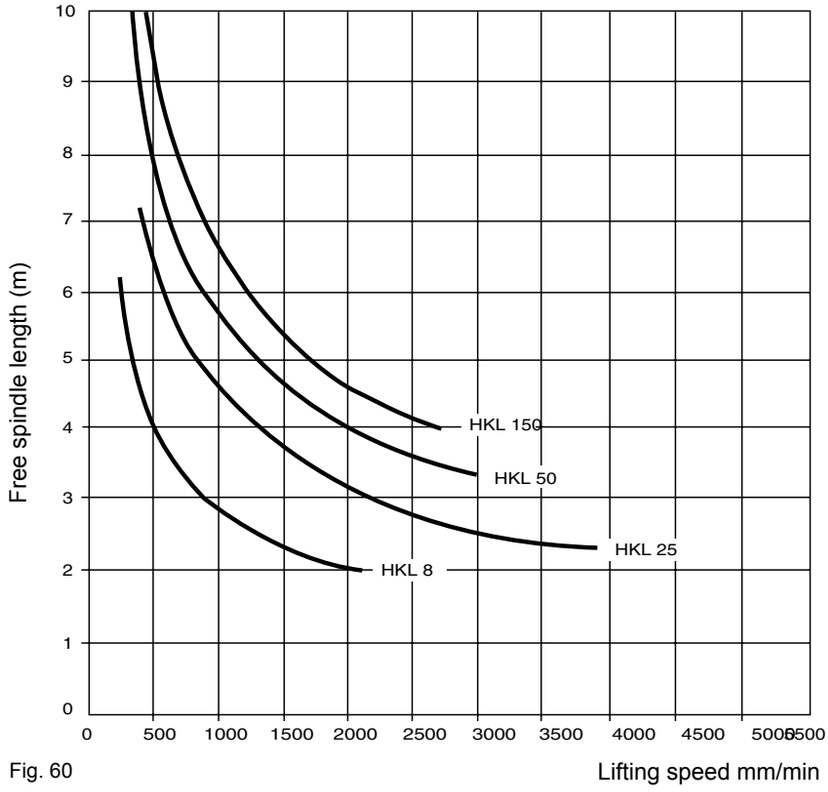


Fig. 60

Max Permissible Speed V mm/min With Grease Lubrication

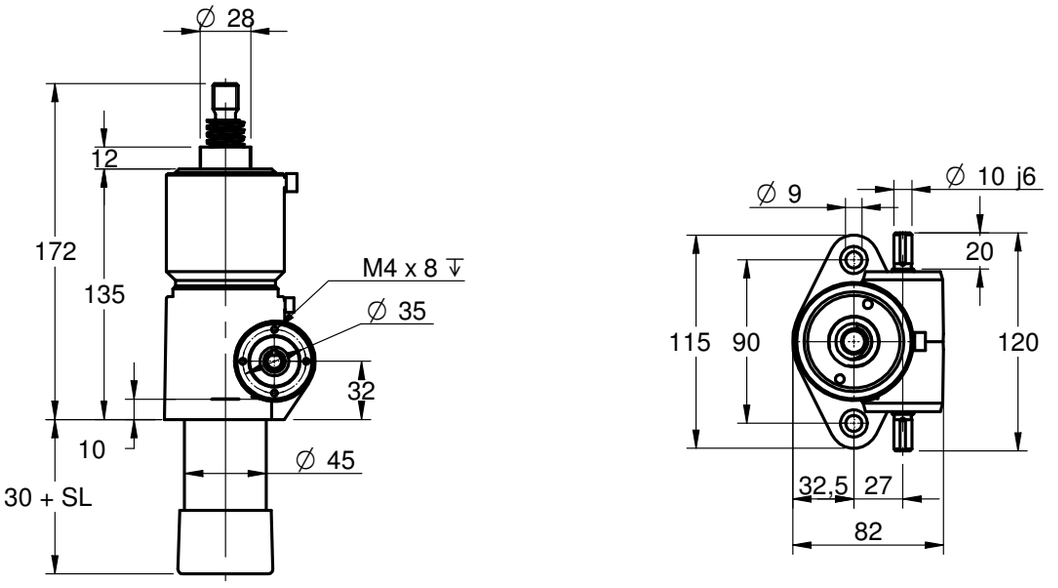
HK/HKL	Ratio Q
8	2100
25	3900
50	3000
125	2700

The nominal lifetime is reached by 90% of the ball screws before the running surfaces show any sign of fatigue. 50% of the ball screws reach a lifetime which is 5 times their nominal lifetime.

Lifetime In Running Metres x 10^3

Type	Max load (kN)	100% of max load	75% of max load	50% of max load
8	8	15.6	37.1	125.1
25	25	5.8	13.7	46.1
50	50	10.8	25.6	86.4
125	125	1.5	3.5	11.8

Dimensions HK 8



Keyway BS 4235

Fig. 61

Dimensions HK 25-125

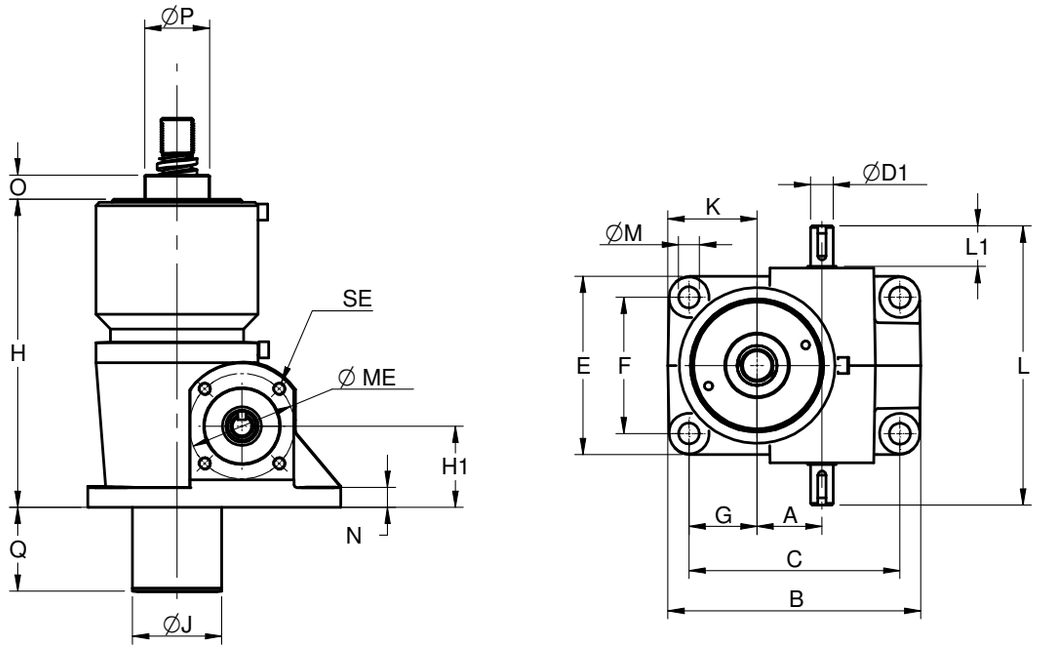


Fig. 62

Type	25	50	125
A	40	58	66
B	156	196	222
C	130	158	178
Ø D1	14	19	24
E	110	170	190
F	84	134	146
G	42	40	51
H	190	265	318
H1	50	55	68
Ø J	45	55	75
K	55	60	73
L	172	237	268
L1	25	35	40
Ø M	13	18	21
N	12	12	16
O	15	15	15
Ø P	40	50	70
Q	35+Stroke	35+Stroke	35+Stroke
SE	M8x12	M8x12	-
Ø ME	65	80	-

Dimensions HK 8-125 End Execution 1, 2, 3

Execution 1 (Road End)

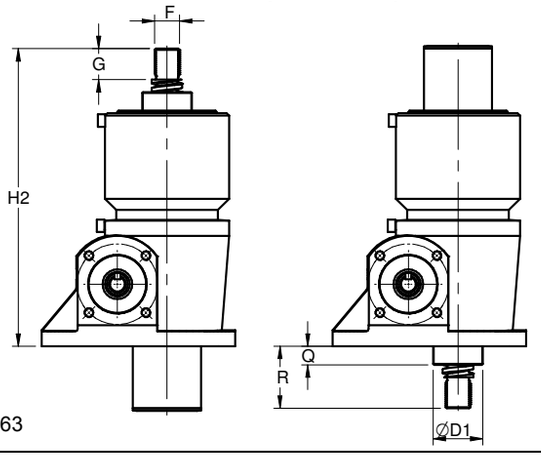


Fig. 63

Execution 2 (Top Plate)

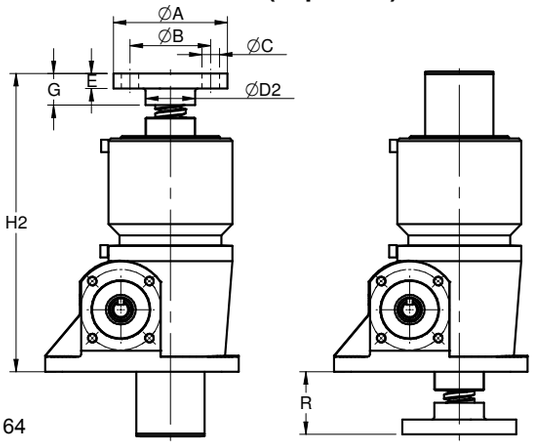


Fig. 64

Execution 3 (Clevis End)

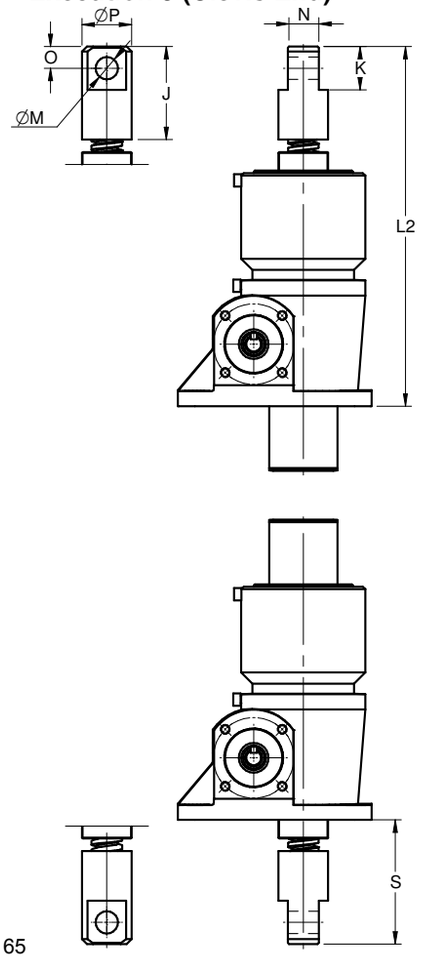


Fig. 65

Type	8	25	50	125
Ø A	65	92	122	150
Ø B	50	65	90	110
Ø C	4x7	4x14	4x18	4x21
Ø D1	28	40	50	70
Ø D2	30	40	55	70
E	8	12	16	20
F	M14x2	M20x1.5	M30x2	M40x3
G	20	25	36	50
H2	172	235	321	388
J	55	75	100	125
K	25	35	50	60
L2	207	285	385	463
Ø M H11	12	18	25	30
N	20	25	35	45
O	12.5	17.5	25	30
Ø P	30	40	55	70
Q	12	15	15	15
R	37	45	56	70
S	72	95	120	145

Dimensions with bellows HK 8-125

Execution 1 (Road End)

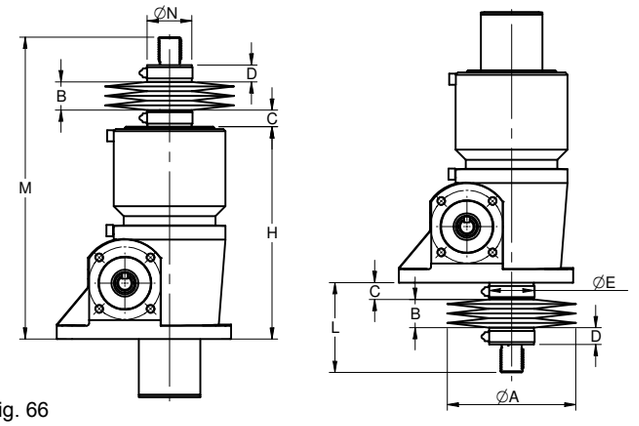


Fig. 66

Execution 2 (Top Plate)

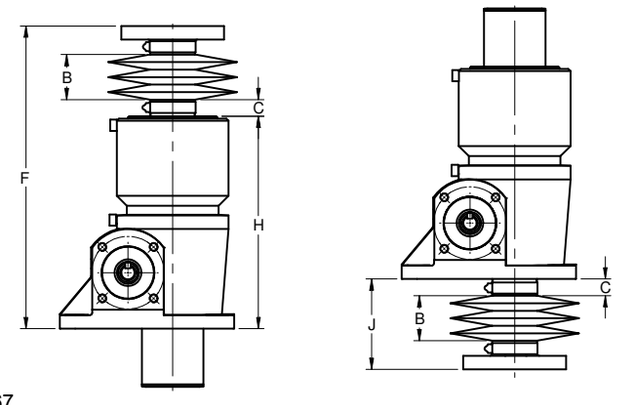


Fig. 67

Execution 3 (Clevis End)

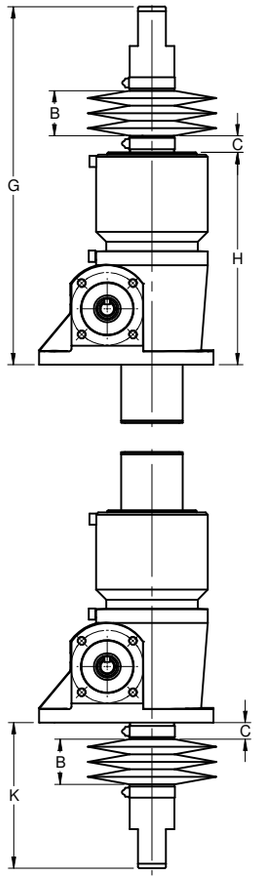


Fig. 68

Type	8	25	50	125
Ø A	95	115	130	150
B min	5	5	5	5
B max	0.05xStroke	0.05xStroke	0.05xStroke	0.05xStroke
C	12	15	15	15
D	15	15	15	15
Ø E*	28	40	50	70
F	172+B	235+B	321+B	388+B
G	207+B	285+B	385+B	463+B
H	135	190	265	318
J	37+B	45+B	56+B	70+B
K	72+B	95+B	120+B	145+B
L	52+B	60+B	71+B	85+B
M	187+B	250+B	336+B	403+B
Ø N	30	40	55	70

* Hole for hose clamp ØE + 30

Dimensions HKL 8-125

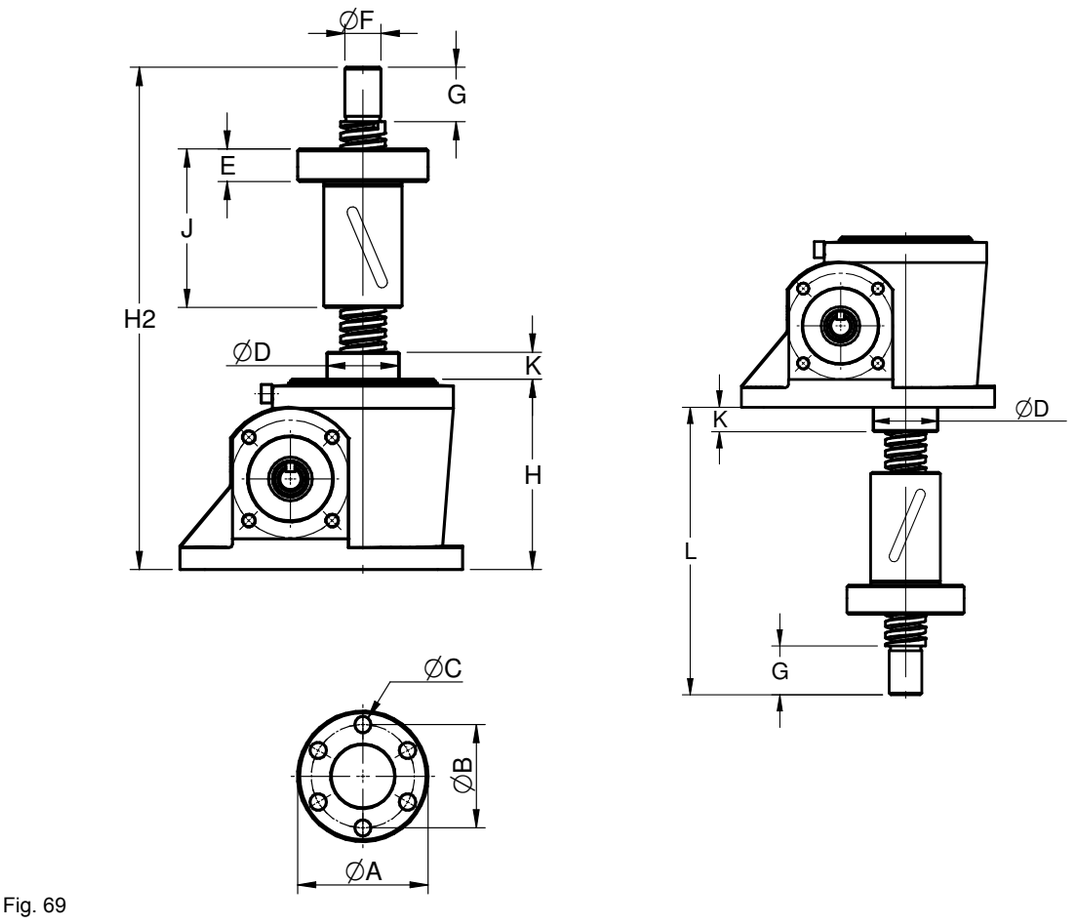


Fig. 69

Type	8	25	50	125
Ø A	83	72	117	137
Ø B	70	57	91	108
Ø C	4x7	6x9	8x18	8x18
Ø D	28	40	50	70
E	17	18	28	30
Ø F h7	12	20	30	40
G	20	30	40	60
H	70	105	130	157
H 2	185+Stroke	250+Stroke	340+Stroke	420+Stroke
J	57	88	114	136
K	12	15	15	15
L	121+Stroke	150+Stroke	230+Stroke	284+Stroke

IEC Motorflange

Further informations for Types 240 - 1000kN consult application engineers.

Type	Motor	Ø A		B	C		Ø H		Ø K		Ø P	Ø Q		R	SE	ME	NE	D	E	F	G
in kN	Size	B14	B5		B14	B5	B14	B5	B14	B5		B14	B5							B14/B5	
8/10	63	90	-		100.5	-	75		60		11	6		3.5					23	17.5	62
8/10	71	105	-	60	111.5	-	85		70		14	7		4	M4x8	35	28	38.5	30	21.5	73
8/10	80	120	-		119	-	100		80		19	7		4					40	19	80.5
20/25	63	92	140		112	112	75	115	60	95	11	6	6	3.5					23	3	52
20/25	71	102	160	86	118	118	85	130	70	110	14	7	7	4	M8x12	65	47	60	30	1/2	57/58
20/25	80	118	200		128	128	100	165	80	130	19	7	11.5	4					40	2	68
20/25	90	140	200		138	138	115	165	95	130	24	9	11.5	4					50	2	78
40/50	71	108	160		151	151	85	130	70	110	14	7	7	4					30	2.5	69
40/50	80	118	200		161	171	100	165	80	130	19	7	11.5	4					40	2.5/12.5	89
40/50	90	140	200	118.5	171	171	115	165	95	130	24	9	11.5	4	M8x12	80	62	82	50	2.5	89
40/50	100/112	160	250		181.5	181.5	130	215	110	180	28	9	14	5					60	3	99.5
120/150	71	108	160		171	171	85	130	70	110	14	7	7	4					30	7	79
120/150	80	118	200	134	181	191	100	165	80	130	19	7	11.5	4	M8x12	80	62	92	40	7	89
120/150	90	140	200		191	191	115	165	95	130	24	9	11.5	4					50	7	99
120/150	100/112	160	250		201.5	201.5	130	215	110	180	28	9	14	5					60	7.5	109
160/200	80	118	200		209	219	100	165	80	130	19	7	11.5	4					40	20	99
160/200	90	140	200	159	219	219	115	165	95	130	24	9		4	M10x15	72	88	110	50	10	109
160/200	100/112	160	250		229	229	130	215	110	180	28	9	14	5					60	10	119
160/200	132	-	300		-	254	-	265	-	230	38	-	14	5		90	108		80	15	144

Bigger jacksizes motorflanges are available on request.

All IEC-motors are accepted.

Other motors on request.

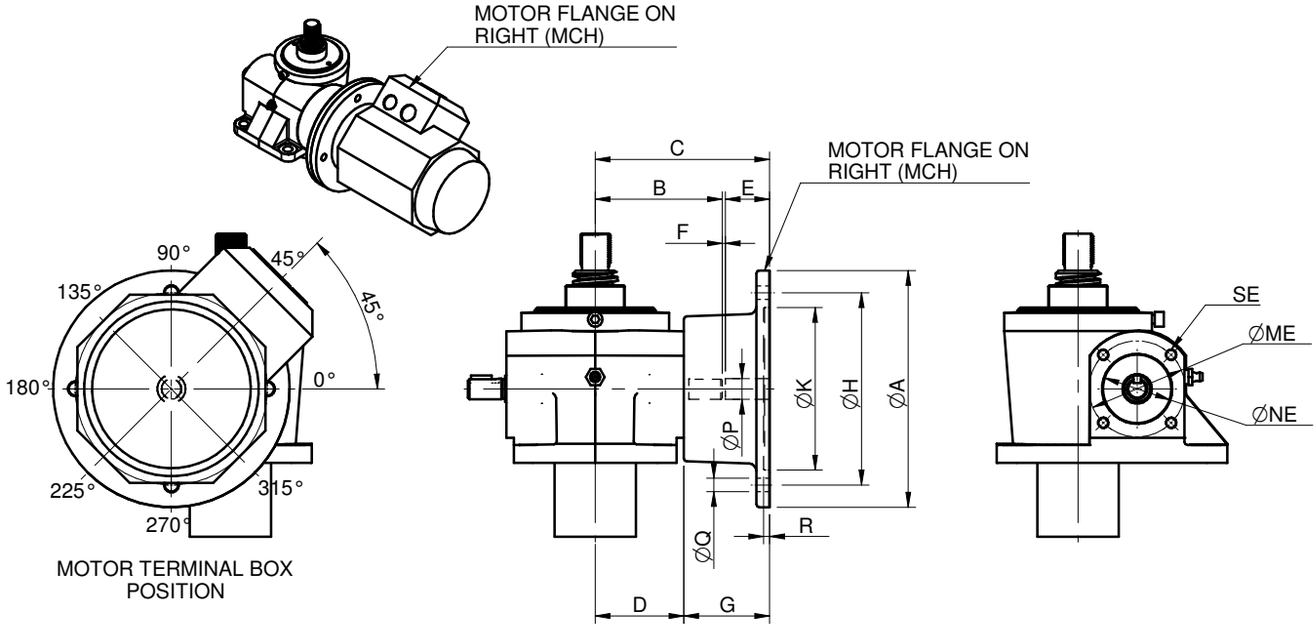
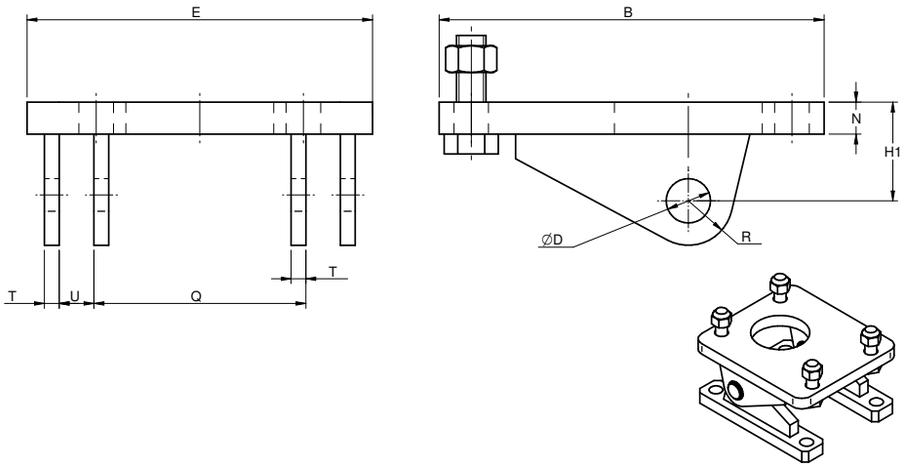


Fig. 70

Single trunnion



Double trunnion

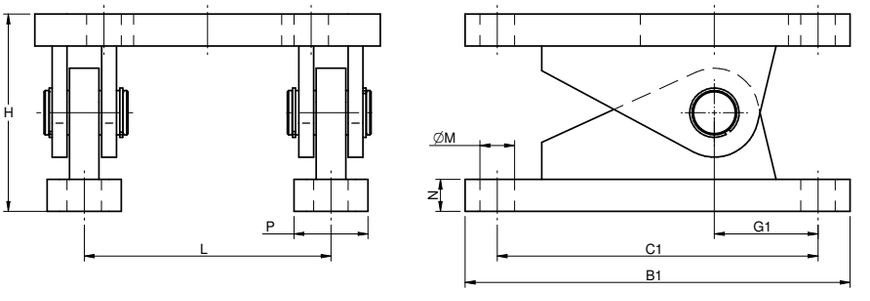


Fig. 71

Type	B	B1	C1	Ø D	E	G1	H	H1	L	Ø M	N	P	Q	R	T	U
8/10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20/25	156	156	130	18H7	140	42	80	40	100	14	13	30	86	18	6	14
40/50	196	205	165	25H7	170	47	105	52.5	125	18	16	35	108	25	8	17
120/150	222	234	190	35H7	250	63	150	75	170	22	22	70	138	35	15	32
160/200	300	300	250	40H7	300	85	170	85	210	26	28	70	173	40	18	37
240/300	350	350	280	50H7	350	95	205	102.5	250	33	34	80	208	50	20	42
400/500	460	460	380	65H7	440	140	260	130	320	39	47	90	268	65	25	52
800/10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

The types 8/10 and 800/1000 on request.

Combination screw jack with other products

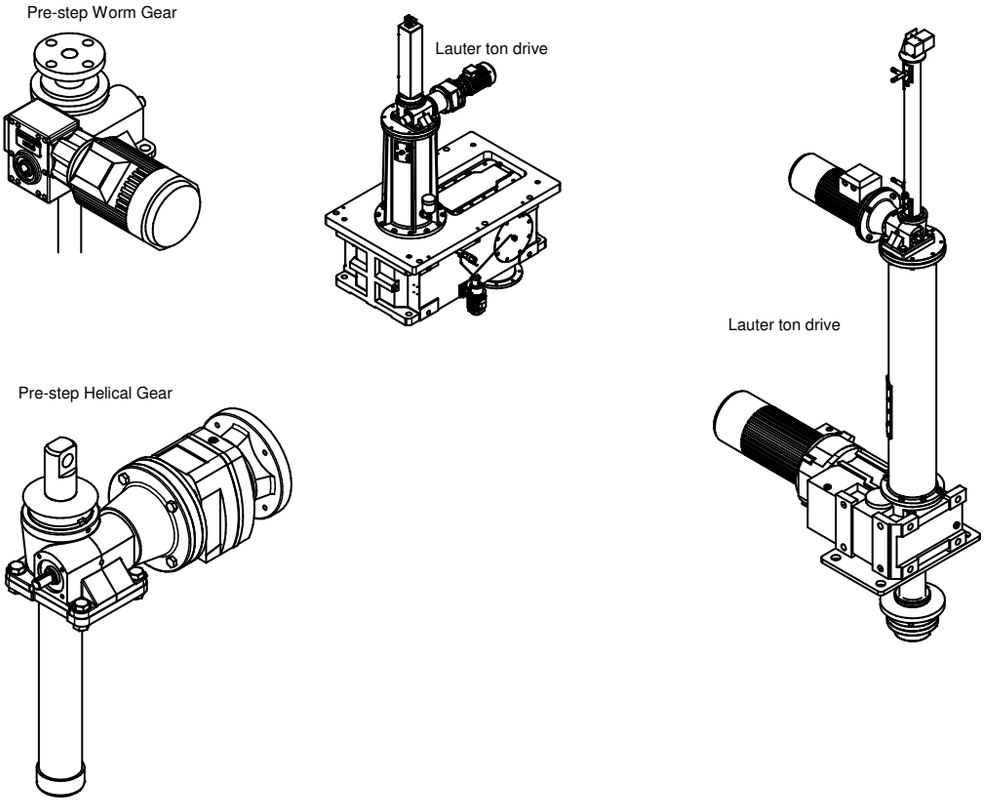


Fig. 72

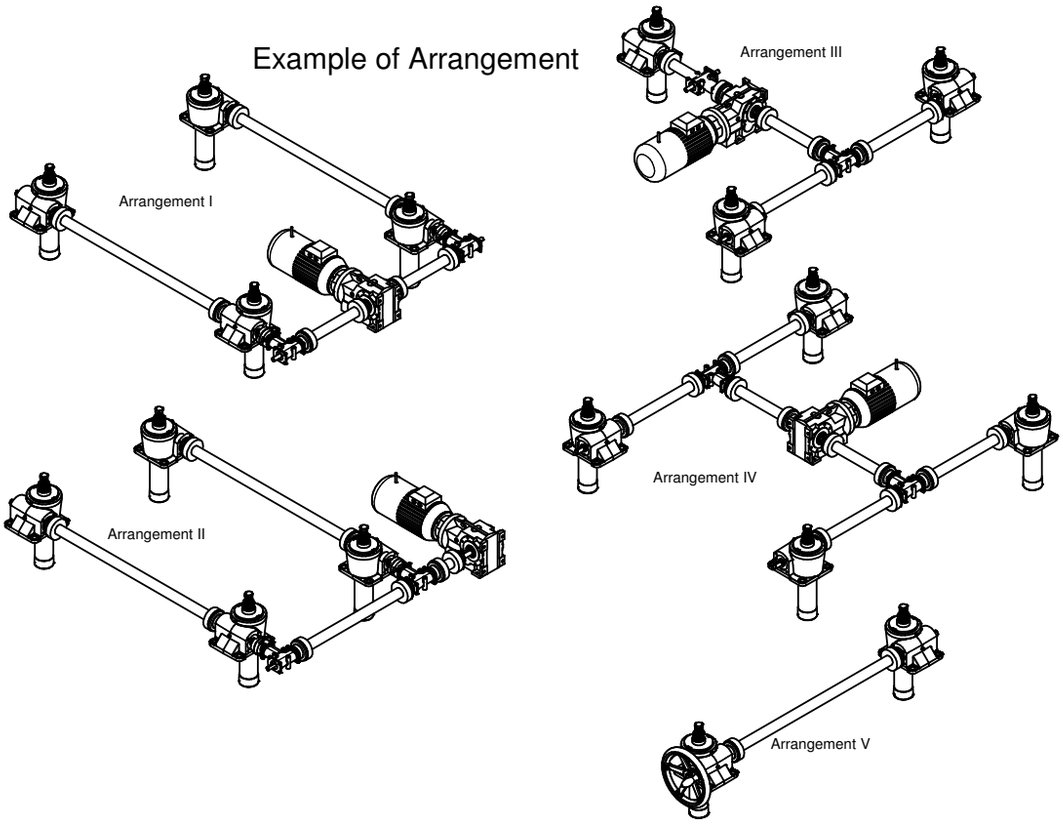


Fig. 73

Type X-G

Universal joint shafts for spanning any distance and for compensating for larger radial offset misalignments.
The element type X is torsionally very stiff, free from play, but has bending elasticty and is axially and angularly flexible.
Moreover, it is oil-resistant and withstands temperatures up to 150° C.

Selection of Universal Joint Shaft:

Torque capacity is in accordance with the table below.
Permissible angular misalignment is as shown in table and diagram below.
The maximum permissible length for the centre part is dependant on the speed. If there is any question, consult our application engineers.

a = parallel offset
L = Length of centre section
F = dimensions as in table below.
a = tan α (L-2F)

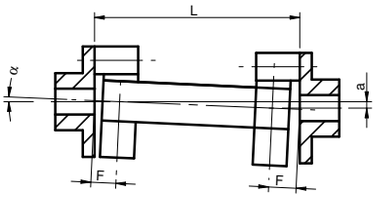


Fig. 74

Permissible Shaft Misalignment

Types	Angular Degree	Parallel Offset mm (a)	Axial mm
X-G	1°	tan α (L-2F)	±1

* Applies for 1500 RPM; for other speeds refer to diagram below.

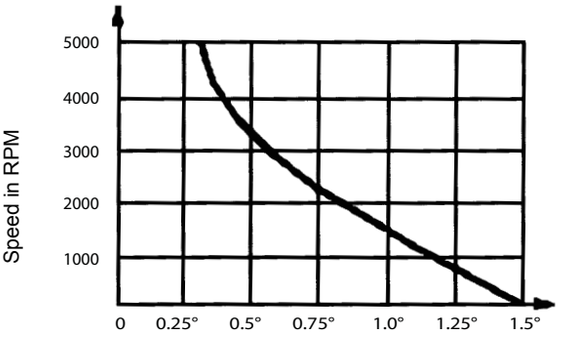


Fig. 75

Dimensions

Size	A	B	Ød1 min	Ød1 max	Ød2	Ød3	F	L1	M	ØN1	ØR	ØTK/Division
1	18	7	8	25	56	57	12	24	M6	36	30	44/2x180°
2	24	8	12	38	85	88	14	28	M8	55	40	68/2x180°
4	25	8	15	45	100	100	14.5	30	M8	65	45	80/3x120°
8	30	10	18	55	120	125	17	42	M10	80	60	100/3x120°
16	35	12	20	70	150	155	21	50	M12	100	70	125/3x120°
25	40	14	20	85	170	175	23	55	M14	115	85	140/3x120°
30	50	16	25	100	200	205	30	66	M16	140	100	165/3x120°

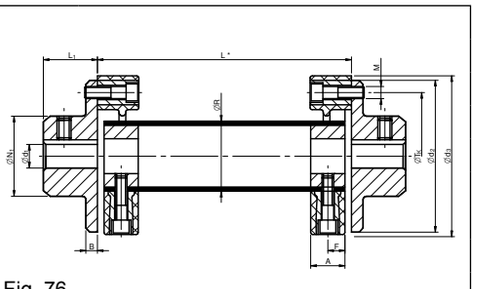


Fig. 76

* - Dimensions L stands for any non standard lengths. Always state the required dimension in enquiries and orders.

Sizes

The shafts are available in 7 sizes for nominal torques from 10 to 550 Nm with a single element for up to 1100 Nm with two elements connected in tandem.
Coupling selection should always be based on nominal torque rating.

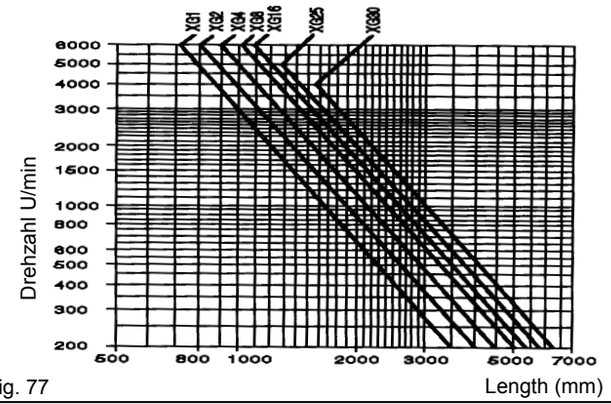


Fig. 77

Permissible Torques and Speeds

Size	Nominal torque TKN Nm	Max torque TKmax Nm	Max speed nmax rpm
1	10	25	10000
2	30	60	10000
4	60	120	8000
8	120	280	7000
16	240	560	6000
25	370	800	5000
30	550	1400	4500

Bevel gears

We recommend two types of bevel gears to be used in screw jack arrangement.

1. DZ-Range

For smaller loads and lower speeds we recommend the DZ-Range.

- Sand cast aluminium housing
- Hardened, straight bevel gears, ratio 1:1 or 2:1
- DZ1: Lubricated for life with grease
  DZ2-3-4: Lubricated with oil to be changed every 1000 hours
- All mounting positions possible
- Shaft dimensions acc. to ISO, keyways acc. to ISO, DZ1 have no keyways
- Lifetime approx 2000 hours.

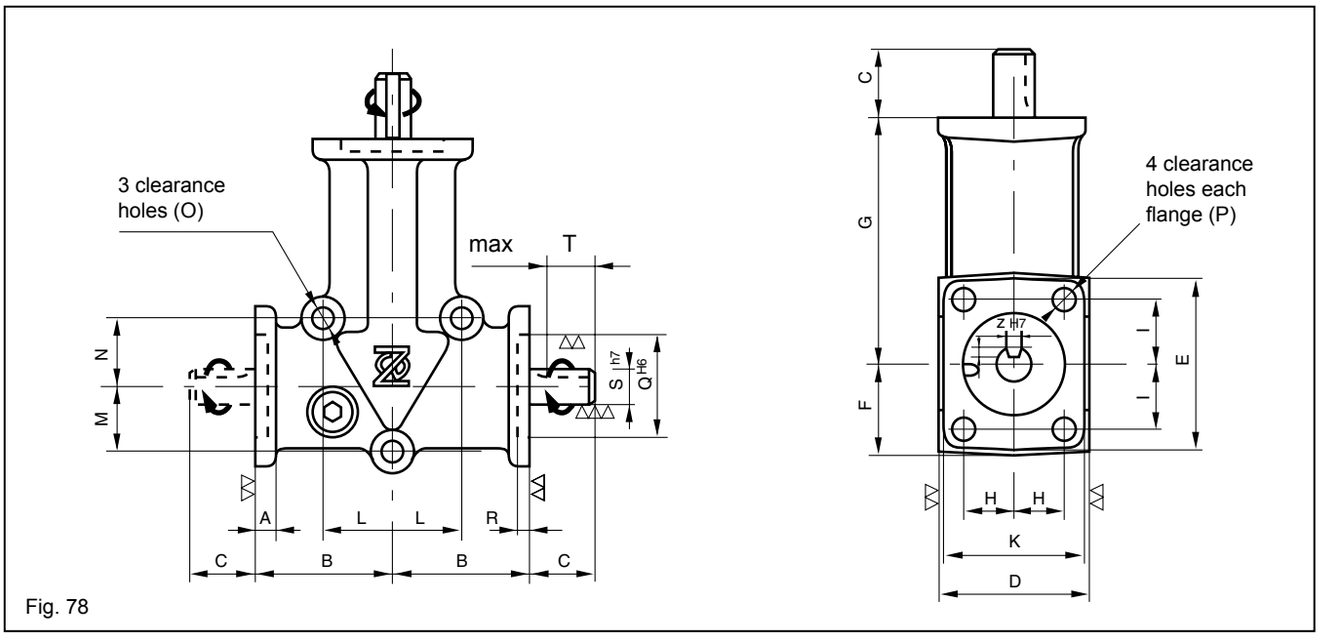


Fig. 78

Type	Shaft S	A	B	C	D	E	F	G	H	K	I	L	M	N	O	P	Q	R	S	T	U	Z	Wt (kg)
DZ 1	3	5	34	15	33	40	21	60	11	32	15	16	16	16	5.2	4.2	22	2.5	8				0.3
DZ 2	3	7	52	35	52	66	33	90	18	50	26	24	24	24	8.2	6.2	35	5	15	27	3	5	1.2
DZ 3	3	8	75	50	76	96	48	140	27	74	38	38	38	38	8.2	8.2	55	3.5	20	40	3.5	6	3.5
DZ 4	3	13	80	70	100	98	55	150	38	98	38	45	45	70	12.3	10.3	65	3.5	25	60	4	8	5.8

			DZ1		DZ2		DZ3		DZ4	
Input speed n1 rpm	Ratio	Output speed n2 rpm	Input power P1 kW	Output torque T2 Nm	Input power P1 kW	Output torque T2 Nm	Input power P1 kW	Output torque T2 Nm	Input power P1 kW	Output torque T2 Nm
50	1:1	50	0.02	3.5	0.07	12.3	0.25	47	0.32	62
50	2:1	25	0.01	2.4	0.02	7.3	0.08	29	0.14	53
200	1:1	200	0.07	3.3	0.24	11.4	0.92	44	1.14	55
200	2:1	100	0.01	1.4	0.07	6.4	0.27	26	0.48	46
600	1:1	600	0.18	2.9	0.65	10.3	2.40	38	2.90	46
600	2:1	300	0.04	1.3	0.18	5.8	0.75	24	1.33	42
1000	1:1	1000	0.27	2.6	0.98	9.3	3.58	34	4.25	41
1000	2:1	500	0.07	1.2	0.28	5.3	1.08	21	1.89	36
1500	1:1	1500	0.37	2.3	1.36	8.7	4.64	29	5.87	37
1500	2:1	750	0.10	1.2	0.42	5.2	1.55	20	2.74	35
3000	1:1	3000	0.62	2.0	2.51	8.0	8.73	28	10.75	34
3000	2:1	1500	0.14	0.9	0.60	3.8	2.78	18	4.56	29

2. C-Range

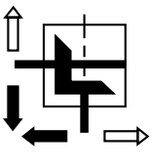
For larger loads and higher speeds we recommend the C-Range.

- High resistance aluminium alloy housing
- Hardened, tempered and lapped spiral bevel gears Ratio 1:1 or 2:1
- Lubricated with synthetic oil (Not filled at delivery)
- All mounting positions are possible without modification of fixing
- Oil sealing to IP 43
- Lifetime approx 6000 hours
- Rotation in two directions.

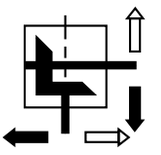
Bevel gears with other ratio and higher power ratings available on request.

Shaft Arrangements

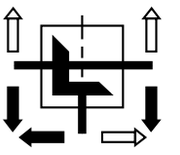
A Option



B Option



C Option



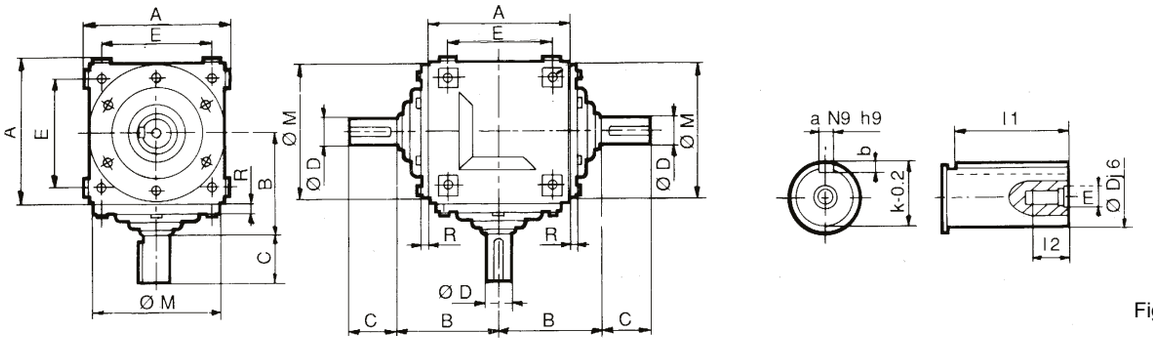


Fig. 79

Type	A	B	C	ØDj6	E	F	ØMf7	R	Kg
C 12	124	97	50	25	95	M8x14	116	10	6
C 16	160	115	60	30	120	M10x20	150	12	12
C 20	200	140	75	40	150	M12x25	190	13	22

Shaft	Shaft key as per DIN 6885 NF 22 1 75 BS 4236				Tapped hole	
Ø Dj6	ah9	b	k-0.2	l1	m	l2
25	8	7	28	45	M8	15
30	8	7	33	55	M8	15
40	12	8	43	70	M10	19

Example of Coding

C	16	C	1
			Ratio: 1 or 2
Size: 12 - 16 - 20		Number of shafts + direction of rotation	

Admissible Radial Loads on Shaft End

Type	Input speed (rpm)								
	1500	500	50	1500	500	50	1500	500	50
	F1 (N)			F2 (N)			F3 (N)		
	Loadfactor Kt = 1.55								
C 12	300	650	1800	300	650	1800	750	1150	2350
C 16	500	1100	3000	500	1100	3000	1250	2000	3900
C 20	1000	1800	5000	1000	1800	5000	2500	3400	6500
	Loadfactor Kt = 2								
C 12	600	850	2350	600	850	2350	800	1350	2600
C 16	950	1400	3800	950	1400	3800	1350	2350	4500
C 20	1900	2300	6400	1900	2300	6400	2700	4000	8500

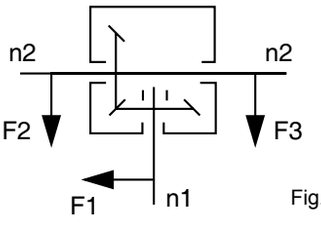


Fig. 80

Kt = 1 for direct coupling

Bevel gears

Nominal Powers Pn - Torques on High Speed Shaft (n1)

P_n is the nominal power calculated for a life of 6000 with service factor Ka = 1.

Type	Torques and powers	Speeds on high speed shaft n1 in RPM														
		10	**50**	**125**	**250**	**500**	**750**	**1000**	**1250**	**1500**	**1750**	**2000**	**2250**	**2500**	**2750**	**3000**
		Ratio = 1														
C 12	Torque - Couple - M.....daNm	19.1	17.2	14.5	13.3	11.4	10.1	9.5	9.1	8.9	8.73	8.6	8	7.6	7.1	6.6
	Power - Pn - Pn .....kW	0.2	0.9	1.9	3.5	6	8	10	12	14	16	18	19	20	20.5	21
C 16	Torque - Couple - M.....daNm	38.2	30.5	26.7	22.9	20	18.4	17.2	15.6	15.2	13.3	11.9	11	10.3	9.55	
	Power - Pn - Pn .....kW	0.4	1.6	3.5	6	10.5	14.5	18	20.5	24	24.5	25	26	27	27.5	
C 20	Torque - Couple - M.....daNm	76.4	61.1	53.5	45.8	40	36.9	34.3	32	31.8	28	25.3	23	22.3		
	Power - Pn - Pn .....kW	0.8	3.2	7	12	21	29	36	42	50	51.5	53	54.5	58.5		
		Ratio = 2														
C 12	Torque - Couple - M.....daNm	9.5	5.7	5.3	4.9	4.7	4	3.8	3.6	3.5	3.2	3.1	2.9	2.8	2.7	2.7
	Power - Pn - Pn .....kW	0.1	0.3	0.7	1.3	2.5	3.2	4	4.7	5.5	6	6.5	7	7.5	8	8.5
C 16	Torque - Couple - M.....daNm	19.1	15.2	12.9	11.4	9.5	8.9	8.1	7.6	7.3	7	6.9	6.5	6.1	5.7	5.4
	Power - Pn - Pn .....kW	0.2	0.8	1.7	3	5	7	8.5	10	11.5	13	14.5	15.5	16	16.5	17
C 20	Torque - Couple - M.....daNm	38.2	28.6	26.7	22.9	19.1	17.8	17.1	16	15.6	15.2	14.3	14	13.7	12.6	11.9
	Power - Pn - Pn .....kW	0.4	1.5	3.5	6	10	14	18	21	24.5	28	30	33	36	36.5	37.5

Selection

Pm = Pu x Ka x Ki x Kt
Pm: Corrected output power (kW)
Pu: Power absorbed by machine (kW)
Ka: Service factor
Ki: Life factor
Kt: Radial load factor

Ratio $i = \frac{n1}{n2}$

n1 = speed on high speed shaft in RPM
n2 = speed on low speed shaft in RPM

Select the “Cubic“ bevel box so:
Pn $\geq$ **Pm**
Pn = Nominal power

Service Factor Ka

Prime mover	Nominal or infrequent starting	Driven machine Moderate shocks or fairly frequent starting	Hevy shocks or very frequent starting
Electric motor Steam turbine	1.00	1.25	1.50

Life Factor Ki

The design life indicate the number of hours running producing normal wear without destruction.

Life required in hours					
100	1000	6000	10000	15000	20000
0.6	0.8	1	1.05	1.2	1.35

Lubrication of Bevel Gears

Lubrication by splash:
- All types
- All positions
- Lubrication: recommended oil given on box (bevel box) delivered without oil

Type	C 12	C 16	C 20
Quantity in litres	0.4	0.8	1.5

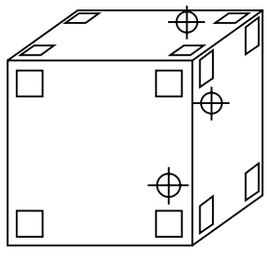


Fig. 81

FILLING BREATHER:
breather on top or with elbow on the vertical face.

DRAINING:
on the side or bottom face.

LEVEL:
(by plug): always in the bottom right hand corner.

The Spring Protection is made of high quality hardened spring steel to dimension shown down.

- Protect the spindle against dirt and damage and reduces the accident risk
- Very good sealing effect between the coils
- Available in stainless steel on request.

Di = inside diam ± 1
Da = outsinde diam ± 2
DF1 = outside diam of centering flange (Di - 2 mm)
DF2 = inside diam of flange socket (Da + 4 mm)
L_{min} = minimale Einbaulänge
L_{max} = maximale Einbaulänge

IMPORTANT
When ordering state vertical or horizontal position!

		Di	Da	L_h max	L_v max	L min	
Type / Capacity (kN) 10							
SF	30/350/30	30	49	290	350	30	
SF	30/550/40	30	58	490	550	40	
SF	30/750/50	30	58	690	750	50	
Type / Capacity (kN) 25							
SF	40/350/30	40	60	290	350	30	
SF	40/550/40	40	68	490	550	40	
SF	40/750/50	40	69	650	750	50	
SF	40/900/60	40	70	-	900	60	
SF	40/1500/75	40	90	-	1500	75	
Type / Capacity (kN) 50							
SF	50/250/30	50	68	190	250	30	
SF	50/550/50	50	73	450	550	50	
SF	50/750/60	50	80	630	750	60	
SF	50/1100/100	50	77	900	1100	100	
SF	50/1800/100	50	94	-	1800	100	
Type / Capacity (kN) 125							
SF	60/250/30	60	78	190	250	30	
SF	60/450/50	60	82	350	450	50	
SF	60/750/60	60	89	630	750	60	
SF	60/1100/75	60	102	950	1100	75	
SF	60/2100/120	60	108	1860	2100	120	
Type / Capacity (kN) 200							
SF	75/250/30	75	98	190	250	30	
SF	75/450/50	75	101	350	450	50	
SF	75/750/60	75	109	630	750	60	
SF	75/900/75	75	111	750	900	75	
SF	75/1700/100	75	126	1500	1700	100	
SF	75/2200/120	75	132	1900	2200	120	
SF	75/1800/150	75	145	2500	2800	150	
SF	75/3250/180	75	156	2500	3250	180	*
SF	75/3500/200	75	158	-	3500	200	*
Type / Capacity (kN) 300							
SF	110/450/60	110	139	330	450	60	
SF	110/600/75	110	140	450	600	75	
SF	110/900/100	110	139	700	900	100	
SF	110/1300/120	110	145	1060	1300	120	*
SF	110/2000/150	110	165	1700	2000	150	*
SF	110/2400/180	110	170	-	2400	180	*
SF	110/2800/200	110	172	2500	2800	200	*

Telescopic Spring Protection

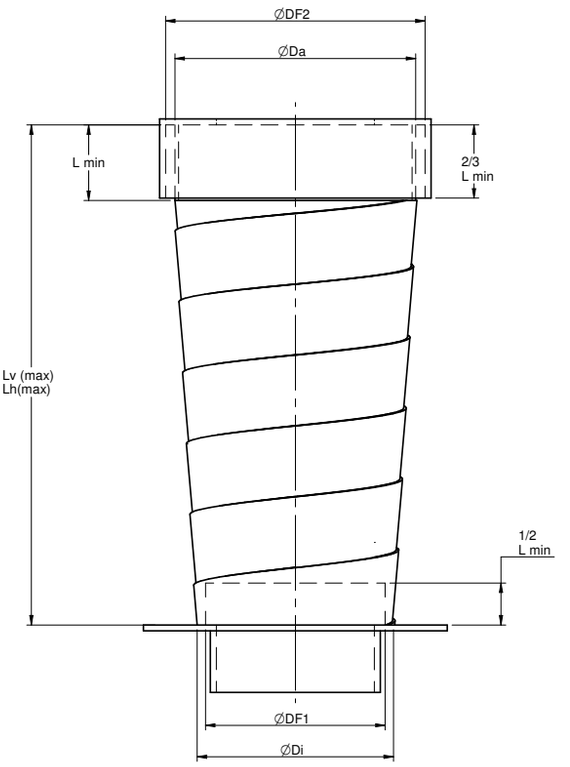


Fig. 82

* - Available in Steel only,
Other dimensions available on request.

Lubrication of screw jacks

Type of Grease

1. At ambient temperature -30° to +30° C

BP	Energrease LS-EP2
Castrol	Spheerol EPL2
Esso	Beacon EP2
Gulf	Gulflex MP
Mobil	Mobilux EP2
Shell	Alvania EP Grease 2 alt Retinax A
SKF	Alfalub LGEP2
Texaco	Mulfifak EP2

2. At ambient temperature -45 °C to -30 °C
   Mobil Mobil SHC32

3. At ambient temperature +30 °C to +60 °C
   Mobil Mobiltemp SHC100
   Sealrings in viton are recommended.

Lubrication intervals

Normal duty < 1 000 mm/min lifting speed:
Every 30 hours of duty

Arduous duty > 1 000 mm/min lifting speed:
Every 10 hours of duty

Renew grease every 400 hours of duty.

Note: On screw jack type HNL and HKL the lifting screw shall always be lubricated with a thin film of grease.

Screw Jack Body Grease Quantity

Type		Grease quantity
HN/HQ & HNL/HQL	10	0.3 kg
HN/HQ & HNL/HQL	25	0.5 kg
HN/HQ & HNL/HQL	50	0.9 kg
HN/HQ & HNL/HQL	150	1.2 kg
HN/HQ & HNL/HQL	200	1.4 kg
HN/HQ & HNL/HQL	300	2.5 kg
HN/HQ & HNL/HQL	500	5.2 kg
HN/HQ & HNL/HQL	1000	15.0 kg
HK	8	0.4 kg
HK	25	0.7 kg
HK	50	1.7 kg
HK	125	2.0 kg
HKL	8	0.3 kg
HKL	25	0.5 kg
HKL	50	0.9 kg
HKL	125	1.2 kg

IMPORTANT

Product Safety Information

General - The following information is important in ensuring safety. It must be brought to the attention of personnel involved in the selection of power transmission equipment, those responsible for the design of the machinery in which it is to be incorporated and those involved in its installation, use and maintenance.

Our equipment will operate safely provided it is selected, installed, used and maintained properly. As with any power transmission equipment proper precautions must be taken as indicated in the following paragraphs, to ensure safety.

Potential Hazards - these are not necessarily listed in any order of severity as the degree of danger varies in individual circumstances. It is important therefore that the list is studied in its entirety:

1) Fire/Explosion
   (a) Oil mists and vapour are generated within gear units. It is therefore dangerous to use naked lights in the proximity of gearbox openings, due to the risk of fire or explosion.
   (b) In the event of fire or serious overheating (over 300° C), certain materials (rubber, plastics, etc.) may decompose and produce fumes. Care should be taken to avoid exposure to the fumes, and the remains of burned or overheated plastic/rubber materials should be handled with rubber gloves.
2) Guards - Rotating shafts and couplings must be guarded to eliminate the possibility of physical contact or entanglement of clothing. It should be of rigid construction and firmly secured.
3) Noise - High speed gearboxes and gearbox driven machinery may produce noise levels which are damaging to the hearing with prolonged exposure. Ear defenders should be provided for personnel in these circumstances.
4) Lifting - Where provided (on larger units) only the lifting points or eyebolts must be used for lifting operations (see maintenance manual or general arrangement drawing for lifting point positions). Failure to use the lifting points provided may result in personal injury and/or damage to the product or surrounding equipment. Keep clear of raised equipment.
5) Lubricants and Lubrication
   (a) Prolonged contact with lubricants can be detrimental to the skin. The manufacturer's instruction must be followed when handling lubricants.
   (b) The lubrication status of the equipment must be checked before commissioning. Read and carry out all instructions on the lubricant plate and in the installation and maintenance literature. Heed all warning tags. Failure to do so could result in mechanical damage and in extreme cases risk of injury to personnel.
6) Electrical Equipment - Observe hazard warnings on electrical equipment and isolate power before working on the gearbox or associated equipment, in order to prevent the machinery being started.
7) Installation, Maintenance and Storage
   (a) In the event that equipment is to be held in storage, for a period exceeding 6 months, prior to installation or commissioning, we must be consulted regarding special preservation requirements. Unless otherwise agreed, equipment must be stored in a building protected from extremes of temperature and humidity to prevent deterioration.

   The rotating components (gears and shafts) must be turned a few revolutions once a month (to prevent bearings brinelling).
   (b) External gearbox components may be supplied with preservative materials applied, in the form of a "waxed" tape overwrap or wax film preservative. Gloves should be worn when removing these materials. The former can be removed manually, the latter using white spirit as a solvent.

   Preservatives applied to the internal parts of the gear units do not require removal prior to operation.
   (c) Installation must be performed in accordance with the manufacturer's instructions and be undertaken by suitably qualified personnel.
   (d) Before working on a gearbox or associated equipment, ensure that the load has been removed from the system to eliminate the possibility of any movement of the machinery and isolate power supply. Where necessary, provide mechanical means to ensure the machinery cannot move or rotate. Ensure removal of such devices after work is complete.
   (e) Ensure the proper maintenance of gearboxes in operation. Use only the correct tools and our approved spare parts for repair and maintenance. Consult the Maintenance Manual before dismantling or performing maintenance work.
8) Hot Surfaces and Lubricants
   (a) During operation, gear units may become sufficiently hot to cause skin burns. Care must be taken to avoid accidental contact.
   (b) After extended running the lubricant in gear units and lubrication systems may reach temperatures sufficient to cause burns. Allow equipment to cool before servicing or performing adjustments.
9) Selection and Design
   (a) Where gear units provide a backstop facility, ensure that back-up systems are provided if failure of the backstop device would endanger personnel or result in damage.
   (b) The driving and driven equipment must be correctly selected to ensure that the complete machinery installation will perform satisfactorily, avoiding system critical speeds, system torsional vibration, etc.
   (c) The equipment must not be operated in an environment or at speeds, powers, torques or with external loads beyond those for which it was designed.
   (d) As improvements in design are being made continually the contents of this catalogue are not to be regarded as binding in detail, and drawings and capacities are subject to alterations without notice.

The above guidance is based on the current state of knowledge and our best assessment of the potential hazards in the operation of the gear units.

Any further information or clarification required may be obtained by contacting our Application Engineers.