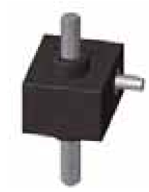
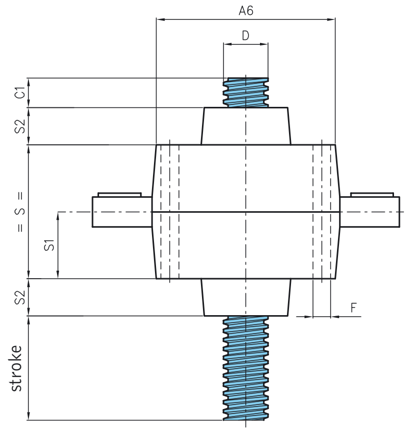
Series construction models

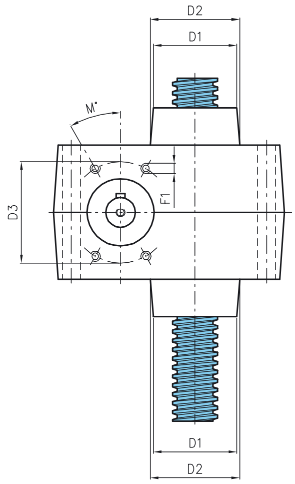
B model

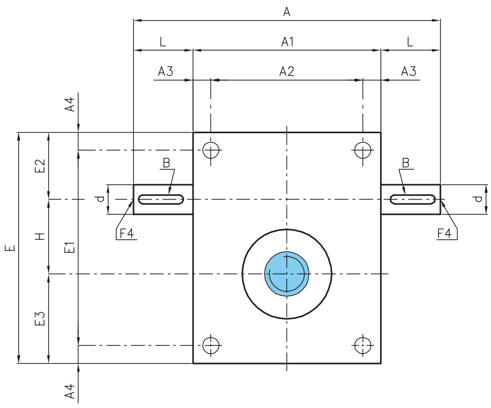
S model



D model

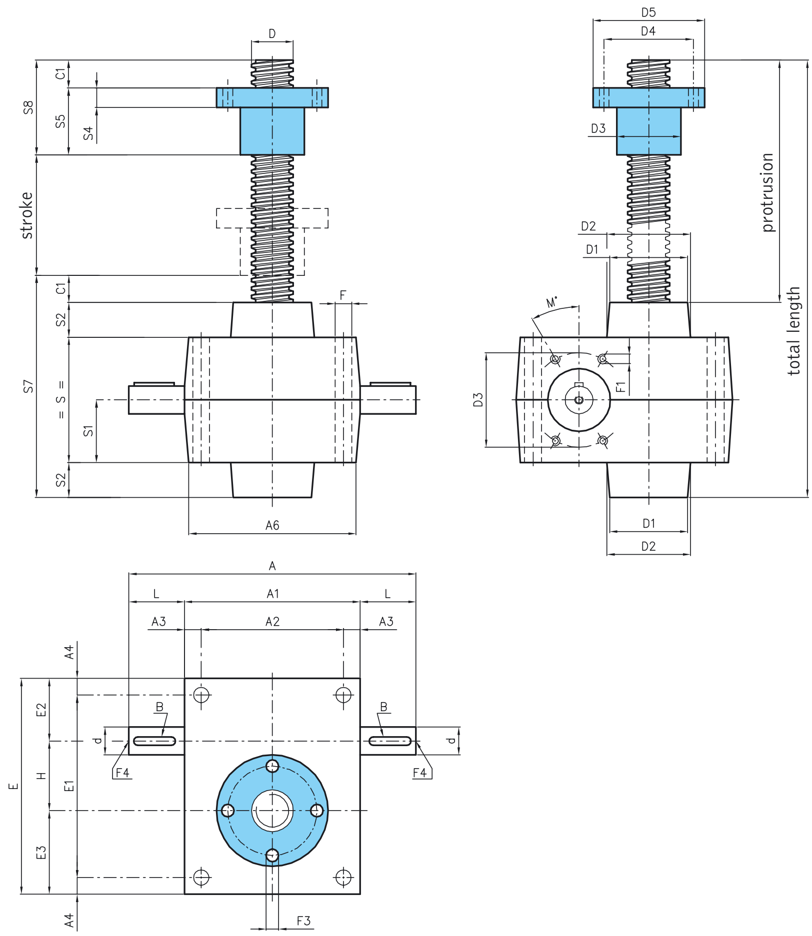






TP - XTP Models*			
Size	**420**	**630**	**740**
A	150	206	270
A1	100	126	160
A2	80	102	130
A3	10	12	15
A4	7,5	12	15
A6	99	125	159
B	4x4x20	6x6x30	8x7x40
C1	15	20	25
d Ø j6	12	20	25
D Ø	20x4	30x6	40x7
D1 Ø	43	59	69
D2 Ø	44	60	70
D3 Ø	52	56	80
E	100	155	195
E1	85	131	165
E2	32,5	45	50
E3	37,5	60	75
F Ø	9	11	13
F1	M6x10	M6x10	M8x10
F4	M5x10	M6x12	M8x15
H	30	50	70
L	25	40	55
M [°]	30	45	30
S	70	90	120
S1	35	45	60
S2	20	25	35

* XTP Model: stainless steel version



Series construction models

B model

S model

D model

TPR - XTPR Models*			
Size	**420**	**630**	**740**
A	150	206	270
A1	100	126	160
A2	80	102	130
A3	10	12	15
A4	7,5	12	15
A6	99	125	159
B	4x4x20	6x6x30	8x7x40
C1	15	20	25
d Ø j6	12	20	25
D Ø	20x4	30x6	40x7
D1 Ø	43	59	69
D2 Ø	44	60	70
D3 Ø	52	56	80
D4 Ø	45	64	78
D5 Ø	60	80	96
E	100	155	195
E1	85	131	165
E2	32,5	45	50
E3	37,5	60	75
F Ø	9	11	13
F1	M6x10	M6x10	M8x10
F3 (4 holes)	9	7	9
F4	M5x10	M6x12	M8x15
H	30	50	70
L	25	40	55
M [°]	30	45	30
S	70	90	120
S1	35	45	60
S2	20	25	35
S4	12	14	16
S5	45	48	75
S7	125	160	215
S8	60	68	100

* XTPR Model: stainless steel version

Series construction models

MBD model

MBS model

MD model

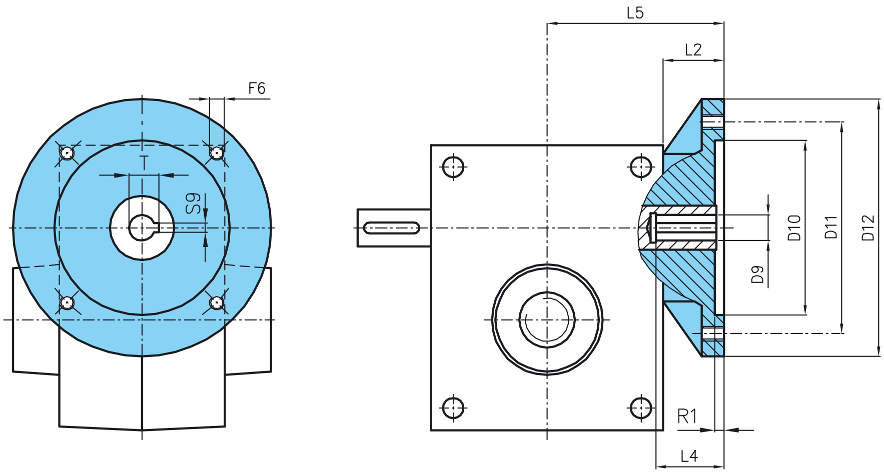
MS model

MBD model

MBS model

MD model

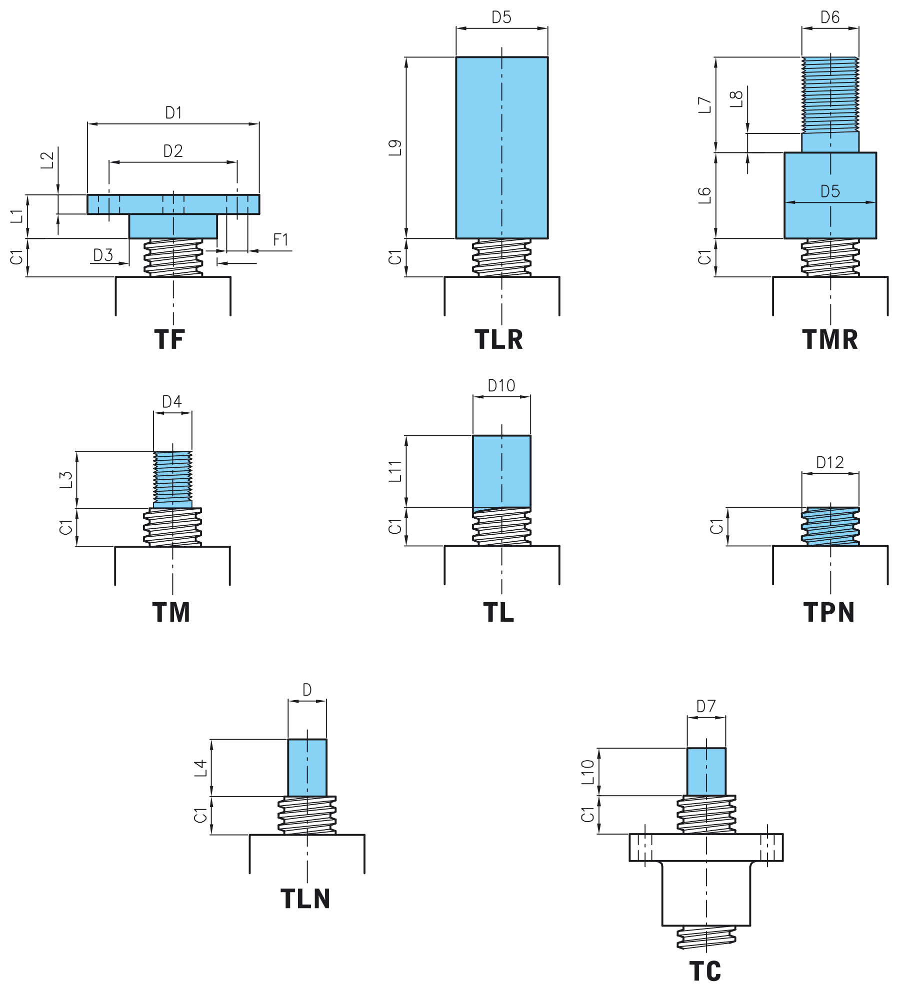
MS model



MTP-MTPR Models

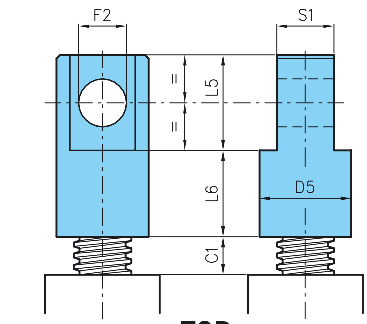
Size	IEC Flange	D9 H7	D10 H7	D11	D12	F6	L2	L4	L5	R1	S9	T
420	63 B5	11	95	115	140	M8	15	23	80	4	4	12,8
630	71 B5	14	110	130	160	M8	20	30	96	4	5	16,3
740	80 B5	19	130	165	200	M10	25	40	120	5	6	21,8

For non quoted dimensions see to the relative tables on pages 110-111

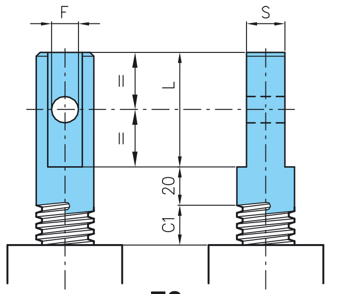


End fittings - X*			
Size	**420**	**630**	**740**
C1	15	20	25
D Ø	15	20	30
D 1 Ø	79	89	109
D2 Ø	60	67	85
D3 Ø	39	46	60
D4 Ø	14x2	20x2,5	30x3,5
D5 Ø	38	48	68
D6 Ø	20x1,5	30x2	39x3
D7 k6	15	20	25
D12	20x4	30x6	40x7
F1 (4 holes)	11	12	13
L1	21	23	30
L2	8	10	15
L3	20	30	30
L4	25	30	45
L6	35	45	55
L7	40	50	70
L8	10	10	10
L9	75	95	125
L10	20	25	30
L11	70	80	100

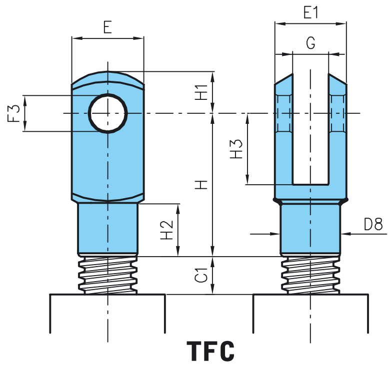
* X Model: stainless steel version



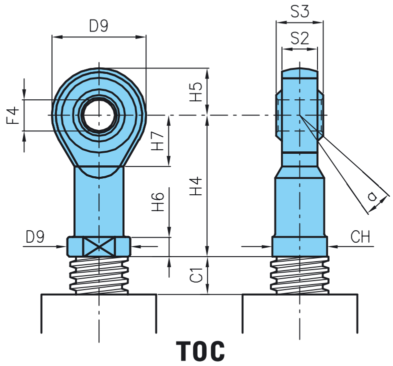
TOR



TO



TFC



TOC

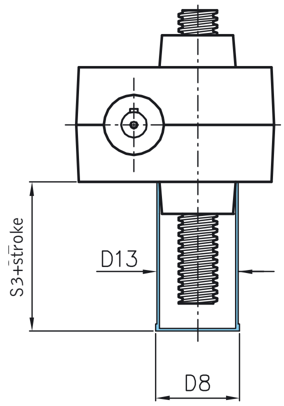
End fittings - X*

Size	420	630	740
C1	15	20	25
CH	19	30	41**
D5 Ø	38	48	68
D8 Ø	20	34	48
D9 Ø	32	50	70**
D11 Ø	22	34	50**
E	24	40	55
E1	24	40	55
F Ø H9	10	14	22
F2 Ø H9	20	25	35
F3 Ø	12	20	30
F4 Ø	12	20	30**
G	12	20	30
H	48	80	110
H1	14	25	38
H2	18	30	38
H3	24	40	54
H4	50	77	110**
H5	16	25	35**
H6	6,5	10	15**
H7	17	27	36**
L	50	60	80
L5	40	50	70
L6	35	45	55
S	14	20	30
S1	25	30	40
S2	12	18	25**
S3	16	25	37**
α [°]	13	14	17**

* X Model: stainless steel version
** Not available in stainless steel

PR rigid protection

The application of a rigid protection in the back side of the screw jack is the ideal solution in order to prevent dust and foreign matters from coming into contact with the coupling and causing damages to the threaded spindle. The PR protection can only be applied to TP models. The overall dimensions are shown in the following table. **Incompatibility: TPR models.**

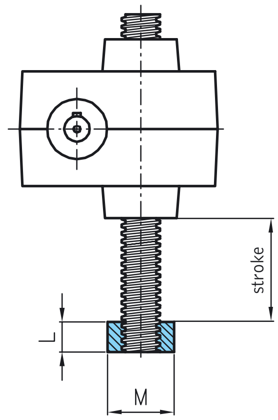


PR rigid protection - XPR Models*			
Size	**420**	**630**	**740**
D8 Ø	48	65	74
D13 Ø	46	63	72
S3	50	60	75

For non quoted dimensions see to the relative tables on pages 110-111
* XPR Model: stainless steel version

BU Anti withdrawing bush

If there's the necessity the spindle, in case of extra-stroke, not to withdraw from the jack body, it's possible assembling a steel withdrawing bush. The BU has a trapezoidal thread, able to sustain the load in extra-stroke case. The BU can apply only in TP models. In case of PRF stroke control, the BU has the function of end-of-stroke too. <u>It's important underline that one only extra-stroke attempt (and the consequent impact between BU and the carter) can hopeless damage the transmission.</u>
The overall dimensions are shown in the table below.
Incompatibility: TPR models – PRA



Anti withdrawing bush BU - XBU Models *			
Size	**420**	**630**	**740**
L	25	25	25
M Ø	38	48	58

* XBU Model: stainless steel version
For non quoted dimensions see to the relative tables on pages 110-111

PE elastic protection

The purpose of the elastic protections is to protect the threaded spindle by following its own movement during stroke. Standard type protections are elastic bellows, made of polyester covered nylon and can have, as serial, collars or flanges at their ends whose dimensions are shown in the table 1 below.
Special implementations are available upon request, as well as a fixing by means of iron.
Fixing flanges can be in plastic or metal. Special materials for the bellows are also available: Neoprene® and Hypalon® (water sea environment), Kevlar® (resistant to cuts and abrasion), glass fiber (for extreme temperatures, from -50 to 250°C) e aluminized carbon (it's an auto-extinguish material for limit applications with molten metal spits). <u>The PE standard material is guarantee for ambient temperature between -30 and 70°C.</u>
If it's needed a waterproof elastic bellow, it's possible to realize protections whose bellows are not sewed but heat-sealed. This kind of protection is not able to solve condensate problem. Moreover, it's possible to have metal protections on demand; such requests are be submitted to the Technical Office. Besides further implementations made of special materials fire-resistant and cold-resistant materials as well as of materials suited for aggressive oxidizing environments can be supplied.
In case of long strokes internal anti-stretching rings are previewed in order to guarantee an uniform bellows opening.

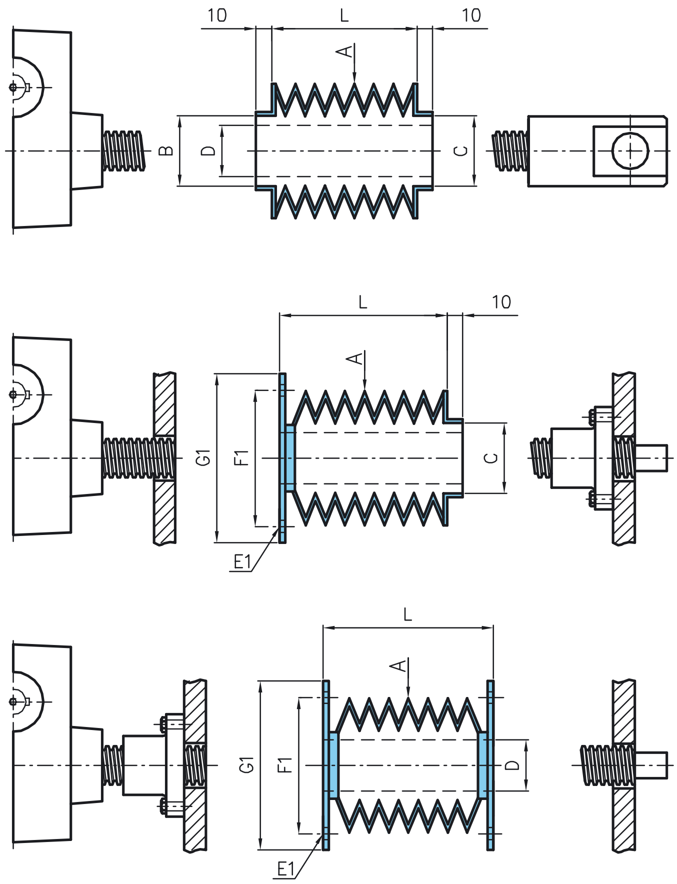


Table 1

PE elastic protection			
Size	**420**	**630**	**740**
A Ø	70	85	105
B Ø	44	60	69
D Ø spindle	20	30	40
C Ø	Dimension function of the end fitting		
E1Ø (n° of holes)	Dimension to be specified by the costumer		
F1 Ø	Dimension to be specified by the costumer		
G1 Ø	Dimension to be specified by the costumer		
L	1/8 of the stroke (completely closed)		

For non quoted dimensions see to the relative tables on pages 110-111

The application of elastic protections on the screw jacks may implicate some dimensioning amendments due to the PE own sizes, as shown in table n.2. Further, in completely close conditions, the PE has an overall dimension equal to 1/8 of the stroke value. In case said value exceeds the C1 quote (which can be taken from the dimension tables on pages 60-63), the total length of the threaded spindle should be fitted to said dimensions. In case of horizontal mounting (of which previous notice should be given) it is necessary to support the protection weight itself in order to avoid that it leans on the threaded spindle; for this purpose special support rings are foreseen. The PE can be applied to TP and TPR models and in case of missing specifications they can be supplied with fabric collars and the dimensions shown in table 1, supposing that a vertical mounting is carried out.
Incompatibility: none

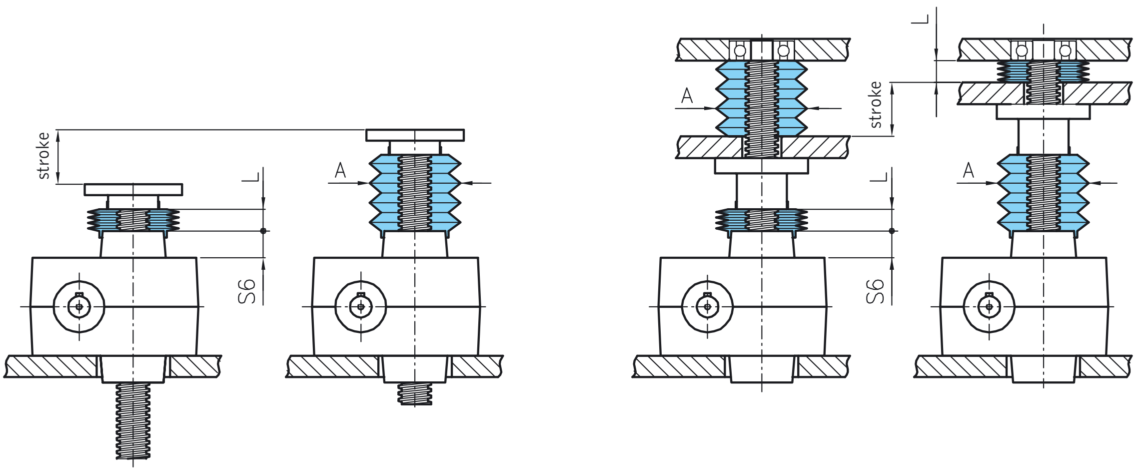


Table 2

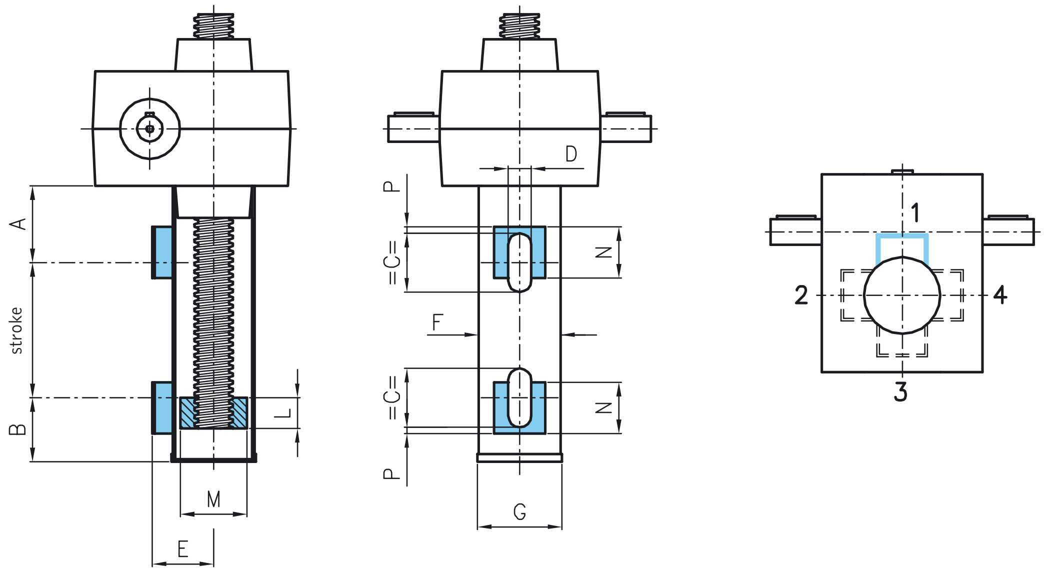
PE elastic protection			
Size	**420**	**630**	**740**
S6	20	25	35
A Ø	70	80	105
L	1/8 of the stroke (completely closed)		

For non quoted dimensions see the schemes on pages 110-111

PRF stroke control

In order to meet the requirement of an electric stroke control it is possible to apply to a rigid protection suitable supports for end-of-stroke. In the standard version these supports are of two types and they are placed at the ends of the stroke in one of the four positions shown below. They are carried out in such a way as to allow a small adjustment. In case more than one end-of-stroke are needed, it is possible to provide intermediate supports or a continuous support for the requested length. In order to enable the end-of-stroke to operate, a steel bushing is mounted on the threaded spindle. More bushings can be mounted upon request. The PRF can only be applied to TP models and in case of missing specifications it will be supplied with the supports mounted according to position 1. Sensor are supplied only on demand. The overall dimensions are shown in the table below. Moreover it's possible assembling magnetic sensors on the protection, avoiding to mill it. The end-of-stroke signal is given by a magnet attached on the bottom of the spindle.

Incompatibility: TPR – PRO models - CU



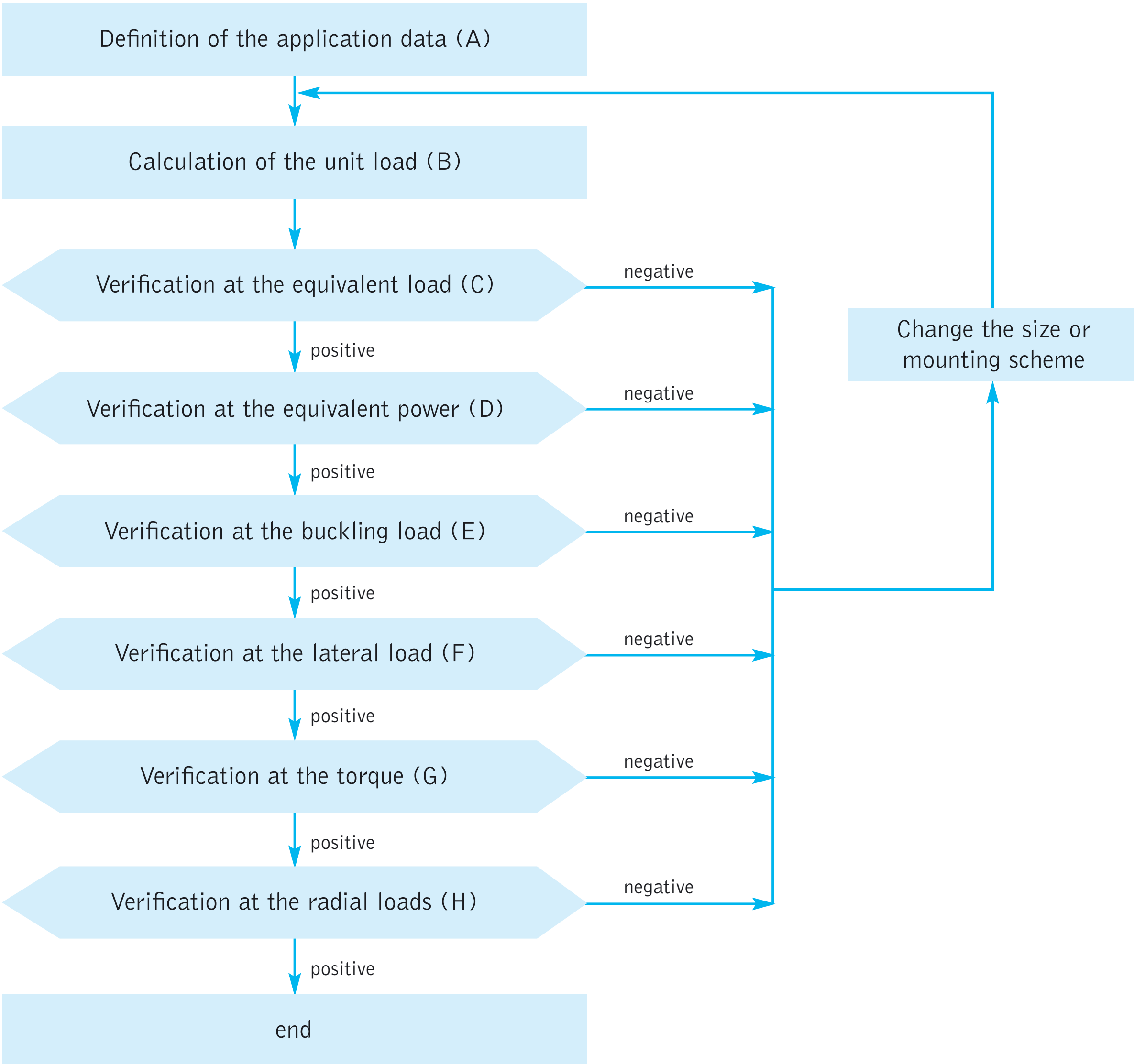
PRF stroke control - XPRF Models*			
Size	**420**	**630**	**740**
A	55	60	70
B	35	50	50
C	45	45	45
D	18	18	18
E	38	47	51
F Ø	46	63	72
G Ø	48	65	74
L	25	25	25
M Ø	38	48	58
N	40	40	40
P	5	5	5

For non quoted dimensions see to the schemes on pages 110-111
* XPRF Model: stainless steel version

DA and FD models (pages 86-87) can suit Aleph series.

DIMENSIONING OF THE SCREW JACK

For a correct dimensioning of the screw jack it is necessary to observe the following steps:



DESCRIPTIVE TABLES

SIZE		420	630	740
Admissible load [daN]		700	1000	1800
Trapezoidal spindle: diameter per pitch [mm]		20x4	30x6	40x7
Theoretical reduction ratio	fast	1/5	1/5	1/5
	normal	1/10	1/10	1/10
	slow	1/30	1/30	1/30
Real reduction ratio	fast	4/19	4/19	6/30
	normal	2/21	3/29	3/30
	slow	1/30	1/30	1/30
Spindle stroke for a turn of the worm wheel [mm]		4	6	7
Spindle stroke for a turn of the worm screw [mm]	fast	0,8	1,2	1,4
	normal	0,4	0,6	0,7
	slow	0,13	0,2	0,23
Running efficiency [%]	fast	31	30	28
	normal	28	26	25
	slow	20	18	18
Operation temperature [°C]		10/60 (for different conditions contact our Technical office)		
Weight of the trapezoidal screw for 100 mm [kg]		0,22	0,5	0,9
Weight of the screw jack (screw not included) [kg]		1	2,7	3

A - THE APPLICATION DATA

For a right dimensioning of the screw jacks it is necessary to identity the application data:

LOAD [daN] = the load is identified with the force applied to the translating device of a screw jack. Normally the dimensioning is calculated considering the maximum applicable load (worst case). It is important to consider the load as a vector, which is defined by a modulus, a direction and a sense, the modulus quantifies the force, the direction orients spatially and gives indications on the eccentricity or on possible lateral loads, the sense identifies the traction or compression load.

TRANSLATION SPEED [mm/min] = the translation speed is the load handling speed. From this speed it is possible to calculate the rotation speed of the rotating devices and the necessary handling power. Wear phenomena and the life of the screw jack proportionally depend on the value of the translation speed. Therefore, it is advisable to limit the translation speed as much as possible. NEVER exceed 1500 rpm for the Aleph series.

STROKE [mm] = it is the linear measure used to handle a load. It may not always coincide with the total length of the threaded spindle.

AMBIENT VARIABLES = these values identify the environment and the operating conditions of the screw jack. Among them: temperature, oxidizing and corrosive factors, working and non-working periods, vibrations, maintenance and cleaning, lubrication quality and quantity etc.

MOUNTING SCHEMES = There are several ways of handling a load by means of screw jacks. The schemes on pages 90-91 will show some examples. Choosing a mounting scheme will condition the choice for the size and the power which is necessary for the application.

B - THE UNIT LOAD AND THE DESCRIPTIVE TABLES

According to the n number of screw jacks contained in the mounting scheme, it is possible to calculate each screw jack's load by dividing the total load by n In case the load is not fairly distributed in all screw jacks, it is recommended to consider the transmission having the heaviest load, by virtue of a dimensioning based on the worst case. According to that value, reading the descriptive tables, it is possible to effect a preliminary selection choosing between the sizes which present an admissible load value higher than the unit load.

C - THE EQUIVALENT LOAD

All the values listed in the catalogue refer to standard use conditions, i.e. a temperature of 20 °C, 50% humidity, foreseen lifetime 10000 cycles, manual handling without shocks and working percentage 10%. For different application conditions, the equivalent load should be calculated: it is the load which would be applied in standard conditions in order to have the same thermal exchange and wear effects, which the real load achieves in the real conditions of use.

It is therefore advisable to calculate the equivalent load according to the following formula

$$C_e = C \bullet f_t \bullet f_a \bullet f_s \bullet f_u \bullet f_d \bullet f_v$$

Size 420

Ratio 1/5

Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	700 P_i [kW]	700 M_{tv} [daNm]	400 P_i [kW]	400 M_{tv} [daNm]	300 P_i [kW]	300 M_{tv} [daNm]	200 P_i [kW]	200 M_{tv} [daNm]	100 P_i [kW]	100 M_{tv} [daNm]
1500	1200	0,38	0,25	0,26	0,17	0,19	0,13	0,13	0,09	0,07	0,05
1000	800	0,26	0,25	0,17	0,17	0,13	0,13	0,09	0,09	0,07	0,05
750	600	0,19	0,25	0,13	0,17	0,10	0,13	0,07	0,09	0,07	0,05
500	400	0,13	0,25	0,09	0,17	0,07	0,13	0,07	0,09	0,07	0,05
300	240	0,11	0,25	0,07	0,17	0,07	0,13	0,07	0,09	0,07	0,05
100	80	0,07	0,25	0,07	0,17	0,07	0,13	0,07	0,09	0,07	0,05
50	40	0,07	0,25	0,07	0,17	0,07	0,13	0,07	0,09	0,07	0,05

Load [daN]: 700, 400, 300, 200, 100

Ratio 1/10

Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	700 P_i [kW]	700 M_{tv} [daNm]	400 P_i [kW]	400 M_{tv} [daNm]	300 P_i [kW]	300 M_{tv} [daNm]	200 P_i [kW]	200 M_{tv} [daNm]	100 P_i [kW]	100 M_{tv} [daNm]
1500	600	0,22	0,14	0,14	0,09	0,11	0,07	0,08	0,05	0,07	0,03
1000	400	0,14	0,14	0,09	0,09	0,07	0,07	0,07	0,05	0,07	0,03
750	300	0,11	0,14	0,07	0,09	0,07	0,07	0,07	0,05	0,07	0,03
500	200	0,07	0,14	0,07	0,09	0,07	0,07	0,07	0,05	0,07	0,03
300	120	0,07	0,14	0,07	0,09	0,07	0,07	0,07	0,05	0,07	0,03
100	40	0,07	0,14	0,07	0,09	0,07	0,07	0,07	0,05	0,07	0,03
50	20	0,07	0,14	0,07	0,09	0,07	0,07	0,07	0,05	0,07	0,03

Ratio 1/30

Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	700 P_i [kW]	700 M_{tv} [daNm]	400 P_i [kW]	400 M_{tv} [daNm]	300 P_i [kW]	300 M_{tv} [daNm]	200 P_i [kW]	200 M_{tv} [daNm]	100 P_i [kW]	100 M_{tv} [daNm]
1500	200	0,11	0,07	0,07	0,05	0,07	0,03	0,07	0,03	0,07	0,03
1000	133	0,07	0,07	0,07	0,05	0,07	0,03	0,07	0,03	0,07	0,03
750	100	0,07	0,07	0,07	0,05	0,07	0,03	0,07	0,03	0,07	0,03
500	67	0,07	0,07	0,07	0,05	0,07	0,03	0,07	0,03	0,07	0,03
300	40	0,07	0,07	0,07	0,05	0,07	0,03	0,07	0,03	0,07	0,03
100	13	0,07	0,07	0,07	0,05	0,07	0,03	0,07	0,03	0,07	0,03
50	6,7	0,07	0,07	0,07	0,05	0,07	0,03	0,07	0,03	0,07	0,03

Size 630

Ratio 1/5									
Load [daN]		1000		750		500		250	
Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]
1500	1800	0,98	0,64	0,74	0,48	0,49	0,32	0,25	0,17
1000	1200	0,65	0,64	0,49	0,48	0,33	0,32	0,17	0,17
750	900	0,49	0,64	0,37	0,48	0,25	0,32	0,13	0,17
500	600	0,33	0,64	0,25	0,48	0,17	0,32	0,10	0,17
300	360	0,20	0,64	0,15	0,48	0,10	0,32	0,10	0,17
100	120	0,10	0,64	0,10	0,48	0,10	0,32	0,10	0,17
50	60	0,10	0,64	0,10	0,48	0,10	0,32	0,10	0,17

Ratio 1/10									
Load [daN]		1000		750		500		250	
Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]
1500	900	0,57	0,37	0,43	0,28	0,29	0,19	0,16	0,10
1000	600	0,38	0,37	0,29	0,28	0,20	0,19	0,10	0,10
750	450	0,29	0,37	0,22	0,28	0,15	0,19	0,10	0,10
500	300	0,19	0,37	0,15	0,28	0,10	0,19	0,10	0,10
300	180	0,12	0,37	0,10	0,28	0,10	0,19	0,10	0,10
100	60	0,10	0,37	0,10	0,28	0,10	0,19	0,10	0,10
50	30	0,10	0,37	0,10	0,28	0,10	0,19	0,10	0,10

Ratio 1/30									
Load [daN]		1000		750		500		250	
Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]
1500	300	0,28	0,18	0,22	0,14	0,14	0,09	0,07	0,05
1000	200	0,19	0,18	0,14	0,14	0,10	0,09	0,07	0,05
750	150	0,14	0,18	0,11	0,14	0,07	0,09	0,07	0,05
500	100	0,10	0,18	0,07	0,14	0,07	0,09	0,07	0,05
300	60	0,07	0,18	0,07	0,14	0,07	0,09	0,07	0,05
100	20	0,07	0,18	0,07	0,14	0,07	0,09	0,07	0,05
50	10	0,07	0,18	0,07	0,14	0,07	0,09	0,07	0,05

Size 740

Ratio 1/5									
Load [daN]		1800		1500		1000		500	
Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]
1500	2100	2,45	1,59	1,84	1,20	1,23	0,80	0,62	0,40
1000	1400	1,64	1,59	1,23	1,20	0,82	0,80	0,41	0,40
750	1050	1,23	1,59	0,92	1,20	0,62	0,80	0,31	0,40
500	700	0,82	1,59	0,62	1,20	0,41	0,80	0,21	0,40
300	420	0,49	1,59	0,37	1,20	0,25	0,80	0,13	0,40
100	140	0,17	1,59	0,13	1,20	0,10	0,80	0,10	0,40
50	70	0,10	1,59	0,10	1,20	0,10	0,80	0,10	0,40

Ratio 1/10									
Load [daN]		1800		1500		1000		500	
Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]
1500	1050	1,40	0,90	1,05	0,67	0,70	0,45	0,35	0,23
1000	700	0,92	0,90	0,69	0,67	0,46	0,45	0,23	0,23
750	525	0,70	0,90	0,52	0,67	0,35	0,45	0,18	0,23
500	350	0,46	0,90	0,35	0,67	0,23	0,45	0,12	0,23
300	210	0,28	0,90	0,21	0,67	0,14	0,45	0,10	0,23
100	70	0,10	0,90	0,10	0,67	0,10	0,45	0,10	0,23
50	35	0,10	0,90	0,10	0,67	0,10	0,45	0,10	0,23

Ratio 1/30									
Load [daN]		1800		1500		1000		500	
Worm screw rotation speed ω_v [rpm]	Threaded spindle rotation speed v [mm/min]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]	P_i [kW]	M_{tv} [daNm]
1500	350	0,63	0,41	0,48	0,31	0,32	0,21	0,17	0,11
1000	233	0,42	0,41	0,32	0,31	0,21	0,21	0,11	0,11
750	175	0,32	0,41	0,24	0,31	0,16	0,21	0,08	0,11
500	117	0,21	0,41	0,16	0,31	0,11	0,21	0,07	0,11
300	70	0,13	0,41	0,10	0,31	0,07	0,21	0,07	0,11
100	23	0,07	0,41	0,07	0,31	0,07	0,21	0,07	0,11
50	11,7	0,07	0,41	0,07	0,31	0,07	0,21	0,07	0,11