MECHJACKS
by polimak

Screw Jack

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Screw Jack

Polimak Process Technology
Screw Jack Systems

Polimak has been producing industrial systems and equipment, offering its clients engineering services with 40 years of experience.

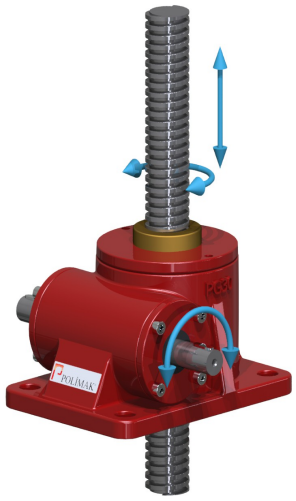
Our screw jacks and powertrain products offer the best solution for linear motion applications with capacities ranging from 5kN to 1500kN. Our goal is to offer the most convenient design, the fastest and the most suitable solution while meeting the required need for the balance of performance, life and cost of the product. We have extensive range of screw jacks for wide range of applications providing services from mechanical and automotive to hardwood and defense industry.

Screw jacks are used in lifting of any load, pulling of any piece, arrangement of working space of machinery, and in many rectilinear work. Screw jacks are also known as linear motor, linear actuator, jack screw, screw-operated jack and mechanical jack. To decide on the best product and fulfill all your needs, please check this catalogue and fill purchase order from our website.

Working principle of screw jacks

V-Travelling Ball Screw Type

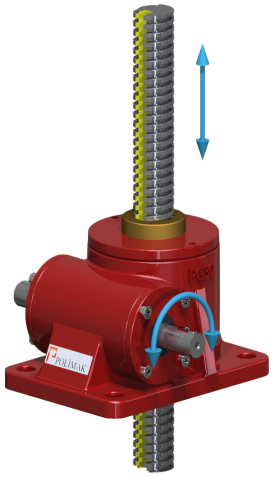
Main components of screw jacks are; trapezoidal lifting screw, worm screw, worm gear and gear housing. Worm screw is rotated manually or by motor. With the rotation of the worm gear, the screw in it moves upwards or downwards linearly. If the screw end connection is connected to a free load, the screw rotates circularly and moves up and down. If it is connected to a fixed load, the gearbox in the jack receives the movement from the gear unit and the trapezoidal screw moves only linearly up and down. In other words, it acts the same as the Wedged type, so there is no need to open wedge channel for trapezoidal screw. The linear motion of the screw depends on the turning speed, the number of teeth of the gears and the size of the screw pitch.



Travelling Ball Screw Type

K-Travelling Ball Wedge Screw Type

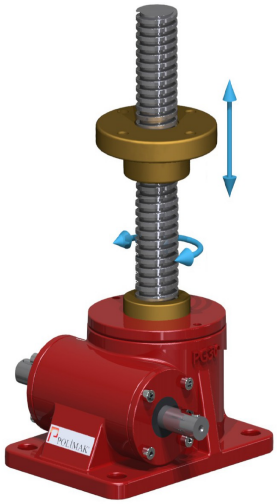
Main components of screw jacks are; trapezoidal lifting screw, worm screw, worm gear and gear housing. Worm screw is rotated manually or by motor. With the rotation of the worm gear, the screw in it moves upwards or downwards linearly. The wedge channel is opened to the screw to prevent the rotation of the screw and only the upward and downward movement of the screw is provided. In this way, the importance of the screw connection is eliminated. The linear motion of the screw depends on the turning speed, the number of teeth of the gears and the size of the screw pitch.



Travelling Ball Wedge Screw Type

T-Travelling Nut Type

Main components of screw jacks are; trapezoidal lifting screw, worm screw, lifting nut and gear housing. Worm screw is rotated manually or by motor. With the rotation of the gear, the screw that is inside the screw jack only makes rotation around it's axis. The flange, which is produced from the bronze material on the screw shaft moves linearly upwards or downwards. One of the purposes of using such systems is the lack of ducting or storage for the movement of the screw used in the ball screw type and ball wedge screw type. Furthermore, the screw does not go beyond the jack base. The linear motion of travelling nut depends on the turning speed, the number of teeth of the gears and the size of the screw pitch.



Travelling Nut Type

Screw Jack Order Code

PG15-P1-F1-V-A-X-500

Stroke Length
(.....mm)

Type og Gear Ratio (X, Y)
X- High Gear Ratio Y- Low Gear Ratio

Equipment Type (A, B, C, D, E)
(Protection Bellow, Cover Pipe, Swivel Mounting Base)

A type B type C type D type E type

Screw Jack Type (V, K, T)
Travelling Ball Screw(V) Travelling Wedge Screw (K) Travelling Ball Nut (T)

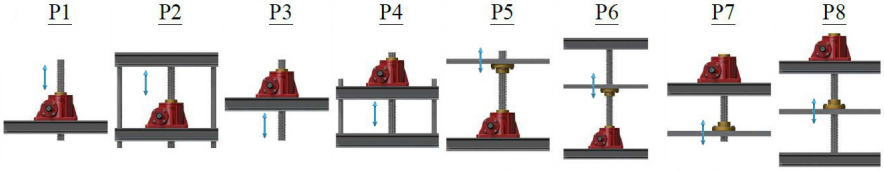
Type of Spindle Heads (F1, F2, F3, F4)

F1 type (Plain End) F2 type (Clevis End) F3 type (Flange End) F4 type (Bronze Nut) F5 type

Special Design

Positions (P1, P2, P3, P4....., P11)

P1 P2 P3 P4 P5 P6 P7 P8



P9 P10 P11

Screw Jack Force (kN)
(5kN,15kN.....1500kN)

Screw Jack

Load Capacity Table

Model	PG5		PG15		PG20		PG30		PG50		PG100		PG150	
Lifting Power (kN)	5 kN		15 kN		20 kN		30 kN		50 kN		100 kN		150 kN	
Screw Dimension	Tr 20x6		Tr 25x6		Tr 25x6		Tr 30x6		Tr 40x7		Tr 55x12		Tr 60x12	
Type of Gear Ratio	X Type	Y Type	X Type	Y Type	X Type	Y Type	X Type	Y Type	X Type	Y Type	X Type	Y Type	X Type	Y Type
Gear Ratio	1/10	1/20	1/8	1/25	1/6	1/24	1/6	1/24	1/6	1/24	1/8	1/24	1/8	1/24
Raise per worm screw revolution (mm)	0,6	0,3	0,75	0,24	1	0,25	1	0,25	1,16	0,290	1,5	0,5	1,5	0,5
Torque corresponding to the lifting power (Nm)	1,59	1,2	5,97	2,87	10,6	3,98	15,92	5,97	30,95	11,61	79,58	39,79	119,4	59,7
Maximum rotation speed (d/d)	1500		1500		1500		1500		1500		1500		1500	
Maximum speed (m/dk)	0,90	0,45	1,12	0,36	1,50	0,37	1,50	0,37	1,75	0,43	2,25	0,75	2,25	0,75
Body weight without screw (kg)	1,5		3,2		7,8		8,2		18		23		28	

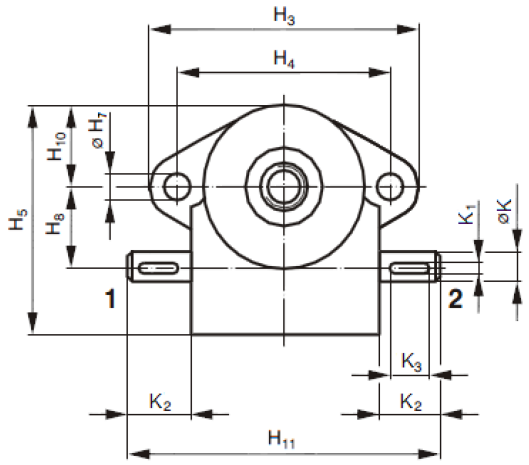
Model	PG200		PG240		PG300		PG350		PG500		PG1000		PG1500	
Lifting Power (kN)	200 kN		240 kN		300 kN		350 kN		500 kN		1000 kN		1500 kN	
Screw Dimension	Tr 65x12		Tr 75x14		Tr 90x16		Tr 100x16		Tr 120 x 16		Tr 160 x 20		Tr 190 x 24	
Type of Gear Ratio	X Type	Y Type	X Type	Y Type	X Type	Y Type	X Type	Y Type	X Type	Y Type	X Type	Y Type	X Type	Y Type
Gear Ratio	1/8	1/24	1/9	1/28	1/14	1/32	1/15	1/32	1/15	1/32	1/15	1/28	1/20	1/36
Raise per worm screw revolution (mm)	1,5	0,5	1,56	0,5	1,14	0,5	1,06	0,5	1,06	0,5	1,33	0,71	1,2	0,66
Torque corresponding to the lifting power (Nm)	159,2	79,6	198,1	95,5	181,9	119,4	198,1	139,3	283	199	2653	1421	3581	1989
Maximum rotation speed (d/d)	1500		1000		1000		1000		1000		1000		1000	
Maximum speed (m/dk)	2,25	0,75	1,55	0,50	1,14	0,50	1,06	0,50	1,06	0,50	1,33	0,71	1,20	0,66
Body weight without screw (kg)	40		58		75		90		180					

Warning:

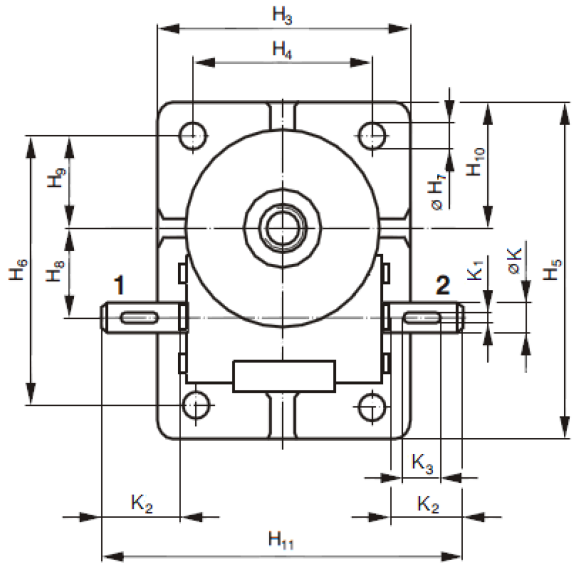
Manual or optional working speed of screw jacks is chosen according to the table above. As for screw jacks that will be used for motors or gearboxes, the progress pace, X and Y type, will be determined by our company according to the selected features.

Dimension Table

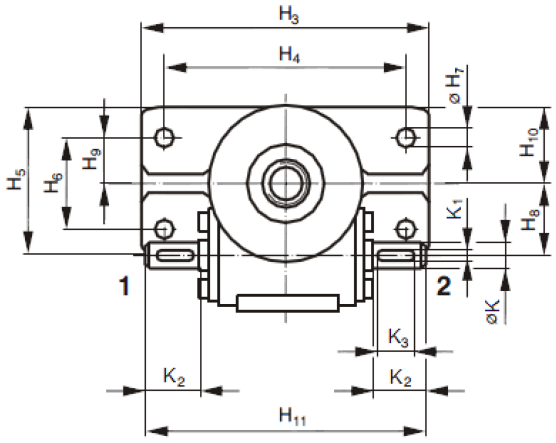
PG 5 Model

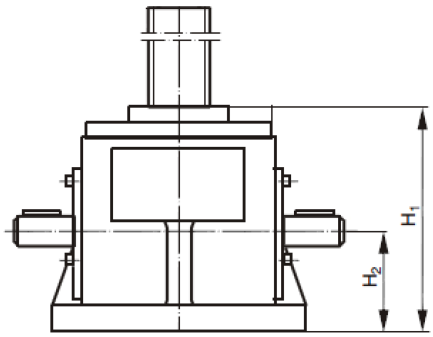


PG 15, 30, 50,100,150, 200, 240,300, 350 Models



PG 20 , 500 Models





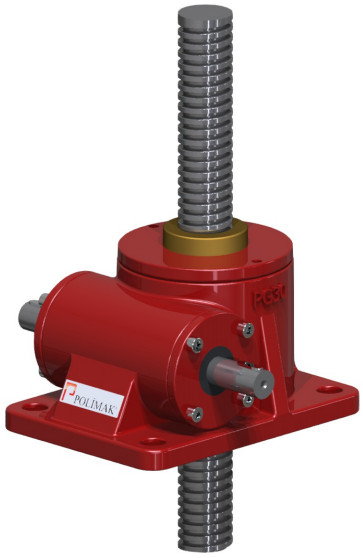
	H1	H2	H3	H4	H5	H6	H7	H8	H9	H10	H11	ØK	K1	K2	K3
PG5	81	32	117	90	85		9	27		34	120	10k6	3	20,5	16
PG15	102	36	100	75	135	110	9,5	36	37,5	50	150	14k6	5	32	22
PG20	112	44	185	152	95	57	11	45,2	28,5	47,5	180	14k6	5	34,5	25
PG30	115	45	120	90	165	135	14	45,2	50	65	180	16k6	5	29,5	25
PG50	141	61,5	160	114	214	168	17	56,2	58	82	228	20j6	6	45	32
PG100	160	66	190	140	225	180	18	63	60	83	250	24k6	8	46	40
PG150	170	70	203	155	240	190	21	66,8	63,5	88	280	25k6	8	46,5	45
PG200	192	87	220	160	297	240	28	72,5	95	124	322	28k6	8	48,5	50
PG240	210	95	240	180	320	260	28	80	90	120	340	32k6	10	62,5	50
PG300	222	102	265	190	355	280	35	97	95	133	355	34k6	10	56,5	56
PG350	250	115	280	210	430	360	35	120	135	170	430	38k6	10	72	70
PG500	306	140	500	400	260	150	48	137	75	132	560	40k6	12	104,5	90
PG750	325	155	560	460	475	365	48	160	125	180	610	52k6	16	110	100
PG1000	370	170	620	520	540	440	48	196	160	210	670	60k6	18	110	100
PG1500	476	194	700	610	660	560	52	225	210	225	660	40k6	14	100	75

Type of Spindle Heads

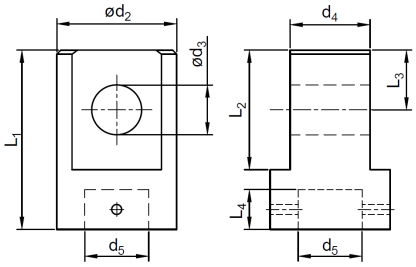
V-Travelling ball screw and K-Travelling ball wedge screw version type

F1-Type (Plain End)

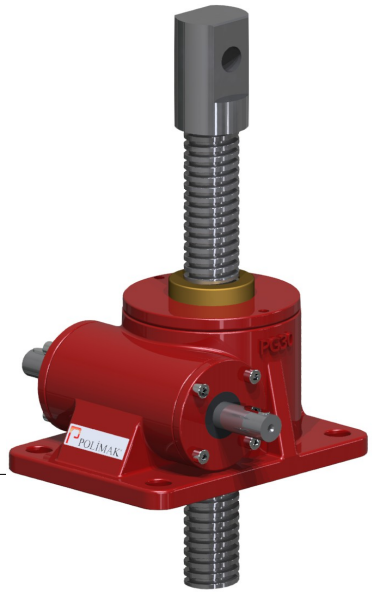
	Screw Dimension (d1)
PG5	Tr 20x6
PG15	Tr 25x6
PG20	Tr 25x6
PG30	Tr 30x6
PG50	Tr 40x7
PG100	Tr 55x12
PG150	Tr 60x12
PG200	Tr 65x12
PG240	Tr 75x14
PG300	Tr 90x16
PG350	Tr 100x16
PG500	Tr 120x16
PG750	Tr 140x16
PG1000	Tr 160x20
PG1500	Tr 190x24



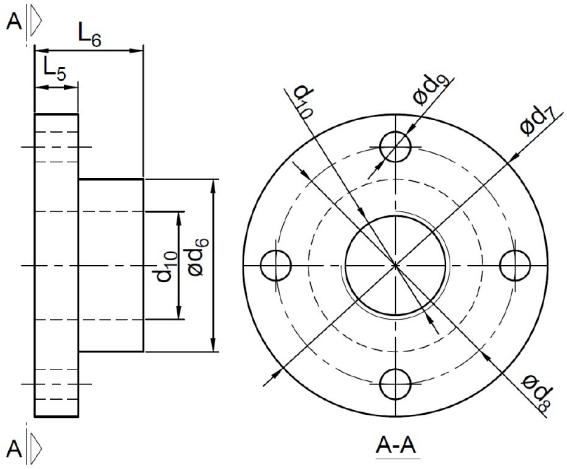
F2-Type (Clevis End)

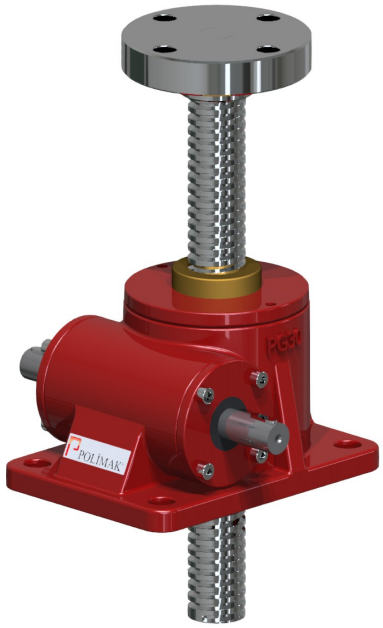


Rod Dimension								
Screw Jack Types	d_2	d_3	d_4	d_5	L_1	L_2	L_3	L_4
PG5	30	15	20	M14x1.5	50	30	15	15
PG15	40	15	30	M16x1.5	65	46	23	20
PG20	40	15	30	M16x1.5	65	46	23	20
PG30	40	15	30	M20x1.5	65	46	23	20
PG50	60	25	40	M30x1.5	90	60	30	20
PG100	80	35	60	M42x2	120	90	45	25
PG150	80	35	60	M42x2	120	90	45	25
PG200	85	40	65	M48x2	130	100	50	25
PG240	95	40	75	M55x2	140	110	55	30
PG300	120	50	80	M65x2	170	120	60	40
PG350	130	60	90	M75x2	200	150	75	40
PG500	150	60	110	M90x2	220	160	80	50
PG750	170	64	120	M100x2	250	180	90	55
PG1000	190	64	130	M120x2	280	200	100	65
PG1500	220	64	140	M140x2	280	200	100	65



F3-Type (Flange End)



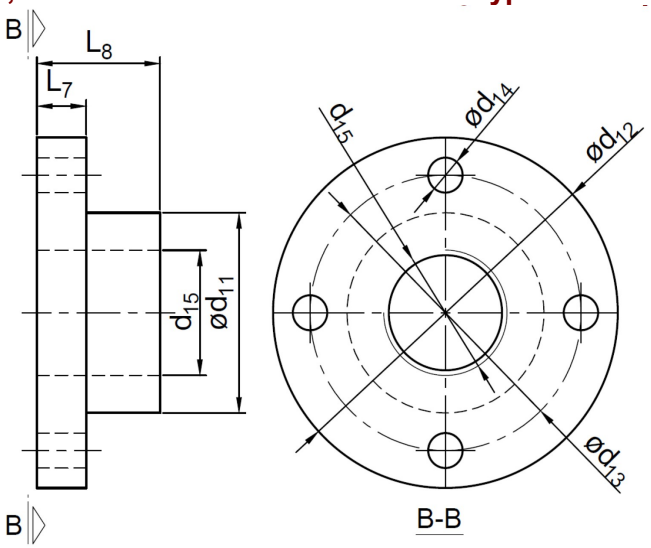


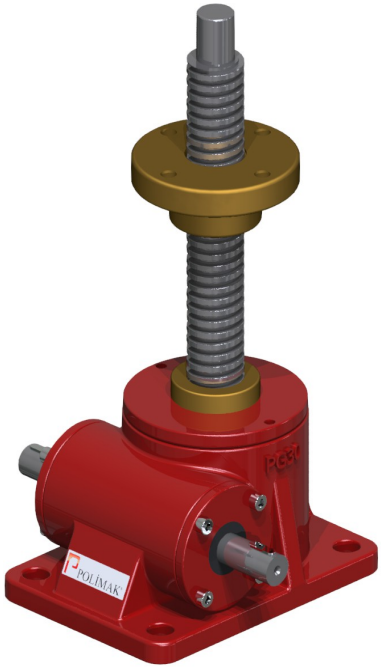
Flange Dimension							
Screw Jack Types	d_6	d_7	d_8	d_9	d_{10}	L_5	L_6
PG5	25	67	45	ø7x4	M14x1.5	12	22
PG15	40	98	75	ø12x4	M16x1.5	18	30
PG20	40	98	75	ø12x4	M16x1.5	18	30
PG30	40	98	75	ø12x4	M20x1.5	18	30
PG50	50	119	85	ø17x4	M30x1.5	20	35
PG100	60	148	105	ø21x4	M42x2	25	45
PG150	65	148	105	ø21x4	M42x2	25	45
PG200	75	175	125	ø26x4	M48x2	30	50
PG240	95	195	145	ø26x4	M55x2	30	50
PG300	95	195	145	ø26x4	M65x2	30	50
PG350	120	245	185	ø32x4	M75x2	35	60
PG500	140	265	205	ø32x4	M90x2	40	65
PG750	180	350	270	ø48x4	M100x2	50	75
PG1000	190	365	280	ø52x4	M120x2	70	100
PG1500	220	400	300	ø52x4	M140x2	80	120

T -Travelling ball nut version

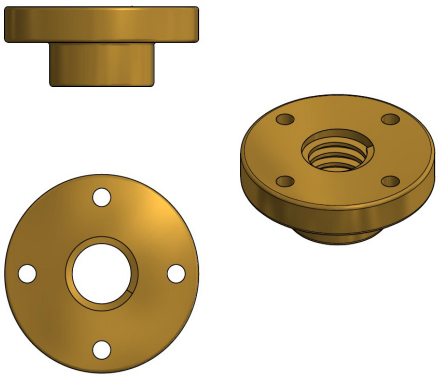
F4-Type (Bronze Nut)

PG5T,PG15T....PG500T models version type





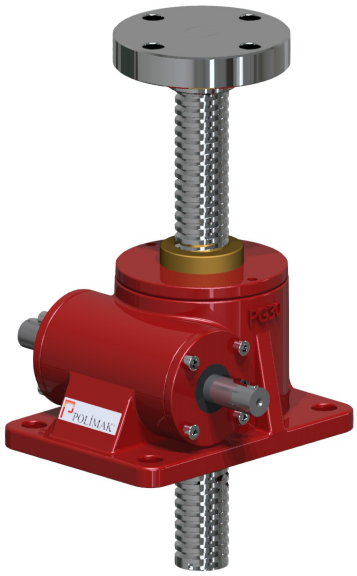
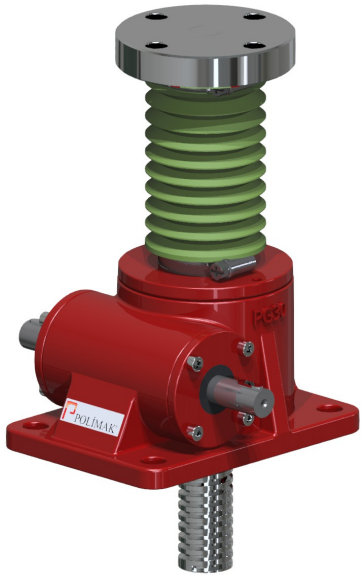
Nut Dimension							
Screw Jack Types	d_{11}	d_{12}	d_{13}	d_{14}	d_{15}	L_7	L_8
PG5T	40	70	55	ø7x4	Tr20x6	10	25
PG15T	40	70	55	ø7x4	Tr25x6	10	25
PG20T	40	70	55	ø7x4	Tr25x6	10	25
PG30T	45	75	60	ø7x4	Tr 30x6	10	25
PG50T	60	95	78	ø10x4	Tr 40x7	10	30
PG100T	80	125	103	ø12x4	Tr 55x12	15	40
PG150T	90	140	115	ø14x4	Tr 60x12	20	50
PG200T	100	150	125	ø14x4	Tr 65x12	25	55
PG240T	115	170	143	ø18x4	Tr 75x14	25	60
PG300T	130	190	162	ø18x4	Tr 90x16	30	70
PG350T	150	210	180	ø18x4	Tr 100x16	30	75
PG500T	170	230	200	ø18x4	Tr 120x16	30	75
PG750T	190	290	240	ø26x4	Tr 140x16	45	90
PG1000T	200	300	250	ø26x4	Tr 160x20	45	90
PG1500T	230	330	280	ø26x4	Tr 190x24	45	90



F5-The special design nut and flange connection types

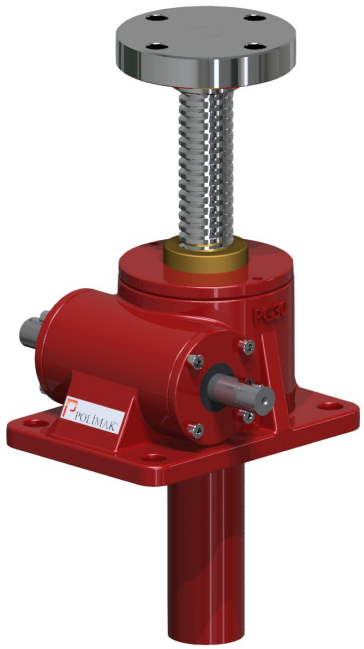
Specially designed nuts and flange connection types and models are designed according to company requirements.

Equipment Type

A-Type V and K types of screw jacks does not have protected bellow and cover pipe.	
B-Type V and K types of screw jack have protected bellow. Used to protect against external factors (water, dust, etc.). Bellow length should be equal to screw stroke length.	

C-Type

V and K types of screw jacks have cover pipe. Used to protect against external factors (water, dust, etc.). Cover pipe length should be equal to screw stroke length.

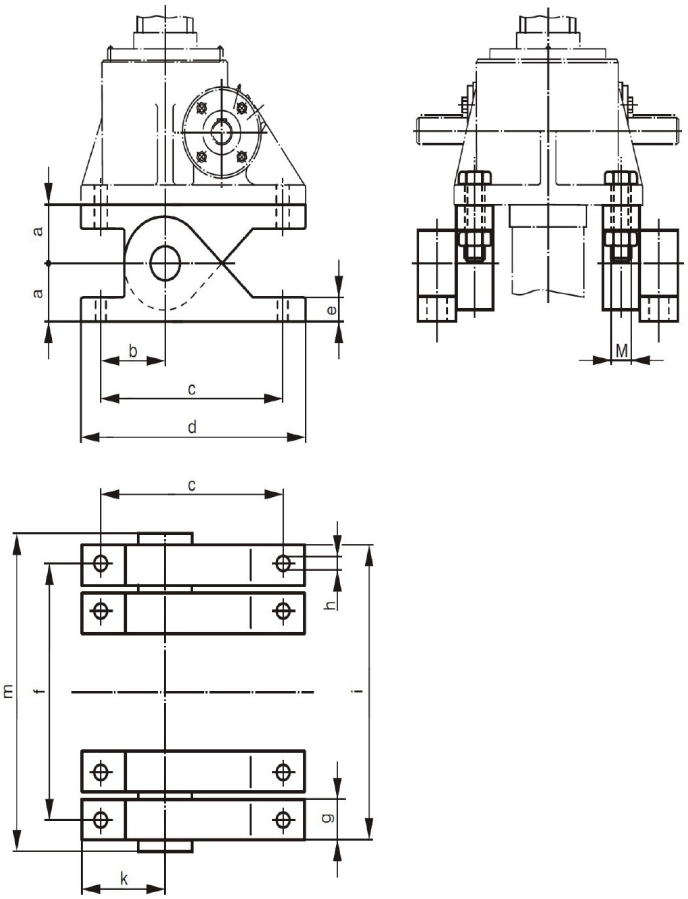


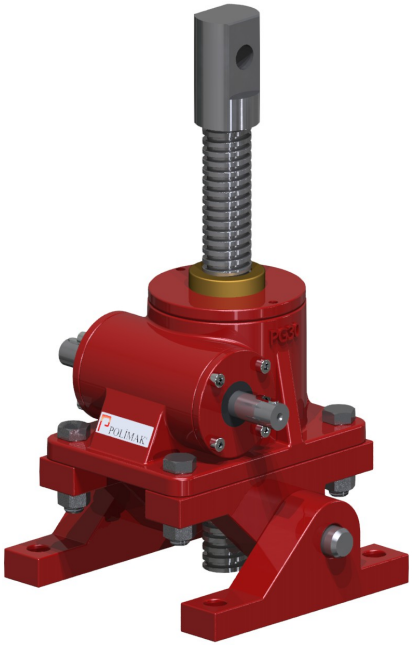
D-Type

V and K types of screw jacks have protected bellow and cover pipe. Used to protect against external factors (water, dust, etc.). Protected bellow and cover pipe length should be equal to screw stroke length.

E-Type

• Swivel Mounting Base





Models	Dimension (mm)												Weight (kg)
	a	b	c	d	e	f	g	h	i	k	m	M	
PG15	40	37,5	110	135	18	115	20	10	135	50	150	M8	3,15
PG20	40	28,5	57	95	18	202	25	12	227	48	247	M10	2,20
PG30	40	50	135	165	18	150	30	14	180	65	200	M12	5,05
PG50	50	59	168	214	22	194	40	17	234	82	254	M16	11,30
PG100	55	61	180	224	25	220	40	18	260	82	280	M16	12,90
PG150	60	63	190	240	25	235	40	21	275	88	295	M20	13,30
PG200	70	95	240	297	29	280	60	28	340	124	360	M27	30,85
PG240	75	90	260	320	30	300	60	28	360	120	380	M27	35,75
PG300	80	96	280	355	30	310	60	35	370	133	390	M33	43,95
PG350	90	135	360	430	60	350	70	35	420	170	440	M33	71,80
PG500	100	75	150	260	50	600	100	48	700	130	720	M45	51,80

• Special Design Equipment

Special design equipment are designed according to company requirements.

Load Graphs

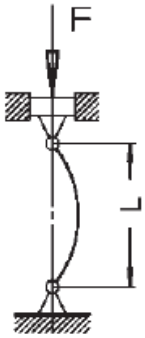
Load capacity of screw jacks depends on the length of screw shaft. Load capacity changes according to screw shaft length and installation methods. Installation methods are named with Euler 1, Euler 2, and Euler 3. Same graphics are valid for travelling screw and travelling nut.

Euler 1

Screw jack housing fixed to the base. Trapezoidal end (or nut) lifting the load freely

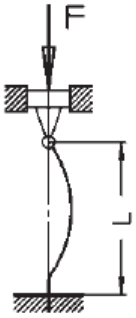
Euler 2

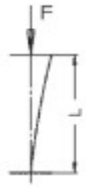
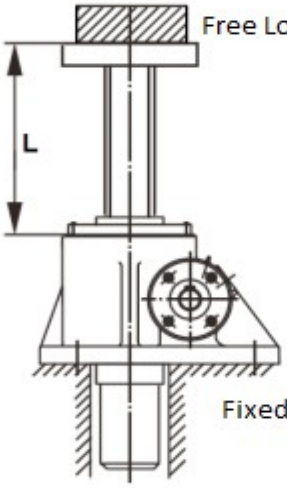
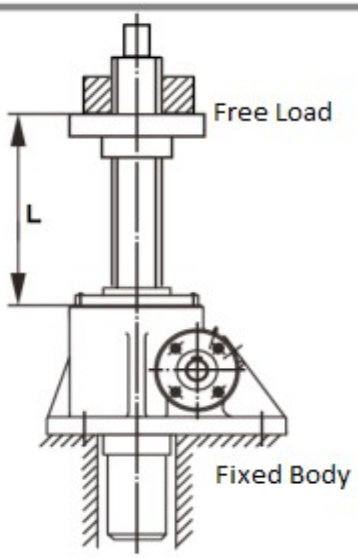
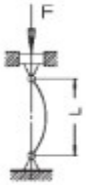
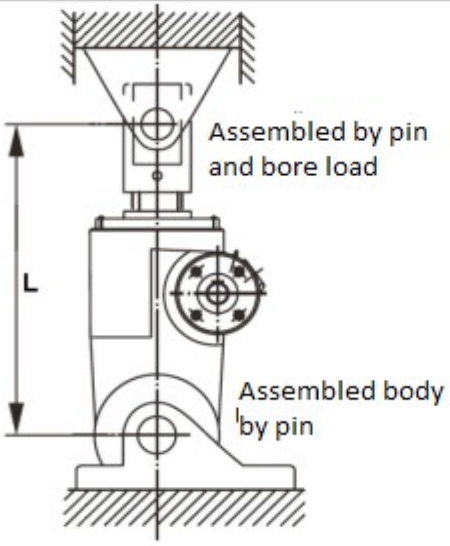
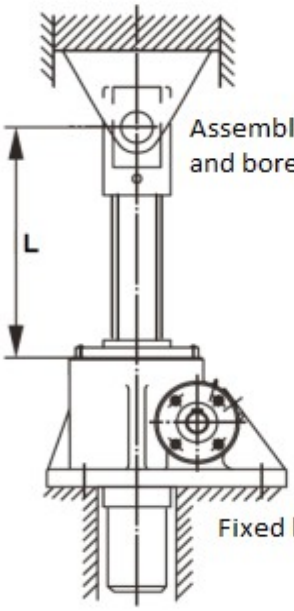
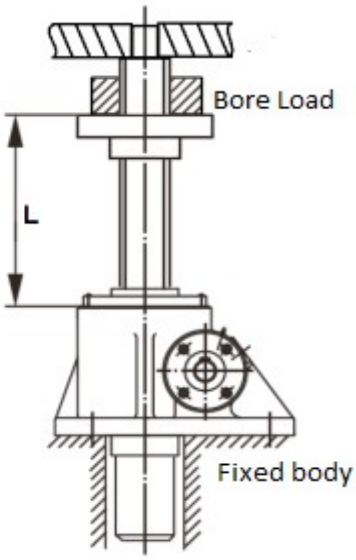
Gear housing assembled by pin or joint. Trapezoidal end (or nut) assembled by pin or joint, and it is collinear to the motion



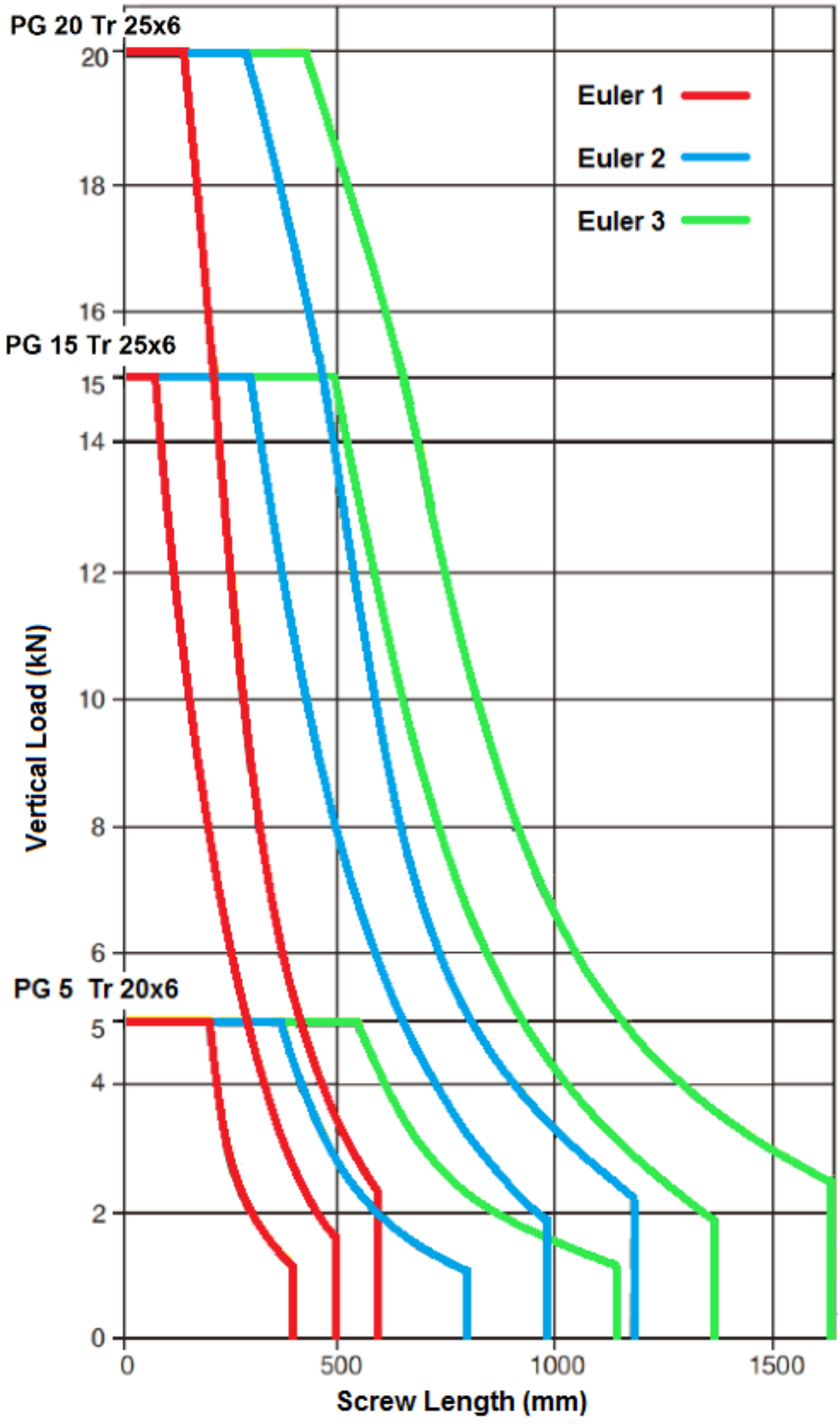
Euler 3

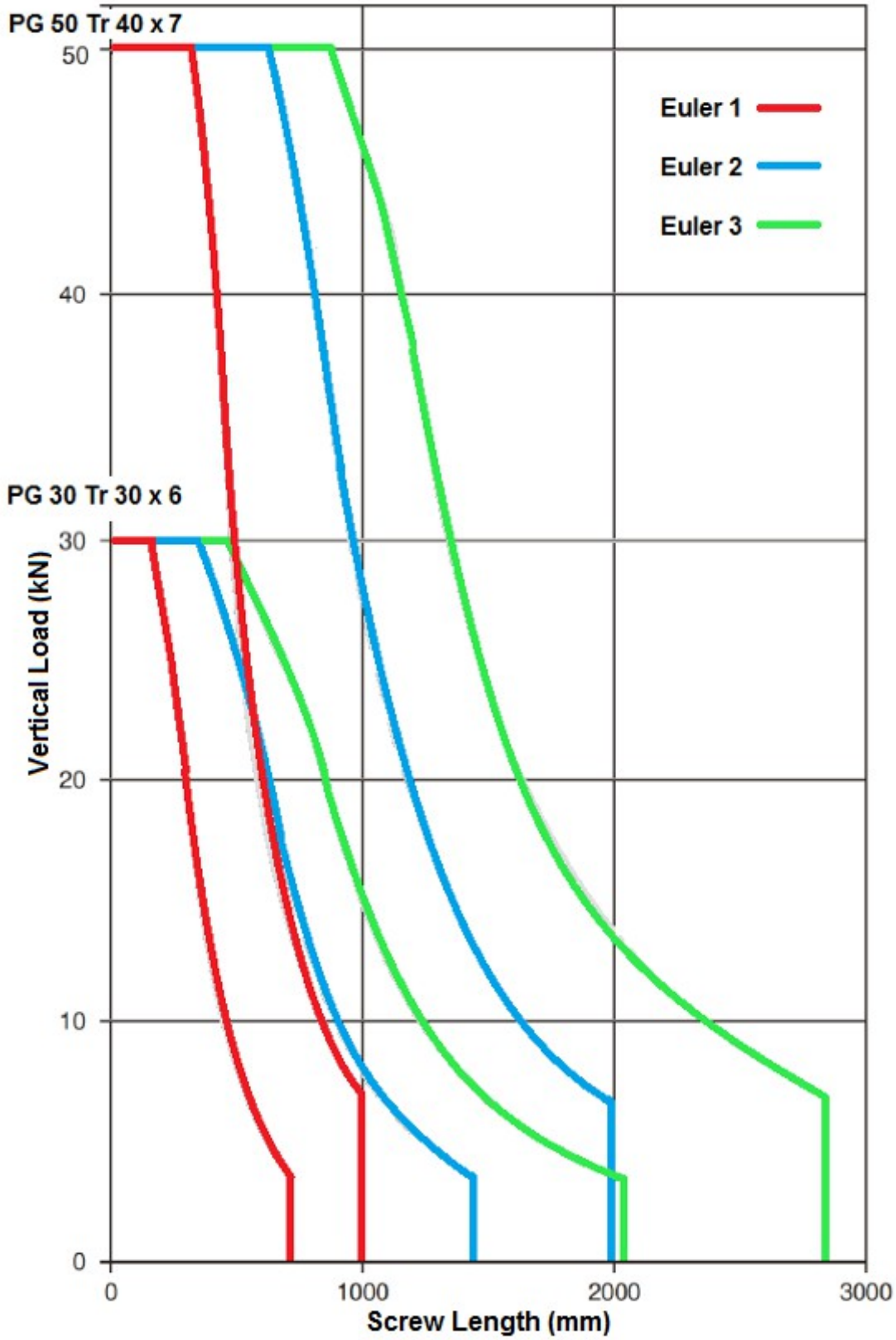
Screw jack housing fixed to the base. Trapezoidal end (or nut) assembled by pin or joint, and it is collinear to motion

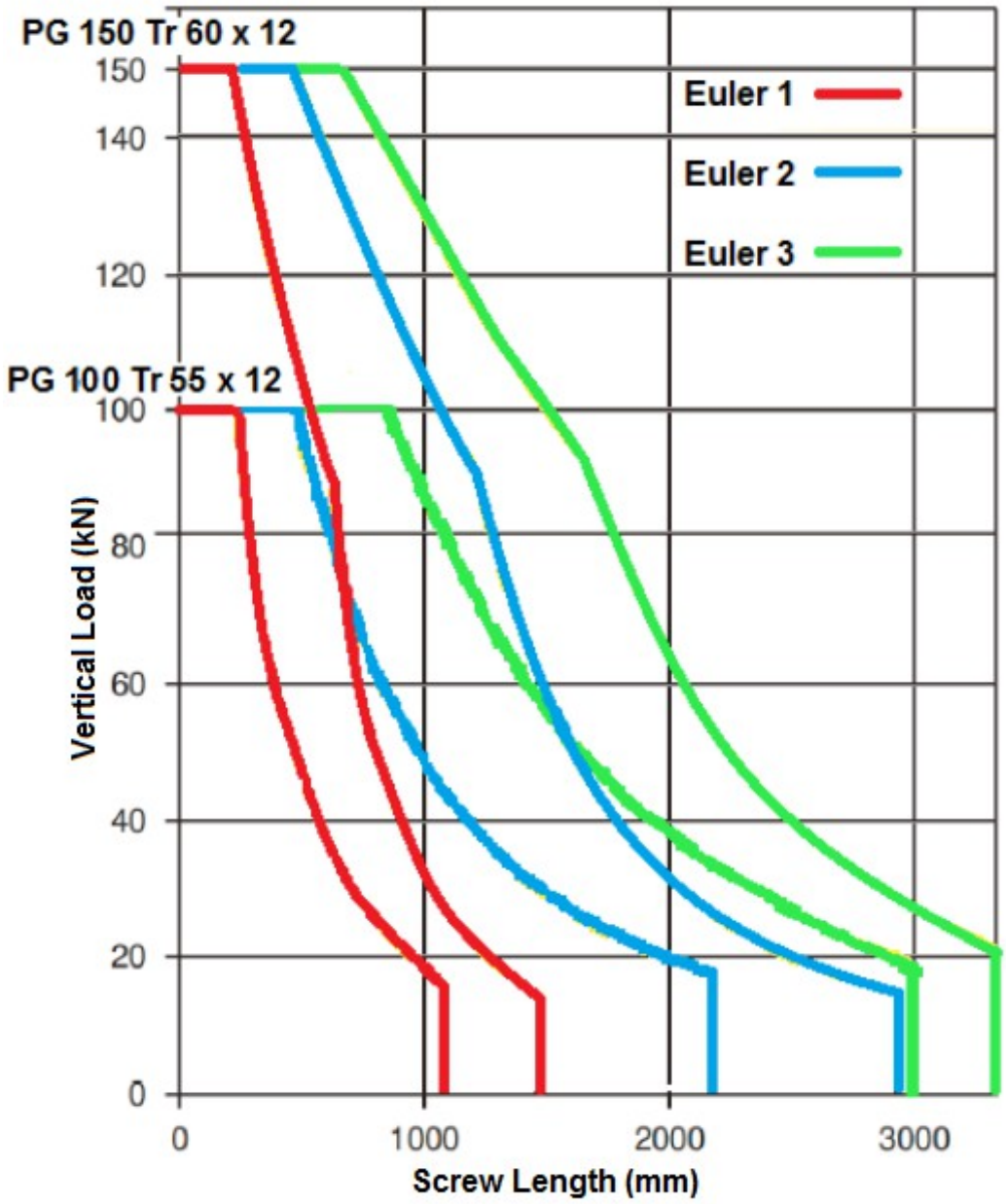


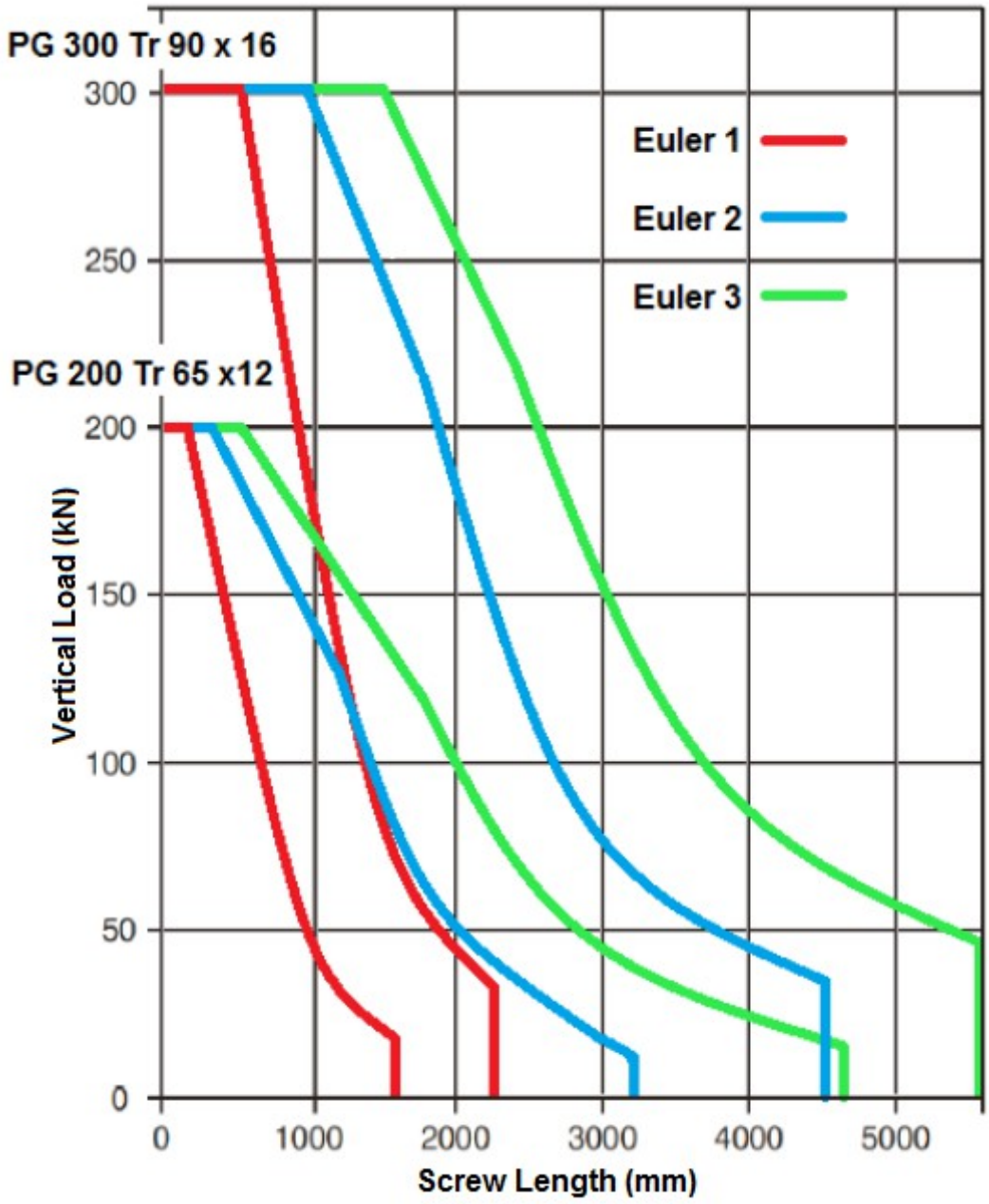
	Travelling Ball Screw	Travelling Ball Nut
Euler 1 		
Euler 2 		
Euler 3 		

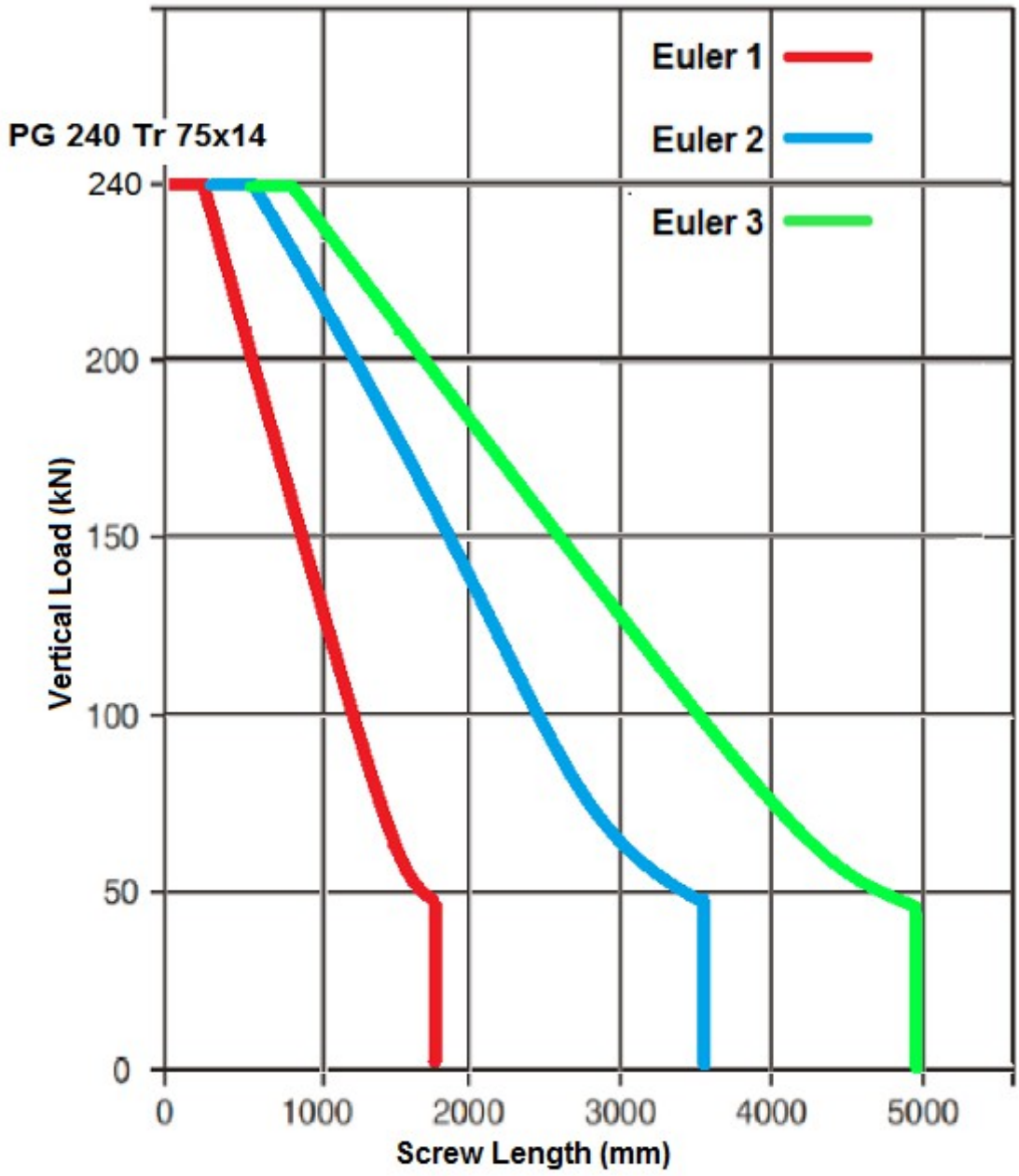
Permissible Capacity Value

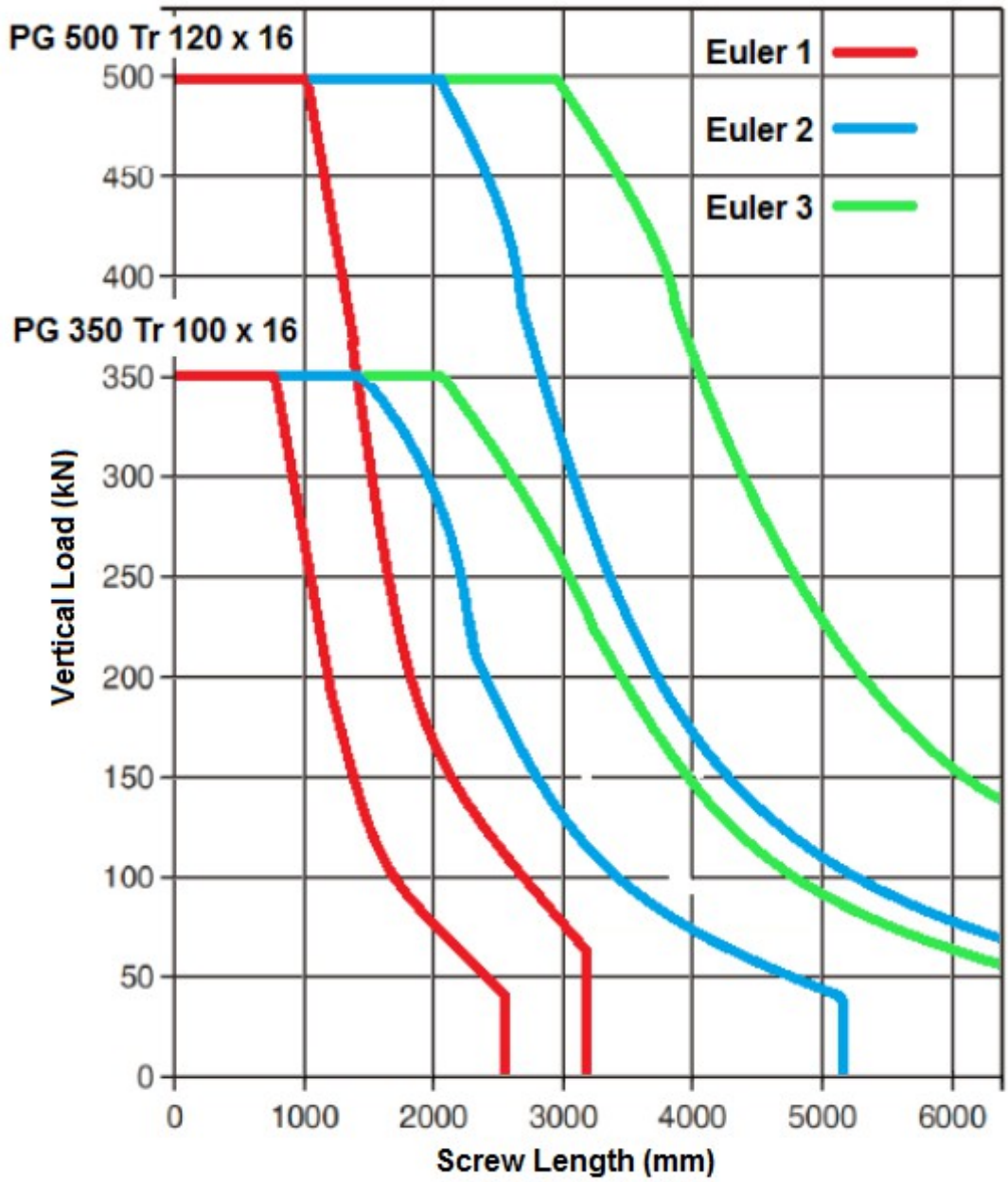


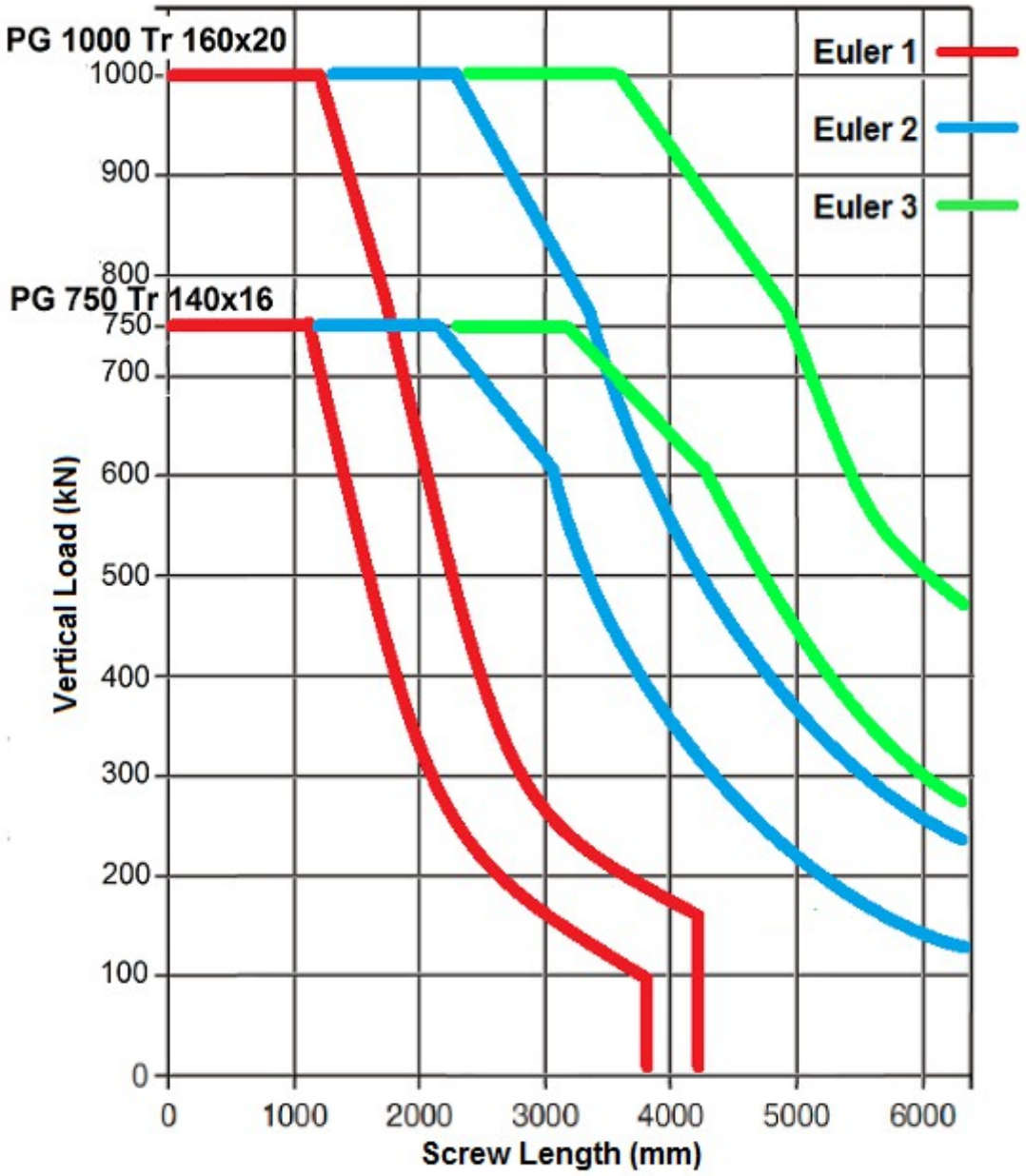

PG 50 Tr 40 x 7
PG 30 Tr 30 x 6
Euler 1
Euler 2
Euler 3
Vertical Load (kN)
50
40
30
20
10
0
0
1000
2000
3000
Screw Length (mm)

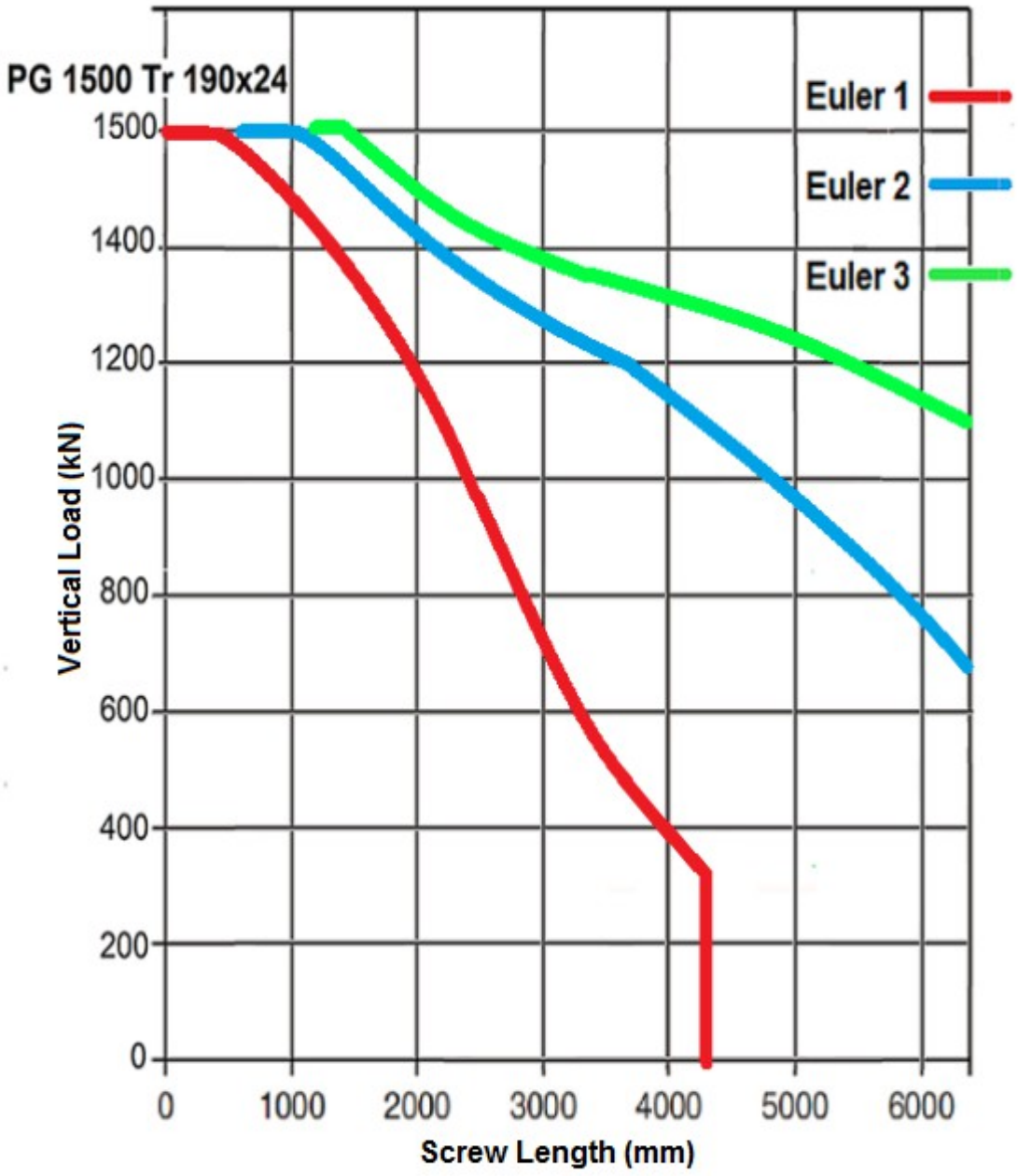

PG 150 Tr 60 x 12
PG 100 Tr 55 x 12
Euler 1
Euler 2
Euler 3
Vertical Load (kN)
150
140
120
100
80
60
40
20
0
0
1000
2000
3000
Screw Length (mm)


PG 300 Tr 90 x 16
PG 200 Tr 65 x12
Euler 1
Euler 2
Euler 3
Vertical Load (kN)
300
250
200
150
100
50
0
0
1000
2000
3000
4000
5000
Screw Length (mm)

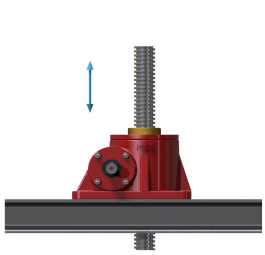

PG 240 Tr 75x14
Euler 1
Euler 2
Euler 3
Vertical Load (kN)
240
200
150
100
50
0
0
1000
2000
3000
4000
5000
Screw Length (mm)


PG 500 Tr 120 x 16
PG 350 Tr 100 x 16
Euler 1
Euler 2
Euler 3
Vertical Load (kN)
500
450
400
350
300
250
200
150
100
50
0
0
1000
2000
3000
4000
5000
6000
Screw Length (mm)

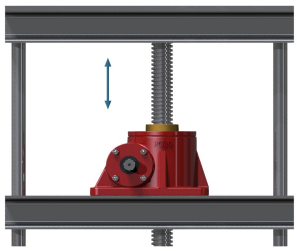

PG 1000 Tr 160x20
PG 750 Tr 140x16
Euler 1
Euler 2
Euler 3
Vertical Load (kN)
1000
900
800
750
700
600
500
400
300
200
100
0
0
1000
2000
3000
4000
5000
6000
Screw Length (mm)


PG 1500 Tr 190x24
Euler 1
Euler 2
Euler 3
Vertical Load (kN)
1500
1400
1200
1000
800
600
400
200
0
0
1000
2000
3000
4000
5000
6000
Screw Length (mm)

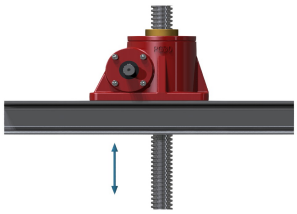
Installation Positions



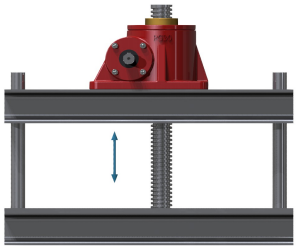
Position-P1



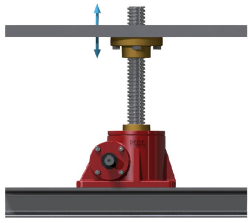
Position-P2



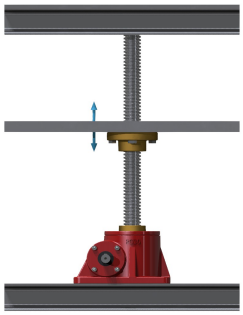
Position-P3



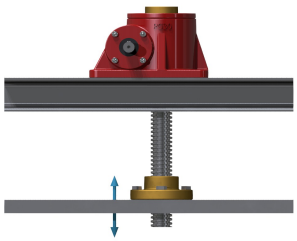
Position-P4



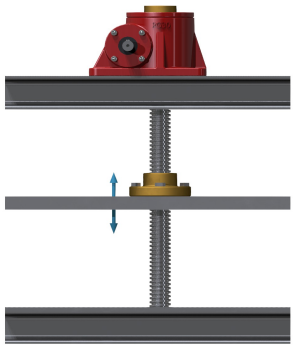
Position-P5



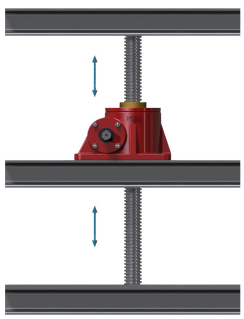
Position-P6



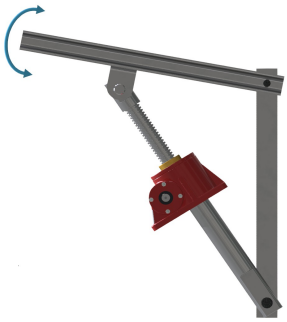
Position-P7



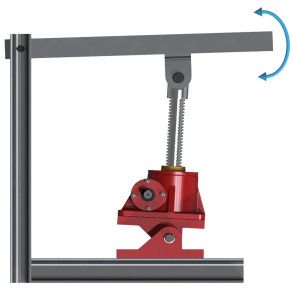
Position-P8



Position-P9

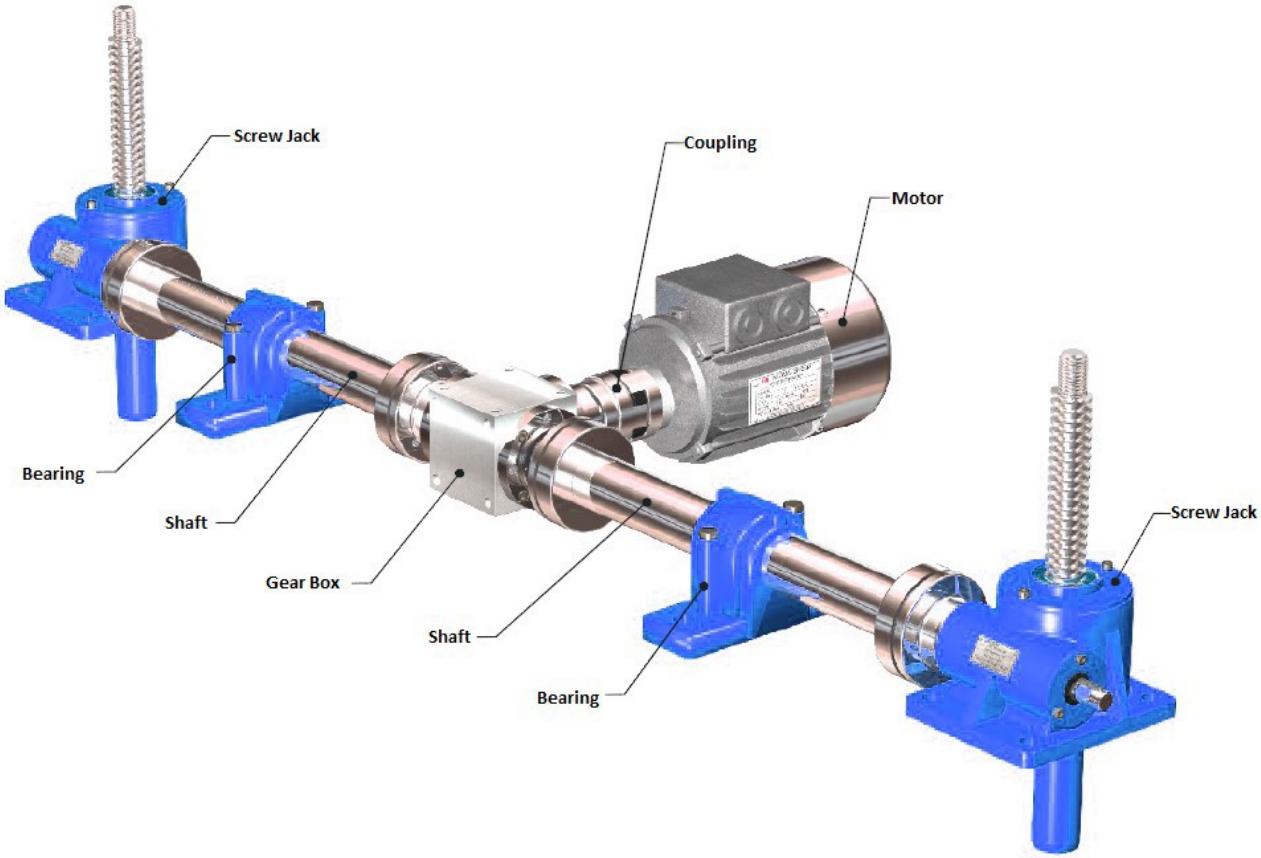


Position-P10



Position-P11

Installation Examples

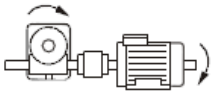


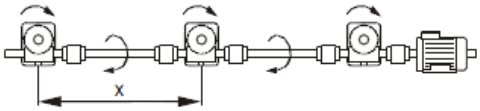
The motorized screw jack is designed to allow moving of motor and shaft connection in both directions. The choice of gear unit type, motor type and interconnection shaft types for the load and materials to be lifted is determined by our company. The choice of X and Y type is also determined by our company according to the requested pace and specifications stated on the order form where the efficiency and performance is ensured.

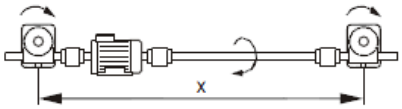
In our assembly examples, we have diagrams of how screwed jack shaft connections, motor and reducer connections are implemented.

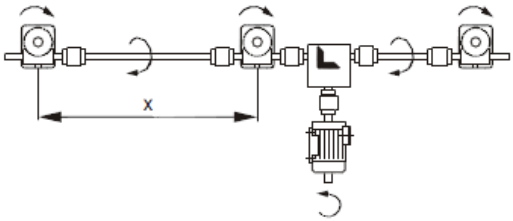
In our practical examples, you can have an idea of where and how your screw jacks are used in everyday life. You can find out more information about screw jack installations and equipment.

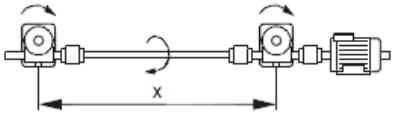
Installation Examples-1

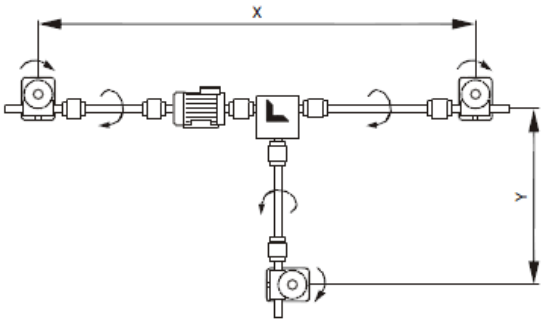


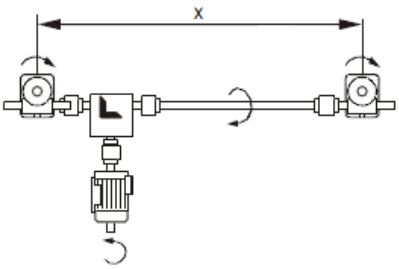


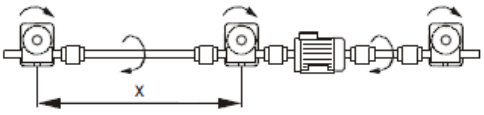


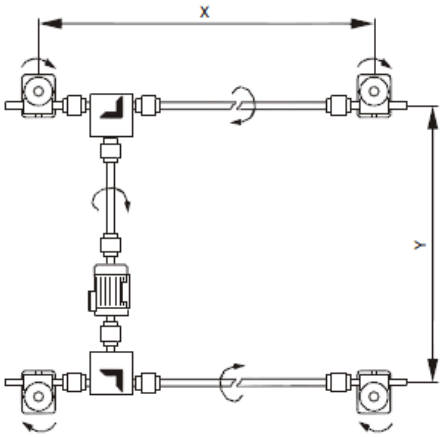


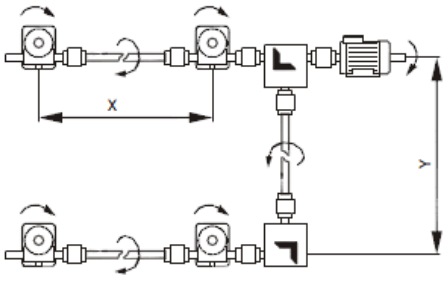




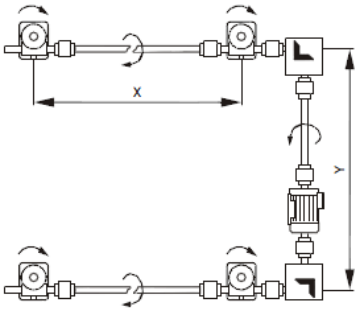


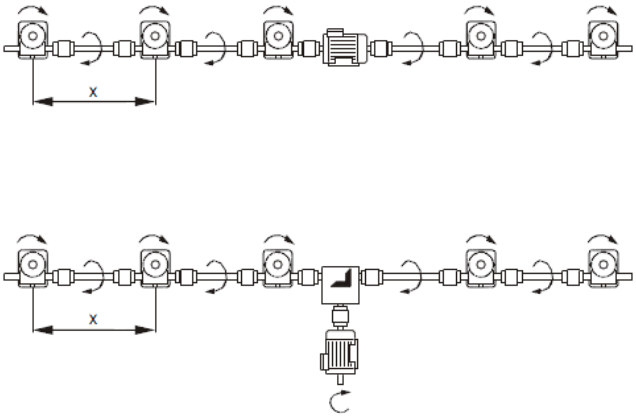


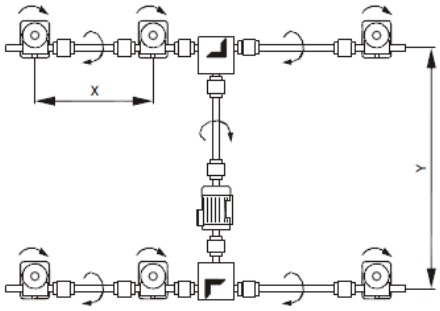


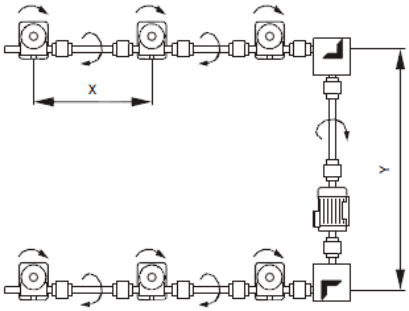


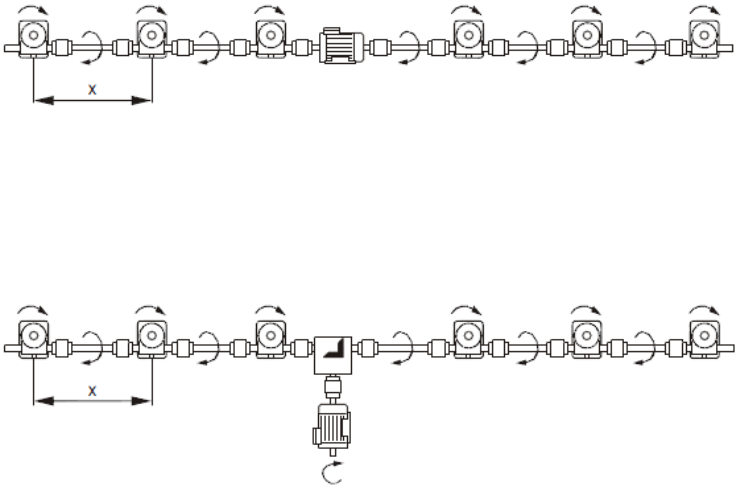
Installation Examples-2

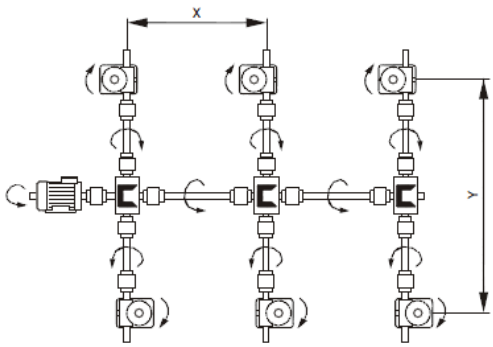








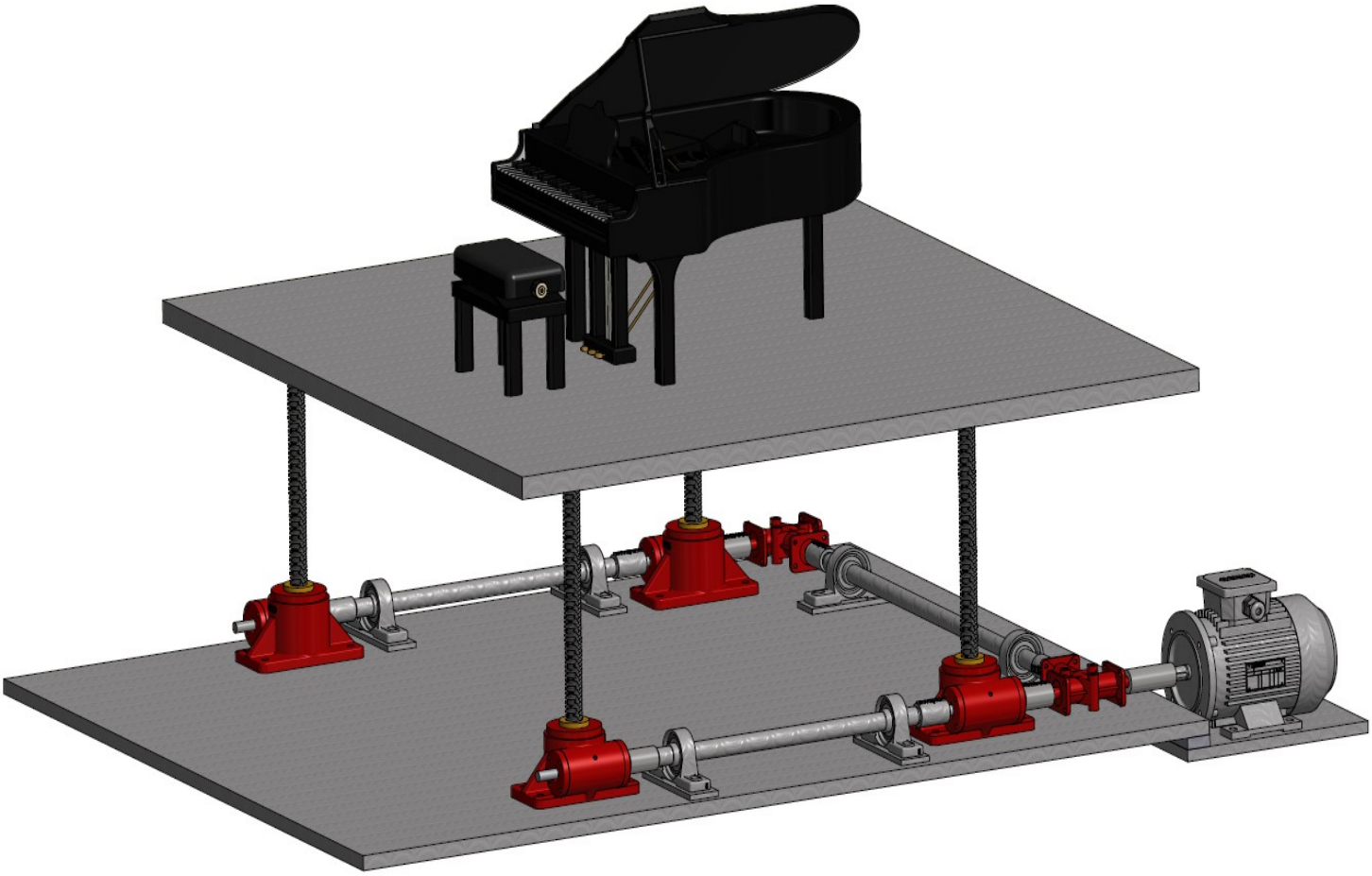




Application Examples

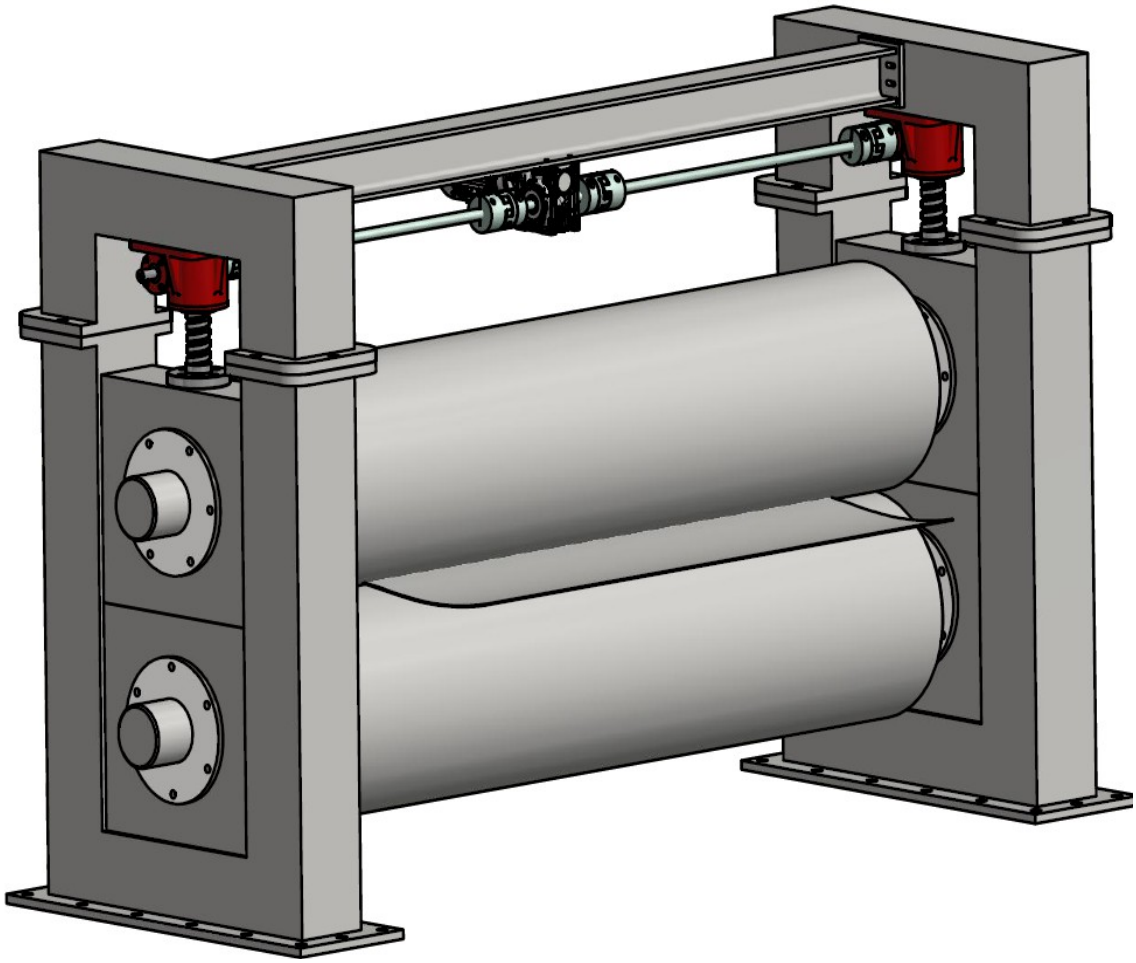
RADAR
APPLICATION

Application Examples



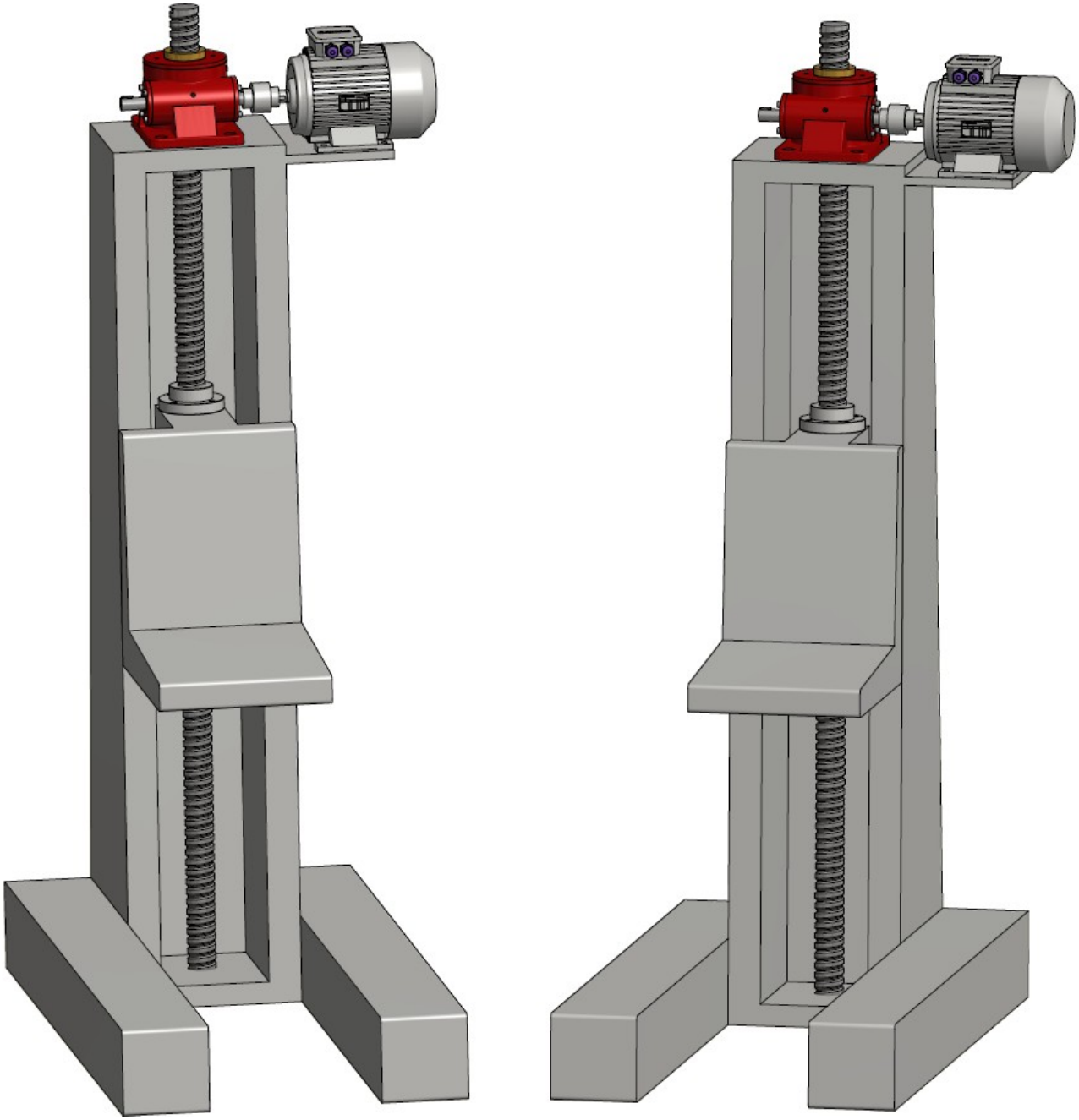
STAGE LIFTING APPLICATION

Application Examples



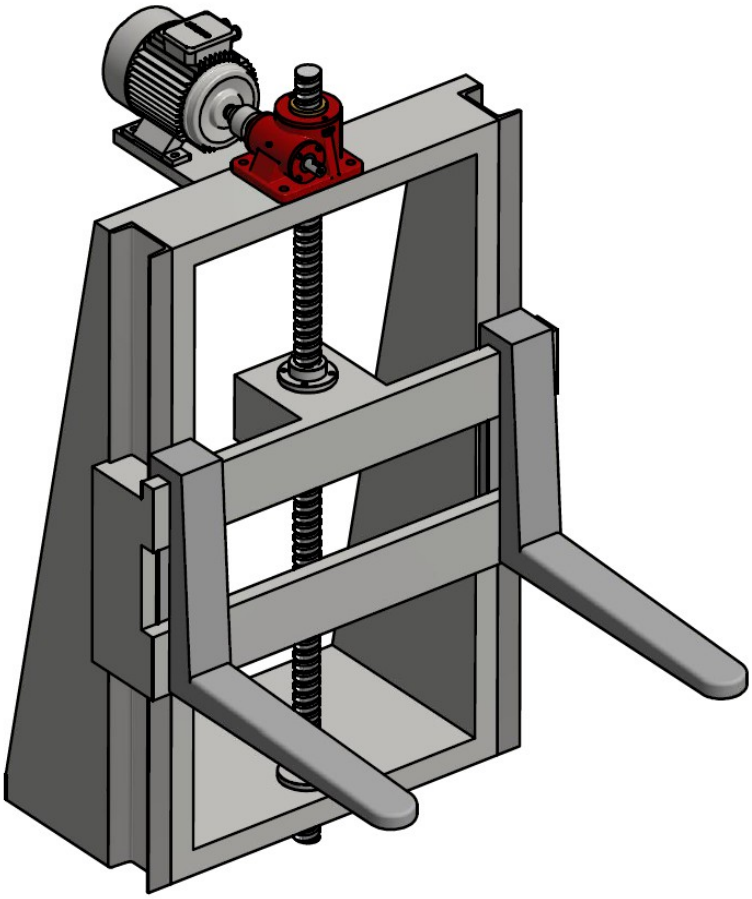
BENDING ROLLER APPLICATION

Application Examples

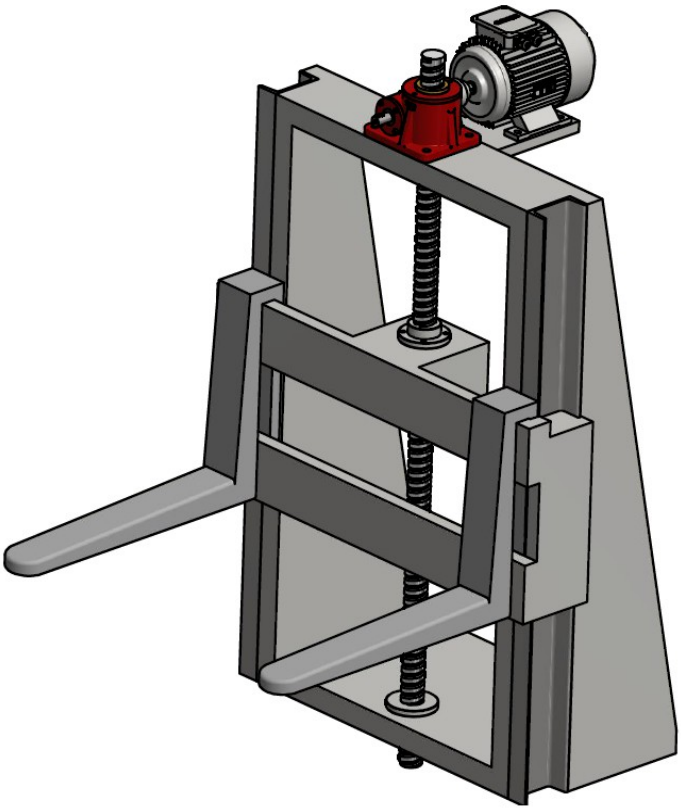


LOAD LIFTING SYSTEM
APPLICATION

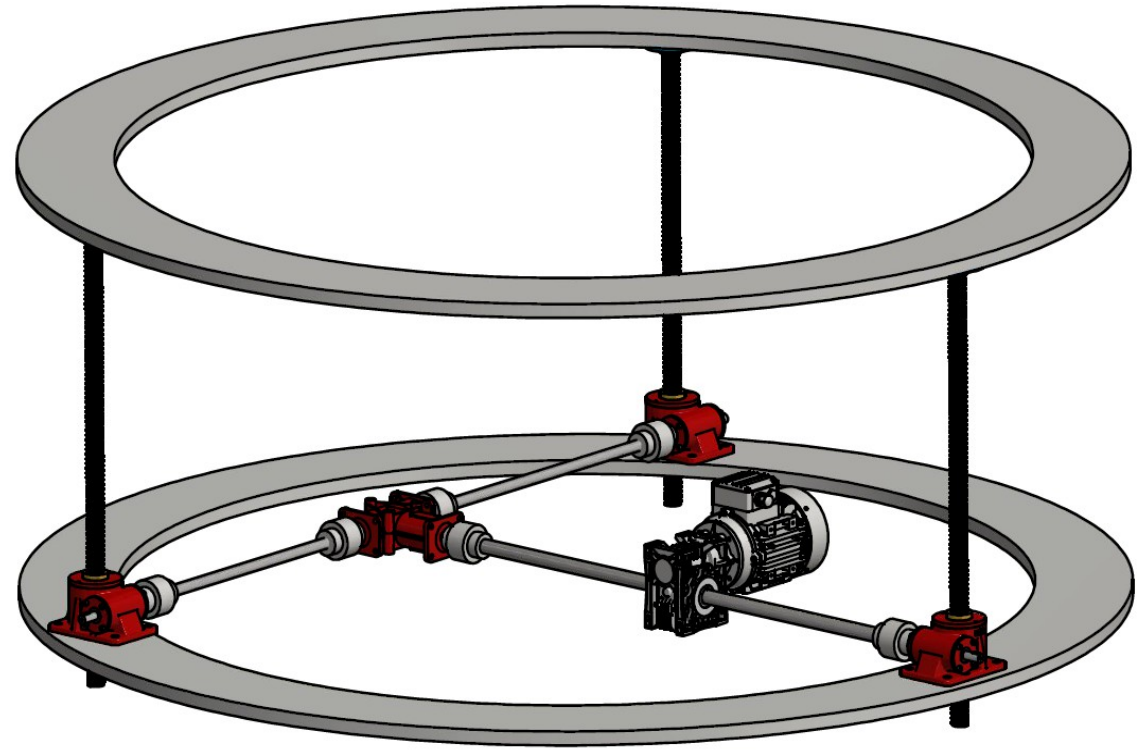
Application Examples

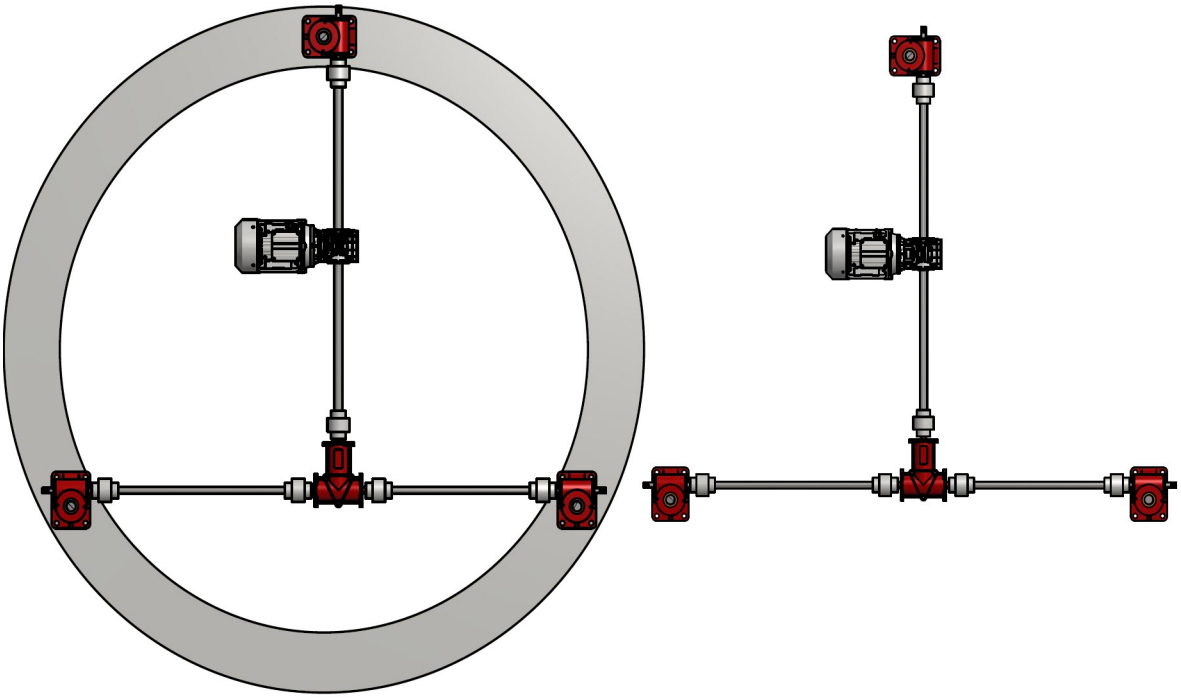


LOAD LIFTING SYSTEM APPLICATION



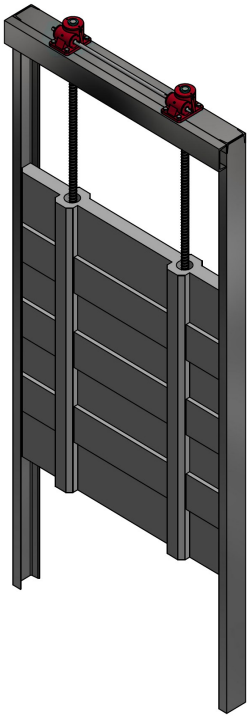
Application Examples





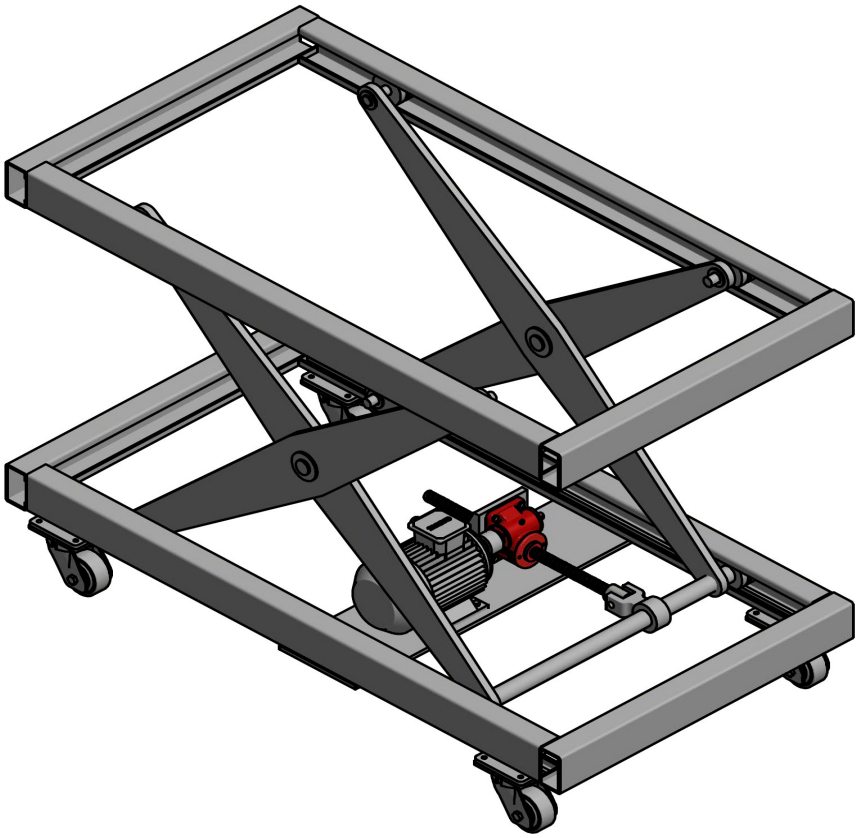
TRIAXIAL LOAD LIFTING SYSTEM APPLICATION

Application Examples

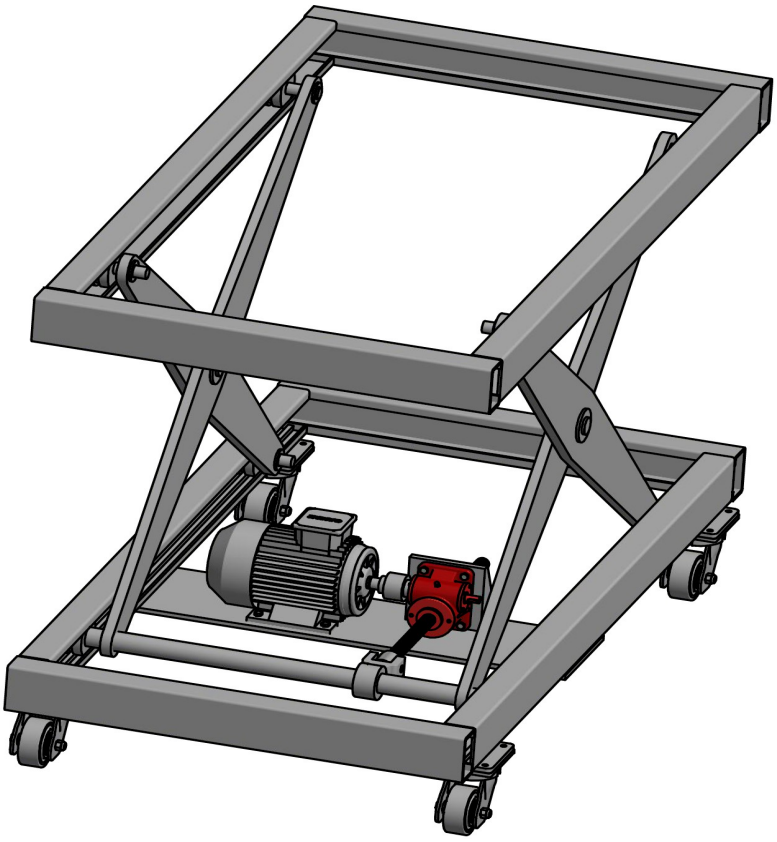


DAM SHUTTER
APPLICATION

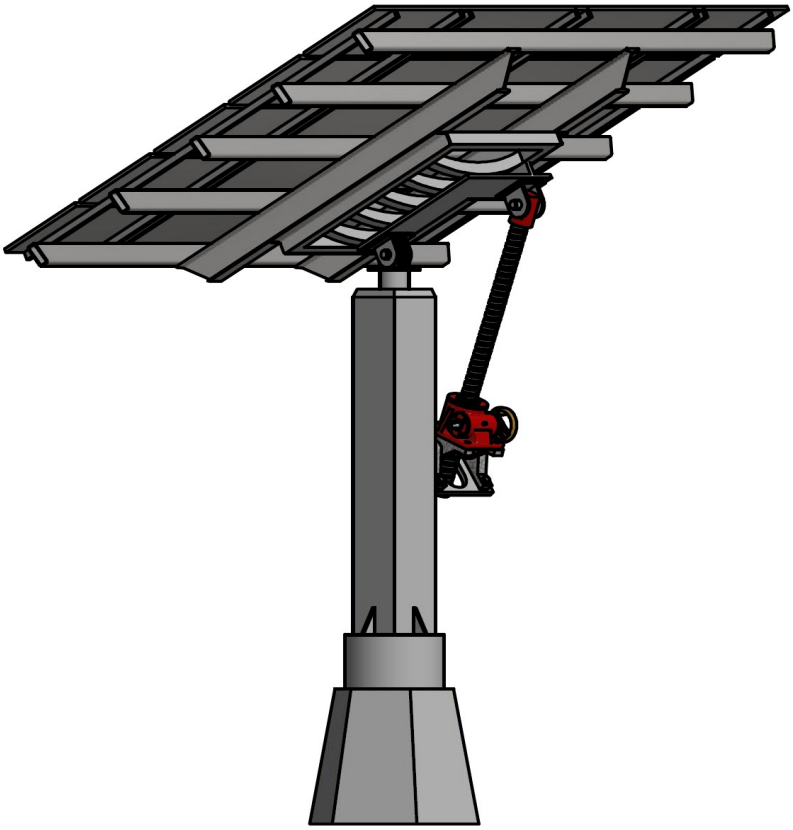
Application Examples



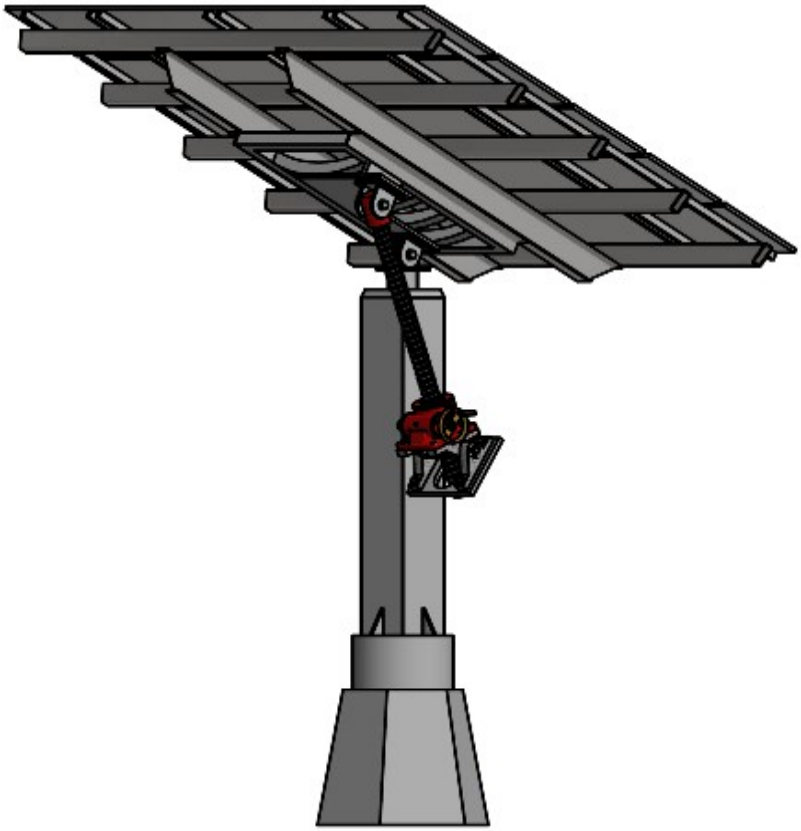
PLATFORM LIFTING APPLICATION



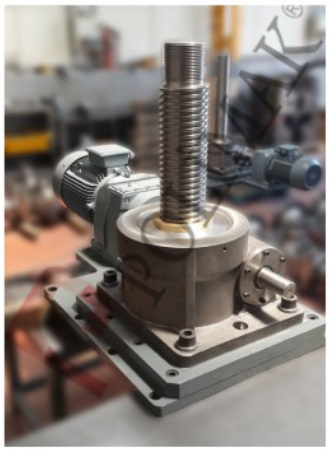
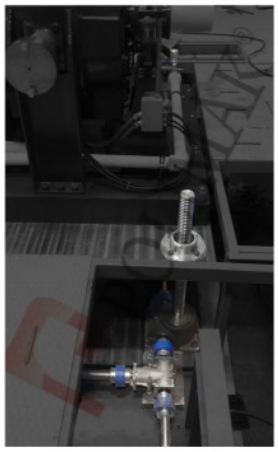
Application Examples

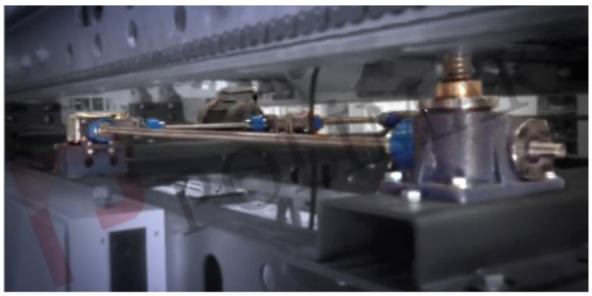
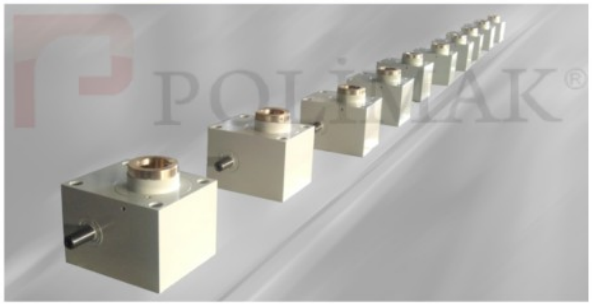


SOLAR ENERGY PANELS LIFTING APPLICATION



Application Examples

SCREW JACK SELECTION QUESTIONNAIRE

COMPANY			
CONTACT PERSON			
ADDRESS			
TEL		**DATE**	
E-MAIL		**FAX**	

SCREW JACK SELECTION

APPLICATION AREA		
APPLIED LOAD		**KN**
		Kg
SCREW JACK FORCE		**KN**
SCREW JACK AMOUNT		**Piece**
STROKE LENGTH		**mm**
SVREW JACK SPEED		**m/min**

TYPE OF GEAR RATIO (Refer. Catalog page 3)	**X-High Gear Ratio** ☐	**Y-Low Gear Ratio** ☐

INSTALLATION POSITIONS		
	Upward and downward move	☐
	Horizontal move	☐

DRIVE SYSTEM		**WORKING CONDITIONS**			
W/Handwheel	W/Electrical Motor	Humid Environment	☐	Corrosive	☐
		Dusty Enviroment	☐	Open Area	☐
☐	☐	OTHER.....			

INSTALLATIONS POSITION TYPE (P1, P2,....., P11)

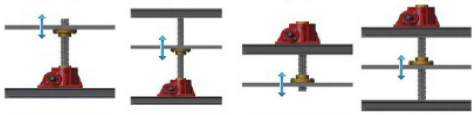
for Travelling Ball and Travelling Wedge Types

P1 ☐ P2 ☐ P3 ☐ P4 ☐

P9 ☐ P10 ☐ P11 ☐

for Travelling Ball Nut Type

P5 ☐ P6 ☐ P7 ☐ P8 ☐

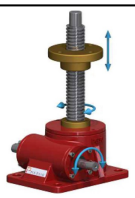


SCREW JACK TYPE (V, K, T)

Travelling Ball Screw (V) ☐

Travelling Wedge Screw (K) ☐

Travelling Ball Nut (T) ☐



TYPE OF SPINDLE HEADS (F1, F2, F3, F4, F5)

for V and K Types

F1 type ☐ (Plane End)

F2 type ☐ (Rod-Type Head)

F3 type ☐ (Flange Plate)

for T Type

F4 type ☐ (Bronze Nut)

F5 type ☐

Special Design

EQUIPMENT TYPE (A, B, C, D, E)

A-Type (None) ☐

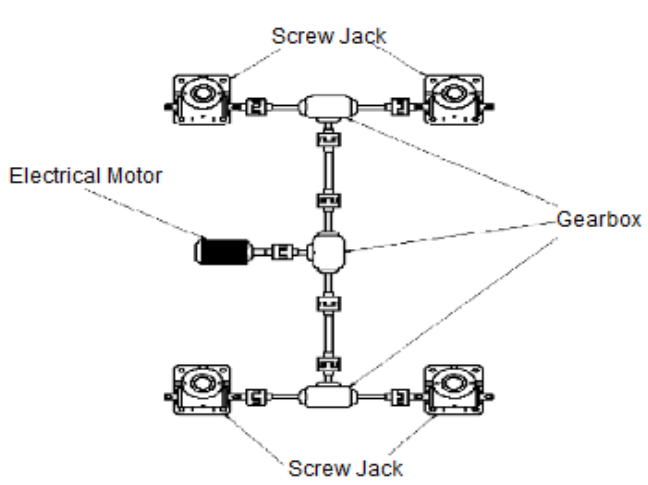
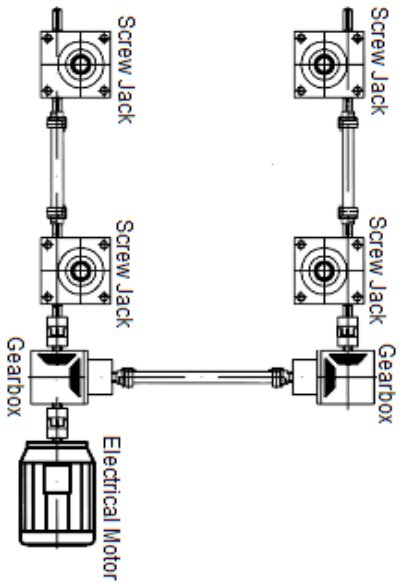
B-Type (Protection Bellow-Available) ☐

C-Type (Cover Pipe-Available) ☐

D-Type (Protection Bellow-Available) (Cover Pipe-Available) ☐

E-Type (Swivel Mounting Base-Available) ☐

DETAIL	

INSTALLATION LAYOUT

EXAMPLES