

POWERJACKS

PRECISION ACTUATION

Morskate®



E-SERIES STAINLESS STEEL SCREWJACKS

POWERJACKS

Best engineered
solution for precision
linear actuation,
power transmission
& jacking systems.



Capability



OUR EXPERTISE HAS BEEN BUILT ON A HISTORY OF MORE THAN 100 YEARS OF ENGINEERING, CRAFTSMANSHIP, VISIONARY DESIGN, QUALITY MANUFACTURE AND CUSTOMER CARE.



Power Jacks is a manufacturing/engineering company specialising in the design and manufacture of actuation, lifting and positioning solutions for applications in Industrial Automation, Energy, Defence, Medical, Transport, and the Civil Engineering sectors.

Headquartered near Aberdeen in the UK, the company is the UK's largest screw jack manufacturing facility, that uses the latest engineering technologies to deliver quality products (BS EN ISO 9001) that offer reliability, performance and economy.

Power Jacks deliver this high quality service in a safe (OHSAS 18001) and environmentally friendly (ISO 14001) working environment thanks to the highly trained, flexible and motivated teams that work throughout the business driving the company to higher levels of performance.

We know our customers demand our engineering expertise to help find a solution for their applications. We take pride in designing and delivering the best solution using standard or special designs that help improve your business.

Our Vision is to become the partner of choice for our products globally

Our Mission is to provide high quality lifting & positioning solutions.

Global Reach

Power Jacks has local representation in 26 countries and supplies its products to more than 80 countries worldwide.



A global reach with a local service as we work closely with our customers to ensure the best solution for all their Electro-Mechanical solution applications.

- Headquarters & Factory
- Local Power Jacks Sales Offices
- Local Representative

1. Introduction

Translating Screw Jack Building System	6
Rotating Screw Jack Building System.....	7
Jacking Systems	8
Screw Jack Product Code.....	10
Selecting a Screw Jack	14

2. E-Series - Stainless Steel Screw Jacks 18

Features	19
Application Focus	22
Performance	23
E-Series Translating Stainless Steel Screw Jack 10kN	24
E-Series Rotating Stainless Steel Screw Jack 10kN	25
E-Series Translating Stainless Steel Screw Jack 25kN	26
E-Series Rotating Stainless Steel Screw Jack 25kN	27
E-Series Translating Stainless Steel Screw Jack 50kN	28
E-Series Rotating Stainless Steel Screw Jack 50kN	29
E-Series Translating Stainless Steel Screw Jack 100kN	30
E-Series Rotating Stainless Steel Screw Jack 100kN	31
E-Series Translating Stainless Steel Screw Jack 200kN	32
E-Series Rotating Stainless Steel Screw Jack 200kN	33
E-Series Translating Stainless Steel Screw Jack 300kN	34
E-Series Rotating Stainless Steel Screw Jack 300kN	35
E-Series Translating Stainless Steel Screw Jack 500kN	36
E-Series Rotating Stainless Steel Screw Jack 500kN	37
E-Series Translating Stainless Steel Screw Jack 1000kN	38
E-Series Rotating Stainless Steel Screw Jacks 1000kN	39
Variants	41
Anti-Backlash	42
Anti-Rotation (Keyed)	44
Anti-Backlash & Anti-Rotation (Keyed)	46
Safety Nut	48
Double Hub Nut for Rotating Screw Jacks.....	50
Double Clevis Screw Jack.....	51

3. E-Series - Screw Jack Accessories 53

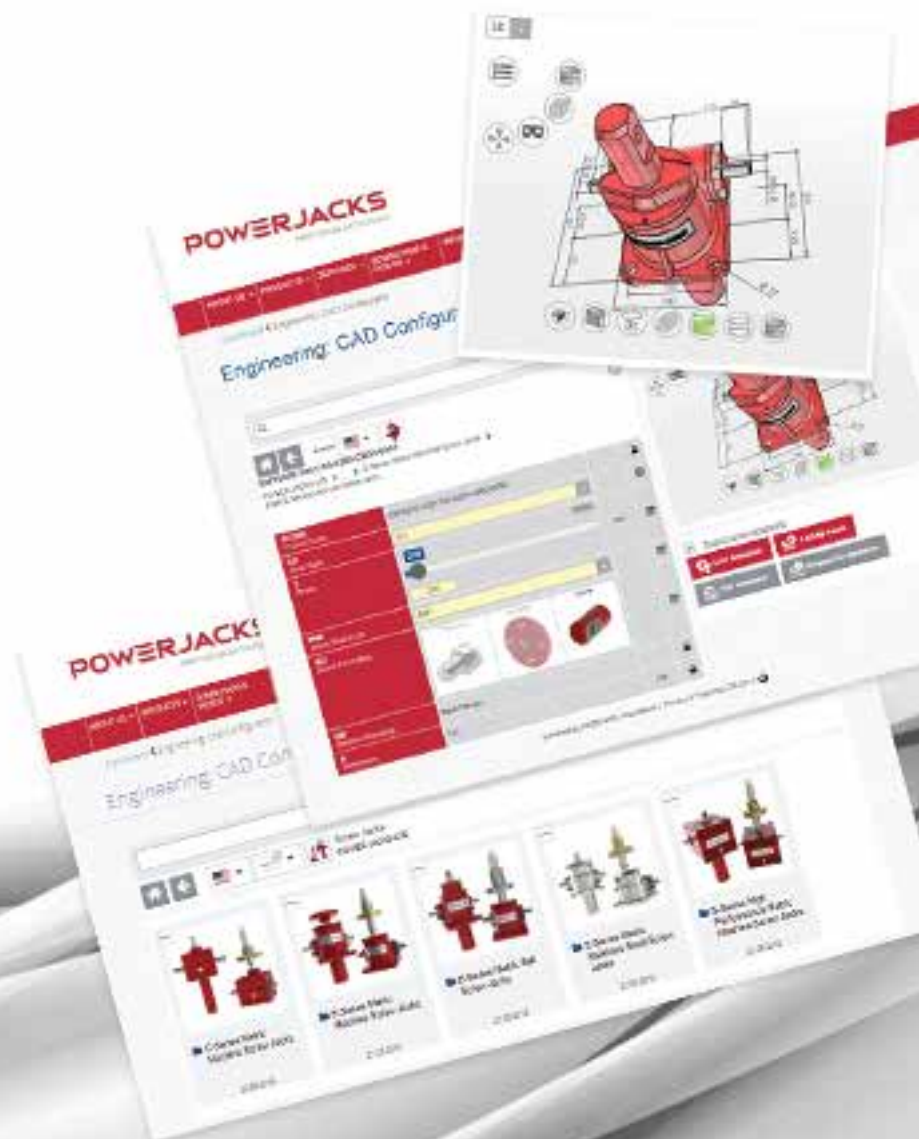
End Fittings.....	54
Stainless Steel Screw Jack Bellow Boots	56
Stop Nuts & Hand Wheels	60
Trunnion Mounts.....	61
Motor Adapter	65
Limit Switches on Cover Pipe.....	66
Rotary Limit Switch - RLS	67

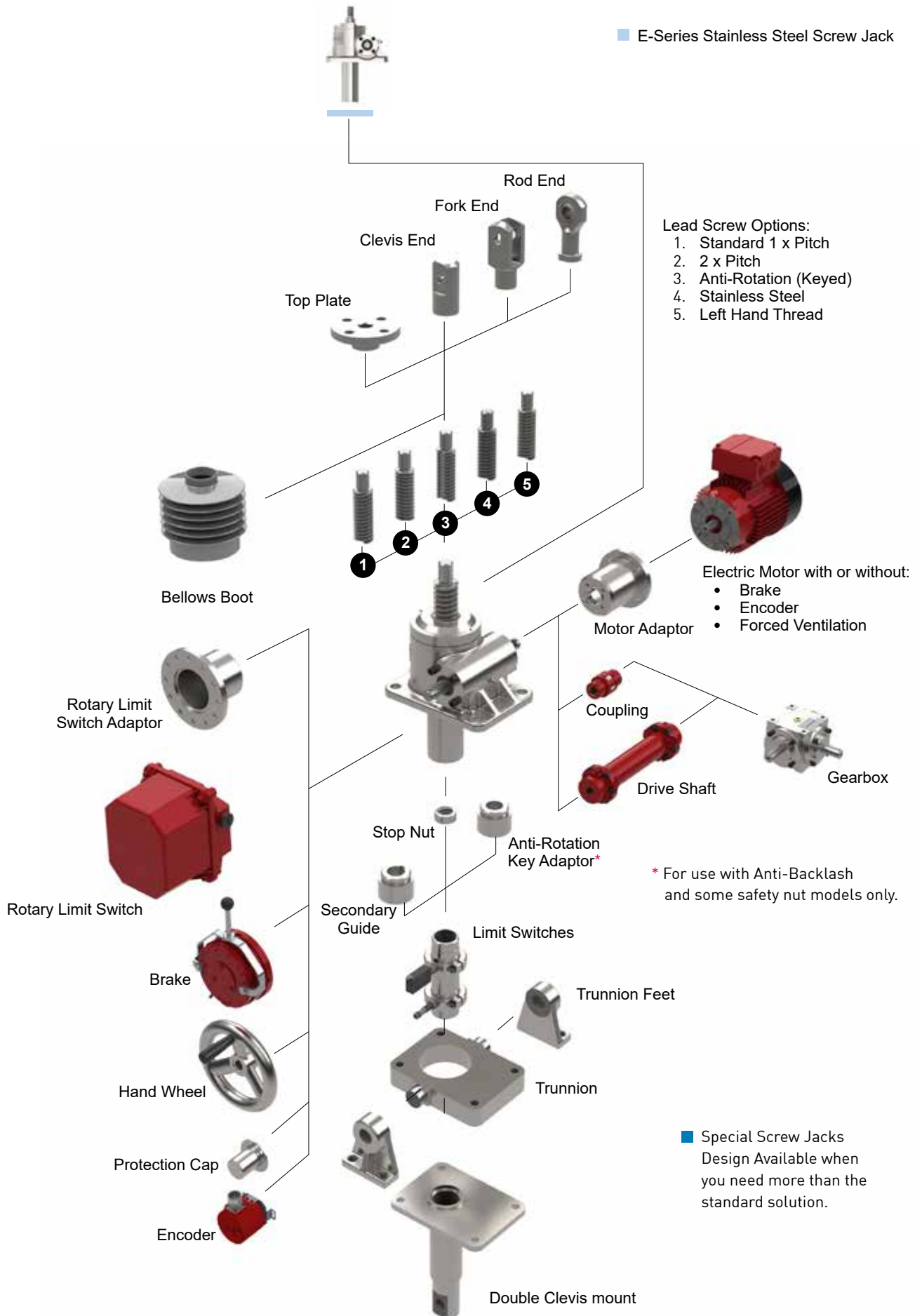
4. Engineering Guide 68

Screw Jack Performance.....	69
Machine Screw Jack Column Strength Charts	70
Ball Screw Jack Column Strength Charts.....	73
Screw Jack Key Torque	74
Side Load Rating.....	75
Radial Loads on Screw Jack Worm Shaft.....	76
Axial Backlash Ratings	77
Lateral Movement Ratings	78
Operation	79
Calculation Formulae	80

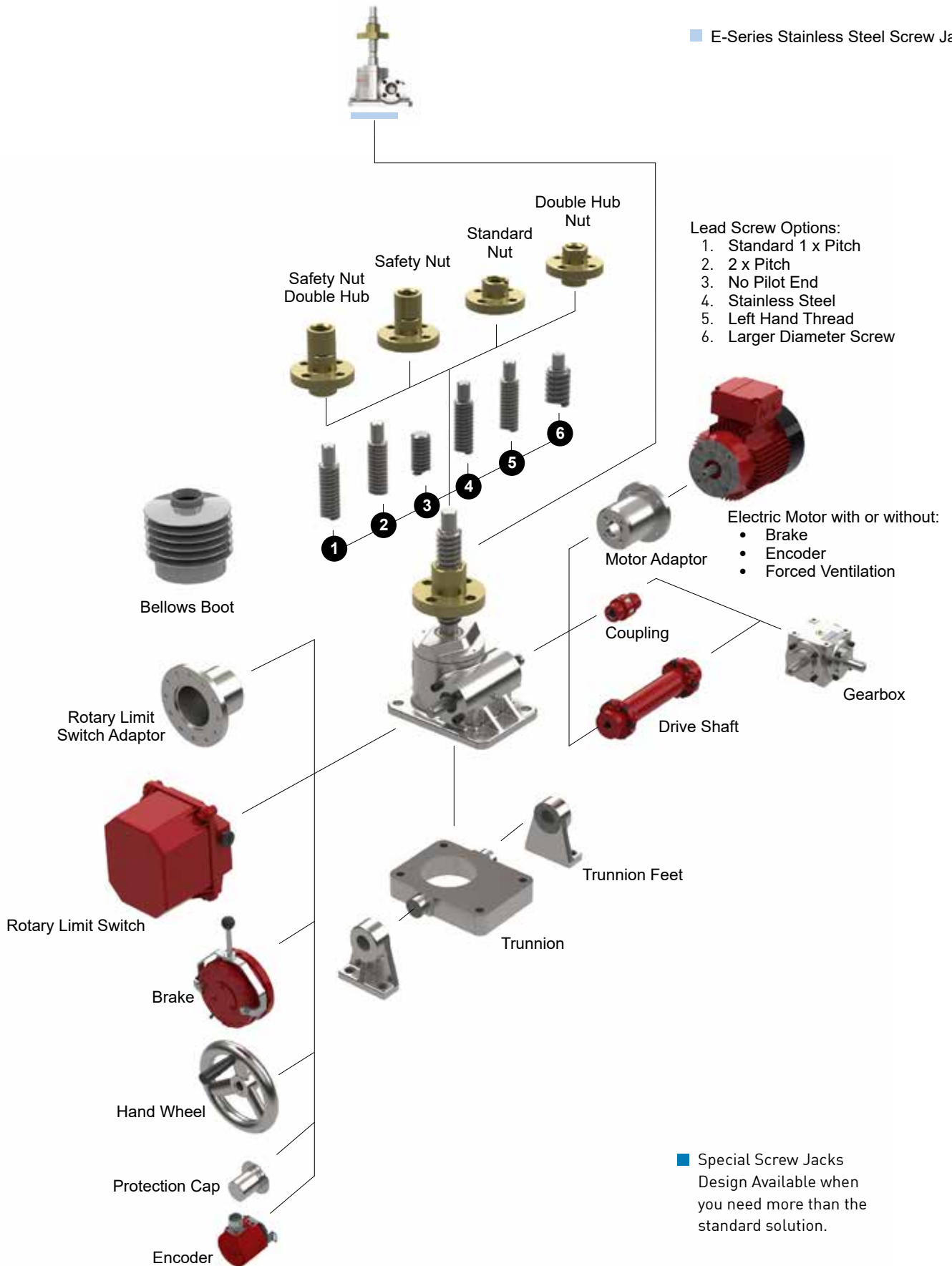
TRY OUR 3D CAD PORTAL

- 2D CAD Drawings
- 3D CAD Models
- Dimensioned Data Sheet





E-Series Stainless Steel Screw Jack

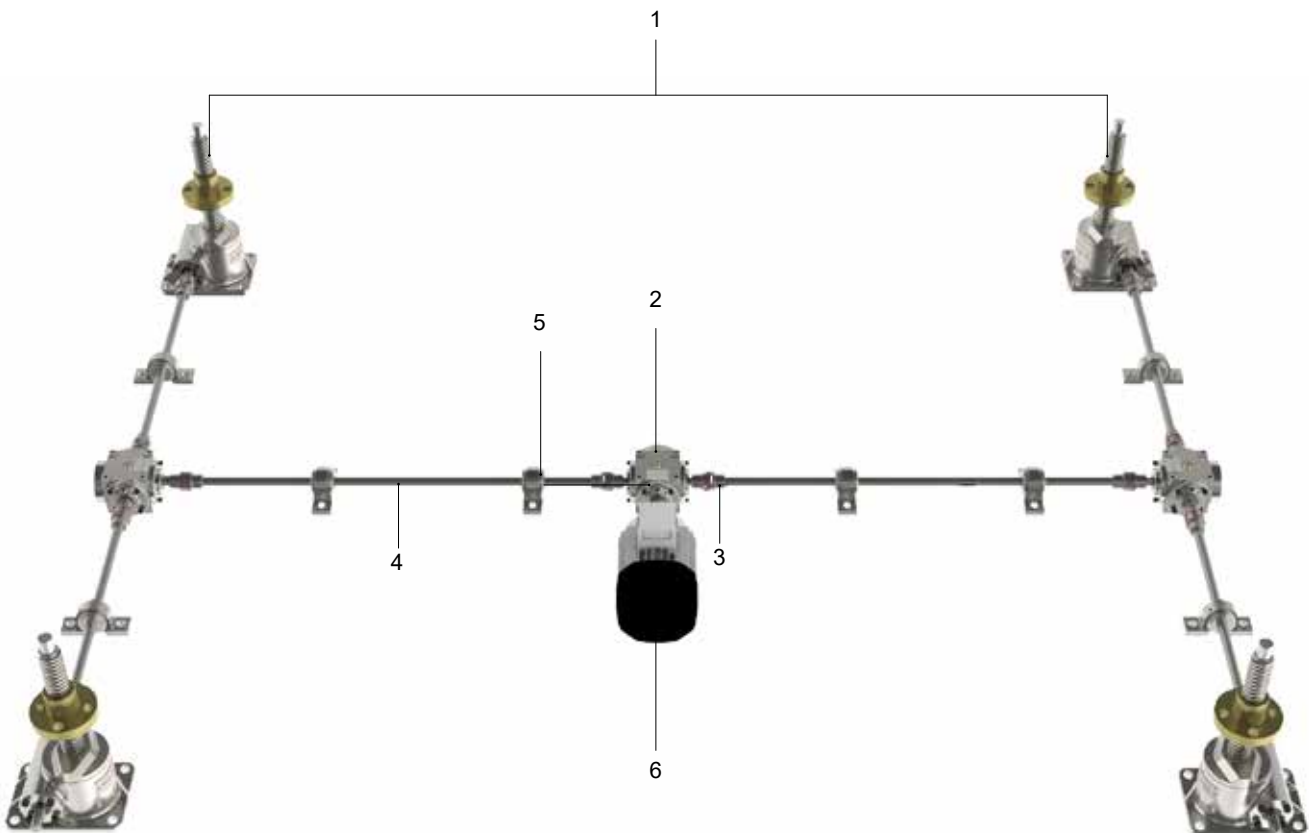


Special Screw Jacks Design Available when you need more than the standard solution.

Screw jacks can be connected together in systems so that multiple units can be operated and controlled together. These jacking system arrangements or configurations can be built in many formats with the use of bevel gearboxes, motors, reduction gearboxes, drive shafts, couplings, plummer blocks and motion control devices.

Four of the most popular system configurations are the 'H', 'U', 'T' and 'I' configured jacking systems. Note that multiple screw jacks can be linked together mechanically or electrically. The latter is useful if there is no space for linking drive shafts.

Typical 'H' configuration System



1. Screw Jack
E-Series Rotating Machine Screw Jack shown here.
2. Bevel Gearbox
Range-N Spiral Bevel Gearboxes
3. Flexible Coupling
A range of couplings are available to suit each systems requirements including Jaw, Spacer and Geared types.
4. Drive Shaft
Every drive shaft is manufactured to order for each system design. Self supporting drive shafts (spacer couplings) are also available.
5. Shaft Supports (plummer blocks).
6. Electric Motor
Standard electric motors in 3 phase, 1 phase, DC and servo designs. Supplied as a basic motor or as part of a geared motor. Brakes are available for all motors.

Jacking systems are not limited to the number of screw jacks shown here. They are regularly supplied to clients with 2, 4, 6, 8 jack systems. Larger systems can extend up to 16 or higher. With the use of electronic synchronisation/control multiple systems or screw jacks can be used in unison. Extending the possible number of screw jacks used in unison in excess of 100.

To facilitate electronic control of screw jacks, feedback devices (eg encoder, limit switch) are available, mounted on the screw jack or its motor or another system component.

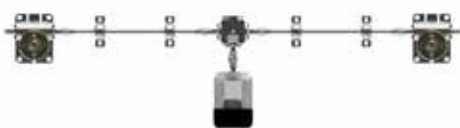
'U' Configuration System



'I' Configuration System



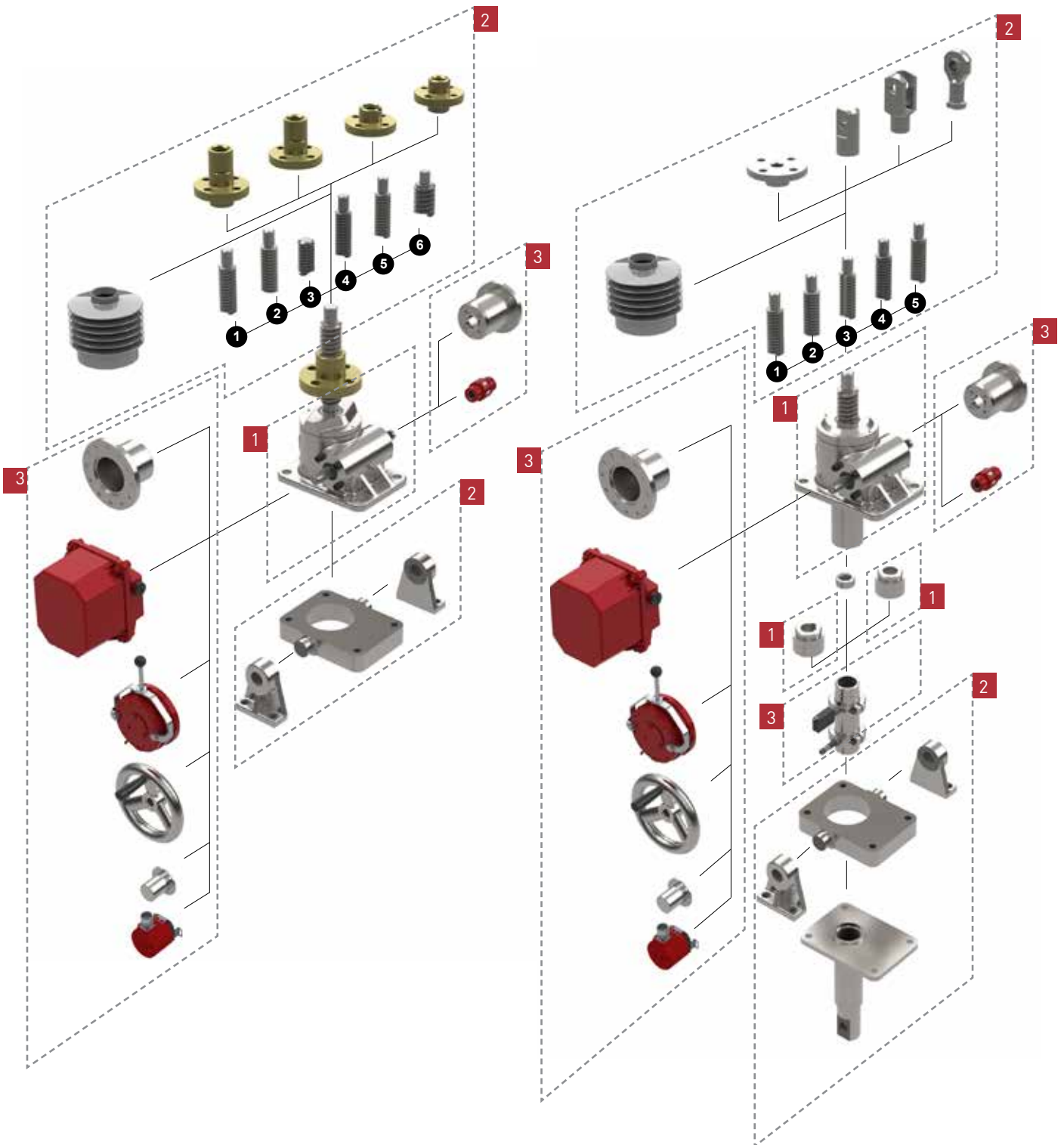
'T' Configuration System



1 GROUP-1 - Screw Jack Gearbox Definition

2 GROUP-2 - Screw Jack Features

3 GROUP-3 - Accessories



1 GROUP-1 - Screw Jack Gearbox Definition**1-Screw Jack Series**

E Series

2 - Screw Type

M Machine Screw

3- Screw Configuration

R Rotating Screw

T Translating Screw

4-7 - Capacity	0025	0050	0100	0200	0300	0500	1000
kN	25	50	100	200	300	500	1000

8 - Character Space**9-Gearbox Type**

V Upright - All Stainless Steel Screw Jack #16

J Inverted - All Stainless Steel Screw Jack #16

10 - Gearbox Feature - 1

0 None

K Anti-Rotation (Keyed)

C Secondary Guide

E Anti-Rotation (keyed) with Secondary Guide

H Double Hub Nut #1, #12

T Trunnion Nut

U Trunnion Nut with Feet

11 - Gearbox Feature - 2

0 None

A Anti-Backlash (this option is zero backlash for ball screws)

B Anti-Backlash with wear monitor - Visual

C Anti-Backlash with wear monitor - Sensor

R Safety Nut Tension

S Safety Nut Compression

T Safety Nut Tension with Wear Monitor - visual

U Safety Nut Compression with wear monitor - visual

V Safety Nut Tension with Wear Monitor - Sensor

W Safety Nut Compression with wear monitor - Sensor

12 - Gear Ratio

1 Option 1 Ratio

2 Option 2 Ratio

A Option 1 Ratio with gear rotation monitor #12

B Option 2 Ratio with gear rotation monitor #12

13 - Lifting Screw Lead

1 Option 1 Lead - Right Hand (Standard) #4

2 Option 2 Lead - Right Hand #4

A Option 1 Lead - Left Hand #5

B Option 2 Lead - Left Hand #5

14 - Worm Shaft Type #16

0 Standard Material

N Nickel Plated Worm Shaft

S Stainless Steel Worm Shaft

15 - Worm Shaft Ends

0 Both

L Left Hand Only

R Right Hand Only

X Both with Protective Cap on LHS #11

Y Both with Protective Cap on RHS #11

16 - Character Space

2 GROUP-2 - Screw Jack Features

17-20 - Stroke	0000
Stroke in mm	0-9999

21 - Character Space

22 - End Type #16 #17	
E	Threaded End
C	Clevis End
T	Top Plate
F	Fork End (standard available up to 200KN)
R	Rod End (standard available up to 200KN)
J	Plain End
P	Pilot End #1
N	No Pilot End #1

23 - Gearbox Mounting	
B	Base Mount
C	Second Clevis on Cover Pipe Standard #6 #9
E	Second Clevis on Cover Pipe 90 degree #9
T	Trunnion Mount Standard #2
U	T + Trunnion Feet
X	Trunnion Mount 90 degree #3
Y	X + Trunnion Feet

24 - Lifting Screw Material #16	
0	Standard
S	Stainless Steel
M	Standard with Low Friction Coating (Molycote)
A	Standard with Protective Coating (Armaloy)

25 - Lifting Screw Covers	
0	Cover Pipe & No Bellows Boot #15
B	Cover Pipe & Fabric Bellows Boot #9
F	Fabric Bellows Boot x 2 - Rotating Screw
R	Cover Pipe & Rubber Bellows Boot #9
S	Rubber Bellows Boot x 2 - Rotating Screw
N	No Cover Pipe & No Bellows Boot #9
W	Cover Pipe & PU Waterproof Bellows Boot #9
X	PU Waterproof Bellows Boot x2 - Rotating Screw

26 - Character Space

3 GROUP-3 - Accessories

27 - Drive Type			
0	None, Standard Features	H	Hand Wheel - LHS
A	Motor Adapter Only, B14 - LHS	J	Hand Wheel - RHS
B	Motor Adapter Only, B14 - RHS	R	Rotation Indicator (Visual) on worm shaft - LHS
C	Motor Adapter B14 & Coupling - LHS	T	Rotation Indicator (Visual) on worm shaft - RHS
E	Motor Adapter B14 & Coupling - RHS		

28- Motor Frame Size / Drive Interface Size			
0	Not Applicable	F	112 Size IEC Frame
A	63 Size IEC Frame	G	132 Size IEC Frame
B	71 Size IEC Frame	H	160 Size IEC Frame
C	80 Size IEC Frame	I	180 Size IEC Frame
D	90 Size IEC Frame	J	200 Size IEC Frame
E	100 Size IEC Frame		

29 - Mounting Kit for Limit Switches & Stop Nuts #18			
0	None	P	Inductive Proximity Sensor, 2, End of Stroke, Adjustable #9
C	RLS-51 Rotary Cam Limit Switch - RHS	S	SKA Rotary Cam Limit Switch - RHS
D	RLS-51 Rotary Cam Limit Switch - LHS	T	SKA Rotary Cam Limit Switch - LHS
E	RLS-51 Rotary Cam Limit Switch - RHS with Stop Nut	U	SKA Rotary Cam Limit Switch - RHS with Stop Nut
F	RLS-51 Rotary Cam Limit Switch - LHS with Stop Nut	V	SKA Rotary Cam Limit Switch - LHS with Stop Nut
M	Electro-Mechanical Limit Switch, 2, End of Stroke, Adjustable #9	W	Stop Nut

30 - Paint, Lubricant, Seals #13 #14	
0	Standard Paint, Lubricant & Seals
1	Standard Paint & Food Grade Lubricant & Standard Seals
2	Standard Paint, Nuclear Grade Lubricant & Seals
3	Standard Paint, High Temperature Lubricant & Seals
4	Standard Paint, Low Temperature Lubricant & Seals
5	Standard Paint, Biodegradable Lubricant & Standard Seals
A	No Paint, Standard Lubricant & Seals
B	No Paint & Food Grade Lubricant & Standard Seals
C	No Paint, Nuclear Grade Lubricant & Seals
D	No Paint, High Temperature Lubricant & Seals
E	No Paint, Low Temperature Lubricant & Seals
F	No Paint, Biodegradable Lubricant & Standard Seals
G	Standard Primer, Lubricant & Seals
H	Standard Primer & Food Grade Lubricant & Standard Seals
I	Standard Primer, Nuclear Grade Lubricant & Seals
J	Standard Primer, High Temperature Lubricant & Seals
K	Standard Primer, Low Temperature Lubricant & Seals
L	Standard Primer, Biodegradable Lubricant & Standard Seals
M	Epoxy Paint, Standard Lubricant & Seals
N	Epoxy Paint & Food Grade Lubricant & Standard Seals
P	Epoxy Paint, Nuclear Grade Lubricant & Seals
R	Epoxy Paint, High Temperature Lubricant & Seals
S	Epoxy Paint, Low Temperature Lubricant & Seals
T	Epoxy Paint, Biodegradable Lubricant & Standard Seals

Notes:

- #1 Rotating screw models only.
- #2 Trunnions on same side as worm shaft (standard).
- #3 Trunnions at 90° to worm shaft.
- #4 Standard right hand thread form. Worm shaft turns clockwise to extend screw.
- #5 Left hand thread form. Worm shaft turns anti-clockwise to extend screw.
- #6 Standard is clevis axis parallel to worm shaft.
- #7 Limit switch mounting included.
- #8 Plain End "A" has same dimensions as "E - threaded end" except no thread form.
- #9 Translating screw models only.
- #10 Basic Translating and Rotating units in both Upright and Rotating versions (all variant & accessories on application).
- #11 All models except E-Series 5 kN & 10 kN models
- #12 Models 10 - 100kN only
- #13 Power Jacks defined standard paint - available as a data sheet.
- #14 Power Jacks defined standard lubricant.
- #15 For Rotating Screw Jacks the "Cover Pipe" may actually be a "Plug"
- #16 All Stainless Steel Screw Jack by default defines the worm shaft, lifting screw and end fitting as Power Jacks standard stainless steel material.
- #17 If Lifting Screw is Stainless Steel material then the End Fitting is Stainless Steel as well by default.
- #18 Limit Switches not included. Limit switch specification to be detailed as separate item.

Product Code Example

EMT0200-V002100-1250-CB00-0000 E-Series, Machine Screw, Translating, 200kN, Upright, Stainless Steel Screw Jack, No extra gearbox features, 8:1 gear ratio, 12mm lead on screw, 1250mm Stroke, Clevis End, Base Mount, standard drive features, standard paint and lubrication.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
E	M	T	0	2	0	0	-	V	0	0	2	1	0	0	-	1	2	5	0	-	C	B	0	0	-	0	0	0	0

Five Step Guide to Initial Screw Jack Selection

The following selection procedure is applicable for Machine Screw and Ball Screw Jacks.

Calculate Power and Torque Requirements

Select a screw jack from the tables with adequate load carrying capacity and note the screw jack static and dynamic efficiency for required input speed.

Step 1 - Screw Jack Input Speed

$$N \text{ (rpm)} = \frac{\text{Linear Speed (mm/min)} \times \text{Gear Ratio}}{\text{Pitch (mm)} \times N^\circ \text{ of Starts on Lifting Screw}}$$

Input speed should not exceed 1800 rpm.
Number of starts on lifting screw is usually 1, unless otherwise stated.

Note: Screw Lead = Pitch x No of Starts

Step 2 - Operating Input Power (kW), P_{in}

$$P_{in} \text{ (kW)} = \frac{\text{Load (kN)} \times \text{Linear Speed (mm/min)}}{60000 \times \eta_d}$$

η_d = Dynamic Screw Jack Efficiency

Step 3 - Operating Input Torque

$$T_{ino} \text{ (Nm)} = \frac{P_{in} \text{ (kW)} \times 9550}{N \text{ (rpm)}}$$

Step 4 - Screw Jack Start-Up Torque

$$T_{ins} = \frac{\text{Load (kN)} \times \text{Pitch (mm)} \times N^\circ \text{ of Starts on Lifting Screw}}{2 \times \pi \times \eta_s \times \text{Gear Ratio}}$$

η_s = Static Screw Jack Efficiency

Note: Screw Lead = Pitch x No of Starts

Step 5 - Mechanical Power and Torque Check

Check whether the screw jack power and torque required for the application is not greater than the maximum allowable mechanical input power ($P_{mechanical}$) and Start-Up Torque at Full Load (T_s) values specified in the screw jack performance tables.

If $P_{mechanical} > P_{in}$ & $T_s > T_{ins}$ then the screw jack selected is acceptable for power requirements.

Example Selection

Application Constraints

- Load on Screw Jack = 15 kN in Tension
- Linear Speed required = 100 mm/min

Consider all application constraints then choose a screw jack that looks suitable for the application with a load rating equal to or greater than the maximum working load. For this example, a 25 kN E-Series Machine Screw Jack (refer P60) with translating screw, 6:1 gear ratio, single start lifting screw (6 mm lead).

Calculate Power and Torque Requirements

Step 1 - Screw Jack Input Speed

$$N \text{ (rpm)} = \frac{100 \text{ (mm/min)} \times 6 \text{ (Gear Ratio)}}{6 \text{ (mm)} \times 1 \text{ (N}^\circ \text{ of starts on Lifting Screw)}}$$

$$N = 100 \text{ rpm}$$

Input speed should not exceed 1800 rpm.

Step 2 - Operating Input Power (kW), P_{in}

$$P_{in} \text{ (kW)} = \frac{15 \text{ (kN)} \times 100 \text{ (mm/min)}}{60000 \times 0.264}$$

$$\eta_d = 0.264 \text{ (Refer P60)}$$

$$P_{in} = 0.095 \text{ kW}$$

Step 3 - Operating Input Torque

$$T_{ino} \text{ (Nm)} = \frac{0.095 \text{ (kW)} \times 9550}{100 \text{ (rpm)}}$$

$$T_{ino} = 9.1 \text{ Nm}$$

Step 4 - Screw Jack Start-Up Torque

$$T_{ins} = \frac{15 \text{ (kN)} \times 6 \text{ (mm)} \times 1 \text{ (N}^\circ \text{ of starts on Lifting Screw)}}{2 \times \pi \times 0.201 \times 6 \text{ (Gear Ratio)}}$$

$$T_{ins} = 11.9 \text{ Nm}$$

$$\eta_s = 0.201 \text{ (refer P60)}$$

Step 5 - Mechanical Power and Torque Check

Find the screw jacks mechanical power and torque rating from the performance data tables (refer P60).

$$P_{\text{mechanical}} = 1.5 \text{ kW} > P_{in} \text{ and } T_s = 19 \text{ Nm} > T_{ins}$$

Therefore the screw jack selected is suitable for application for initial constraints tested, further analysis may be required to ensure the screw jack is suitable for all application conditions. Continue with further selection calculations or consult Power Jacks Ltd.

Screw Jack Constraints for Detailed Selection

Lifting Screw Column Strength

For compressive loads on the screw jack lifting screw column strength calculations are required to check for buckling. As a screw jack selection guide use the following process:

1. Determine the maximum column strength (L) for the screw jack being considered.
2. Referring to the relevant column buckling chart determine the permissible compressive load (Wp) corresponding to the column length (L) for the appropriate end constraints. This permissible compressive load is the maximum load (inclusive of shock loads) which may be applied to the screw jack for a given column length.
3. Where an application involves human cargo or there is a risk to personnel, it is highly recommended that the permissible compressive load (as calculated above) be factored by 0.7 to enhance working safety. (Equivalent to a column strength safety factor of 5).

$$W_{phc} = W_p \times 0.7 \quad \text{(Permissible compressive load for personnel risk applications)}$$

- Note**
1. For detailed analysis of screw jacks and their systems consult Power Jacks.
 2. Safety factor of 3.5 for column strength's used for normal industrial cargo.

Lifting Screw Critical Speed

For fast operating rotating screw jacks, the critical speed (rotational speed) of the lifting screw needs to be considered in case of shaft whirling. To calculate the critical speed for rotating screw jacks:

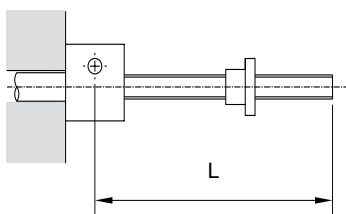
1. Refer to the appropriate critical speed chart.
2. Select the correction factor F_{cs} corresponding to the end support conditions for the application.
3. From the critical speed chart, select the critical speed corresponding to the unsupported screw length (m) and the screw jack load rating (kN).
4. Calculate the limiting critical speed with the formula: **Limiting Critical Speed = Critical screw speed x F_{cs}**

Lifting Screw Deflection

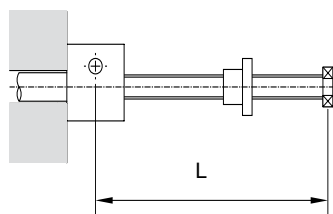
The lifting screw of a screw jack mounted horizontally will deflect under its own weight to some extent. The amount of deflection tolerable (y_T) should be less than 0.5 mm per metre.

Deflection Factors, F_{sd}

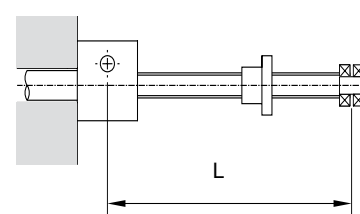
Fixed/Fixed. $F_{sd} = 8$



Fixed/Fixed. $F_{sd} = 186$



Fixed/Fixed. $F_{sd} = 384$



$$\text{Deflection, } y, \text{ (mm)} = \frac{6 \times 10^{-9} \times L^4}{F_{sd} (d-p)^2}$$

$$\text{Deflection Tolerable, } y_T, \text{ (mm)} = \frac{0.5 \times L}{1000}$$

L = Lifting Screw Length (mm)
 d = Diameter of Lifting Screw (mm)
 p = Pitch of Lifting Screw (mm)

If $y < y_T$ then the lifting screw deflection is acceptable.

Note: This is only a deflection guide. For detailed analysis, including methods to reduce deflections, consult Power Jacks Ltd.

Screw Jack Input Torque

Start up/static torque values are listed in all performance tables. Whereas dynamic torque values are either calculated using the tabulated dynamic efficiencies or taken direct from torque tables where listed. For detailed screw jack analysis consult Power Jacks Ltd.

Side Loads on Screw Jacks

It is recommended that all side loads (F_{sl}) are carried by guides in your arrangement and not by the lifting screw and nut. If there are any side loads on the screw jack, they must not exceed those tabulated in the Engineering Guide, Side Load Rating Section, and it must be noted that any such loads will adversely affect the life of the lifting screw and nut.

Radial Forces on Screw Jack Worm Shaft

For applications where a screw jack is belt driven, radial force (F_R) values exerted on the worm shaft must not exceed those tabulated in the Engineering Guide Section. Values are tabulated for the metric machine screw jacks and ball screw jacks. The values are maximum values for the screw jacks at rated load regardless of worm speed or load direction.

Screw Jack Self-Locking

Approximately 50% of machine screw jacks are self-locking either in the gearbox or the lifting screw, however to ensure there is no self-lowering and to reduce drift due to the motor slowing, a brake is recommended. Standard motor frame size brakes will be suitable for most applications with only slight vibration and thermal fluctuation present. Motor selection as normal.

For dynamic braking consult Power Jacks.

Use the closest standard brake size that is greater or equal to the motor brake torque required.

- Note**
1. Self lowering can occur in any jacking system not fitted with a brake, where high levels of vibration are present in the application.
 2. Power Jacks recommend the use of a brake on single screw jack applications in the vertical position.

Jacking System Power Input

Total Input Power for Jacking Systems (kW), P_s :

$$P_s = \frac{\text{Input Power per Screw Jack (kW)} \times \text{Number of Screw jacks}}{\text{Arrangement Efficiency} \times \text{Gearbox Efficiency}}$$

Number of Screw Jacks in System	2	3	4	6-8
Jacking System Efficiency	0.95	0.90	0.85	0.80

Gearbox Efficiency = Bevel Gearbox Efficiency x Reduction Gearbox Efficiency

Bevel Gearbox Efficiency = 0.95 typical

Reduction Gearbox Efficiency = Consult unit details, if no reduction gearbox present assume efficiency of 1.

Note

For Screw Jacks connected in-line, the worm shaft can transmit up to 3 times the torque for a single screw jack at its maximum capacity, except the E--0200 (200kN) Unit which can transmit 1.5 times the torque.

E-Series

1

E-Series Stainless Steel Screw Jacks

DESIGNED FOR USE IN
HARSH & CORROSIVE
ENVIRONMENTS
CAPACITIES - 10KN TO
1000KN AS STANDARD.

TRANSLATING SCREW JACKS

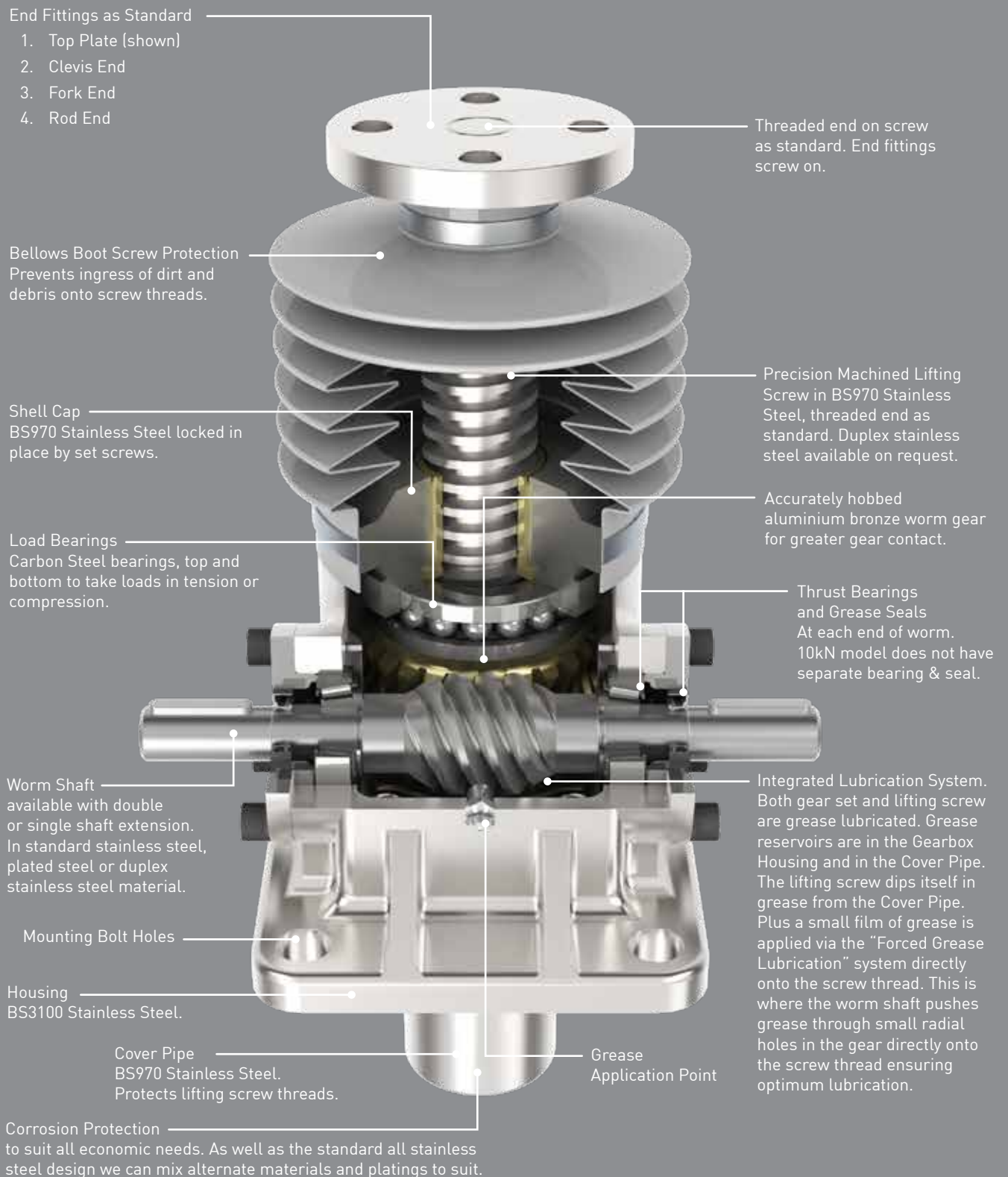


Key Features

- Standard Performance Power Jack
- Stainless Steel Machine Screw Jacks
- Capacities - 10kN to 1000kN as standard
- Translating and Rotating Screw in Upright and Inverted types
- Precision Worm Gear Set
- 2 Gear ratios and 1 screw lead as standard
- Anti-backlash and anti-rotation (keyed) options
- 6 mounting options including trunnion and double clevis
- Special custom designs available



ROTATING SCREW JACKS



The stainless steel screw jacks are ideal for use in harsh or corrosive environments such as marine, nuclear, water, food processing or paper making machinery, where standard materials may be inadequate.

Translating Screw



Upright

Inverted

Rotating Screw



Upright

Inverted

Typical Applications

Stainless Steel Machine Screw Jacks are typically used in harsh or corrosive environments or those with a regular wash down requirement. Industries such as Marine, Water Treatment, Nuclear, Food Processing, Offshore, Pulp and Paper use stainless steel screw jacks. For each application, variants with different material grades or plated components can be used, tailoring the product for the specific application and budget.

Standard Designs

Stainless steel E-Series machine screw jacks are available in translating and rotating screw designs in capacity sizes from 10kN to 1000kN. The design is optimised for reliable performance in some of the most arduous environments. Plus there is a large selection of standard accessories (section-7) and options so you can configure a standard design that is just right for your application. These options include Anti-Backlash, Anti-Rotation (Keyed) and Safety Nut designs.

Special Designs

We can fully customise our screw jacks so that your application can be the best.

Customisation can be anything from a small modification such as an extra bolt hole on an end fitting to a completely new design of screw jack based on our class leading technology.

For more details please see the Special Screw Jack information in Section-8 or contact us today with your requirements. Our team are looking forward to working with you.

Selecting the Right Screw Jack

Consider all application constraints then choose a product that looks suitable for the intended application. Calculate the power and torque requirements. This is a 5 step process:

- Screw Jack Input Speed (RPM)
- Operating Input Power (kW)
- Operating Input Torque (Nm)
- Screw Jack Start-up Torque (Nm)
- Mechanical Power and Torque Check

Systems

The screw jacks can be connected together in systems so that multiple units can be operated and controlled together. These jacking system arrangements or configurations can be built in many formats with the use of bevel gearboxes, motors, reduction gearbox, drive shafts, couplings, plummer blocks and motion control devices.

The use of bevel gearboxes allows the distribution of drive throughout a jacking system. The gearboxes come in 2,3 and 4 way drive types. See the Bevel Gearbox Section-10 for more details.

Bevel gearboxes and other system components can also be supplied in stainless steel or other corrosion resistant designs.



Two of the most popular system configurations are the 'H' and 'U' configured jacking systems. Remember that multiple screw jacks can be linked together mechanically or electrically. The latter is useful if there is no space for linking drive shafts.

If multiple machine screw jacks are connected in a mechanically linked system then the complete system may be considered self-locking. If you would like this checked consult Power Jacks. Alternatively, to be sure, include a brake on the system either as a stand alone device or as a brake motor.



DRUM POSTING EQUIPMENT (DPE)

Dunreay cementation plant waste transfer facility.

Raise and lower drum transfer table.

Two stainless steel E-Series translating machine screw jacks
100kN capacity with 24:1 gear ratio and 1805mm stroke connected
in series by a stainless steel drive shaft and geared couplings.

For more application examples see the 'Power at Work' brochure or www.powerjacks.com.



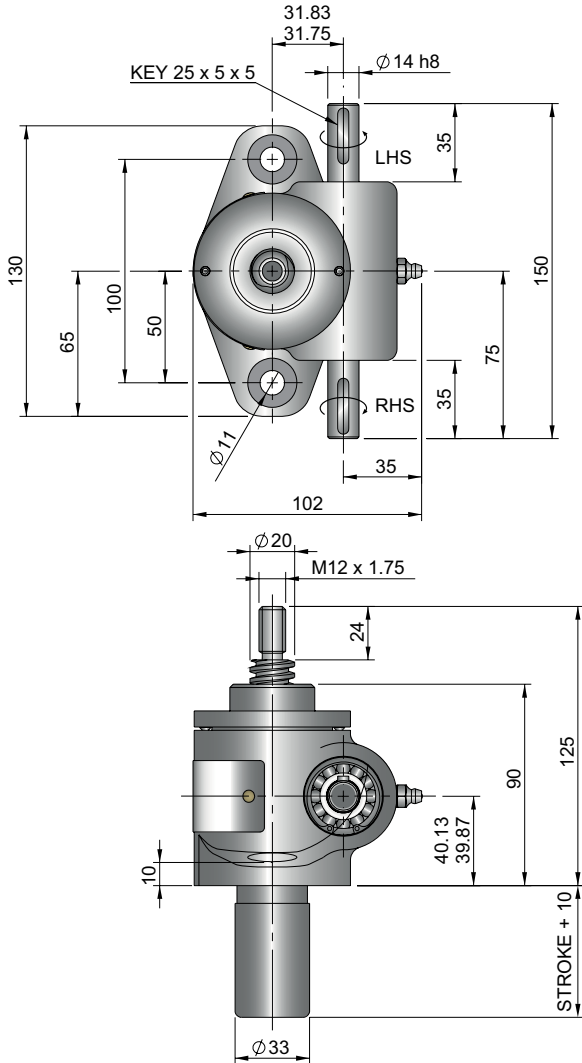
Stainless Steel Screw Jack Standard Performance

Model		EMT0010 EMR0010	EMT0025 EMR0025	EMT0050 EMR0050	EMT0100 EMR0100	EMT0200 EMR0200	EMT0300 EMR0300	EMT0500 EMR0500	EMT1000 EMR1000	
Capacity	kN	10	25	50	100	200	300	500	1000	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	6.6	16.5	33	66	132	200	333	666
		Compression	10	25	50	100	200	300	500	1000
	Duplex Lifting Screw	10	25	50	100	200	300	500	1000	
Operating Capacity (kN)	Stainless Steel Worm Shaft		3.3	8.25	16.5	33	66	100	167	333
	Duplex or Plated Worm Shaft with 316 Screw	Tension	6.6	16.5	33	66	132	200	333	666
		Compression	10	25	50	100	200	300	500	1000
Duplex or Plated Worm Shaft with Duplex Screw		10	25	50	100	200	300	500	1000	
Lifting Screw	Diameter (mm)	20	30	40	55	65	95	120	160	
	Lead (mm)	5	6	9	12	12	16	16	20	
Gear ratios	Option 1	5:1	6:1	6:1	8:1	8:1	10 2/3	10 2/3:1	12:1	
	Option 2	20:1	24:1	24:1	24:1	24:1	32:1	32:1	36:1	
Turn of worm for travel of lifting screw	Ratio Option 1	1 Turn	1mm	1mm	1.5mm	1.5mm	1.5mm	1.5mm	1.67mm	
	Ratio Option 2	4 Turn	1mm	1mm	1.5mm	2mm	2mm	2mm	2.22mm	
Max. Input power (kW)	Gear Ratio Option 1	0.375	1.5	3.0	3.75	3.75	6.0	11.25	18.5	
	Gear Ratio Option 2	0.19	0.375	0.55	1.125	1.125	1.9	4.5	8.25	
Start up torque at full load (Nm)	Gear Ratio Option 1	6.8	19.8	56	115.9	263.8	480	904	2025	
	Gear Ratio Option 2	3	8.7	25.5	60.5	137	284	504	1119	
Weight (kg) - stroke = 150mm	EMT	2.36	8.45	14.9	24.3	42.4	92.4	183.7	459.1	
	EMR	2.6	8.85	16.54	28.8	49.58	113.78	224	560.4	
Weight (kg) per extra 25mm	EMT	0.11	0.21	0.32	0.58	0.84	1.55	2.48	4.11	
	EMR	0.05	0.11	0.19	0.36	0.52	1.13	1.94	3.38	
Gear Ratio Option 1	Gear Ratio	5:1	6:1	6:1	8:1	8:1	10 2/3:1	10 2/3:1	12:1	
	Screw Jack Static Efficiency	0.233	0.201	0.213	0.206	0.181	0.149	0.132	0.131	
	Screw Jack Dynamic Efficiency	0.306	0.264	0.281	0.272	0.242	0.205	0.181	0.178	
Gear Ratio Option 2	Gear Ratio	20:1	24:1	24:1	24:1	24:1	32:1	32:1	36:1	
	Screw Jack Static Efficiency	0.130	0.115	0.117	0.132	0.116	0.084	0.079	0.079	
	Screw Jack Dynamic Efficiency	0.194	0.167	0.172	0.190	0.169	0.128	0.120	0.123	

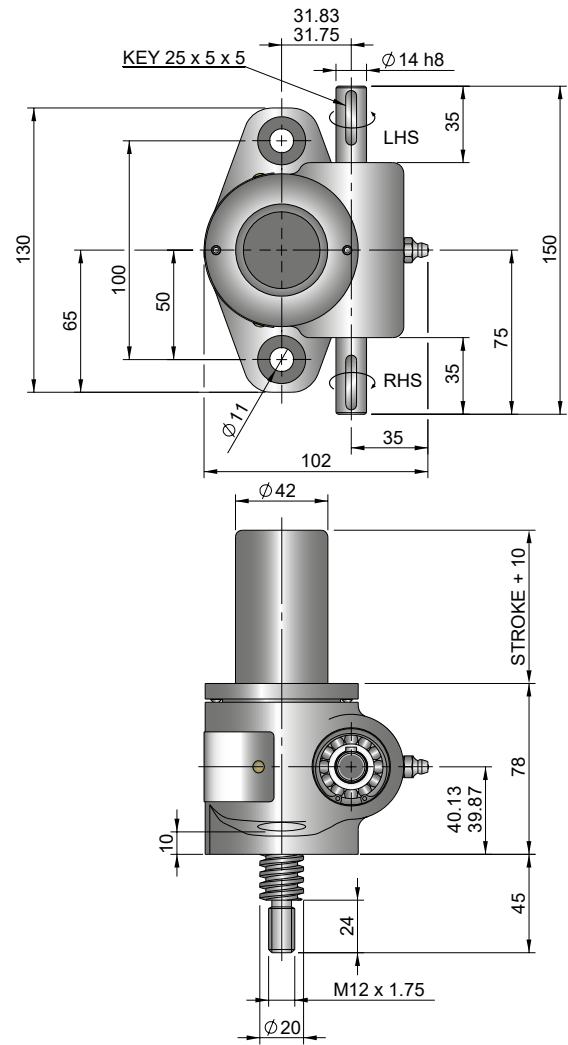
Notes

- All metric stainless steel machine screws have a trapezoidal thread form, single start as standard. Other screw lead options are available on request.
- Based on operating capacity for loads of 25% to 100% of screw jack capacity, torque requirements are approximately proportional to the load.
- Efficiency values for standard grease lubricated worm gear box and lifting screw

Upright EMT0010-V00



Inverted EMT0010-J00



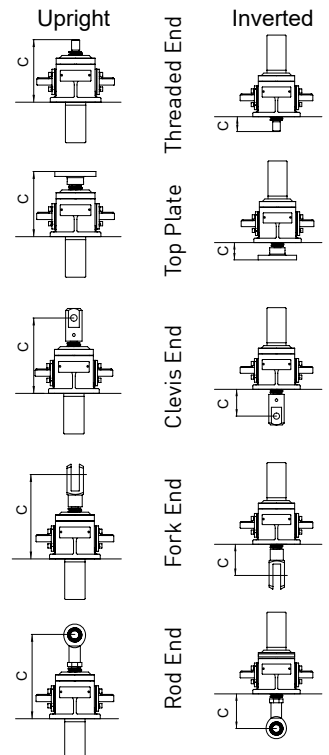
Performance

Model			EMT0010 EMR0010	
Capacity (kN)			10	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	6.6	
		Compression	10	
Duplex Lifting Screw			10	
Operating Capacity (kN)	Standard 316 Worm Shaft		3.3	
	Duplex or Plated Worm Shaft with 316 Screw	Tension	6.6	
		Compression	10	
Duplex or Plated Worm Shaft with Duplex Screw			10	
Lifting Screw	Diameter (mm)		20	
	Lead	Option	1	2
mm		5	10	
Gear Ratio Option 1	Gear Ratio		5:1	
	Screw Jack Static Efficiency		0.233	0.339
	Screw Jack Dynamic Efficiency		0.306	0.424
Gear Ratio Option 2	Gear Ratio		20:1	
	Screw Jack Static Efficiency		0.130	0.192
	Screw Jack Dynamic Efficiency		0.194	0.268

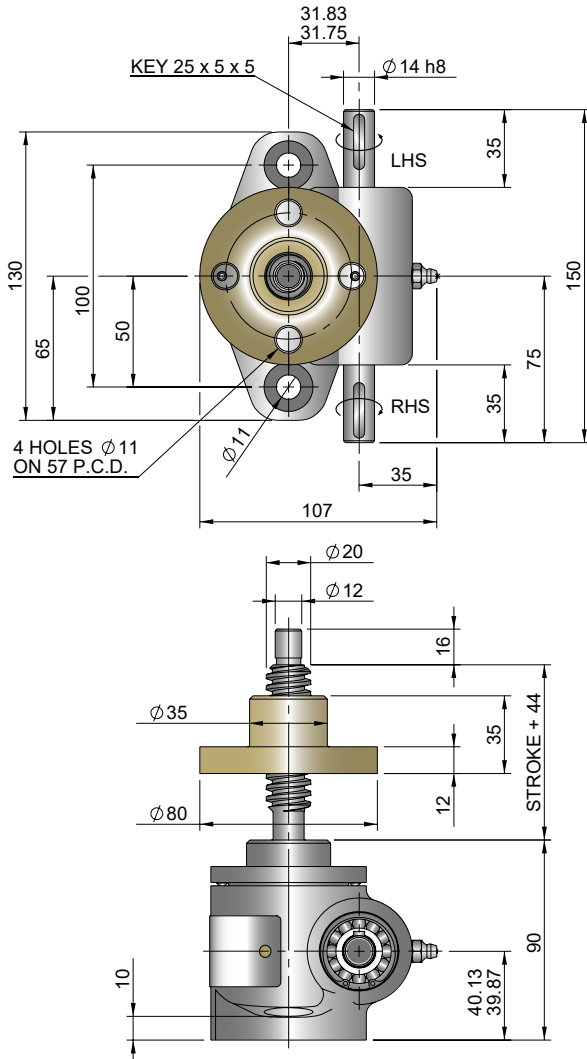
Model			EMT0010 EMR0010	
Capacity	kN		10	
Lifting Screw Lead (mm)			5	10
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1mm	2mm
	Gear Ratio 2	4 Turn	1mm	2mm
Maximum Through Torque (Nm)			20	
Lifting Screw Restraining Torque (Nm)			22	30
Worm Shaft Maximum Radial Load (N)			325	
Maximum Input Speed (rpm)			1800	
Gear Case Material			Stainless Steel	
Weight (kg) - stroke = 150mm			EMT	2.36
			EMR	2.6
Weight (kg) - per extra 25mm stroke			EMT	0.11
			EMR	0.05

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

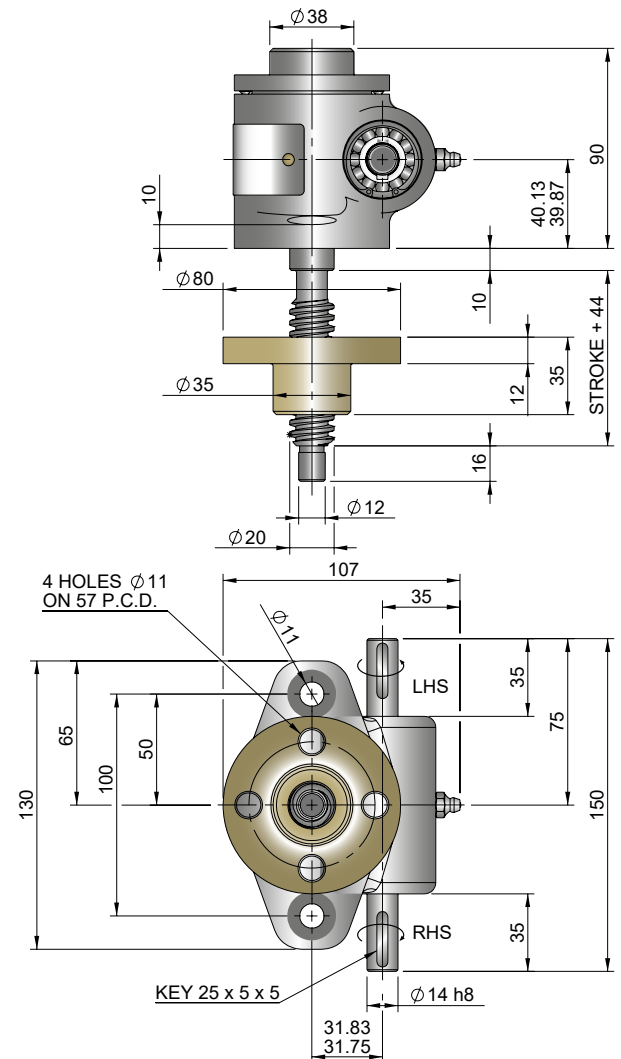
Closed Height



Upright EMR0010-V00



Inverted EMR0010-J00

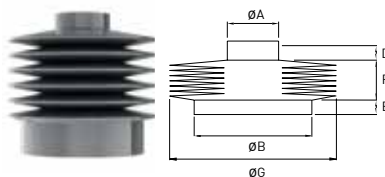


Closed Height & Bellows Boots

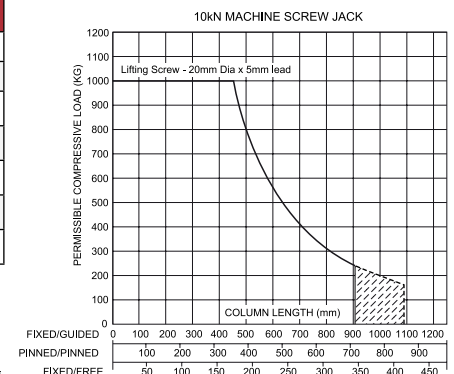
Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0010	125	45	125	45	145	65	148	98	150	70
Stroke (mm)	EMT0010 with Bellows Boots									
0-150	125	75	125	75	145	95	148	98	165	115
151-300	130	95	130	95	150	115	153	118	170	135
301-600	140	95	140	95	160	115	163	118	180	135
751-1000	-	-	-	-	-	-	-	-	-	-

Model	A	B	D	E	G
EMT0010	30	70	15	15	110

Stroke	1-150	151-300	301-600	601-900	901-1050
EMT0010	8	20	35	-	-

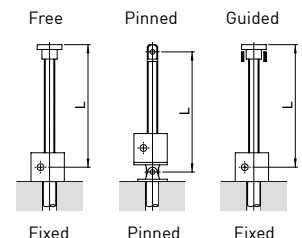


Column Strength



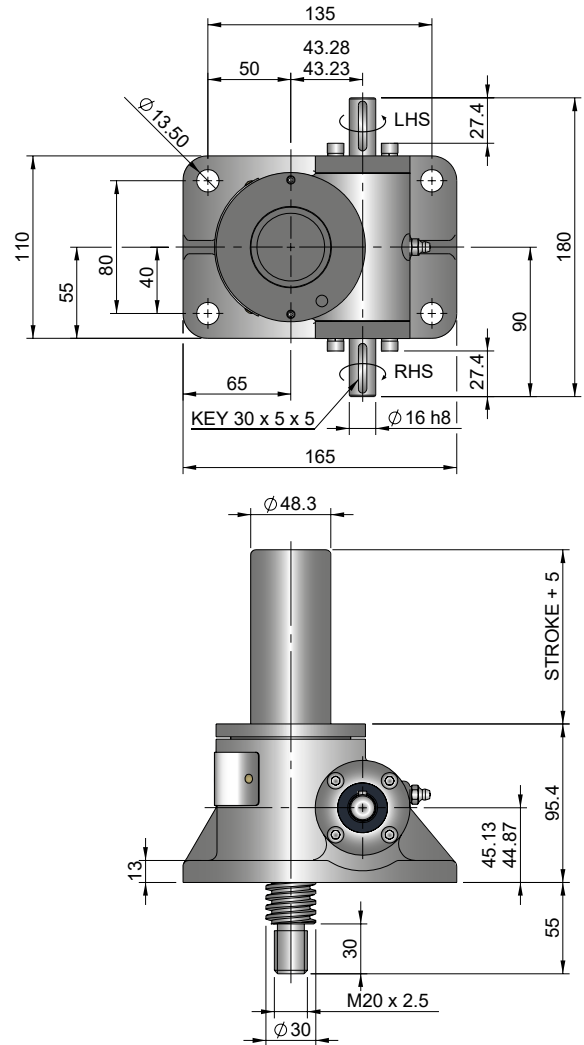
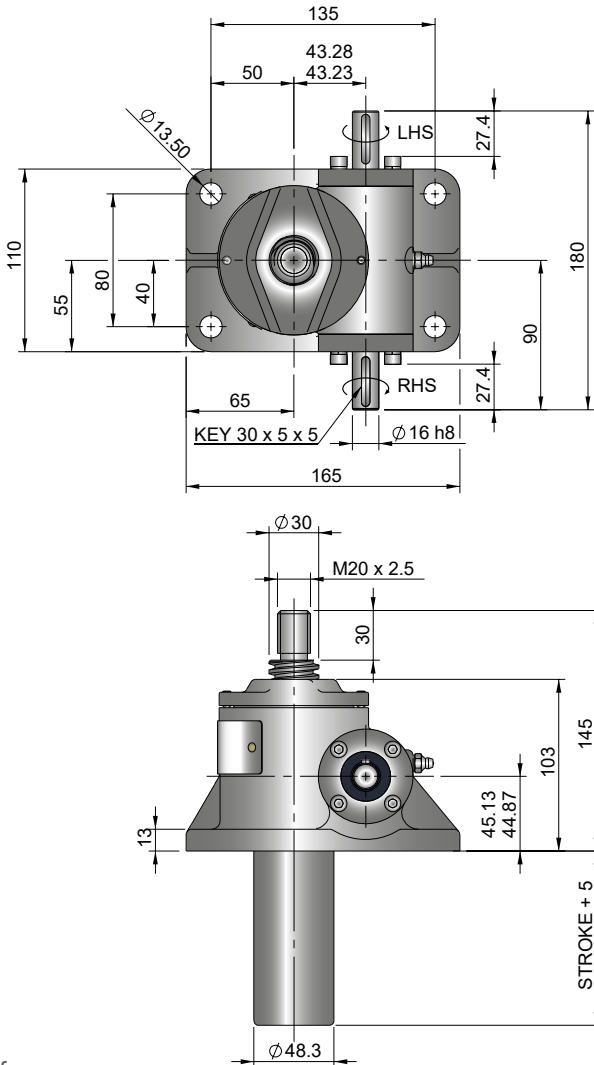
Note:

- 1 Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
- 2 Inverted Screw Jacks - Recommended bellows boot mounting plate $\varnothing B \times [E + 5\text{mm}]$ thick.
- 3 Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
- 4 † Control tapes fitted (increase outer diameter by 20mm approximately).
- 5 For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
- 6 Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
- 7 Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.



Upright EMT0025-V00

Inverted EMT0025-J00



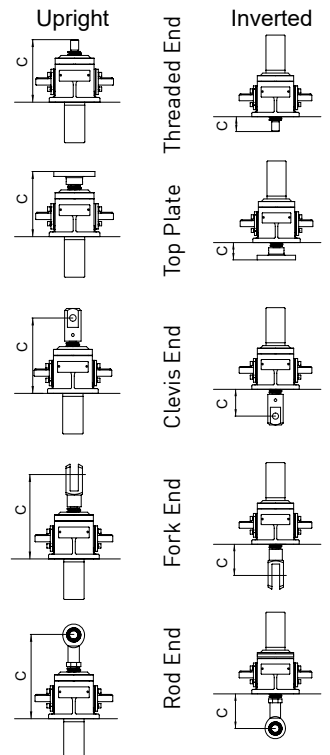
Performance

Closed Height

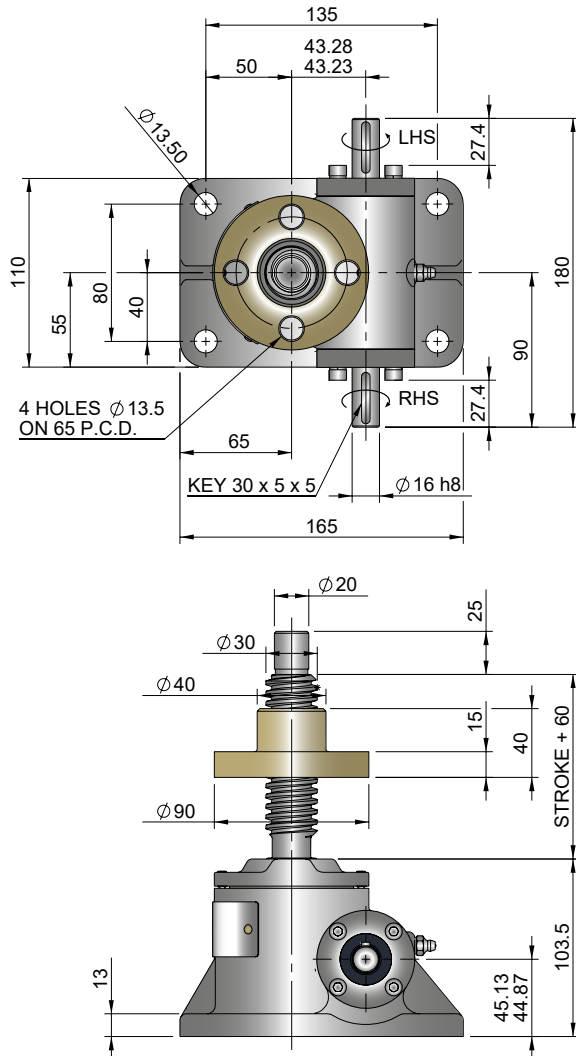
Model		EMT0025 EMR0025	
Capacity (kN)		25	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	16.5
	Duplex Lifting Screw	Compression	25
Operating Capacity (kN)	Standard 316 Worm Shaft		8.25
	Duplex or Plated Worm Shaft with 316 Screw	Tension	16.5
		Compression	59
Duplex or Plated Worm Shaft with Duplex Screw		25	
Lifting Screw	Diameter (mm)		30
	Lead	Option	1 2
		mm 6 12	
Gear Ratio Option 1	Gear Ratio		6:1
	Screw Jack Static Efficiency		0.201 0.302
	Screw Jack Dynamic Efficiency		0.264 0.383
Gear Ratio Option 2	Gear Ratio		24:1
	Screw Jack Static Efficiency		0.115 0.171
	Screw Jack Dynamic Efficiency		0.167 0.242

Model		EMT0025 EMR0025	
Capacity	kN	25	
Lifting Screw Lead (mm)		6	12
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1mm 2mm
	Gear Ratio 2	4 Turn	1mm 2mm
Maximum Through Torque (Nm)		59	
Lifting Screw Restraining Torque (Nm)		76	102
Worm Shaft Maximum Radial Load (N)		380	
Maximum Input Speed (rpm)		1800	
Gear Case Material		Stainless Steel	
Weight (kg) - stroke = 150mm		EMT	8.45
		EMR	8.85
Weight (kg) - per extra 25mm stroke		EMT	0.21
		EMR	0.11

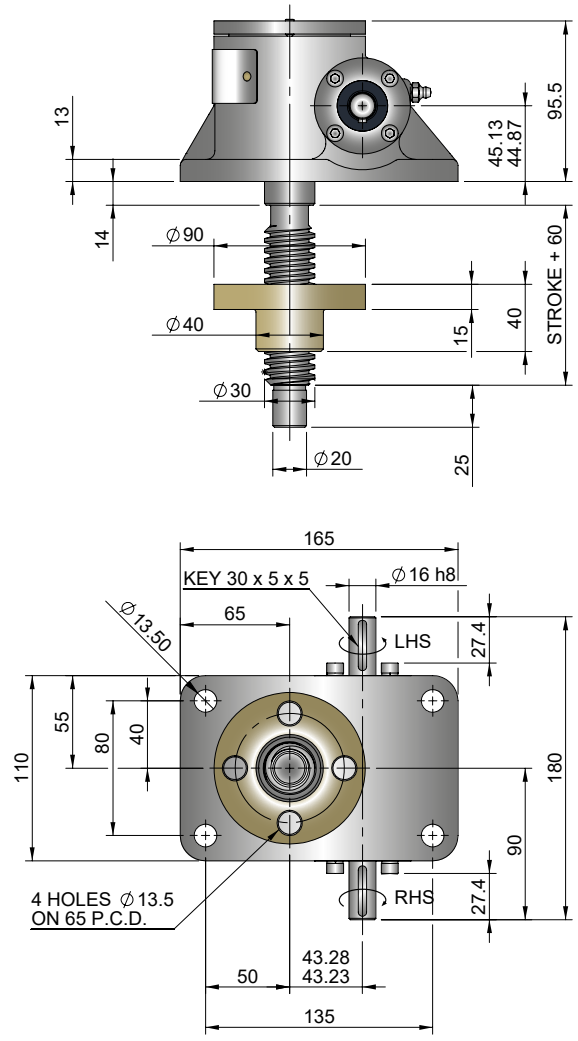
Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice



Upright EMR0025-V00



Inverted EMR0025-J00



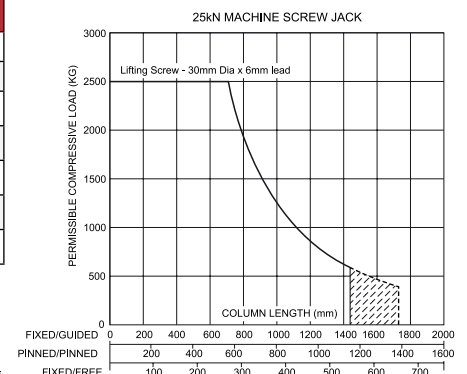
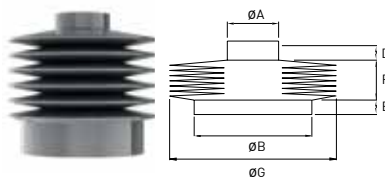
Closed Height & Bellows Boots

Column Strength

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0025	145	55	145	55	170	80	194	104	190	100
Stroke (mm)	EMT0025 with Bellows Boots									
1-300	145	80	145	80	170	105	194	129	205	140
301-600	145	105	145	105	170	130	194	154	205	165
601-1050	170	130	170	130	195	155	219	179	230	190
1051-1500	195	130	195	130	220	155	244	179	255	190

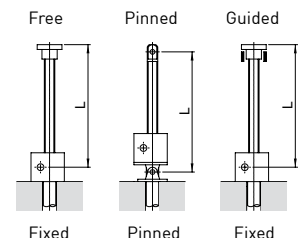
Model	A	B	D	E	G
EMT0025	40	90	15	23	120

Stroke	1-150	151-301	301-600	601-1050	1051-1500
EMT0025	8	20	30	50	70



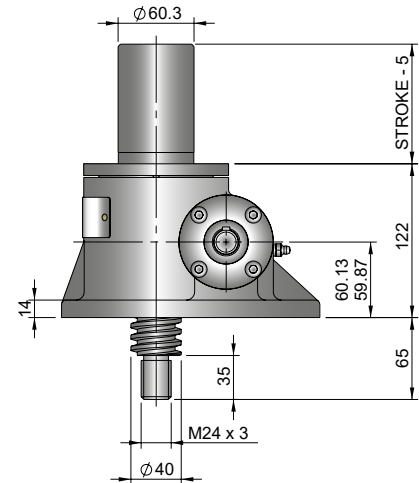
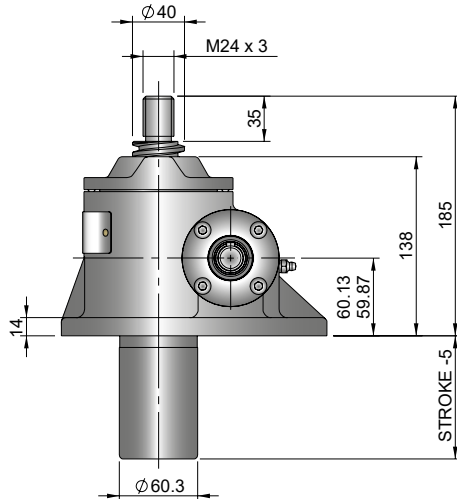
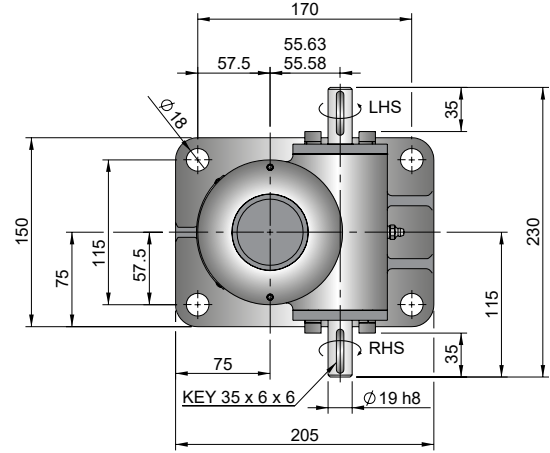
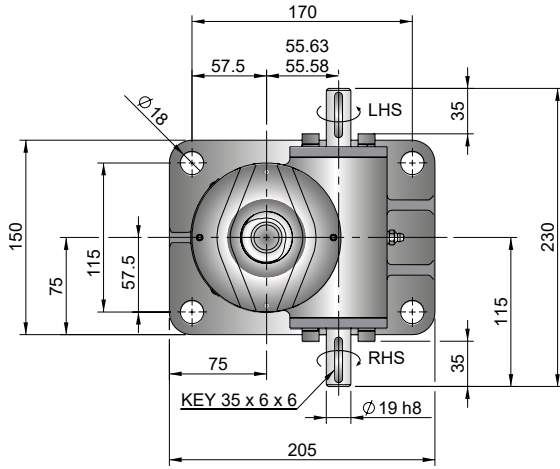
Note:

- 1 Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
- 2 Inverted Screw Jacks - Recommended bellows boot mounting plate $\text{ØB} \times [\text{E} + 5\text{mm}]$ thick.
- 3 Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
- 4 † Control tapes fitted (increase outer diameter by 20mm approximately).
- 5 For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
- 6 Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
- 7 Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.



Upright EMT0050-V00

Inverted EMT0050-J00



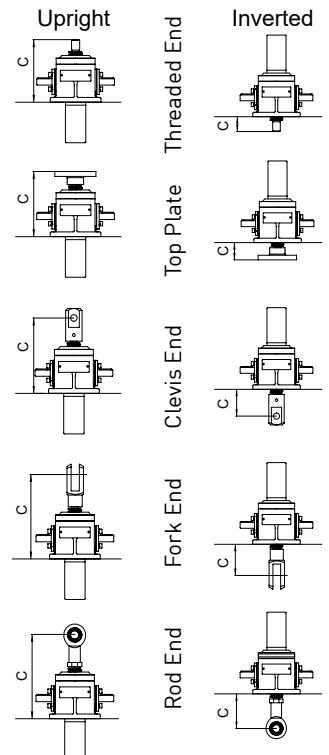
Performance

Closed Height

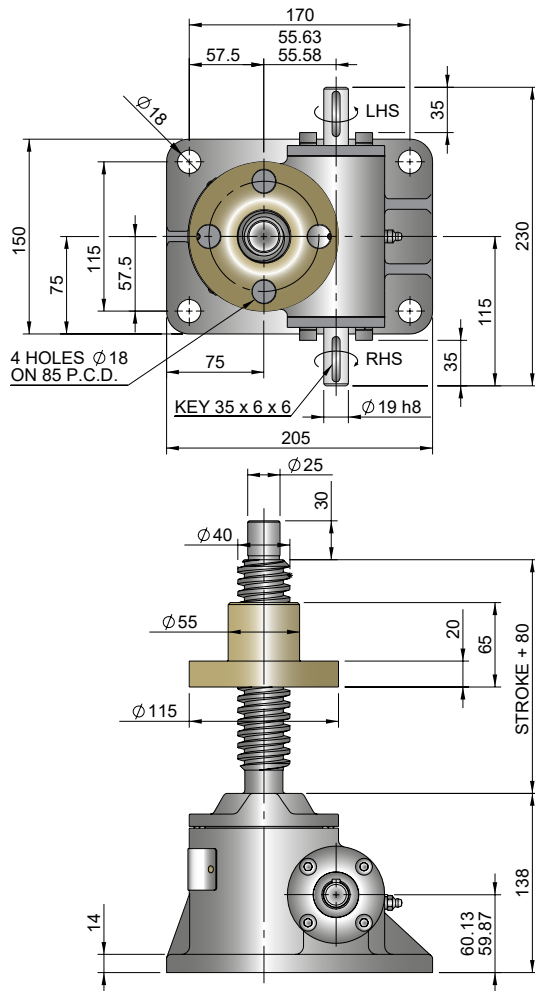
Model		EMT0050 EMR0050	
Capacity (kN)		50	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	33
	Duplex Lifting Screw	Compression	33
Operating Capacity (kN)	Standard 316 Worm Shaft		50
	Duplex or Plated Worm Shaft with 316 Screw	Tension	33
		Compression	50
Duplex or Plated Worm Shaft with Duplex Screw		50	
Lifting Screw	Diameter (mm)		40
	Lead	Option	1 2
		9 18	
Gear Ratio Option 1	Gear Ratio		6:1
	Screw Jack Static Efficiency		0.213 0.314
	Screw Jack Dynamic Efficiency		0.281 0.398
Gear Ratio Option 2	Gear Ratio		24:1
	Screw Jack Static Efficiency		0.117 0.172
	Screw Jack Dynamic Efficiency		0.172 0.244

Model		EMT0050 EMR0050	
Capacity	kN	50	
Lifting Screw Lead (mm)		9	18
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm 3mm
	Gear Ratio 2	4 Turn	1.5mm 3mm
Maximum Through Torque (Nm)		168	
Lifting Screw Restraining Torque (Nm)		210	290
Worm Shaft Maximum Radial Load (N)		740	
Maximum Input Speed (rpm)		1800	
Gear Case Material		Stainless Steel	
Weight (kg) - stroke = 150mm		EMT	14.9
		EMR	16.54
Weight (kg) - per extra 25mm stroke		EMT	0.32
		EMR	0.19

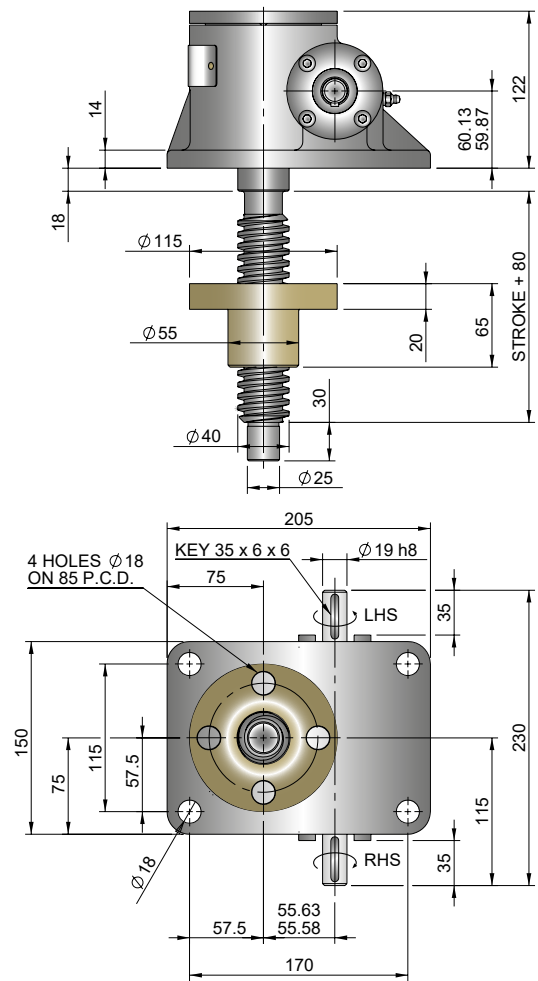
Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice



Upright EMR0050-V00



Inverted EMR0050-J00

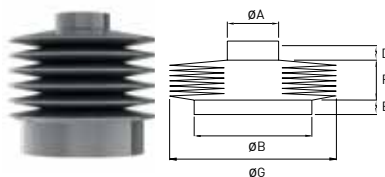


Closed Height & Bellows Boots

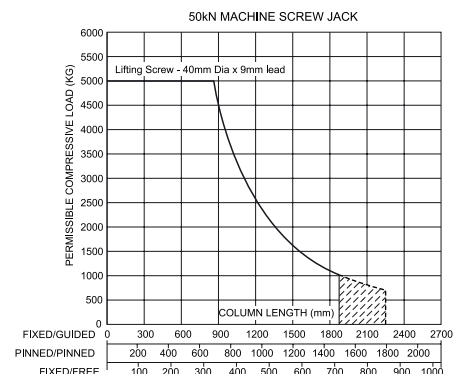
Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0050	185	65	185	65	210	90	248	128	242	122
Stroke (mm)	EMT0050 with Bellows Boots									
1-150	185	110	185	110	210	135	248	173	257	182
151-300	185	120	185	120	210	145	248	183	257	192
301-600	210	130	210	130	235	155	273	193	282	202
601-1050	210	150	210	150	235	175	273	213	282	222
1051-1500	235	170	235	170	260	195	298	233	307	242

Model	A	B	D	E	G
EMT0050	50	115	15	31	140

Stroke	1-150	151-300	301-600	601-1050	1051-1500
EMT0050	8	20	30	50	70

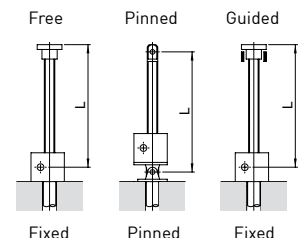


Column Strength

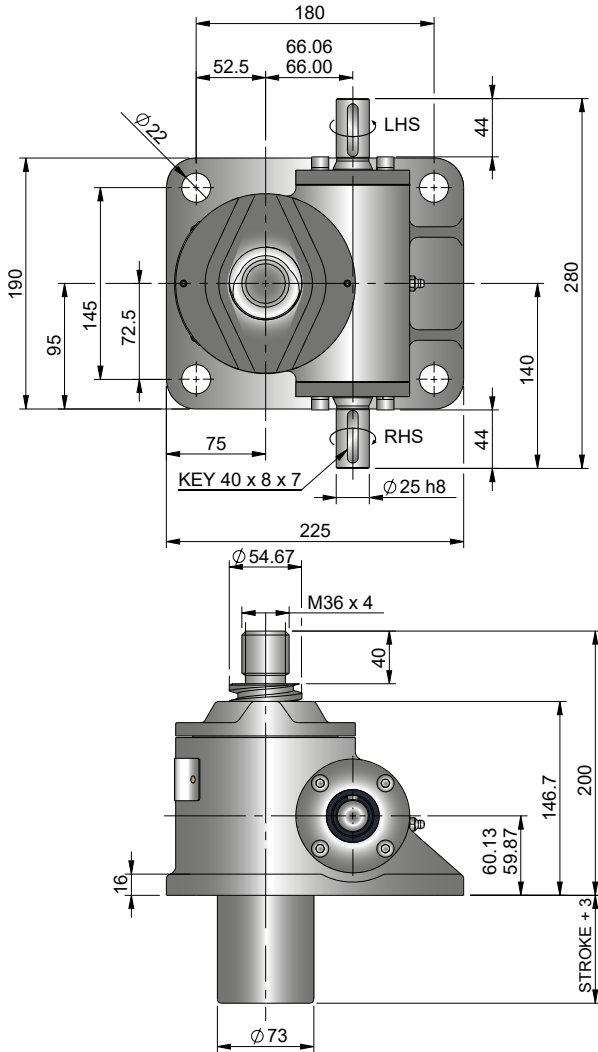


Note:

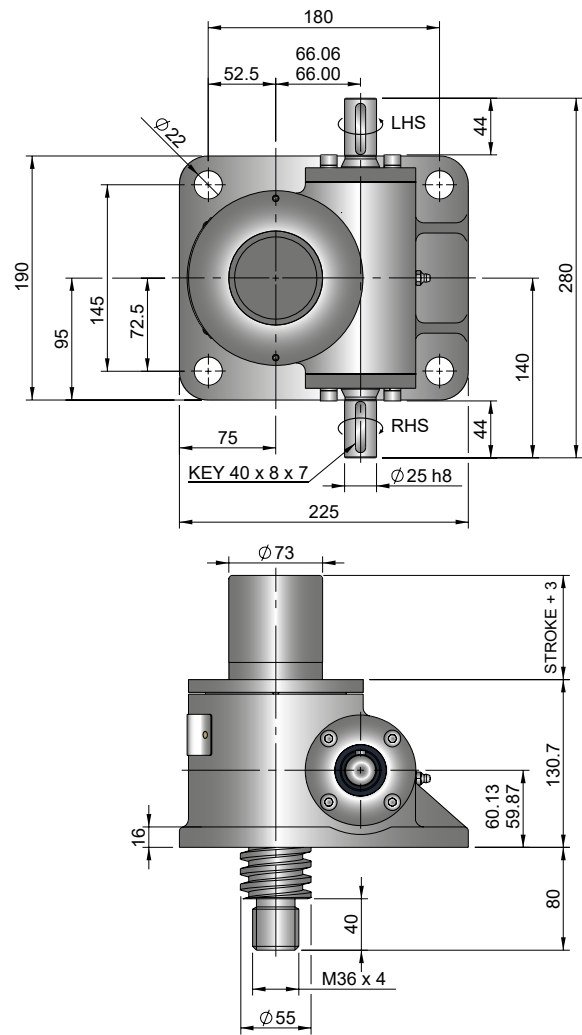
- 1 Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
- 2 Inverted Screw Jacks - Recommended bellows boot mounting plate $\text{ØB} \times [\text{E} + 5\text{mm}]$ thick.
- 3 Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
- 4 † Control tapes fitted (increase outer diameter by 20mm approximately).
- 5 For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
- 6 Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
- 7 Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.



Upright EMT0100-V00



Inverted EMT0100-J00



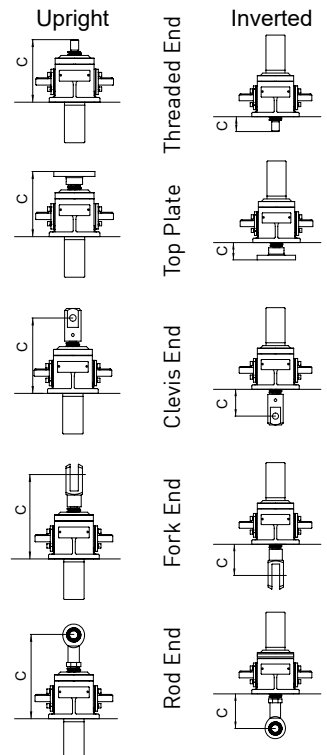
Performance

Model		EMT0100 EMR0100	
Capacity (kN)		100	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	66
		Compression	100
Duplex Lifting Screw		100	
Operating Capacity (kN)	Standard 316 Worm Shaft		33
	Duplex or Plated Worm Shaft with 316 Screw	Tension	66
		Compression	100
Duplex or Plated Worm Shaft with Duplex Screw		100	
Lifting Screw	Diameter (mm)		55
	Lead	Option	1 2
		mm	12 24
Gear Ratio Option 1	Gear Ratio		8:1
	Screw Jack Static Efficiency		0.206 0.305
	Screw Jack Dynamic Efficiency		0.272 0.388
Gear Ratio Option 2	Gear Ratio		24:1
	Screw Jack Static Efficiency		0.132 0.195
	Screw Jack Dynamic Efficiency		0.190 0.271

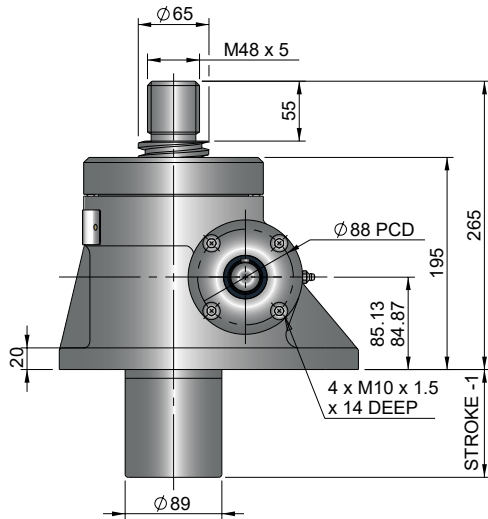
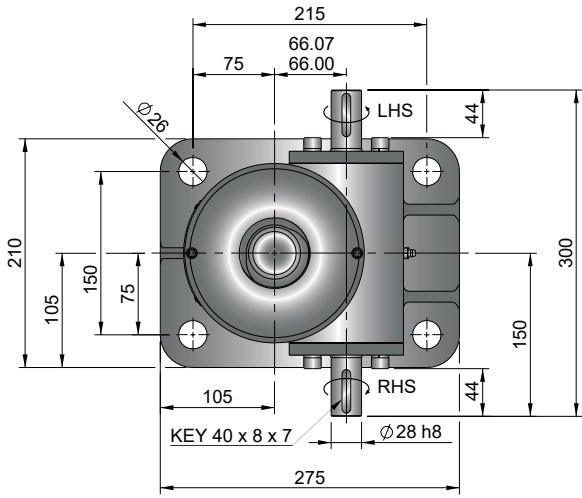
Model		EMT0100 EMR0100	
Capacity	kN		100
Lifting Screw Lead (mm)		12	24
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm 3mm
	Gear Ratio 2	4 Turn	2mm 4mm
Maximum Through Torque (Nm)		347	
Lifting Screw Restraining Torque (Nm)		575	780
Worm Shaft Maximum Radial Load (N)		1000	
Maximum Input Speed (rpm)		1800	
Gear Case Material		Stainless Steel	
Weight (kg) - stroke = 150mm		EMT	24.3
		EMR	28.8
Weight (kg) - per extra 25mm stroke		EMT	0.58
		EMR	0.36

Note: All dimension in millimetres unless otherwise stated. Designs subject to change without notice

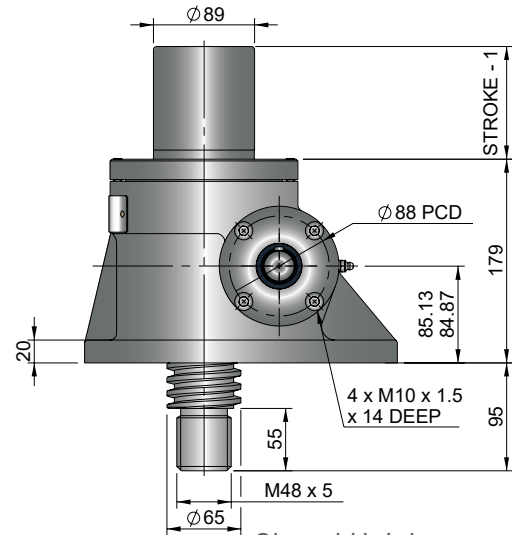
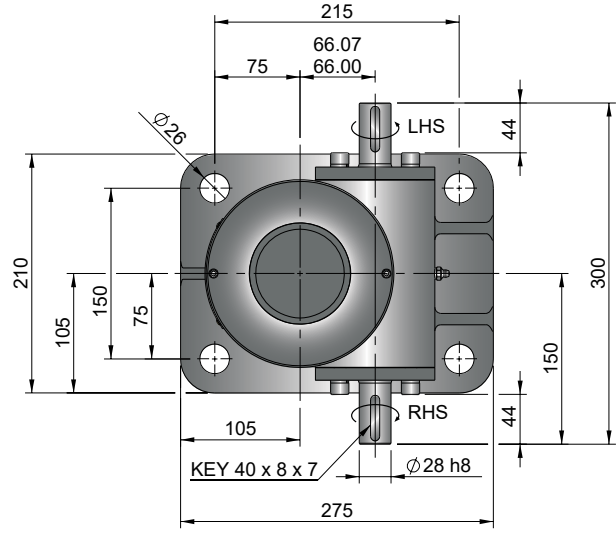
Closed Height



Upright EMT0200-V00



Inverted EMT0200-J00



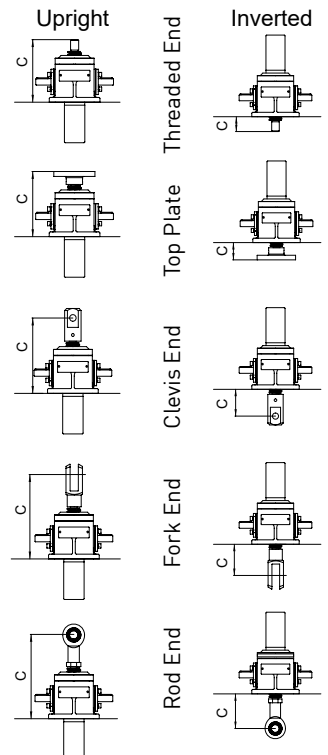
Performance

Model		EMT0200 EMR0200	
Capacity (kN)		200	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	132
		Compression	200
Duplex Lifting Screw		200	
Operating Capacity (kN)	Standard 316 Worm Shaft		66
	Duplex or Plated Worm Shaft with 316 Screw	Tension	132
		Compression	200
Duplex or Plated Worm Shaft with Duplex Screw		200	
Lifting Screw	Diameter (mm)		65
	Lead	Option mm	1 12 2 24
Gear Ratio Option 1	Gear Ratio		8:1
	Screw Jack Static Efficiency		0.181 0.279
	Screw Jack Dynamic Efficiency		0.242 0.357
Gear Ratio Option 2	Gear Ratio		24:1
	Screw Jack Static Efficiency		0.116 0.178
	Screw Jack Dynamic Efficiency		0.169 0.250

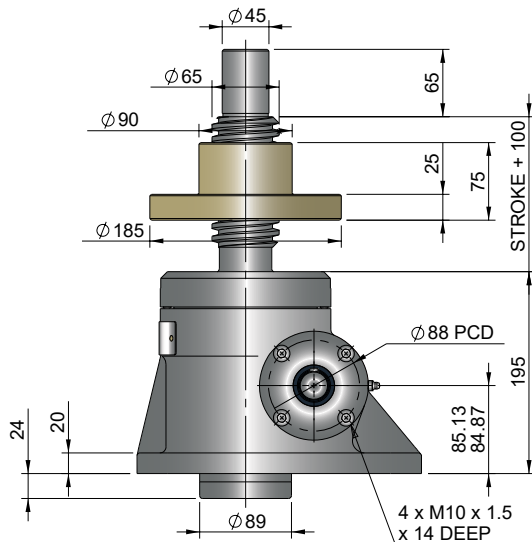
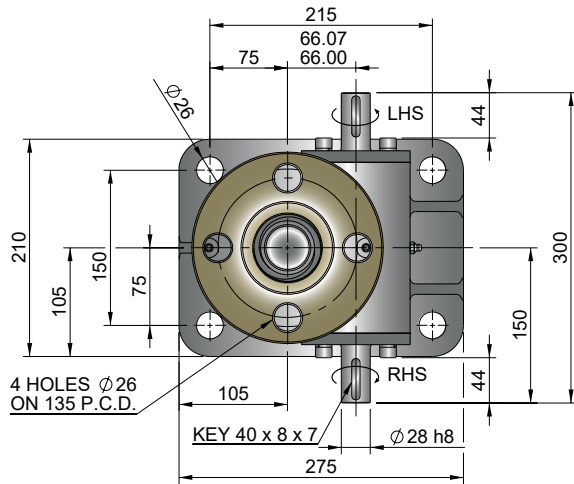
Model		EMT0200 EMR0200	
Capacity	kN		200
Lifting Screw Lead (mm)		12	24
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm 3mm
	Gear Ratio 2	4 Turn	2mm 4mm
Maximum Through Torque (Nm)		396	
Lifting Screw Restraining Torque (Nm)		1300	1705
Worm Shaft Maximum Radial Load (N)		1600	
Maximum Input Speed (rpm)		1800	
Gear Case Material		Stainless Steel	
Weight (kg) - stroke = 150mm		EMT	42.4
		EMR	49.58
Weight (kg) - per extra 25mm stroke		EMT	0.84
		EMR	0.52

Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

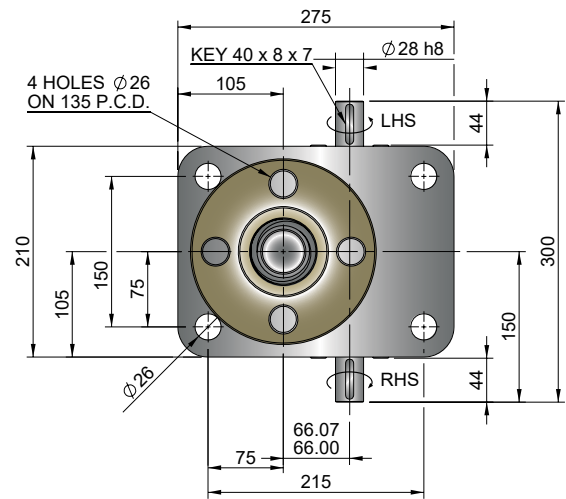
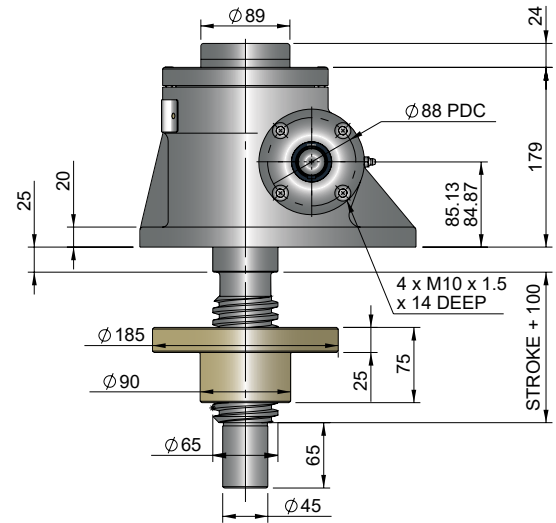
Closed Height



Upright EMR0200-V00



Inverted EMR0200-J00

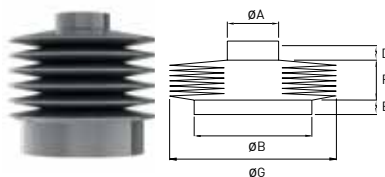


Closed Height & Bellows Boots

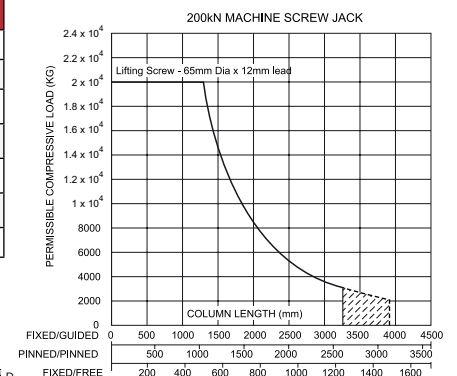
Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0200	265	95	265	95	310	140	400	230	367	197
Stroke (mm)	EMT0200 with Bellows Boots									
1-300	265	120	265	120	310	165	400	255	387	242
301-600	265	145	265	145	310	190	400	280	387	267
601-1050	290	145	290	145	335	190	425	280	412	267
1051-1500	315	170	315	170	360	215	450	305	437	292

Model	A	B	D	E	G
EMT0200	75	165	20	20	165

Stroke	1-300	301-600	601-1050	1051-1500
EMT0200	20	30	50	70

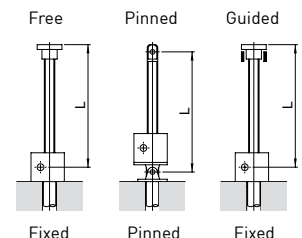


Column Strength

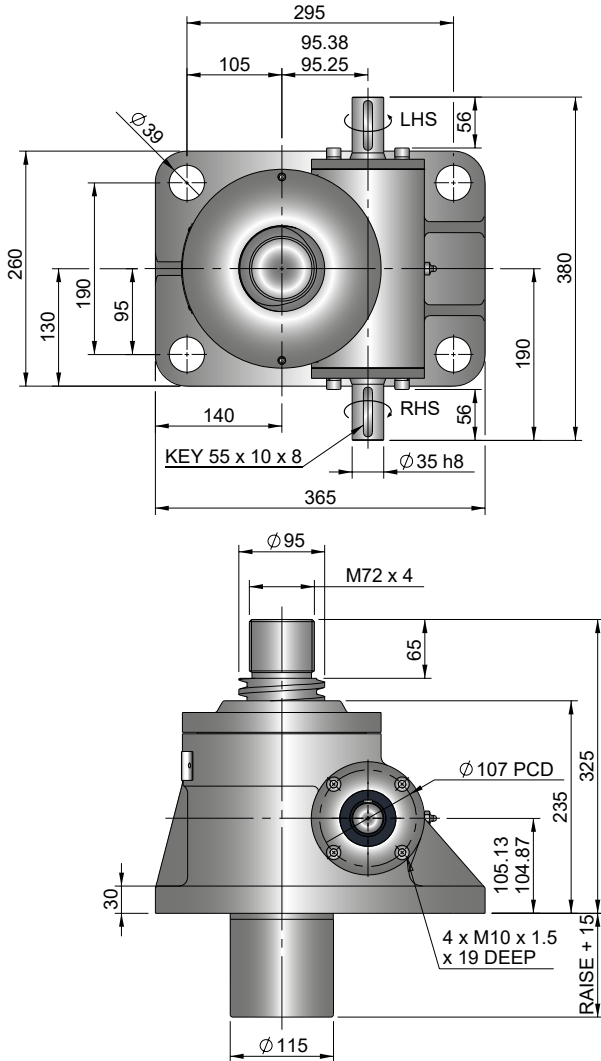


Note:

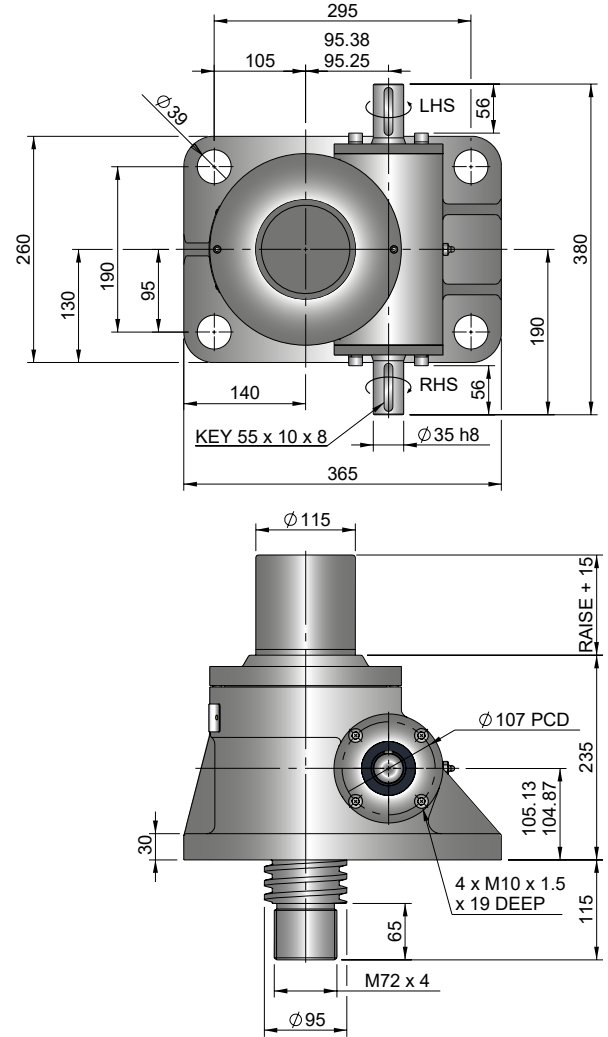
- 1 Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
- 2 Inverted Screw Jacks - Recommended bellows boot mounting plate $\varnothing B \times [E + 5mm]$ thick.
- 3 Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
- 4 † Control tapes fitted (increase outer diameter by 20mm approximately).
- 5 For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
- 6 Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
- 7 Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.



Upright EMT0300-V00



Inverted EMT0300-J00



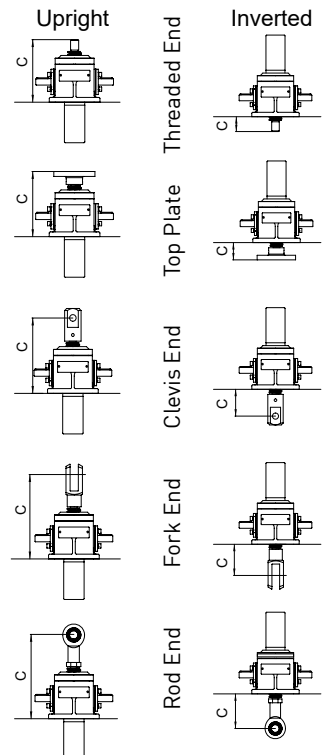
Performance

Closed Height

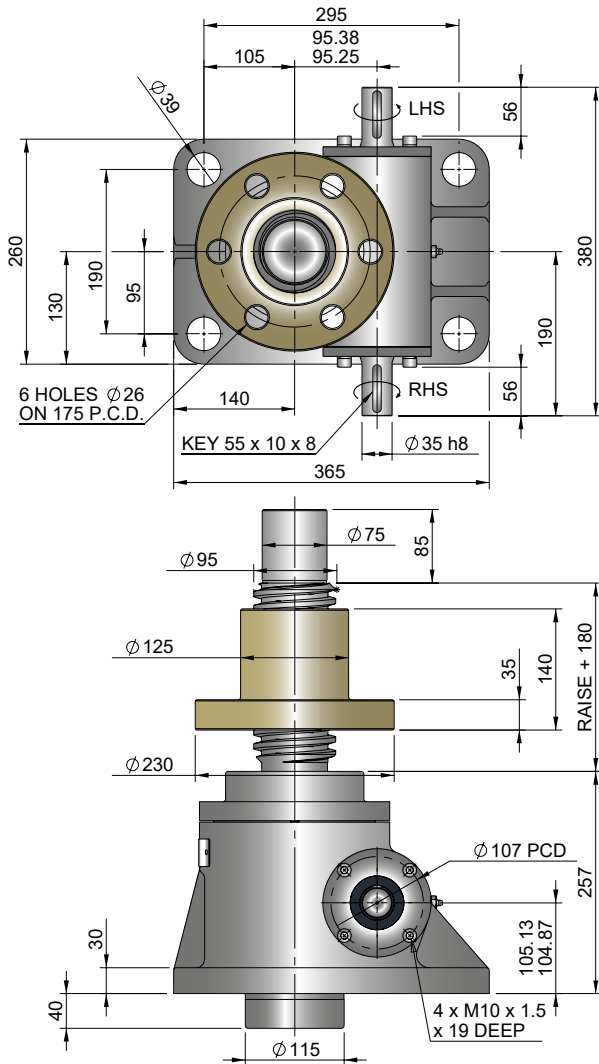
Model		EMT0300 EMR0300	
Capacity (kN)		300	
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	200
		Compression	300
Duplex Lifting Screw		300	
Operating Capacity (kN)	Standard 316 Worm Shaft		100
	Duplex or Plated Worm Shaft with 316 Screw	Tension	200
		Compression	300
Duplex or Plated Worm Shaft with Duplex Screw		300	
Lifting Screw	Diameter (mm)		95
	Lead	Option	1 2
		mm	16 32
Gear Ratio Option 1	Gear Ratio		10 2/3:1
	Screw Jack Static Efficiency		0.149 0.232
	Screw Jack Dynamic Efficiency		0.205 0.308
Gear Ratio Option 2	Gear Ratio		32:1
	Screw Jack Static Efficiency		0.084 0.131
	Screw Jack Dynamic Efficiency		0.128 0.192

Model		EMT0300 EMR0300	
Capacity	kN		300
Lifting Screw Lead (mm)			16 32
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.5mm 3mm
	Gear Ratio 2	4 Turn	2mm 4mm
Maximum Through Torque (Nm)		1440	
Lifting Screw Restraining Torque (Nm)		2805 3610	
Worm Shaft Maximum Radial Load (N)		2170	
Maximum Input Speed (rpm)		1800	
Gear Case Material		Stainless Steel	
Weight (kg) - stroke = 150mm		EMT	92.4
		EMR	113.78
Weight (kg) - per extra 25mm stroke		EMT	1.55
		EMR	1.13

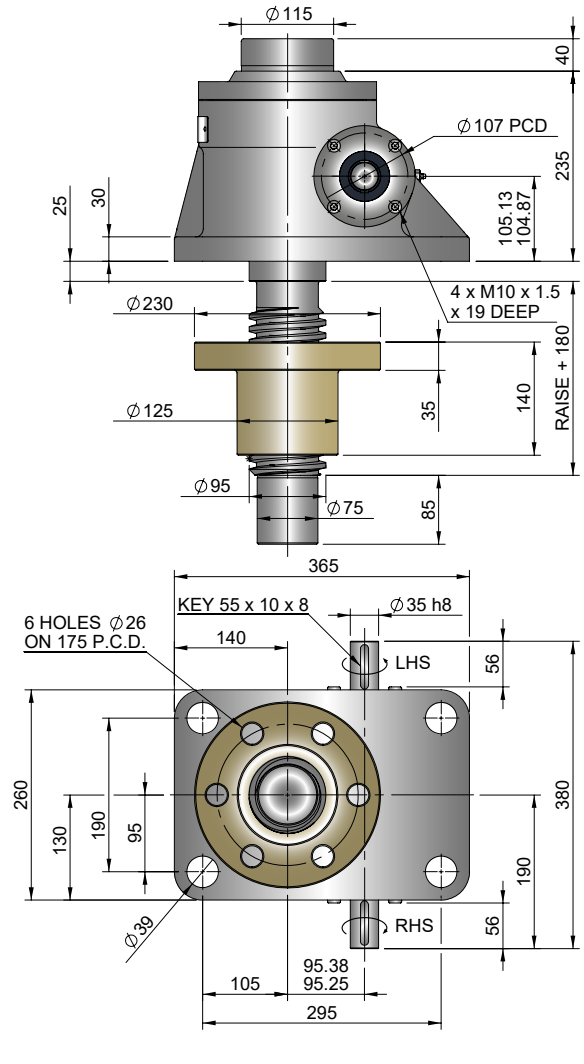
Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice



Upright EMR0300-V00



Inverted EMR0300-J00



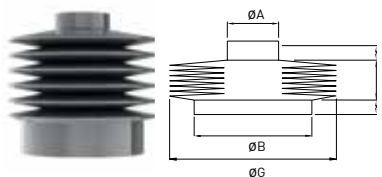
Closed Height & Bellows Boots

Column Strength

Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0300	325	115	325	115	365	155	on request		on request	
Stroke (mm)	EMT0300 with Bellows Boots									
1-300	325	140	325	140	365	180	-	-	-	-
301-600	325	165	325	165	365	205	-	-	-	-
601-1050	350	165	350	165	390	205	-	-	-	-
1051-1500	375	190	375	190	415	230	-	-	-	-

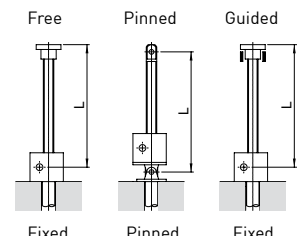
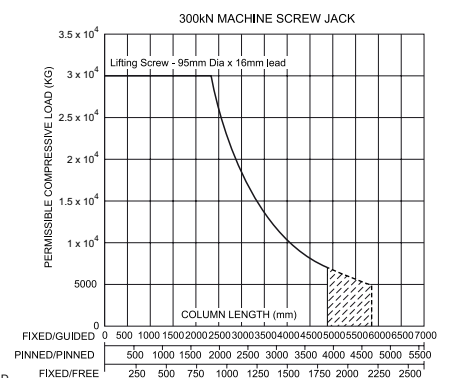
Model	A	B	D	E	G
EMT0300	110	220	20	20	191

Stroke	1-300	301-600	601-1050	1051-1500
EMT0300	20	30	50	70



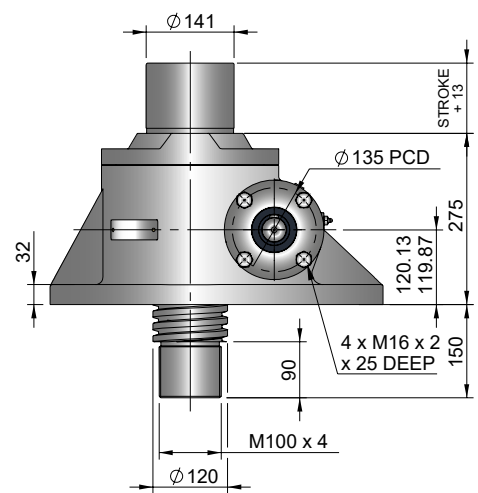
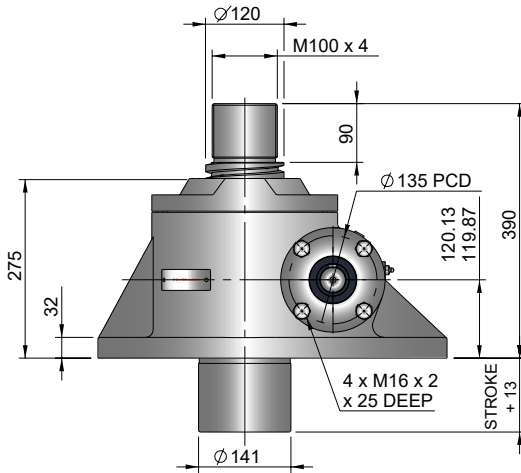
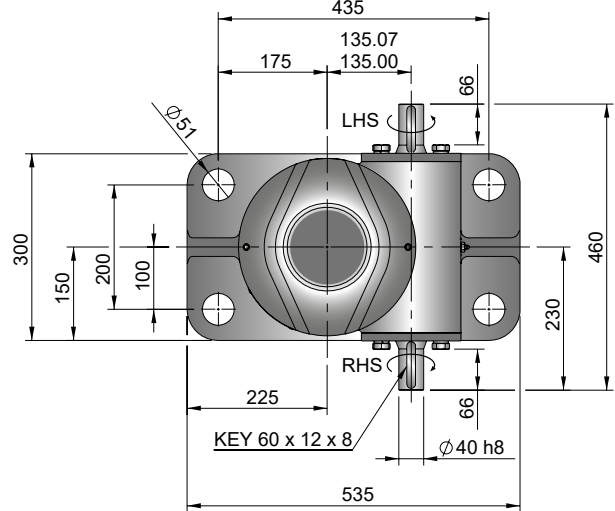
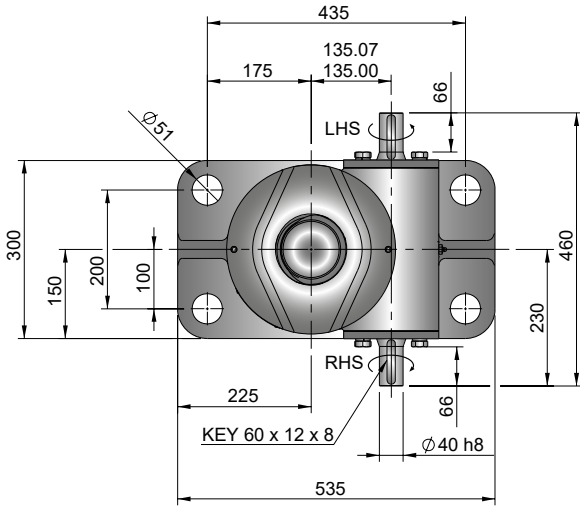
Note:

- 1 Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
- 2 Inverted Screw Jacks - Recommended bellows boot mounting plate $\text{ØB} \times [\text{E} + 5\text{mm}]$ thick.
- 3 Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
- 4 † Control tapes fitted (increase outer diameter by 20mm approximately).
- 5 For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
- 6 Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
- 7 Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.



Upright EMT0500-V00

Inverted EMT0500-J00



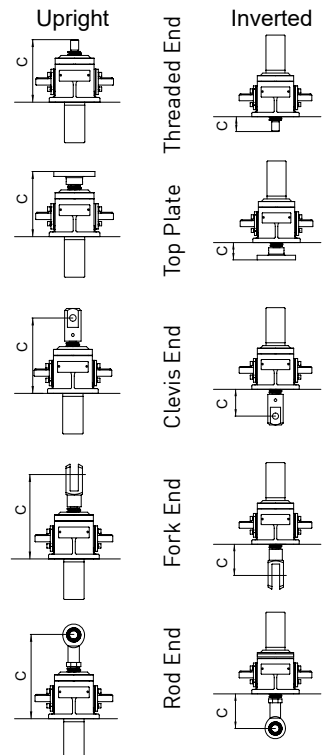
Performance

Closed Height

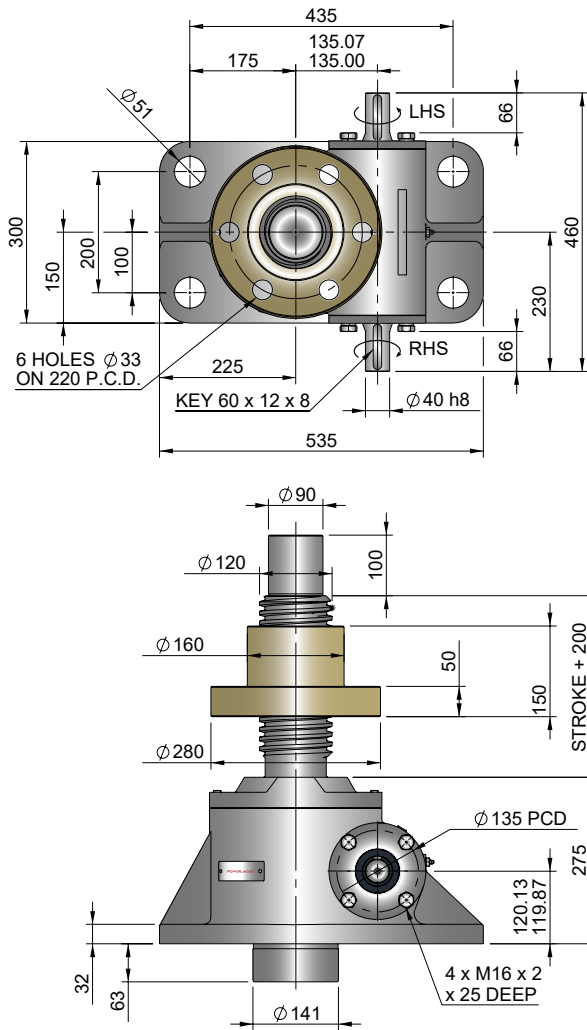
Model	EMT0500		EMR0500	
Capacity (kN)	500			
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	333	
		Compression	500	
	Duplex Lifting Screw	500		
Operating Capacity (kN)	Standard 316 Worm Shaft		167	
	Duplex or Plated Worm Shaft with 316 Screw	Tension	333	
		Compression	500	
	Duplex or Plated Worm Shaft with Duplex Screw		500	
Lifting Screw	Diameter (mm)		120	
	Lead	Option	1	2
		mm	16	32
Gear Ratio Option 1	Gear Ratio		10 2/3:1	
	Screw Jack Static Efficiency		0.132	0.215
	Screw Jack Dynamic Efficiency		0.181	0.284
Gear Ratio Option 2	Gear Ratio		32:1	
	Screw Jack Static Efficiency		0.079	0.129
	Screw Jack Dynamic Efficiency		0.120	0.188

Model	EMT0500		EMR0500	
Capacity	kN			
Capacity	500			
Lifting Screw Lead (mm)			16	32
Turn of worm for travel of lifting screw	Gear Ratio	1 Turn	1.5mm	3mm
		4 Turn	2mm	4mm
Maximum Through Torque (Nm)		2712		
Lifting Screw Restraining Torque (Nm)		5645	6975	
Worm Shaft Maximum Radial Load (N)		2190		
Maximum Input Speed (rpm)		1800		
Gear Case Material		Stainless Steel		
Weight (kg) - stroke = 150mm	EMT	183.7		
	EMR	224		
Weight (kg) - per extra 25mm stroke	EMT	2.48		
	EMR	1.94		

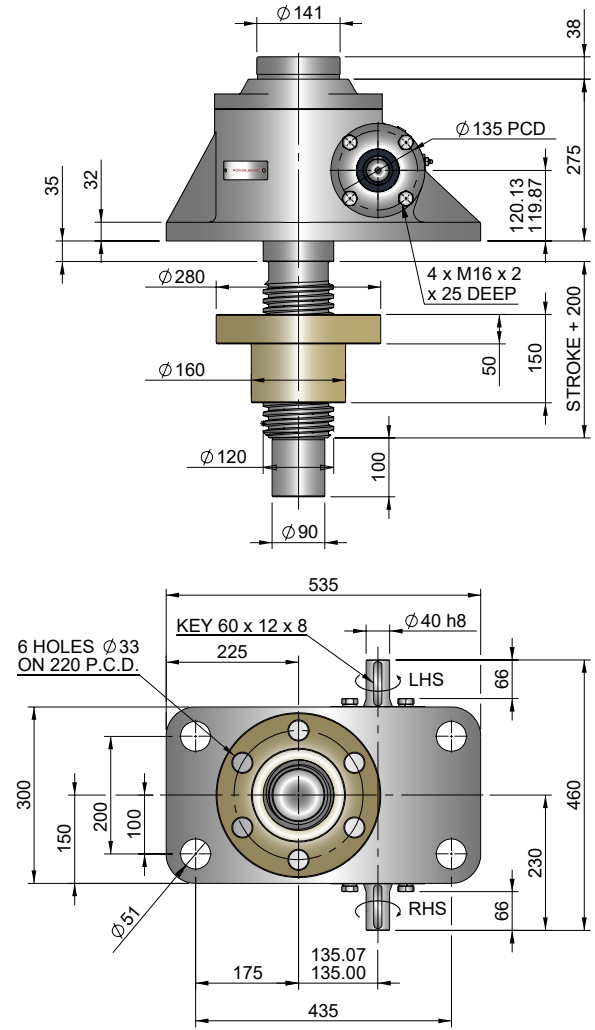
Note: All dimension in millimetres unless otherwise stated. Designs subject to change without notice



Upright EMR0500-V00



Inverted EMR0500-J00

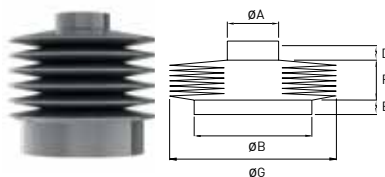


Closed Height & Bellows Boots

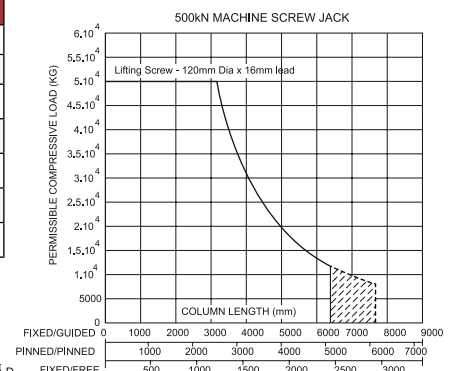
Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT0500	390	150	390	150	440	200	on request		on request	
Stroke (mm)	EMT0500 with Bellows Boots									
1-300	390	175	390	175	440	225	-	-	-	-
301-600	415	200	415	200	465	250	-	-	-	-
601-1050	440	225	440	225	490	275	-	-	-	-
1051-1500	465	250	465	250	515	300	-	-	-	-

Model	A	B	D	E	G
EMT0500	150	285	20	45	210

Stroke	1-300	301-600	601-1050	1051-1500
EMT0500	20	30	50	70

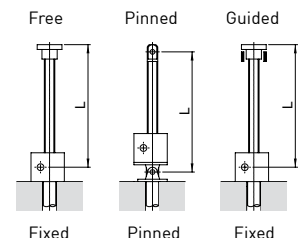


Column Strength



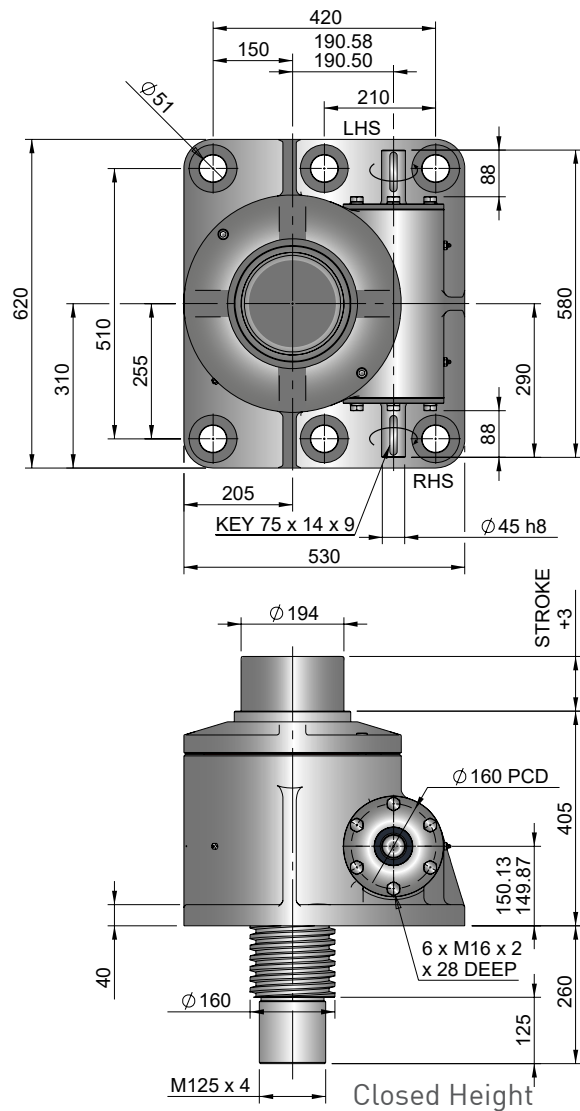
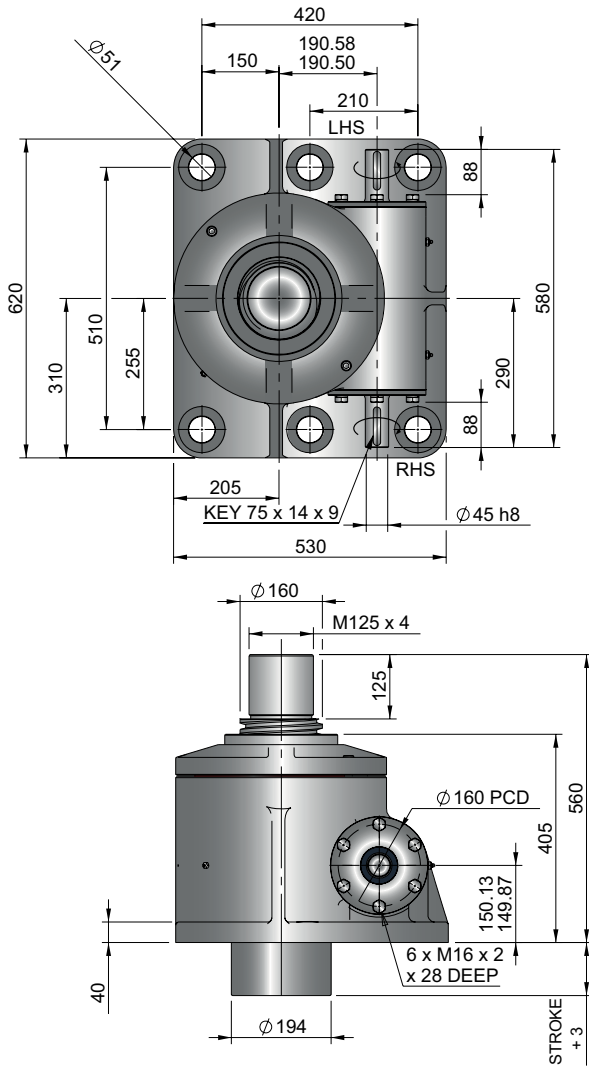
Note:

- 1 Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
- 2 Inverted Screw Jacks - Recommended bellows boot mounting plate $\text{ØB} \times [\text{E} + 5\text{mm}]$ thick.
- 3 Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
- 4 † Control tapes fitted (increase outer diameter by 20mm approximately).
- 5 For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
- 6 Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
- 7 Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.



Upright EMT1000-V00

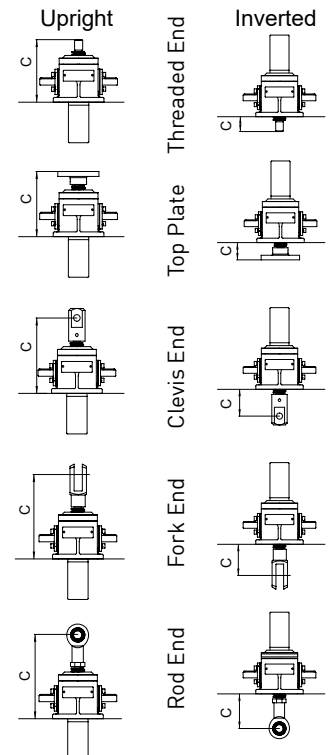
Inverted EMT1000-J00



Performance

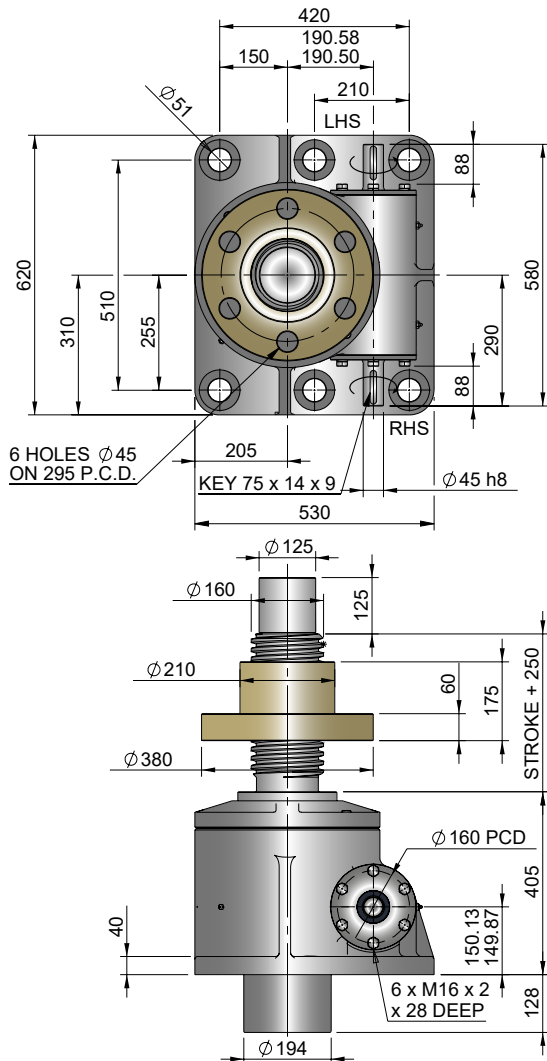
Model			EMT1000 EMR1000
Capacity (kN)			1000
Sustaining Capacity (kN)	Standard 316 Lifting Screw	Tension	666
		Compression	1000
Duplex Lifting Screw			1000
Operating Capacity (kN)	Standard 316 Worm Shaft		333
	Duplex or Plated Worm Shaft with 316 Screw	Tension	666
		Compression	1000
Duplex or Plated Worm Shaft with Duplex Screw			1000
Lifting Screw	Diameter (mm)		160
	Lead	Option	1
		mm	20
Gear Ratio Option 1	Gear Ratio		12:1
	Screw Jack Static Efficiency		0.131
	Screw Jack Dynamic Efficiency		0.178
Gear Ratio Option 2	Gear Ratio		36:1
	Screw Jack Static Efficiency		0.079
	Screw Jack Dynamic Efficiency		0.123

Model			EMT1000 EMR1000	
Capacity	kN		1000	
Lifting Screw Lead (mm)			20	
Turn of worm for travel of lifting screw	Gear Ratio 1	1 Turn	1.67mm	
	Gear Ratio 2	4 Turn	6.67mm	
Maximum Through Torque (Nm)			6075	
Lifting Screw Restraining Torque (Nm)			14890	
Worm Shaft Maximum Radial Load (N)			2220	
Maximum Input Speed (rpm)			1800	
Gear Case Material			Stainless Steel	
Weight (kg) - stroke = 150mm			EMT	459.1
			EMR	560.4
Weight (kg) - per extra 25mm stroke			EMT	4.11
			EMR	3.38

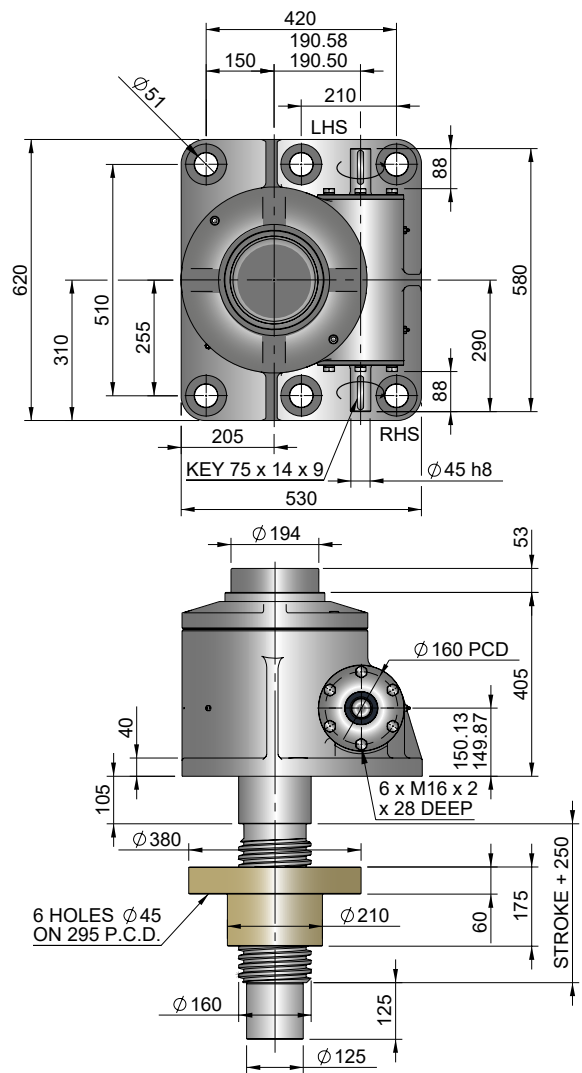


Note: All dimension in millimetres unless otherwise stated.
Designs subject to change without notice

Upright EMR1000-V00



Inverted EMR1000-J00

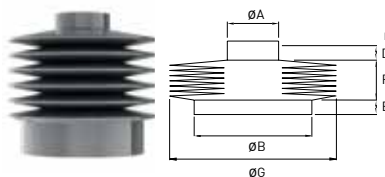


Closed Height & Bellows Boots

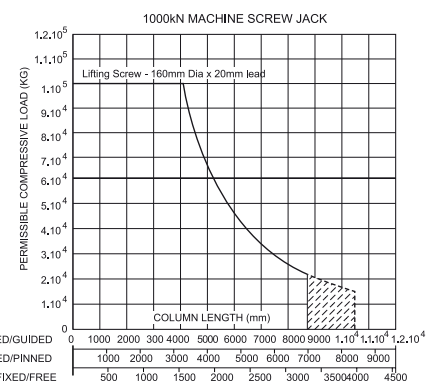
Closed Height "C"	Threaded End		Top Plate		Clevis End		Fork End		Rod End	
	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted	Upright	Inverted
EMT1000	560	260	560	260	625	325	on request		on request	
Stroke (mm)	EMT1000 with Bellows Boots									
1-300	560	260	560	260	625	325	-	-	-	-
301-600	560	260	560	260	625	325	-	-	-	-
601-1050	585	285	585	285	650	350	-	-	-	-
1051-1500	610	310	610	310	675	375	-	-	-	-

Model	A	B	D	E	G
EMT1000	200	220	20	20	244

Stroke	1-300	301-600	601-1050	1051-1500
EMT1000	20	30	50	70

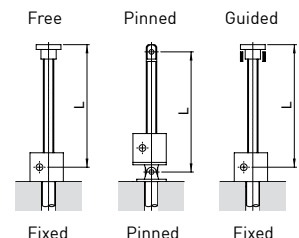


Column Strength



Note:

- 1 Inverted Screw Jacks - Bellows Boot Closed Height assumes screw jack mounted on a structure with thickness = 15mm
- 2 Inverted Screw Jacks - Recommended bellows boot mounting plate ØB x [E +5mm] thick.
- 3 Inverted Screw Jacks - Screw Jack mounting plate & bellows boot mounting plate are customers own supply
- 4 † Control tapes fitted (increase outer diameter by 20mm approximately).
- 5 For horizontal installations with than 450 mm of stroke, internal boot guides are recommended.
- 6 Customers with threaded end screw jacks must provide a fixing for the unattached bellows boot collar.
- 7 Bellows boots for Rotating Screw Jacks, other sizes, stroke and materials please consult Power Jacks.



E-Series

2

E-Series Stainless Steel Screw Jacks

PERFORMANCE
ENHANCED VARIANTS
TO SOLVE SPECIFIC
APPLICATION
REQUIREMENTS



Minimise Axial Backlash for Reversing Loads

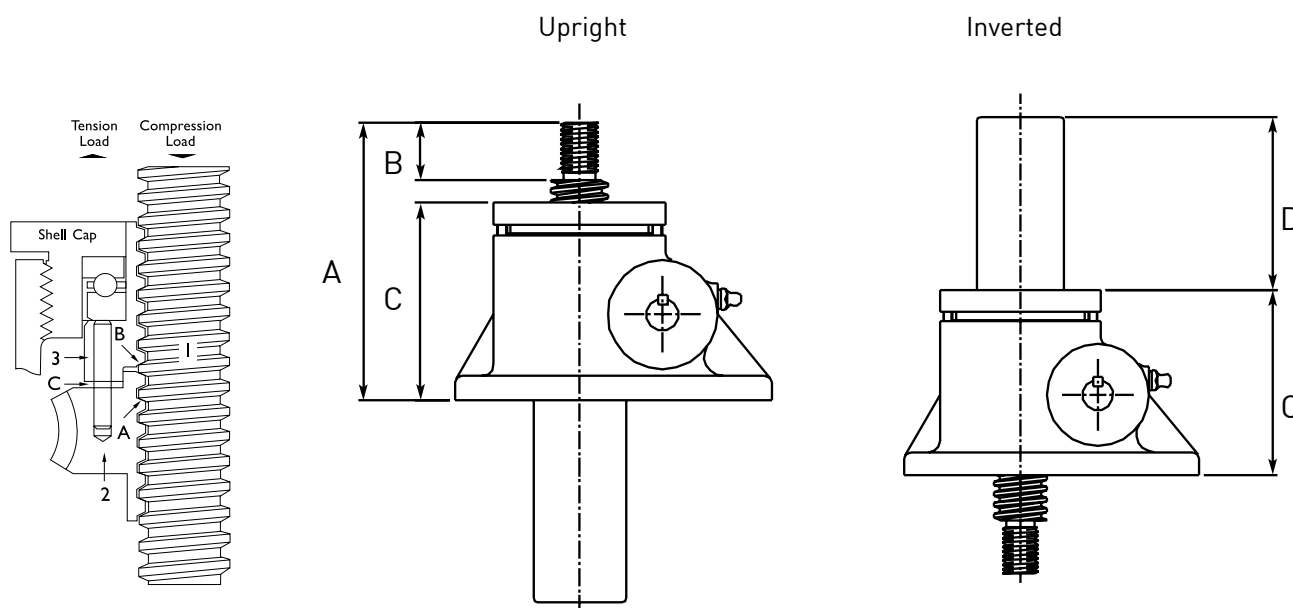
The Anti-Backlash feature provides a reliable method to regulate the axial backlash in a screw jack for applications where there is a reversal of loading from tension to compression. The amount of backlash between the screw and worm gear nut can be adjusted (adjust shell cap) to a desired amount or a practical minimum. To avoid binding and excessive wear do not adjust backlash to less than 0.025mm.

The Anti-Backlash feature also acts as a safety device, providing dual nut load carrying unit, when the worm gear becomes worn.

A visual wear indicator is available on request for all models and a "feeler" gauge can be used to measure the wear. This can be upgraded to use a sensor for wear monitoring. Consult Power Jacks for either option.



Dimensions



How it works - refer p193

The dimensions for these screw jacks are the same as the standard units except those detailed below.

Model	EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
A	125	145	185	200	265	340	415	585
B	24	30	35	40	55	65	90	125
C	86	103.5	138	146.5	195	250	295	415
D	Stroke + 35	Stroke + 30	Stroke + 20	Stroke + 3	Stroke + 24	Stroke + 38	Stroke + 28	Stroke + 3

E-Series - Stainless Steel Screw Jacks - Anti-Backlash - Performance

Model		EMT0010-V0A EMT0010-J0A		EMT0025-V0A EMT0025-J0A		EMT0050-V0A EMT0050-J0A		EMT0100-V0A EMT0100-J0A		
Capacity	kN	10		25		50		100		
Sustaining Capacity (kN)	Tension	6.6		16.5		33		66		
	Compression	10		25		50		100		
Operating Capacity (kN)	Stainless Steel Worm Shaft		3.3		8.25		16.5		33	
	Plated Worm Shaft	Tension	6.6		16.5		33		66	
		Compression	10		25		50		100	
Lifting Screw ¹	mm		20		30		40		55	
	Lead	Option	1	2	1	2	1	2	1	2
		mm	5	10	6	12	9	18	12	24
Gear Ratios	Option 1		5:1		6:1		6:1		8:1	
	Option 2		20:1		24:1		24:1		24:1	
Max. Input Power (kW)	Gear Ratio Option 1		0.375		1.5		3.0		3.75	
	Gear Ratio Option 2		0.19		0.375		0.55		1.125	
Start up torque at full load (Nm) ²	Gear Ratio Option 1		7.8	10.9	23.5	31.3	62.3	84.9	129.2	147.8
	Gear Ratio Option 2		3.6	5.1	9.8	13.0	28.5	38.8	66.8	90.4
Weight (kg) - stroke = 150mm		2.72		8.62		16.78		26.12		
Weight (kg) per extra 25mm		0.13		0.21		0.32		0.57		
Gear Ratio Option 1	Gear Ratio		5:1		6:1		6:1		8:1	
	Screw Jack Static Efficiency		0.203	0.291	0.169	0.254	0.192	0.281	0.185	0.273
	Screw Jack Dynamic Efficiency		0.263	0.365	0.222	0.322	0.251	0.356	0.243	0.325
Gear Ratio Option 2	Gear Ratio		20:1		24:1		24:1		24:1	
	Screw Jack Static Efficiency		0.109	0.157	0.102	0.153	0.105	0.154	0.119	0.176
	Screw Jack Dynamic Efficiency		0.159	0.220	0.150	0.217	0.154	0.218	0.172	0.245

Model		EMT0200-V0A EMT0200-J0A		EMT0300-V0A EMT0300-J0A		EMT0500-V0A EMT0500-J0A		EMT1000-V0A EMT1000-J0A		
Capacity	kN	200		300		500		1000		
Sustaining Capacity (kN)	Tension	132		200		333		666		
	Compression	200		300		500		1000		
Operating Capacity (kN)	Stainless Steel Worm Shaft		3.3		100		167		333	
	Plated Worm Shaft	Tension	6.6		200		333		666	
		Compression	10		300		500		1000	
Lifting Screw ¹	mm		65		95		120		160	
	Lead	Option	1	2	1	2	1	2	1	
		mm	12	24	16	32	16	32	20	
Gear Ratios	Option 1		8:1		10 2/3:1		10 2/3:1		12:1	
	Option 2		24:1		32:1		32:1		36:1	
Max. Input Power (kW)	Gear Ratio Option 1		3.75		6.0		11.25		18.5	
	Gear Ratio Option 2		1.125		1.9		4.5		8.25	
Start up torque at full load (Nm) ²	Gear Ratio Option 1		281.2	368.5	534	687	1000	1236	2243	
	Gear Ratio Option 2		153.7	201.4	315	405	568	702	1244	
Weight (kg) - stroke = 150mm		49		91		209		610		
Weight (kg) per extra 25mm		0.86		1.58		2.49		4.31		
Gear Ratio Option 1	Gear Ratio		8:1		10 2/3:1		10 2/3:1		12:1	
	Screw Jack Static Efficiency		0.170	0.259	0.134	0.209	0.119	0.193	0.118	
	Screw Jack Dynamic Efficiency		0.226	0.332	0.184	0.277	0.163	0.256	0.160	
Gear Ratio Option 2	Gear Ratio		24:1		32:1		32:1		36:1	
	Screw Jack Static Efficiency		0.104	0.158	0.076	0.118	0.070	0.113	0.071	
	Screw Jack Dynamic Efficiency		0.151	0.222	0.115	0.173	0.105	0.165	0.106	

Note

1. All metric machine screws have a trapezoidal thread form.
2. For loads of 25% to 100% of screw jack capacity, torque requirements are approximately proportional to the load.
3. Efficiency values for standard grease lubricated worm gear box and lifting screw.
4. All E-Series screw jacks have grease lubricated gearbox and lead screw as standard.

2 E-Series - Stainless Steel Screw Jack

44 Anti-Rotation (Keyed)

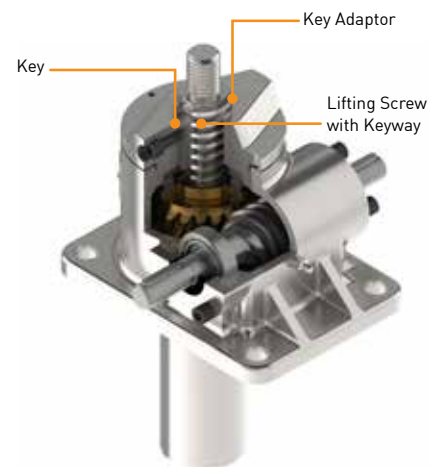
POWERJACKS

Linear Movement for Rotationally Unconstrained Loads

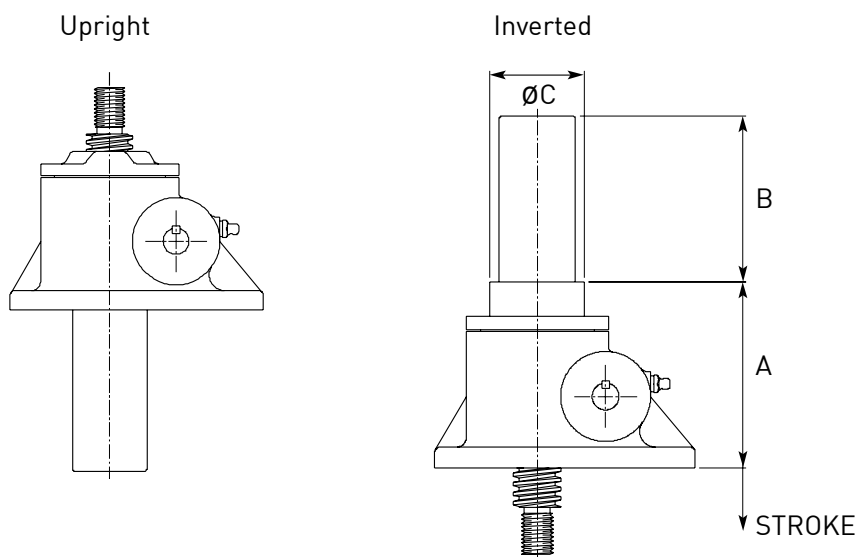
The Anti-Rotation feature for translating screw jacks stops the lifting screw from rotating without the need for end fixing. This is done by keying the lifting screw.

Benefits:

- Compact unit integrates anti-rotation into gearbox
- Dimensions are the same as the standard translating screw jack
- Standard round cover pipe for easy installation
- Proven industrial anti-rotation design



Dimensions



Dimensions for Upright Models with Anti-Rotation (Keyed)

The Dimensions for upright E-Series machine screw jacks with anti-rotation (keyed) mechanism are the same as the standard screw jacks without the feature.

Dimensions for Inverted Models with Anti-Rotation (Keyed)

The dimensions for these screw jacks are the same as the standard units except those detailed below.

Model	EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
A	78	125.5	159	167.5	210	267	307	445
B	Stroke + 35	Stroke + 30	Stroke + 20	Stroke + 3	Stroke - 1	Stroke + 15	Stroke + 13	Stroke + 3
øC	N/A	60	75	90	102	141.5	180	236

E-Series - Stainless Steel Screw Jacks - Anti-Rotation (Keyed) - Performance

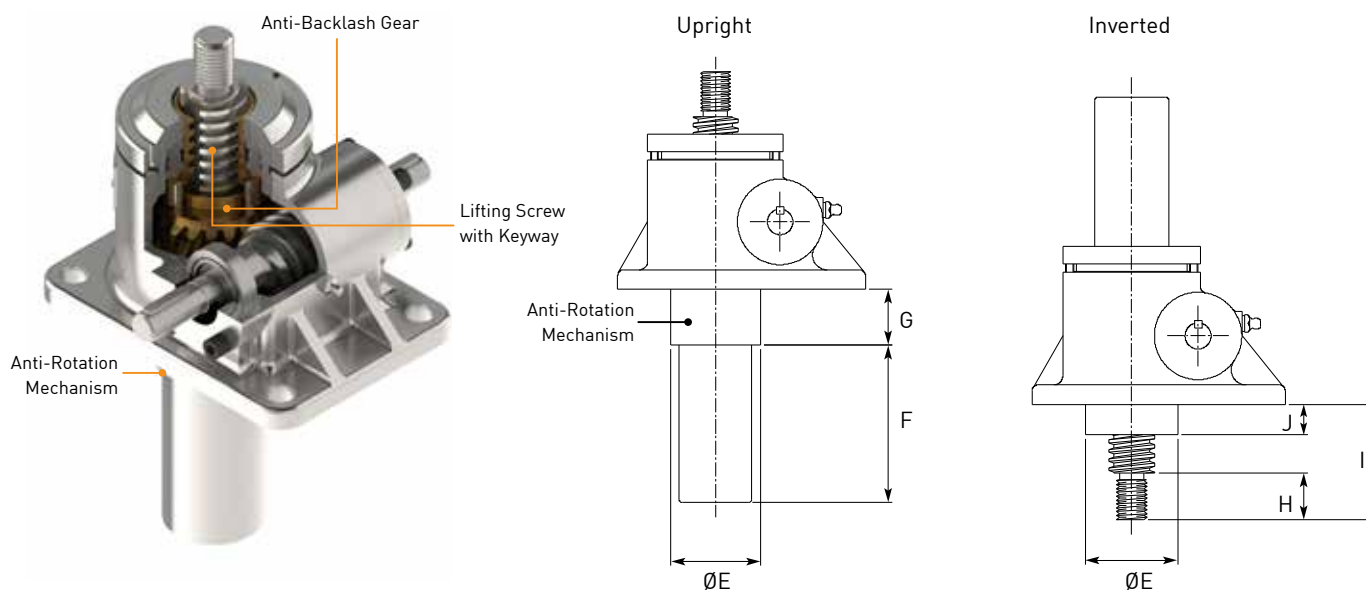
Model		EMT0010-VK0 EMT0010-JK0		EMT0025-VK0 EMT0025-JK0		EMT0050-VK0 EMT0050-JK0		EMT0100-VK0 EMT0100-JK0		
Capacity	kN	10		25		50		100		
Sustaining Capacity (kN)	Tension	6.6		16.5		33		66		
	Compression	10		25		50		100		
Operating Capacity (kN)	Stainless Steel Worm Shaft	3.3		8.25		16.5		33		
	Plated Worm Shaft	Tension	6.6		16.5		33		66	
		Compression	10		25		50		100	
Lifting Screw ¹	mm		20		30		40		55	
	Lead	Option	1	2	1	2	1	2	1	2
		mm	5	10	6	12	9	18	12	24
Gear Ratios	Option 1	5:1		6:1		6:1		8:1		
	Option 2	20:1		24:1		24:1		24:1		
Max. Input Power (kW)	Gear Ratio Option 1	0.375		1.5		3.0		3.75		
	Gear Ratio Option 2	0.19		0.375		0.55		1.125		
Start up torque at full load (Nm) ²	Gear Ratio Option 1	7.1	9.9	20.8	27.7	58.7	80	121.7	164.7	
	Gear Ratio Option 2	3.1	4.4	9.2	12.2	26.8	36.6	63.6	86.1	
Weight (kg) - stroke = 150mm		2.27		8.17		15.88		24.72		
Weight (kg) per extra 25mm		0.13		0.21		0.32		0.57		
Gear Ratio Option 1	Gear Ratio	5:1		6:1		6:1		8:1		
	Screw Jack Static Efficiency	0.224	0.322	0.191	0.287	0.203	0.299	0.196	0.290	
	Screw Jack Dynamic Efficiency	0.291	0.403	0.251	0.364	0.267	0.378	0.258	0.368	
Gear Ratio Option 2	Gear Ratio	20:1		24:1		24:1		24:1		
	Screw Jack Static Efficiency	0.127	0.182	0.108	0.162	0.111	0.163	0.125	0.185	
	Screw Jack Dynamic Efficiency	0.184	0.255	0.159	0.230	0.164	0.232	0.180	0.257	

Model		EMT0200-VK0 EMT0200-JK0		EMT0300-VK0 EMT0300-JK0		EMT0500-VK0 EMT0500-JK0		EMT1000-VK0 EMT1000-JK0		
Capacity	kN	200		300		500		1000		
Sustaining Capacity (kN)	Tension	200		300		500		1000		
	Compression	132		200		333		666		
Operating Capacity (kN)	Stainless Steel Worm Shaft	200		300		500		1000		
	Plated Worm Shaft	Tension	3.3		100		167		333	
		Compression	6.6		200		333		666	
Lifting Screw ¹	mm		10		300		500		1000	
	Lead	Option	65		95		120		160	
		mm	12	24	16	32	16	32	20	
Gear Ratios	Option 1	8:1		10 2/3:1		10 2/3:1		12:1		
	Option 2	24:1		32:1		32:1		36:1		
Max. Input Power (kW)	Gear Ratio Option 1	3.75		6.0		11.25		18.5		
	Gear Ratio Option 2	1.125		1.9		4.5		8.25		
Start up torque at full load (Nm) ²	Gear Ratio Option 1	275.3	360.7	506	651	947	1170	2125		
	Gear Ratio Option 2	144	188.7	298	384	526	650	1126		
Weight (kg) - stroke = 150mm		45		86		195		553		
Weight (kg) per extra 25mm		0.86		1.58		2.49		4.31		
Gear Ratio Option 1	Gear Ratio	8:1		10 2/3:1		10 2/3:1		12:1		
	Screw Jack Static Efficiency	0.173	0.265	0.142	0.220	0.126	0.204	0.125		
	Screw Jack Dynamic Efficiency	0.230	0.34	0.195	0.292	0.172	0.270	0.169		
Gear Ratio Option 2	Gear Ratio	24:1		32:1		32:1		36:1		
	Screw Jack Static Efficiency	0.111	0.169	0.080	0.124	0.076	0.122	0.079		
	Screw Jack Dynamic Efficiency	0.161	0.237	0.121	0.182	0.144	0.178	0.117		

Note

1. All metric machine screws have a trapezoidal thread form.
2. For loads of 25% to 100% of screw jack capacity, torque requirements are approximately proportional to the load.
3. Efficiency values for standard grease lubricated worm gear box and lifting screw.
4. All E-Series screw jacks have grease lubricated gearbox and lead screw as standard.

Combine Anti-Backlash & Anti-Rotation in One Screw Jack



Dimensions for E-Series Stainless Steel Screw Jacks with Anti-Backlash & Anti-Rotation

Model	EMT0010-VKA EMT0010-JKA	EMT0025-VKA EMT0025-JKA	EMT0050-VKA EMT0050-JKA	EMT0100-VKA EMT0100-JKA	EMT0200-VKA EMT0200-JKA	EMT0300-VKA EMT0300-JKA	EMT0500-VKA EMT0500-JKA	EMT1000-VKA EMT1000-JKA
ØE	38	60	75	90	102	138	206	264
F	Stroke + 9	Stroke + 30	Stroke + 20	Stroke + 3	Stroke + 24	Stroke + 15	Stroke + 13	Stroke + 28
G	30	37	40	37	58	73	58	180
H	24	30	35	30	55	65	55	125
I	45	55	65	55	110	115	110	405
J	16	19.5	24	19.5	39	43	39	145

The dimensions for these screw jacks are the same as the Anti-Backlash units except those detailed above.

E-Series - Stainless Steel Screw Jacks - Anti-Backlash & Anti-Rotation (Keyed) - Performance

Model		EMT0010-VKA EMT0010-JKA		EMT0025-VKA EMT0025-JKA		EMT0050-VKA EMT0050-JKA		EMT0100-VKA EMT0100-JKA		
Capacity	kN	10		25		50		100		
Sustaining Capacity (kN)	Tension	6.6		16.5		33		66		
	Compression	10		25		50		100		
Operating Capacity (kN)	Stainless Steel Worm Shaft		3.3		8.25		16.5		33	
	Plated Worm Shaft	Tension	6.6		16.5		33		66	
		Compression	10		25		50		100	
Lifting Screw ¹	mm		20		30		40		55	
	Lead	Option	1	2	1	2	1	2	1	2
		mm	5	10	6	12	9	18	12	24
Gear Ratios	Option 1		5:1		6:1		6:1		8:1	
	Option 2		20:1		24:1		24:1		24:1	
Max. Input Power (kW)	Gear Ratio Option 1		0.375		1.5		3.0		3.75	
	Gear Ratio Option 2		0.19		0.375		0.55		1.125	
Start up torque at full load (Nm) ²	Gear Ratio Option 1		8.3	11.5	24.8	33	65.6	89.3	136	184
	Gear Ratio Option 2		3.8	5.3	10.3	13.7	30	40.9	70.3	95.2
Weight (kg) - stroke = 150mm		2.72		8.62		16.78		26.12		
Weight (kg) per extra 25mm		0.13		0.21		0.32		0.57		
Gear Ratio Option 1	Gear Ratio		5:1		6:1		6:1		8:1	
	Screw Jack Static Efficiency		0.193	0.277	0.161	0.241	0.182	0.267	0.176	0.259
	Screw Jack Dynamic Efficiency		0.250	0.346	0.211	0.306	0.239	0.338	0.231	0.330
Gear Ratio Option 2	Gear Ratio		20:1		24:1		24:1		24:1	
	Screw Jack Static Efficiency		0.104	0.149	0.097	0.145	0.100	0.146	0.113	0.167
	Screw Jack Dynamic Efficiency		0.151	0.209	0.142	0.206	0.146	0.208	0.163	0.233

Model		EMT0200-VKA EMT0200-JKA		EMT0300-VKA EMT0300-JKA		EMT0500-VKA EMT0500-JKA		EMT1000-VKA EMT1000-JKA		
Capacity	kN	200		300		500		1000		
Sustaining Capacity (kN)	Tension	132		200		333		666		
	Compression	200		300		500		1000		
Operating Capacity (kN)	Stainless Steel Worm Shaft		66		100		167		333	
	Plated Worm Shaft	Tension	132		200		333		666	
		Compression	200		300		500		1000	
Lifting Screw ¹	mm		65		95		120		160	
	Lead	Option	1	2	1	2	1	2	1	1
		mm	12	24	16	32	16	32	20	20
Gear Ratios	Option 1		8:1		10 2/3:1		10 2/3:1		12:1	
	Option 2		24:1		32:1		32:1		36:1	
Max. Input Power (kW)	Gear Ratio Option 1		3.75		6.0		11.25		18.5	
	Gear Ratio Option 2		1.125		1.9		4.5		8.25	
Start up torque at full load (Nm) ²	Gear Ratio Option 1		296	387.9	562	723	1052	1301	2361	2361
	Gear Ratio Option 2		161.8	387.9	331	426	598	739	1309	1309
Weight (kg) - stroke = 150mm		49		91		209		610		
Weight (kg) per extra 25mm		0.86		1.58		2.49		4.31		
Gear Ratio Option 1	Gear Ratio		8:1		10 2/3:1		10 2/3:1		12:1	
	Screw Jack Static Efficiency		0.161	0.246	0.128	0.198	0.113	0.184	0.112	0.112
	Screw Jack Dynamic Efficiency		0.214	0.316	0.175	0.263	0.155	0.243	0.152	0.152
Gear Ratio Option 2	Gear Ratio		24:1		32:1		32:1		36:1	
	Screw Jack Static Efficiency		0.098	0.150	0.072	0.112	0.067	0.108	0.068	0.068
	Screw Jack Dynamic Efficiency		0.143	0.211	0.109	0.164	0.100	0.157	0.100	0.100

Note

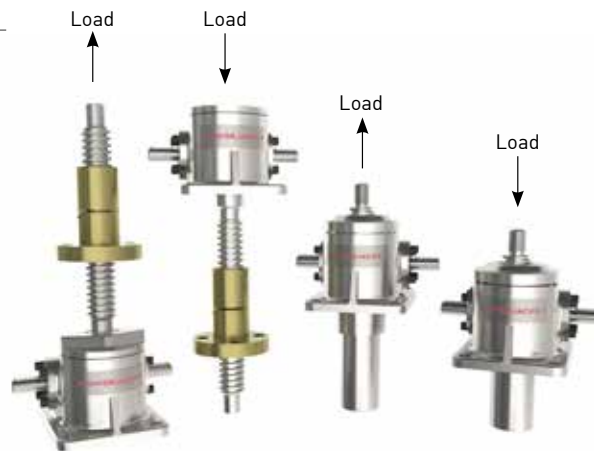
- All metric machine screws have a trapezoidal thread form.
- For loads of 25% to 100% of screw jack capacity, torque requirements are approximately proportional to the load.
- Efficiency values for standard grease lubricated worm gear box and lifting screw.
- All E-Series screw jacks have grease lubricated gearbox and lead screw as standard.

Extra Safety for Critical Applications

Power Jacks metric machine screw jacks can be fitted with a safety nut, which provides 2 safety roles:

1. In the event of excessive wear on the nut thread the load will be transferred from the standard nut to the safety nut. This will also provide visual wear indication as the gap between the safety nut decreases to zero as the standard lifting nut wears.
2. In the unlikely event of catastrophic nut thread failure the safety nut will sustain the load. The safety of industrial and human cargo is therefore improved.

There are several configurations for each safety nut device as they only work in one load direction. For this reason when ordering please supply a sketch of your application showing load directions.

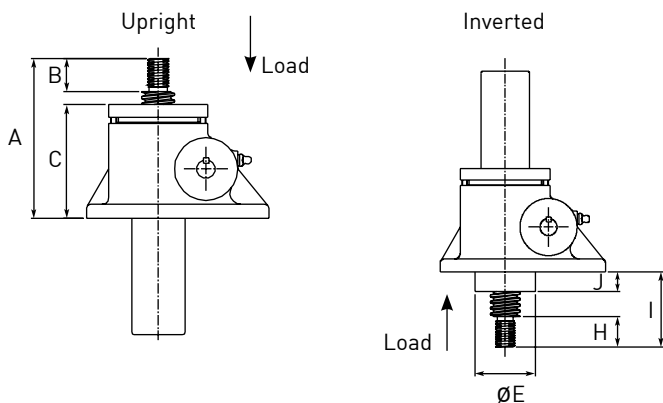


All Safety Nuts are BS EN 1570 Compliant

Translating Screw Jacks with Safety Nuts

Compression Safety Nut

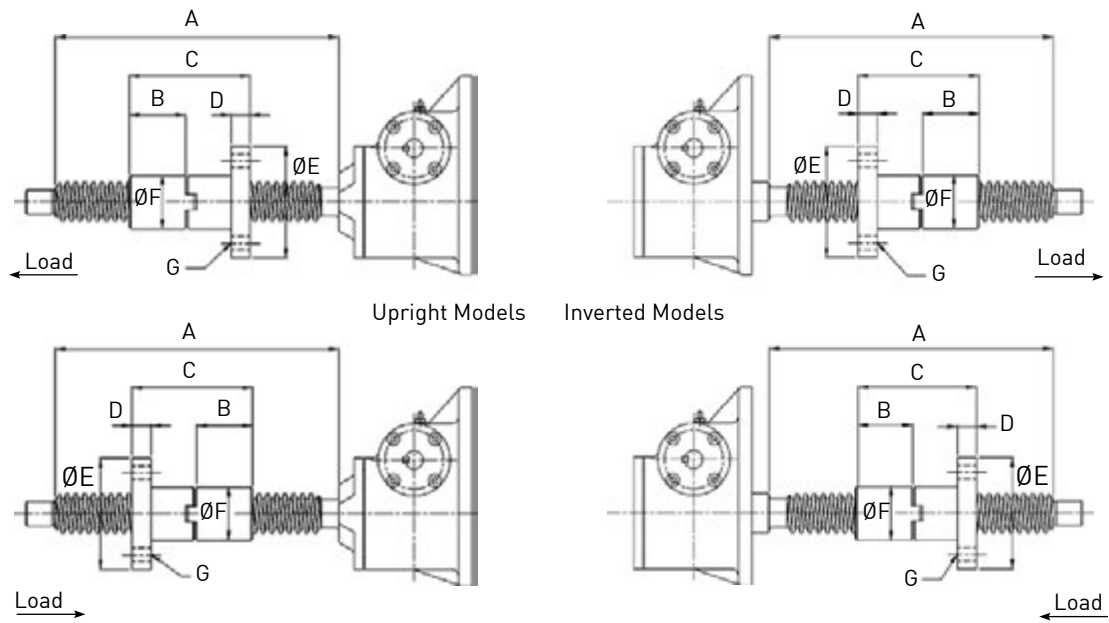
Tension Safety Nut



Dimensions - Translating Screw

Model	Rating (kN)	A	B	C	D	ØE	F	G	H	I	J
EMT0010	10	125	24	86	Stroke + 35	38	Stroke + 9	30	24	45	16
EMT0025	25	145	30	104	Stroke + 30	60	Stroke + 30	37	30	55	20
EMT0050	50	185	35	138	Stroke + 20	75	Stroke + 20	40	35	65	24
EMT0100	100	200	40	146	Stroke + 3	90	Stroke + 28	48	40	80	30
EMT0200	200	265	55	195	Stroke + 24	102	Stroke + 24	58	55	110	39

Rotating Screw Jacks with Safety Nuts

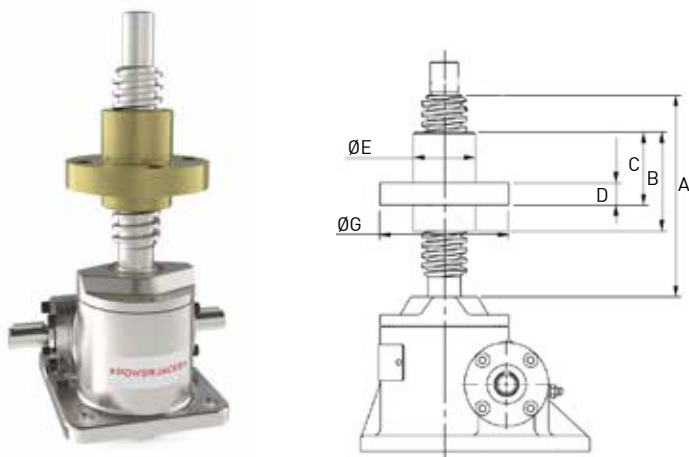


Dimensions - Rotating Screw

Model	Rating (kN)	A	B	C	D	ØE	ØF	G
EMR0010	10	Stroke + 76	30	66.5	12	80	35	4 x Ø11, Ø57 PCD
EMR0025	25	Stroke + 95	33.5	75	15	90	40	4 x Ø13.5, Ø65 PCD
EMR0050	50	Stroke + 140	58	125	20	115	55	4 x Ø18, Ø85 PCD
EMR0100	100	Stroke + 170	67	145	25	160	80	4 x Ø22, Ø120 PCD
EMR0200	200	Stroke + 170	67	145	25	185	90	4 x Ø26, Ø135 PCD
EMR0300	300	Stroke + 310	126	270	35	230	125	6 x Ø26, Ø175 PCD
EMR0500	500	Stroke + 335	130	284	50	280	160	6 x Ø33, Ø220 PCD
EMR1000	1000	Stroke + 410	155	335	60	380	210	6 x Ø45, Ø295 PCD

2 E-Series - Stainless Steel Screw Jack

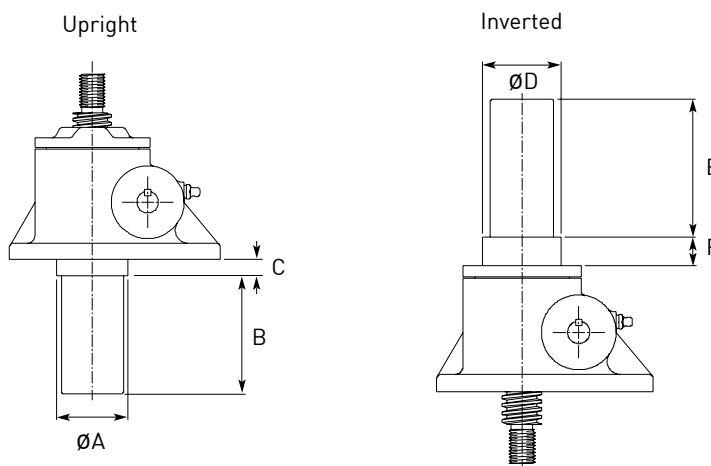
50 Double Hub Nut for Rotating Screw Jacks



Model	A	B	C	D	ØE	F	ØG
EMR0010	Stroke + 61	52	35	12	35	4 x Ø11, Ø57 PCD	80
EMR0025	Stroke + 80	60	40	15	40	4 x Ø13.5, Ø65 PCD	90
EMR0050	Stroke + 100	85	65	20	55	4 x Ø18, Ø85 PCD	115
EMR0100	Stroke + 120	95	75	25	80	4 x Ø22, Ø120 PCD	160
EMR0200	Stroke + 120	95	75	25	90	4 x Ø26, Ø135 PCD	185
EMR0300	Stroke + 200	160	140	35	125	6 x Ø26, Ø175 PCD	230
EMR0500	Stroke + 225	175	150	50	160	6 x Ø33, Ø220 PCD	280
EMR1000	Stroke + 275	200	175	60	210	6 x Ø45, Ø295 PCD	380

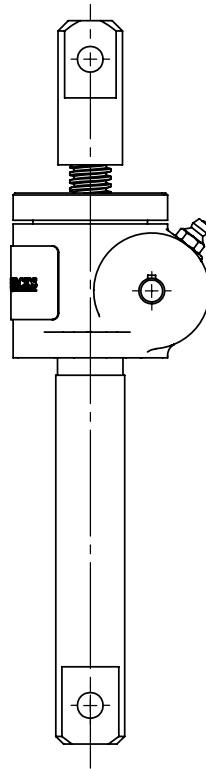
Secondary Guide - Greater Lateral Rigidity for Lifting Screw

Secondary Guiding for the screw for greater lateral rigidity aiding screw guidance and improved side load resilience.

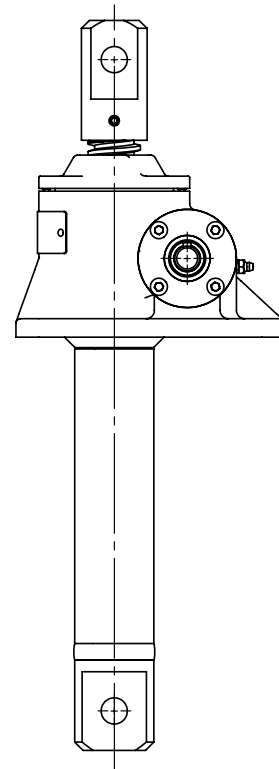


Dimensions for Screw Jacks with Secondary Guides

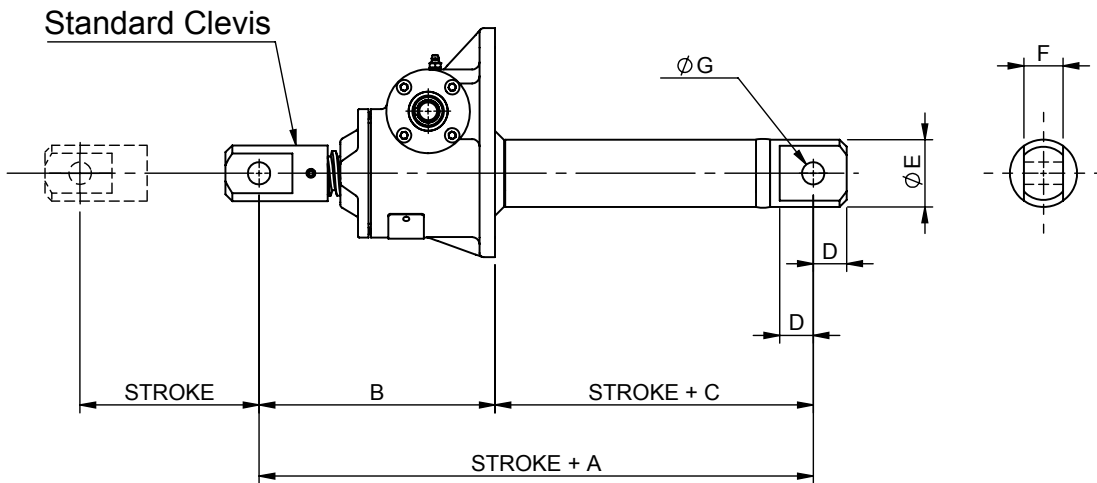
Model	EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000	
Upright	ØA	38	60	70	90	100	138	155	225
	B	Stroke + 34	Stroke + 30	Stroke + 20	Stroke + 29	Stroke + 24	Stroke + 40	Stroke + 38	Stroke + 50
	C	20	20	18	20	20	38	38	65
Inverted	ØD	N/A	60	70	90	100	138	155	On Request
	E	Stroke + 34	Stroke + 30	Stroke + 20	Stroke + 29	Stroke + 24	Stroke + 40	Stroke + 38	
	F	N/A	20	18	20	20	38	38	



Style 1



Style 2



Model	EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
Capacity (kN)	10	25	50	100	200	300	500	1000
Style	1	2	2	2	2	2	2	On Request
A	180	213	260	352	428	492	570	
B	145	170	210	247	313	367	440	
C	35	43	50	105	115	125	130	
D	20	23	30	33	40	60	75	
E	33.4	48.3	60.3	73	102	133	168	
F	20	30	35	40	50	80	110	
ØG	12	16	20	22	30	45	60	
Max Stroke at Rated Load (Compression)	175	352	420	593	592	1338	1920	

Note: All dimensions in millimetres unless otherwise stated.

E-Series

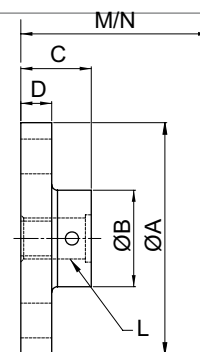
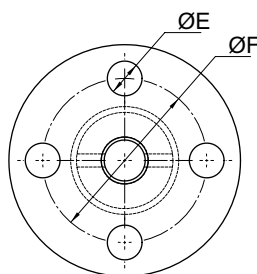
3

E-Series Screw Jack

ACCESSORIES FOR STAINLESS STEEL SCREW JACKS

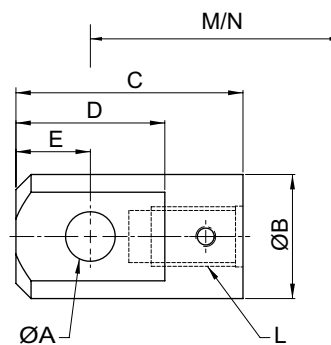
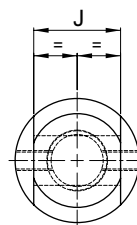


Top Plate



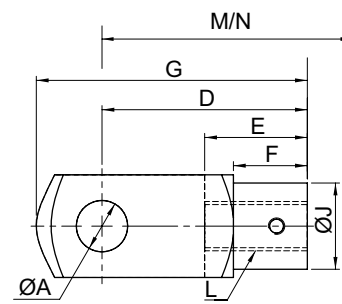
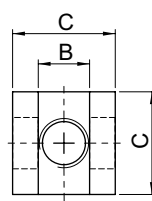
Base of Screw Jack

Clevis End



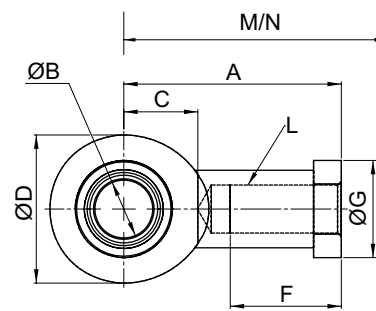
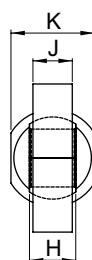
Base of Screw Jack

Fork End



Base of Screw Jack

Rod End



Base of Screw Jack

Capacity (kN)		10	25	50	100	200	300	500	1000
Top Plate	ØA	80	100	120	150	170	240	280	380
	ØB	30	40	50	65	75	110	150	200
	C	25	31.5	36.5	42	58	67	92	127
	D	10	12	16	20	25	30	35	75
	ØE x QTY	11 x 4	13.5 x 4	18 x 4	22 x 4	26 x 4	33 x 4	33 x 4	51 x 4
	ØF (PCD)	55	70	85	110	120	170	215	290
	L	M12 x 1.75	M20 x 2.5	M24 x 3	M36 x 4	M48 x 5	M72 x 4	M100 x 4	M125 x 4
	M#1	Upright	125	145	185	200	265	325	390
Inverted		45	55	65	80	95	115	150	260

Capacity (kN)		10	25	50	100	200	300	500	1000
Clevis Plate	ØA	12	16	20	22	30	45	60	90
	ØB	30	40	50	65	75	110	150	200
	C	63	79.5	91.5	120	143	167	217	297
	D	36	46	60	66	80	120	150	210
	E	18	23	30	33	40	60	75	105
	J	20	30	35	40	50	80	110	140
	L	M12 x 1.75	M20 x 2.5	M24 x 3	M36 x 4	M48 x 5	M72 x 4	M100 x 4	M125 x 4
	M#1	Upright	145	170	210	245	310	365	440
Inverted		65	80	90	125	140	155	200	325

Capacity (kN)		10	25	50	100	200	300	500	1000
Fork End	ØA	12	20	25	35	50	Available on Request	Available on Request	Available on Request
	B	12	20	25	35	50			
	C	24	40	50	70	96			
	D	48	80	100	144	192			
	E	24	40	50	72	96			
	F	18	30	36	54	73			
	G	62	105	132	188	265			
	ØJ	20	34	42	60	82			
	L	M12 x 1.75	M20 x 2.5	M24 x 3	M36 x 4	M48 x 5			
	M#1	Upright	148	194	248	302			
Inverted		68	104	128	182	230			

Capacity (kN)		10	25	50	100	200	300	500	1000
Rod End	A	50	77	94	125	160	Available on Request	Available on Request	Available on Request
	ØB	12	20	25	35	50			
	C	18	27	32	42	60			
	ØD	34	53	64	82	112			
	F	23	40	48	60	68			
	ØG	22	35	42	58	75			
	H	10	16	20	25	35			
	J	8	13	17	21	30			
	K	19	32	36	50	65			
	L	M12 x 1.75	M20 x 1.5	M24 x 2	M36 x 3	M45 x 3			
M#1	Upright	150	190	242	283	367			
	Inverted	70	100	122	163	197			

Note

1. M = For Machine Screw Jacks

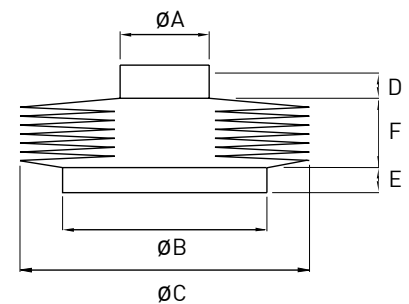
Features

- Protects the screw from dust and dirt
- Guards against moisture and corrosive contaminants
- Helps maintain the proper lubrication
- Boots are made of P.V.C. coated nylon with sewn construction. Other materials are available for applications involving high temperatures, highly corrosive atmospheres and other special conditions.



Boot Dimensions

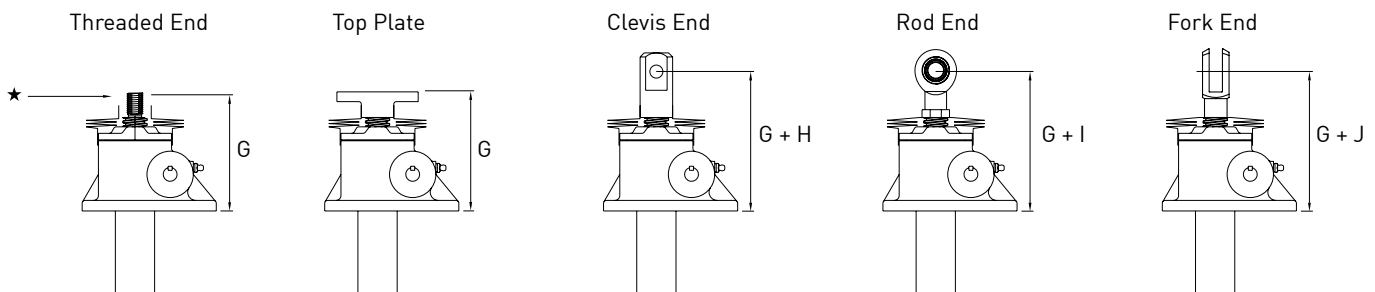
Model	A	B	C	D	E
EMT0010	30	70	110	15	15
EMT0025	40	90	120	15	23
EMT0050	50	115	140	15	31
EMT0100	65	136	150	15	31
EMT0200	75	165	165	20	20
EMT0300	110	220	191	20	20
EMT0500	150	285	210	20	45
EMT1000	200	220	244	20	20



Model	EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
F	Stroke 0 → 150	8	8	8	-	-	-	-
	Stroke 0 → 300	20	20	20	20	20	20	20
	Stroke 0 → 500	-	-	-	-	-	-	-
	Stroke 301 → 600	35	30	30	30	30	30	30
	Stroke 501 → 1000	-	-	-	-	-	-	-
	Stroke 601 → 1050	-	50	50	50	50	50	50
	Stroke 1051 → 1500	-	70	70	70	70	70	70
	Stroke 1001 → 2000	-	-	-	-	-	-	-
Stroke 2001 → 4000	-	-	-	-	-	-	-	

F = Bellows boot minimum closed thickness, - = Not applicable

Closed Heights



Notes for all metric machine screw jacks with bellows boots

1. Supplied complete with a set of corrosion-resistant 'jubilee' clips (2) suitable for fitting over collar diameters.
2. † Control tapes are fitted (approximately 20 mm increase to outer diameter).
3. For horizontal installation exceeding 450 mm of travel, internal boot guides are recommended.
4. Customers with threaded end screw jacks must provide a fixing for the unattached collar (★).
5. Bellows boots for Rotating Screw Jacks consult Power Jacks Ltd.
6. For other sizes, strokes and materials please consult Power Jacks Ltd.
7. All dimensions in millimetres unless otherwise stated.
8. Dimensions subject to change without notice.
9. Screw Jack mounting plate and bellows boot mounting plate are usually all part of the customers superstructure (★ ★).
For other options consult Power Jacks.

Closed Height for all Upright Machine Screw Jacks and Anti-Rotation (Keyed) Types

Model	EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
G	Stroke 0 → 150	125	145	185	-	-	-	-
	Stroke 0 → 300	130	145	185	200	265	325	390
	Stroke 0 → 500	-	-	-	-	-	-	-
	Stroke 301 → 600	140	170	210	200	265	325	415
	Stroke 501 → 1000	-	-	-	-	-	-	-
	Stroke 601 → 1050	-	195	210	225	290	350	440
	Stroke 1051 → 1500	-	195	235	250	315	375	465
	Stroke 1001 → 2000	-	-	-	-	-	-	-
	Stroke 2001 → 4000	-	-	-	-	-	-	-
H	Extra Closed Height for Clevis	20	25	25	45	45	40	50
I	Extra Closed Height for Fork	23	49	63	102	135	Request	Request
J	Extra Closed Height for Rod End	40	60	72	98	122	Request	Request

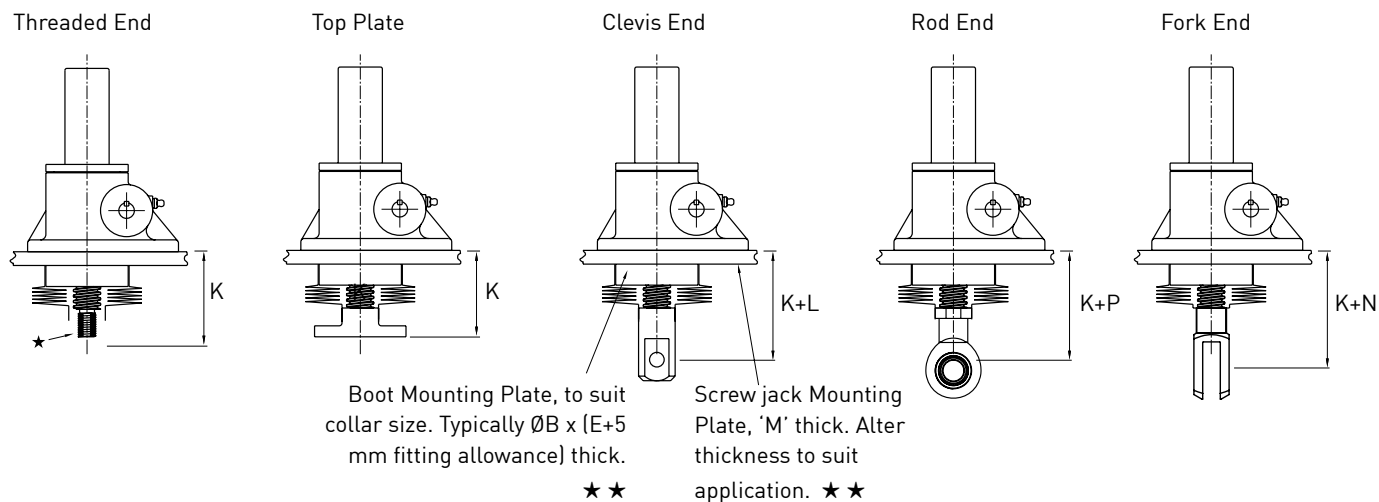
Closed Height for all Upright Machine Screw Jacks with Anti-Backlash

Model	EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
G	Stroke 0 → 150	125	145	185	-	-	-	-
	Stroke 0 → 300	130	145	185	200	265	340	415
	Stroke 0 → 500	-	-	-	-	-	-	-
	Stroke 301 → 600	140	170	210	200	265	340	440
	Stroke 501 → 1000	-	-	-	-	-	-	-
	Stroke 601 → 1050	-	195	210	225	290	340	465
	Stroke 1051 → 1500	-	195	235	250	315	365	490
	Stroke 1001 → 2000	-	-	-	-	-	-	-
	Stroke 2001 → 4000	-	-	-	-	-	-	-
H	Extra Closed Height for Clevis	20	25	25	45	45	40	50
I	Extra Closed Height for Fork	23	49	63	102	135	Request	Request
J	Extra Closed Height for Rod End	40	60	72	98	122	Request	Request

Closed Height for all Upright Machine Screw Jacks with Anti-Backlash & Anti-Rotation (Keyed)

Model	EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
G	Stroke 0 → 150	125	145	185	-	-	-	-
	Stroke 0 → 300	130	145	185	200	265	340	415
	Stroke 0 → 500	-	-	-	-	-	-	-
	Stroke 301 → 600	140	170	195	200	265	340	440
	Stroke 501 → 1000	-	-	-	-	-	-	-
	Stroke 601 → 1050	-	195	195	225	290	365	465
	Stroke 1051 → 1500	-	195	220	250	315	390	490
	Stroke 1001 → 2000	-	-	-	-	-	-	-
	Stroke 2001 → 4000	-	-	-	-	-	-	-
H	Extra Closed Height for Clevis	20	25	25	45	45	40	50
I	Extra Closed Height for Fork	23	49	63	102	135	Request	Request
J	Extra Closed Height for Rod End	40	60	72	98	122	Request	Request

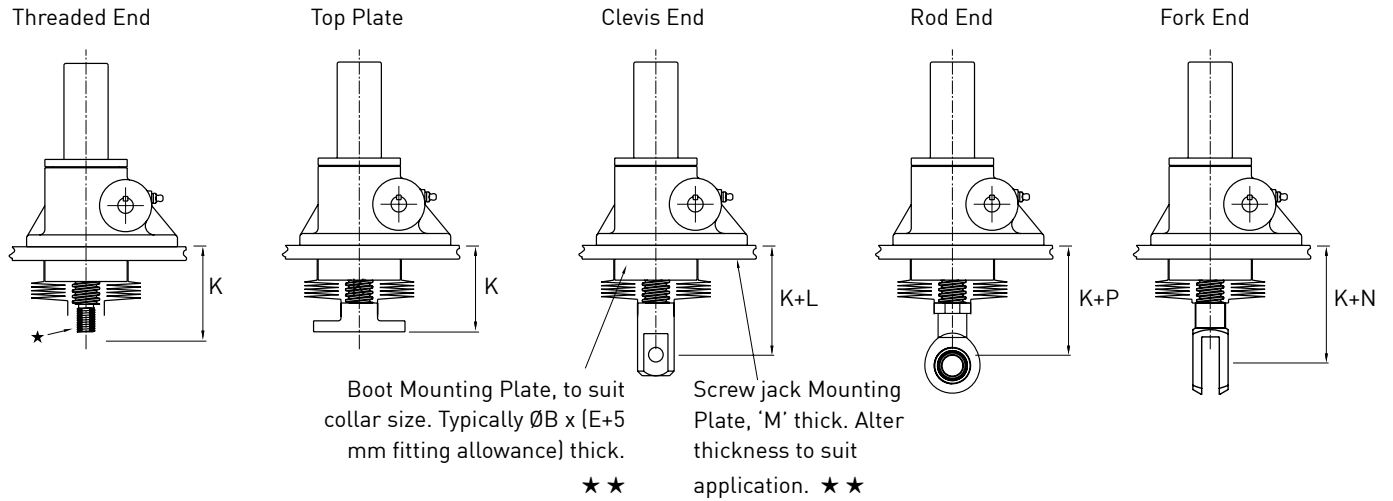
Closed Heights



Closed Height for all Inverted Machine Screw Jacks Standard or Anti-Backlash or Anti-Rotation (Keyed)

Model		EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
M	Mounting Plate	10	15	15	20	20	30	30	50
K	Stroke 0 → 150	75	80	110	-	-	-	-	-
	Stroke 0 → 300	95	80	120	105	120	140	175	260
	Stroke 301 → 500	-	-	-	-	-	-	-	-
	Stroke 301 → 500	95	105	130	130	145	165	200	260
	Stroke 501 → 1000	-	-	-	-	-	-	-	-
	Stroke 601 → 1050	-	130	150	130	145	165	225	285
	Stroke 1051 → 1500	-	130	170	155	170	190	250	310
	Stroke 1001 → 2000	-	-	-	-	-	-	-	-
Stroke 2001 → 4000	-	-	-	-	-	-	-	-	
L	Extra Closed Height for Clevis	20	25	25	45	45	40	50	65
N	Extra Closed Height for Fork	23	49	63	102	135	Request	Request	Request
P	Extra Closed Height for Rod End	40	60	72	98	122	Request	Request	Request

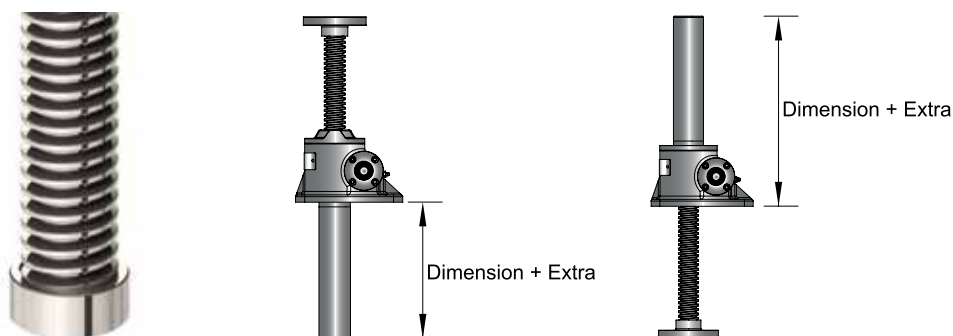
Closed Heights



Closed Height for all Inverted Machine Screw Jacks with Anti-Backlash and Anti-Rotation (Keyed)

Model		EMT0010	EMT0025	EMT0050	EMT0100	EMT0200	EMT0300	EMT0500	EMT1000
M	Mounting Plate	10	15	15	20	20	30	30	50
K	Stroke 0 → 150	75	80	110	-	-	-	-	-
	Stroke 0 → 300	95	80	120	105	135	140	238	405
	Stroke 301 → 500	-	-	-	-	-	-	-	-
	Stroke 301 → 500	95	105	130	130	160	165	263	405
	Stroke 501 → 1000	-	-	-	-	-	-	-	-
	Stroke 601 → 1050	-	130	150	130	160	165	288	430
	Stroke 1051 → 1500	-	130	170	155	185	190	313	455
	Stroke 1001 → 2000	-	-	-	-	-	-	-	-
Stroke 2001 → 4000	-	-	-	-	-	-	-	-	
L	Extra Closed Height for Clevis	20	25	25	45	45	40	50	65
N	Extra Closed Height for Fork	23	49	63	102	135	Request	Request	Request
P	Extra Closed Height for Rod End	40	60	72	98	122	Request	Request	Request

Stop Nut



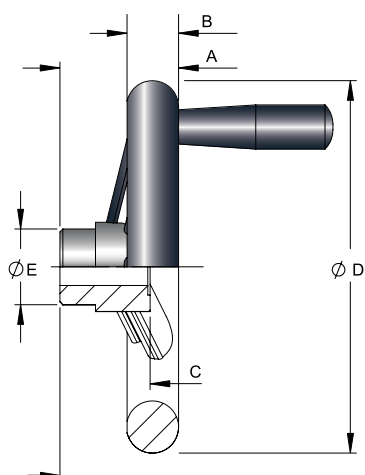
Machine Screw Jack

Model	Extra (mm)	
	Upright	Inverted
EMT0010	15	50
EMT0025	20	20
EMT0050	40	40
EMT0100	42	37
EMT0200	41	31
EMT0300	55	35
EMT0500	47	47
EMT1000	72	92

Note

These are full power stop nuts. They should only be used as an emergency stop safety feature.

Hand Wheels



Model	A	B	C	D	E	H7 Bore
HW 010	50	22	38	157	32	Ø14
HW 025	56	24	43	198	40	Ø16
HW 050	56	24	43	198	40	Ø19
HW 100	66	30	44	247	49	Ø25
HW 200	78	32	56	288	58	Ø28
HW 300	108	40	77	375	58	Ø35
HW 500	108	40	77	375	58	Ø40

Notes:

1. Material: Polished aluminium casting and rotating handle
2. Bored and keyed to BS4235 Part 1
3. All dimensions in millimetres unless otherwise stated
4. Other types of hand wheels are available on request. Consult Power Jacks.

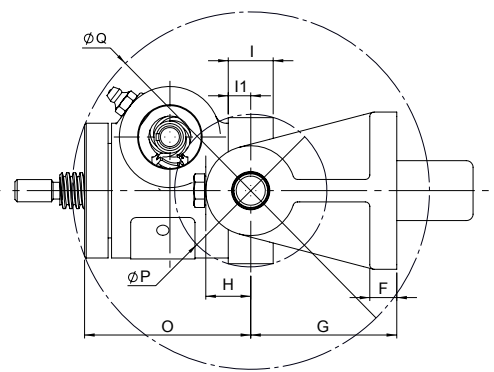
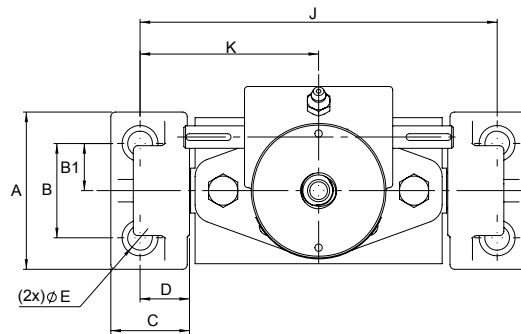
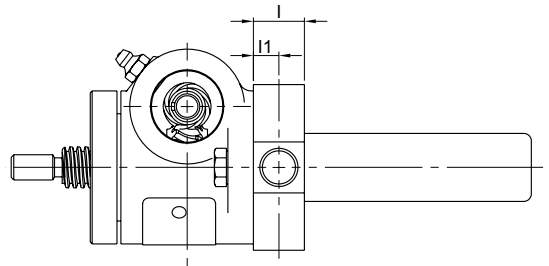
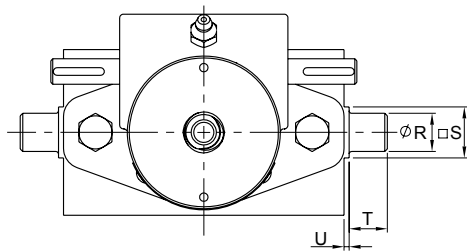
Base mounted trunnions are an ideal bolt-on accessory for a screw jack to add a pivot point to the gearbox of the screw jack. These base mounted trunnions can be used for both translating and rotating screw jacks with any lifting screw type.

Available in both male or female designs with the option to add standard trunnion feet. Most designs offer trunnions in 2 mounting positions.

If you need trunnions fitted at another position on a screw jack then please contact us as we can provide customised trunnion mounts to suit your exact applications needs

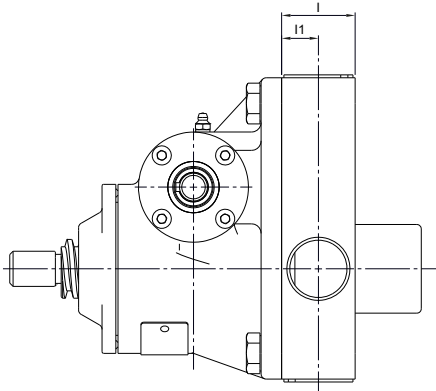
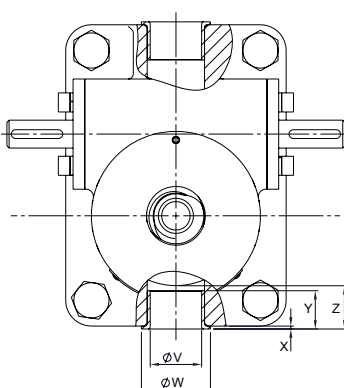
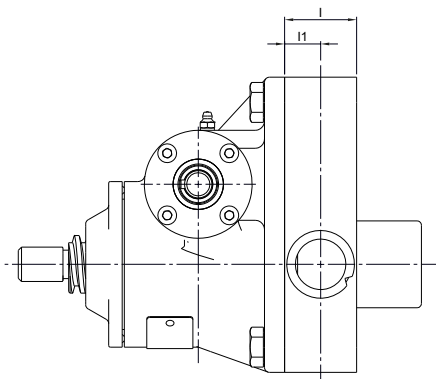
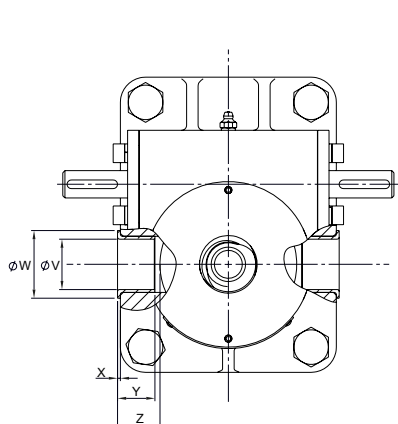
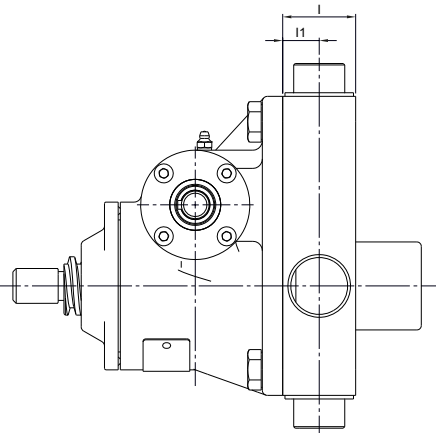
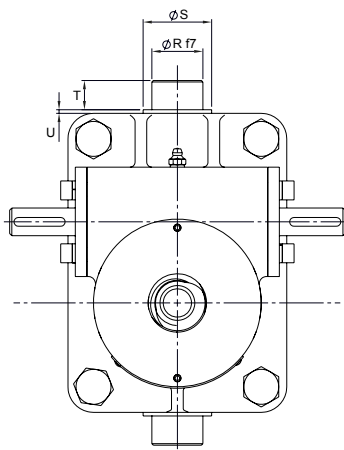
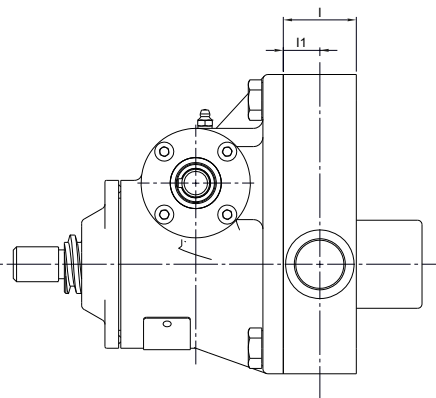
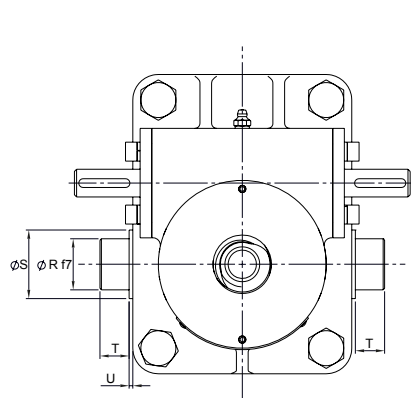


5kN and 10kN Trunnion Mounts

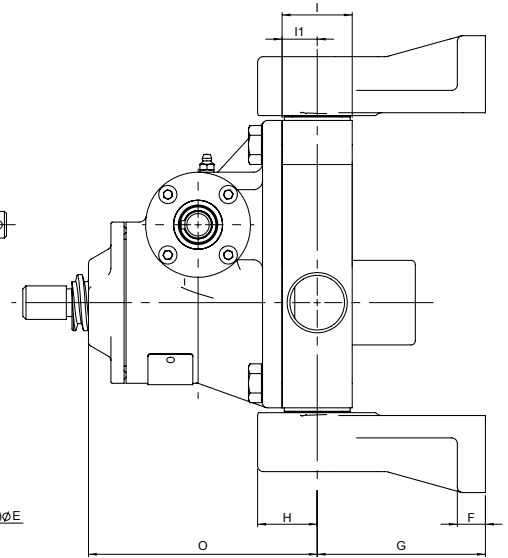
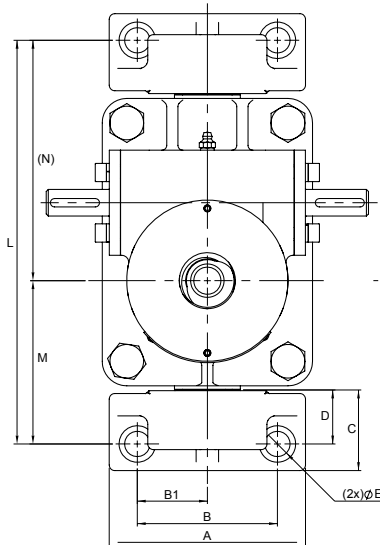
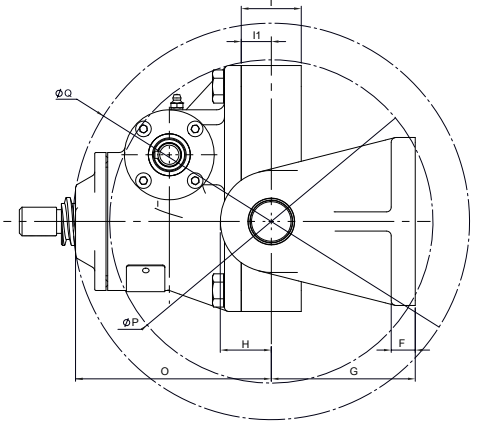
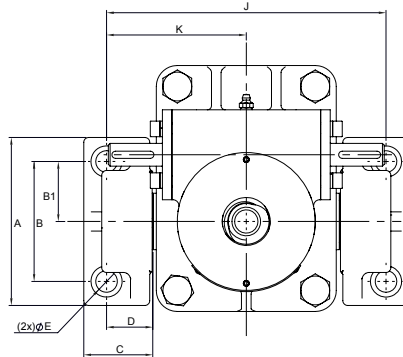


Capacity	A	B	B1	C	D	ØE	F	G	H	I	I1	J	K	O	P	Q	ØR (h6)	S	T	U
5kN	70	42	21	35	22	11	12	65	20	20	10	159	79.5	74	68	160	15	20	15	2
10kN	70	42	21	35	22	11	12	65	20	25	12.5	181	90.5	103	84	209	20	24	20	2.5

25kN to 500kN Trunnion Mounts



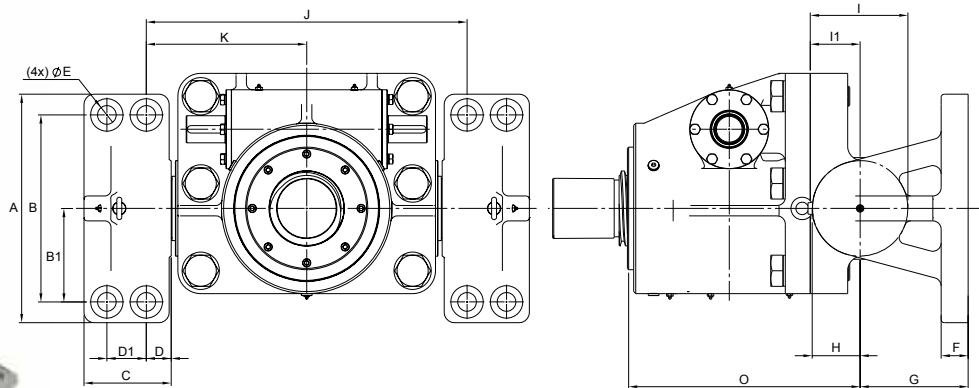
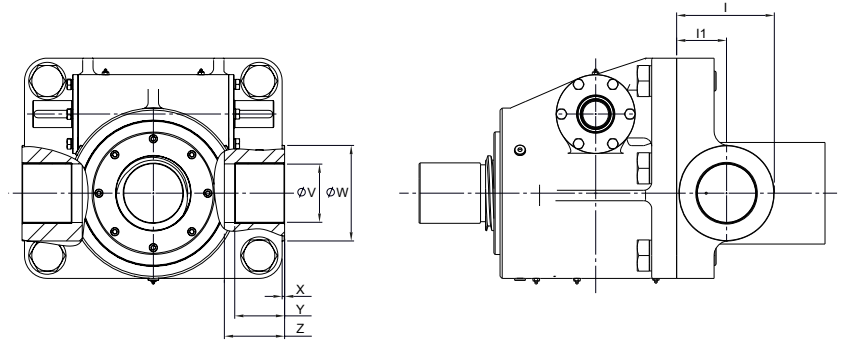
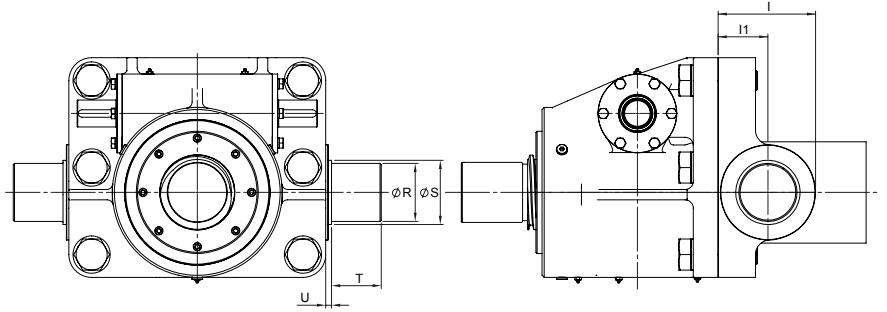
25kN to 500kN Trunnion Mounts



Capacity	A	B	B1	C	D	ØE	F	G	H	I	I1	J	K	L
25kN	100	70	35	40	26	13.5	14	85	30	36	18	171	85.5	226
50kN	140	100	50	55	35.5	18	20	120	42.5	50	25	233	116.5	288
100kN	170	120	60	70	43.5	22	25	130	47.5	60	30	292	146	327
200kN	220	150	75	90	61	33	25	170	59	85	42.5	344	172	409
300kN	280	190	95	120	80	39	35	180	60	100	45	434	217	539
500kN	360	250	125	155	100	51	40	200	70	120	55	514	257	749

Capacity	M	N	O	P	Q	ØR (f7)	S	T	U	V	W	X	Y	Z
25kN	95.5	130.5	121.5	208	248	25	35	20	2.5	25	35	1.5	16.5	26
50kN	116.5	171.5	163	270	332	35	47	20	2.5	35	47	2	26	39
100kN	126	201	177	312	361	45	58	35	5	45	74	2	32	40
200kN	172	237	238	361	500	60	75	45	5	60	78	2	42	45
300kN	227	312	280	473	578	70	85	70	6	70	90	3	53	58
500kN	332	417	330	643	681	80	95	70	6	80	110	2	62	62

1000kN to 2000kN Trunnion Mounts



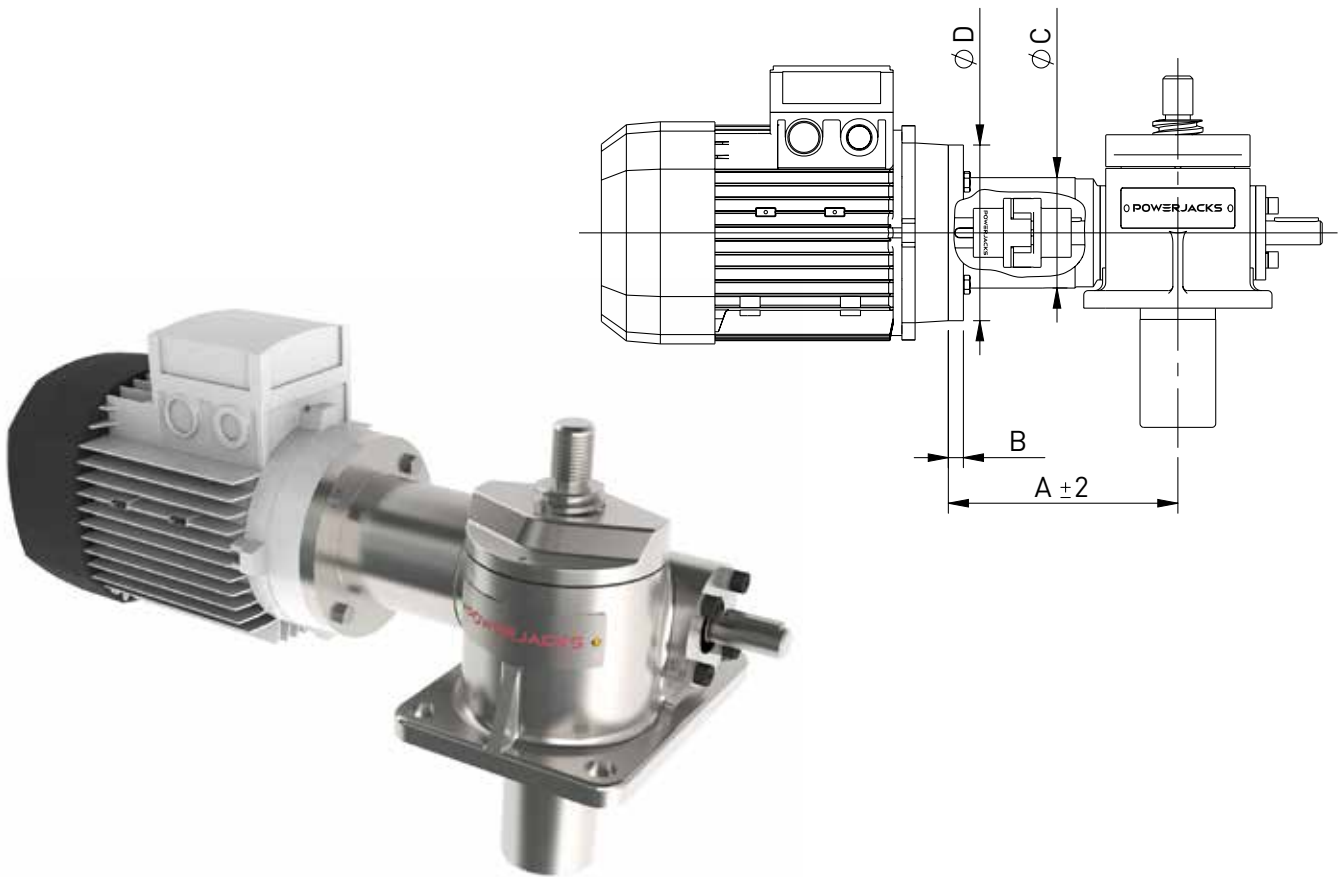
Capacity	A	B	B1	C	D	ØE	F	G	H	I	I1	J	K	L
1000kN	550	450	225	210	60	95	45	50	240	92.5	212.5	120	772	386

Capacity	M	N	O	P	Q	ØR (f7)	S	T	U	ØV	W	X	Y	Z
1000kN	N/A	N/A	525	725	1074	110	125	115	14	110	185	6	115	145

- Standard adapters for 25 kN - 200 kN metric machine screw and ball screw jacks
- Designed for standard IEC frame sizes
- Allows direct motor coupling on either side of the screw jack input shaft
- Complete with drive coupling and mounting hardware

Note

- When direct coupling a motor to a screw jack, it is necessary to match motor power to screw jack load so the motor does not exceed the maximum power for the screw jack gear set.



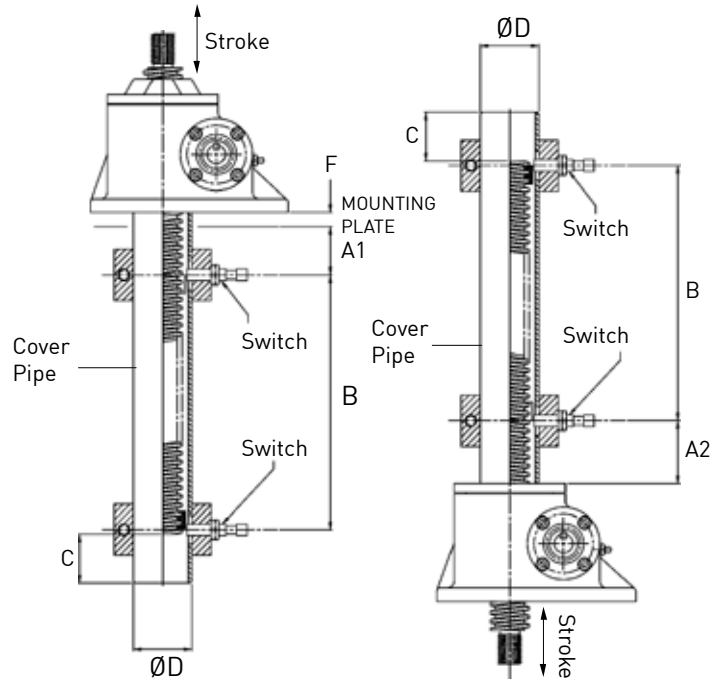
Motor Adapters		Capacity [kN]															
		25				50				100				200			
Frame Size	Motor Mounting	A	B	ØC	ØD	A	B	ØC	ØD	A	B	ØC	ØD	A	B	ØC	ØD
71	B14 C105	142.5	10	71	105	-	-	-	-	-	-	-	-	-	-	-	-
80	B14 C120	146.5	12	81	120	171	12	86	120	-	-	-	-	-	-	-	-
90	B14 C140	157.5	12	81	140	183	12	88	140	208	12	98	140	218	12	125	140
100	B14 C160	168	12	81	160	193	12	88	160	218	12	98	160	228	12	125	160
112	B14 C190	168	12	81	160	193	12	88	160	218	12	98	160	228	12	125	160
132	B14 C200	-	-	-	-	218	14	95	200	240	14	98	200	250	14	125	200

Notes:

1. Motor Adapters for IEC Frames with B5 Flange mounts available on request.
2. Motor Adapters for screw jacks of capacities 300kN and above are available on request.
3. Adapters for geared motors are available on request for all types of geared motor or gear head.
4. Motor Adapters for Servo Motors available on request.
5. Motor Adapters for NEMA Frame motors are available on request.
6. All dimensions in millimetres unless otherwise stated.
7. Dimensions subject to change without notice.

End of Travel Proximity Sensors Sensor Kit

- Inductive Proximity Sensors as standard, others available on request.
- No contact so no wearing parts.
- 2 wire sensor for either Normally Closed (NC) or Normally Open (NO) switching.
- Sensor has rugged one-piece metal housing.
- Optical setting aid with 2 LED colour settings:- Red LED indicates just in sensing range. Yellow LED only indicates within 80% safe sensing range.
- M12 plug in connection for fast change-ability.
- M12 sockets available straight or angled with 5-m cable (other cable lengths available on request).
- Full 360° visibility for switching with 4 yellow LED's at 90° offset.
- Sensor kit includes - sensor, mounting ring, target ring and modification to screw jacks cover pipe.



Upright & Inverted Machine Screw Jacks								
Capacity Rating (kN)	Switch Dia (mm)	A1 (mm)	A2 (mm)	B (mm)	C (mm)	D (Ømm)	F (mm)	Switch Adjustment (mm)
5	8	40	40	Stroke + 12	38	33.4	10	±5
10	8	40	40	Stroke + 20	40	33.4	10	±5
25	12	35	60	Stroke + 15	60	48	15	±5
50	12	40	70	Stroke + 25	65	60	15	±5
100	12	55	85	Stroke + 25	77	73	20	±10
200	12	65	80	Stroke +25	77	89	20	±10
300	18	65	80	Stroke +40	96	141	30	±10
500	18	95	95	Stroke +40	108	168	30	±15
1000	18	155	105	Stroke +50	135	245	50	±15
1500	On Request							
2000	On Request							



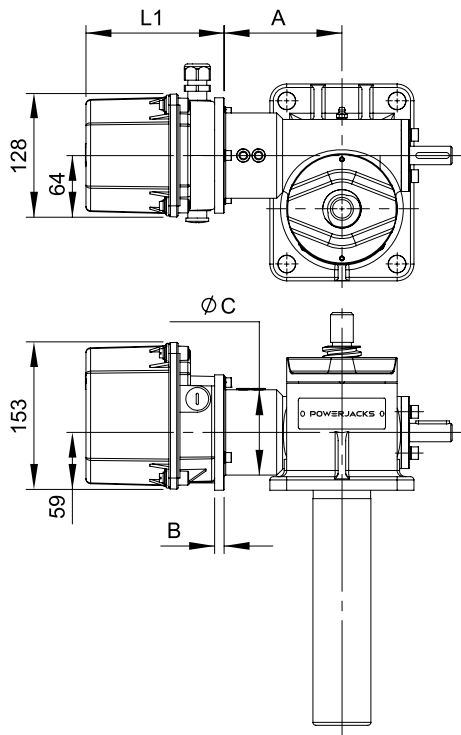
Note

1. All dimensions in mm unless otherwise stated.

End of Travel Electro-Mechanical Switches

The screw jacks can be fitted with electro-mechanical limit switches in a similar design. For dimensions please consult Power Jacks Ltd.





Rotary limit switches can be used as end of travel limit switches, with the option of intermediate switches as well. These units are mounted onto a screw jacks free worm shaft and offer an alternative where bottom pipe mounted limit switches are not possible e.g. rotating screw jacks. Up to 8 limit switches can be accommodated in one enclosure (IP66). Operating temperature -40°C to +80°C.

More RLS-51 rotary limit switch details in System Components section of design guide

Screw Jack Capacity (kN)								
		25			50			
Adapter Mounting	Std. Part	A	B	ØC	Std. Part	A	B	ØC
B5	x	-	-	-	x	-	-	-
B14	✓	117	10	70	✓	133	10	89

Screw Jack Capacity (kN)								
		100			200			
Adapter Mounting	Std. Part	A	B	ØC	Std. Part	A	B	ØC
B5	✓	150	13	98	✓	174	13	125
B14	x	-	-	-	x	-	-	-

The mounting kit includes the flexible coupling and drive adapter.

Gear Size	Usable revs. selected	Usable revs. theoretical with 15° cam discs	Gear Ratio	1 rev. of the drive shaft - corresp. to an ang. motion of cam disc =°	Change - over contact reset rev. at driving shaft	Max drive speed (RPM)	Min drive shaft speed (only for change - over contact)	L1 (mm)			
								Limit Switches			
								2	4	6	8
1	4.1	4.16	4.285	84	0.00714	1000	0.67	132	132	157	157
	6.5	6.88	7.083	50.8	0.0118	1200	1.1				
	11	11.23	11.56	31.14	0.0193	1500	1.8				
2	17.5	17.84	18.361	19.6	0.0306	1800	2.9	132	132	157	182
	29	29.5	30.35	11.86	0.0505	1800	4.7				
	48	48.13	49.538	7.27	0.0825	1800	7.7				
3	75	76.45	78.678	4.57	0.131	1800	12.2	132	132	157	182
	125	126.39	130.054	2.77	0.2166	1800	20.2				
	205	206.26	212.272	1.69	0.3536	1800	33				
4	323	327.6	337.135	1.06	0.5616	1800	52	132	157	182	207
	540	541.5	557.284	0.65	0.9284	1800	87				
	880	883.8	909.59	0.4	1.515	1800	141				
5	1384	1403.7	1444.62	0.25	2.406	1800	224	132	157	182	207
	2288	2320.2	2387.96	0.15	3.978	1800	371				
	3735	3787.1	3897.58	0.09	6.493	1800	606				
6	5900	6014.77	6190.204	0.06	10.313	1800	*	157	157	182	207
	9800	9942.2	10232.407	0.04	17.047	1800	*				
	16000	16227.6	16701.17	0.02	27.824	1800	*				

Note

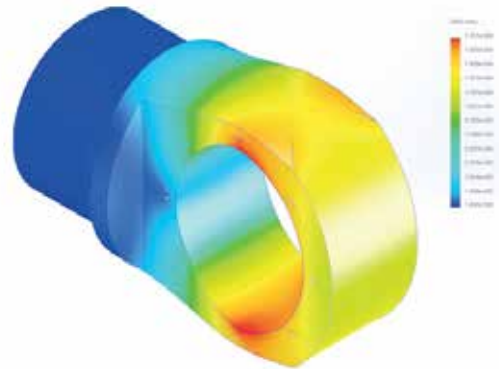
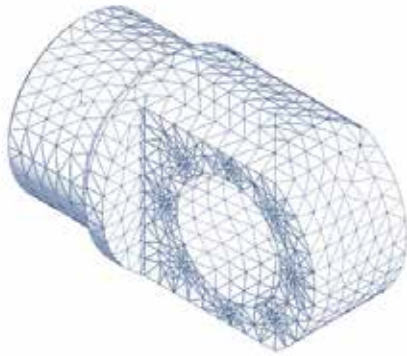
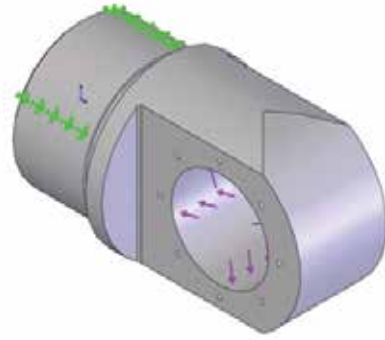
1. More than 8 contacts on request.
2. Dimensions with more than 8 contacts and with special executions, eg. potentiometer, on request.
3. RLS-51 B5 Flange thickness = 4mm.
4. Options available include Anti-condensation heaters, potentiometer, pulse transmitter, encoder, aluminium housing and VBG-70 STAGE technology.
5. Mounting kits available for all screw jacks. For those not listed, consult Power Jacks.

E-Series

4

ENGINEERING GUIDE

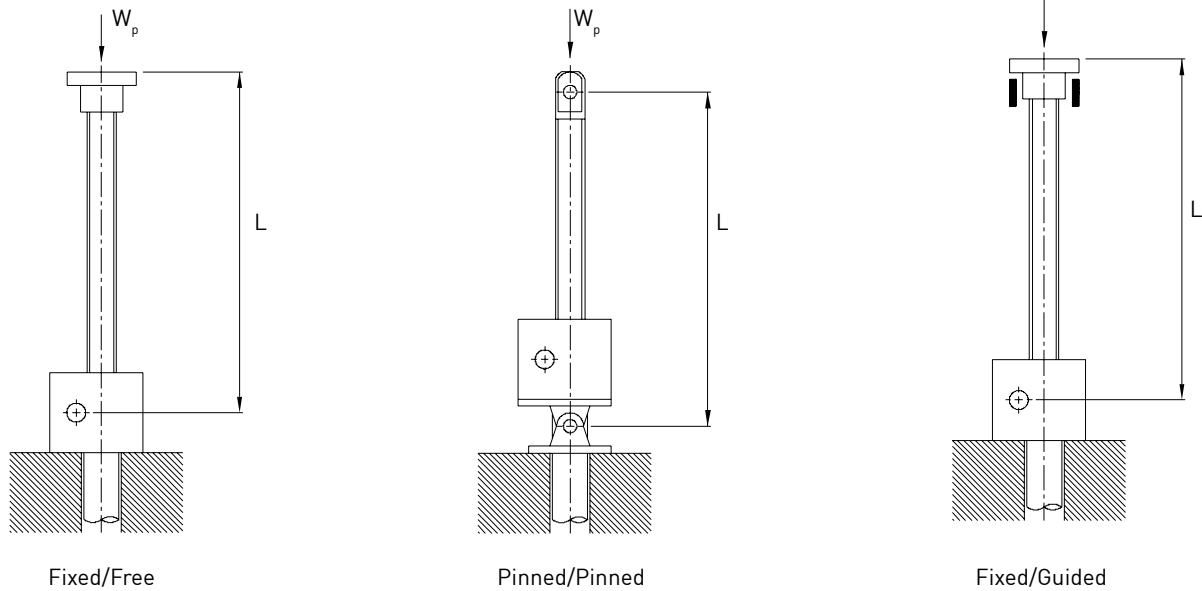
USEFUL PERFORMANCE & OPERATIONAL DETAIL FOR SCREW JACKS



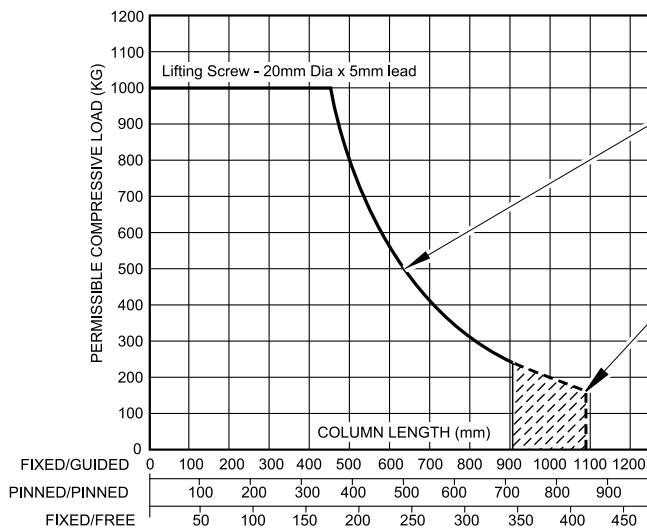
Important Notes

1. All charts are rated for industrial cargo with a safety factor of 3.5.
2. For human cargo a safety factor of 5 is recommended. To alter the permissible compressive load (WP) for human cargo multiply the load selected from the chart by 0.7 e.g. $W_{PHC} = W_P * 0.7$.

Column Length Correction Factors, F_{cb}



10kN MACHINE SCREW JACK



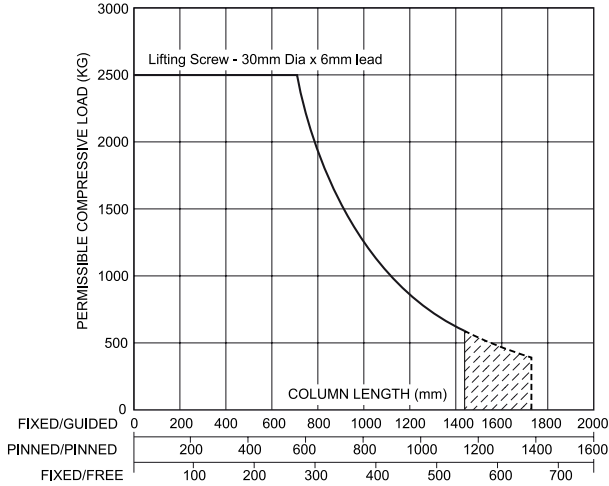
Euler Buckling Curve

Column strength cut off point due to slenderness ratio considerations

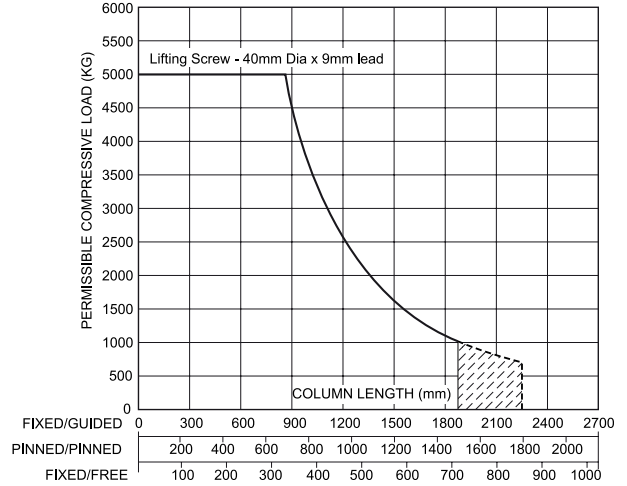


Applications in hatched area - consult Power Jacks Ltd for detailed analysis.

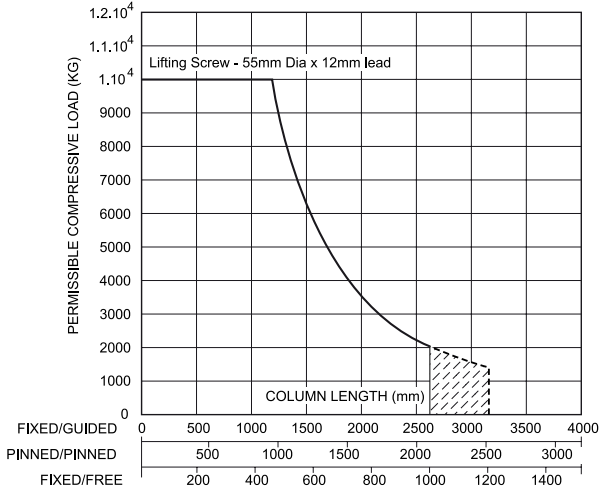
25kN MACHINE SCREW JACK



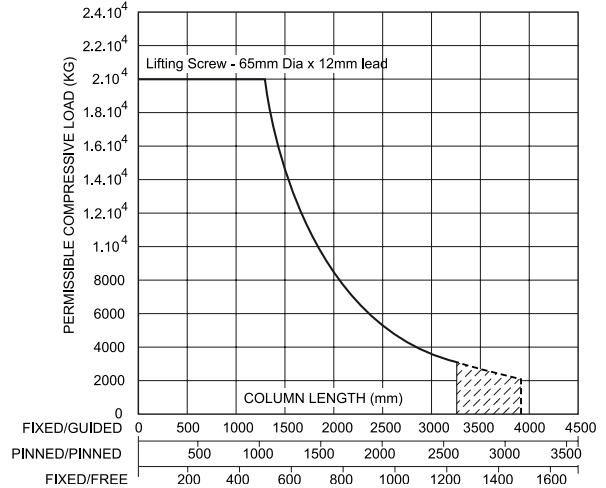
50kN MACHINE SCREW JACK



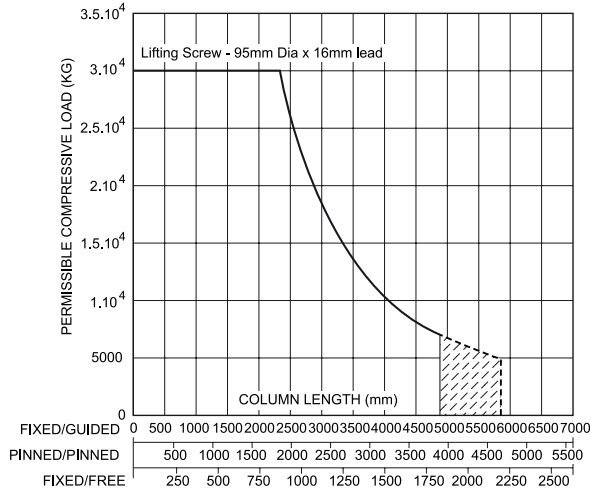
100kN MACHINE SCREW JACK



200kN MACHINE SCREW JACK

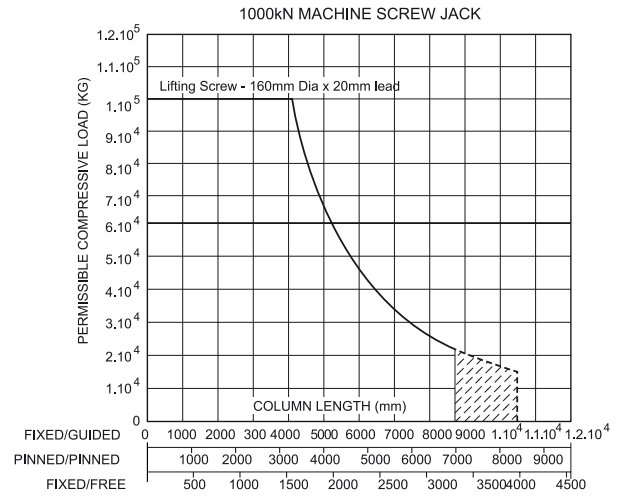
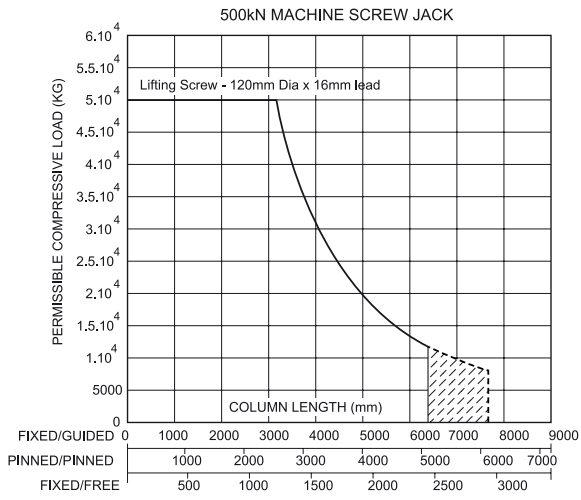


300kN MACHINE SCREW JACK



Note

1. Column end constraints based on A.I.S.C. recommended values
2. All screw jack column strength charts show a Euler buckling curve and three scales for the appropriate end condition for the application under analysis.

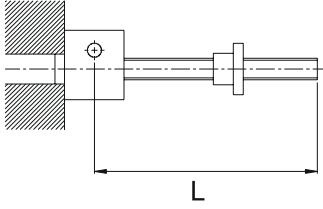


Note

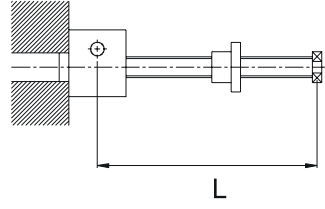
1. Column end constraints based on A.I.S.C. recommended values
2. All screw jack column strength charts show a Euler buckling curve and three scales for the appropriator end condition for the application under analysis.

Critical Screw Speed Factors, F_{cs}

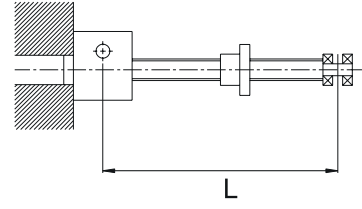
Fixed/Free, $F_{cs} = 0.15$



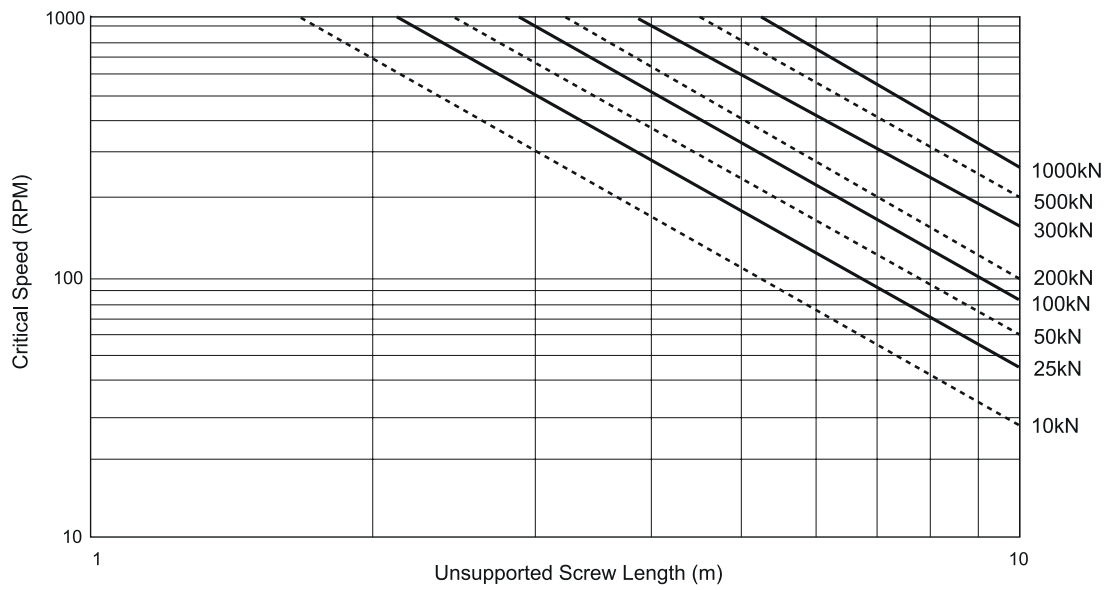
Fixed/Supported, $F_{cs} = 0.7$



Fixed/Fixed, $F_{cs} = 1$



Machine Screw Critical Screw Speed (Shaft Whirling)



Based on both ends fixed and 80% of the critical speed.

The key torque (restraining torque) is caused by the tendency of the lifting screw to rotate. It is a function of the screw lead, screw efficiency and the load. It is not affected by the screw jack unit gear ratio.

Note

The values below are given at rated load. For a smaller load reduce the key torque in direct proportion.

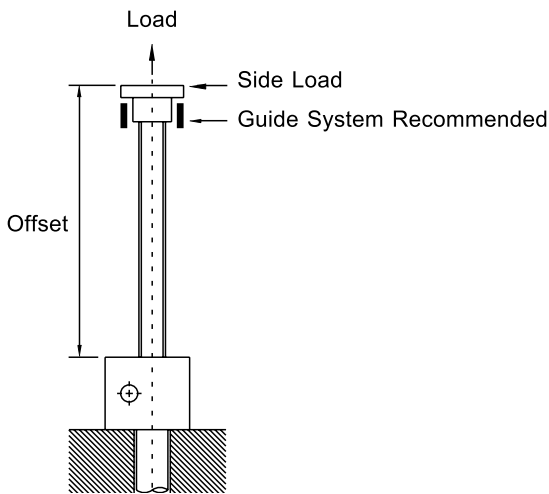
Machine Screw Jacks

Capacity (kN)	Screw Diam (mm)	Lead (mm)	Key Torque (Nm)
10	20	0.005	22
10	20	0.010	30
25	30	0.006	76
25	30	0.012	102
50	40	0.009	210
50	40	0.018	290
100	55	0.012	575
100	55	0.024	780
200	65	0.012	1300
200	65	0.024	1705
300	95	0.016	2805
300	95	0.032	3610
500	120	0.016	5645
500	120	0.032	6975
1000	160	0.020	14890
1000	160	0.040	18220

Maximum Jack Side Load Ratings with Full Jack Rated Load in Tension

Machine Screw Jacks

Metric Machine Screw Jack								
Capacity (kN)	10	25	50	100	200	300	500	1000
Max. Side Load 300mm Offset (N)	150	540	1130	2900	3350	17500	37800	83400



To calculate maximum side load for different raises for screw jacks in tension under full rated load use the following formula to modify the above tabulated values.

$$\text{Permissible Max. Side Load for Actual Offset} = \frac{\text{Max Side Load Rating Tabulated} \times \text{Stated Offset}}{\text{Actual Offset}}$$

Note
The correct units must be used

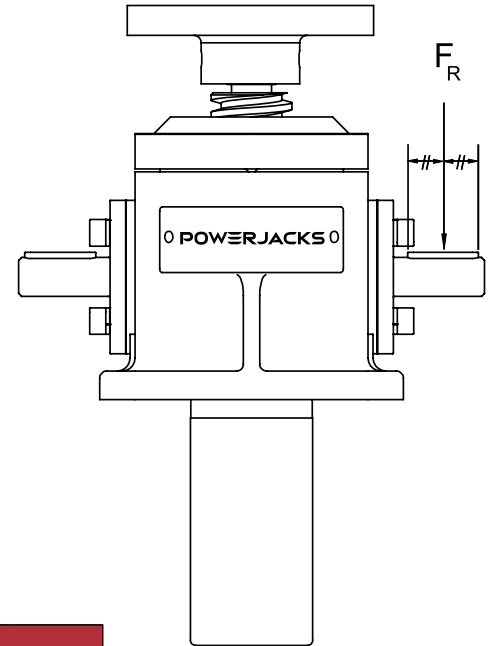
Important Notes

1. **These figures are for Screw Jacks in tension only.**
2. The figures given above are permissible side load ratings, however, we recommend that all side loads be carried by guides in your arrangement and not by the screw and nut.
3. Life of the lifting screw and nut will be adversely affected the more side load they see.
4. These figures are based on acceptable stresses in the lifting screw and not on lifting screw deflection.
5. For maximum side load ratings for screw jacks in compression consult Power Jacks Ltd.
6. For precise calculations for your application consult Power Jacks Ltd.

For applications where a screw jack is belt/chain driven, a calculation must be made to determine the radial force (F_R) and compared to the allowable radial load exerted on the worm shaft, that must not exceed those tabulated below. The values below are maximum values for the screw jacks at rated load regardless of worm speed or load direction and the radial load applied midway along the key of the worm shaft. For all applications the sprocket, gear etc. Should be positioned as close as possible to the screw jack housing in order to reduce bearing loads and shaft stresses and to prolong life.

$$\text{Radial Force, } F_R = \frac{2000 \times T \times K}{D}$$

- Where
- F_R = Radial Load (N)
 - T = Torque applied to the screw jacks input shaft (Nm)
 - K = Factor from table below
 - D = PCD in mm of gear, sprocket



Transmission Element	Factor K
Chain sprocket	1
Gears (spur or helical pinion)	1.25
V-Belt pulley	1.5
Flatbelt pulley	2.0

Machine Screw Jack								
Capacity (kN)	10	25	50	100	200	300	500	1000
Radial Load (N)	325	380	740	1000	1600	2170	2190	2220

Machine Screw Jacks

Component	Normal Backlash
Lifting Screw and Nut	0.12mm → 0.2mm (0.005" → 0.008")
Load Bearings	0.00mm → 0.03mm (0.000" → 0.001")
Total	0.12mm → 0.23mm (0.005" → 0.009")

Note

1. The lifting screw backlash will increase during operation due to wear of threads in the nut
2. Axial play can be reduced by altering the load bearings preload to eliminate bearing play or by specifying a screw jack with the Anti-Backlash feature
3. For exact backlash ratings for an individual unit consult Power Jacks.

Anti-Backlash Option

Machine screw jacks fitted with the anti-backlash feature can be adjusted for screw thread and bearing clearances to a minimum of 0.025 mm (0.001"). Some clearances must be maintained to keep torque requirements within reason and to provide adequate space for a lubrication film to form.

Pitch Deviation of Lifting Screw

Lifting Screw	Pitch Deviation
Machine Screw	0.05mm → 0.25mm per 300mm

Note

1. Pitch deviation is cumulative and **NOT** detrimental to the operation of the Screw Jack
2. The Lifting screws are manufactured from material with a straightness tolerance of 0.2 mm per metre
3. Pitch deviation is related to the cutting machines tolerance and the material used.

Machine Screw Jacks

Stroke (mm)	10kN	25kN	50kN	100kN	200kN	300kN	500kN	1000kN
100	0.6	0.8	1.0	1.0	0.4	0.4	0.7	0.7
200	1.1	1.4	1.7	1.7	0.7	0.6	1.0	1.0
300	1.5	1.9	2.3	2.3	0.9	0.8	1.3	1.3
400	2.0	2.5	2.9	2.9	1.2	1.0	1.7	1.6
500	2.4	3.1	3.6	3.6	1.4	1.2	2.0	1.9
600	2.8	3.6	4.2	4.2	1.6	1.4	2.3	2.2
700	3.3	4.2	4.8	4.8	1.9	1.6	2.6	2.4
800	3.7	4.8	5.5	5.5	2.1	1.8	2.9	2.7
900	4.2	5.3	6.1	6.1	2.4	1.9	3.2	3.0
1000	4.6	5.9	6.7	6.7	2.6	2.1	3.6	3.3

Notes

1. Values quoted above are the maximum expected lateral movement for the given raise and screw jack model.
2. Does not allow for possible deflection due to side loads.
3. Lateral movements are for information only. For best results we recommend guides where possible.
4. Lateral movements will be reduced if the screw jack is fitted with secondary guides.
5. The above movements apply to machine screw jack only and not ball screw jacks. Permitting lateral movement on the ball screw jack under load will exert side thrust on the ball screw and ball nut and will be detrimental to the ball screw and nut life. Ball screw applications should be guided to ensure a minimum of lateral movement.
6. Where lateral movement is critical consult Power Jacks for exact values for the application.



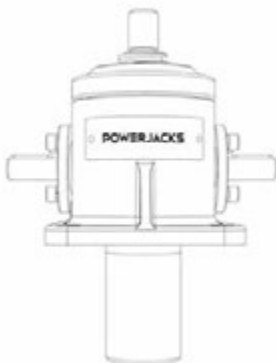
How a Rotating Screw Jack Works

The rotation of the worm shaft causes the worm gear to rotate. For rotating screw jacks the lead screw is fixed to the worm gear and they rotate at the same speed. The lifting nut moves along the lead screw. As the worm gear turns, the friction forces on the screw thread act to turn the nut also. The greater the load on the screw jack unit, the greater the tendency of the nut to turn. If the nut turns with the screw, it will not raise the load. Therefore the nut needs to be fixed to a structure to prevent rotation. The restraining torque required for the structure, also known as the "lead screw key torque" can be found on the product performance tables in this catalogue or requested from Power Jacks.



How a Translating Screw Jack Works

The rotation of the worm shaft causes the worm gear to rotate. For translating screw jacks the worm gear is threaded to accommodate the lead screw thread. The lead screw translates through the gear. As the worm gear turns, the friction forces on the screw thread act to turn the screw also. The greater the load on the screw jack unit, the greater the tendency of the screw to turn. If the screw turns with the nut (worm gear), it will not raise the load. In those cases where a single unit is used, and where the load cannot be restrained from turning, it is necessary to use a screw jack with an anti-rotation mechanism (keyed screw jack). Lead screw key torque (refer to the product performance tables in this catalogue or request from Power Jacks) must be checked as excessively heavy unguided loads could break the Anti-rotation mechanism (key).



Anti-Backlash Screw Jack – When To Use

For reduced axial backlash of the lead screw in the screw jack select a model with the "Anti-Backlash" mechanism. This is typically used when the load direction changes from tension to compression and minimal axial backlash is required. This design is only available for translating screw jacks. It can be combined with Anti-Rotation mechanism as well.

Input Torque Required for a Screw Jack

The input torque for a single screw jack depends on the load, the worm gear ratio, type of screw (machine screw, ball screw or roller screw) and the pitch of the lead screw. Torque values are listed in the individual product specification charts based on capacity loads. For loads from 25% to 100% of screw jack model capacity, torque requirements are approximately proportional to the load.

Note

The input torque, as well as the efficiency and side load ratings, is the same for both translating screw and rotating screw jacks.

Maximum Input Power & Speed for a Screw Jack

The input power to the screw jacks should not exceed the power rating shown in the specifications table. Maximum input speed in rpm (revolutions per minute) to a screw jacks worm shaft should not exceed 1800 rpm for E-Series screw jacks.

Efficiency of a Screw Jack

Screw Jack model efficiencies are listed in the individual product specification charts.

Expected Life of a Screw Jack

The life expectancy of a screw jacks lead screw, bearings, nut and worm gear set varies considerably due to the extent of lubrication, abrasive or chemical action, overloading, excessive heat, improper maintenance, etc. For detailed life calculations, consult Power Jacks.

Screw Jack with Anti-Rotation (Keyed) Mechanism

This design is only available for translating screw jacks. If the structure/object connected to the lead screw is not prevented from rotating or the lead screw is not always in contact with the structure then a screw jack with an "Anti-Rotation" mechanism (keyed) should be used.

Standard Screw Jacks - How To Prevent The Load from Rotating

For multiple screw jack systems, fix the lead screw end fittings (e.g. top plate or clevis) to the common member being lifted by all the units. For single screw jack applications, bolt the lead screw end fitting (e.g. top plate or clevis) to the load and ensure the load is guided to prevent rotation.

A guided load is always recommended to ensure that the screw jack does not receive any side load and so guidance can be scaled suitably for the load without altering the screw jack design unnecessarily. Note that an external guidance system can provide a higher restraining "key" torque than compared to an anti-rotation mechanism in a screw jack.

Self-Locking of Screw Jacks

Screw Jacks with 24:1 or higher gear ratios are considered self-locking in most cases. Consult Power Jacks for a recommendation specific to your application.

All screw jacks with multi-start lifting screws are considered not to be self-locking.

All ball screw and roller screw jacks are considered not to be self-locking.

Screw Jacks considered not self-locking will require a brake or other holding device.

Shock Loads on a Screw Jack

Shock loads should be eliminated or reduced to a minimum, if they cannot be avoided, the screw jack model selected should be rated at twice the required static load.

For severe shock load applications, the load bearings can be replaced with heat-treated steel thrust rings which is an option available from Power Jacks. Note this will increase the input torque by approximately 100%.

Axial Backlash in a Screw Jack

Backlash in Standard Machine Screw Jacks

Machine screw jacks have backlash due not only to normal manufacturing tolerances, but to the fact that there must be some clearances to prevent binding and galling when the screw jack unit is under load. Usually, the axial backlash is not a problem unless the load on the screw jack unit changes between compression and tension. If a problem does exist, a unit with the anti-backlash feature should be considered.

Screw Jacks with the Anti-Backlash Device

The anti-backlash device reduces the axial backlash between the lead screw and nut assembly to a regulated minimum. As the backlash will increase as the lead screw thread on the gear wears the anti-backlash device can be adjusted to remove this normal condition.

How the Anti-Backlash Device Works

When the screw (1) is under a compression load, the bottom of its thread surfaces are supported by the top thread surfaces of the worm gear (2) at point (A). The anti-backlash nut (3), being pinned to the worm gear and floating on these pins and being adjusted downward by the shell cap, forces its bottom thread surfaces against the upper thread surfaces of the lifting screw at point (B). Thus, backlash between worm gear threads is reduced to a regulated minimum.

When wear occurs in the worm gear threads and on the load carrying surfaces of the lifting screw thread, the load carrying thickness of the worm gear thread will be reduced. This wear will create a gap at point (B) and provide backlash equal to the wear on the threads.

Under compression load, the lifting screw will no longer be in contact with the lower thread surface of the anti-backlash nut. Under this condition, backlash will be present when a tension load is applied. The anti-backlash feature can be maintained simply by adjusting the shell cap until the desired amount of backlash is achieved.

To avoid binding and excessive wear do not adjust lifting screw backlash to less than 0.025mm (0.001"). This will reduce the calculated separation (C) between the anti-backlash nut and worm gear and will reduce the backlash between the worm gear threads and the lifting screw to the desired minimum value.

When separation (C) has been reduced to zero, wear has taken place. Replace the worm gear (2) at this point. This feature acts as a built in safety device which can be used to provide wear indication for critical applications.

Column Strength of the Screw Jack

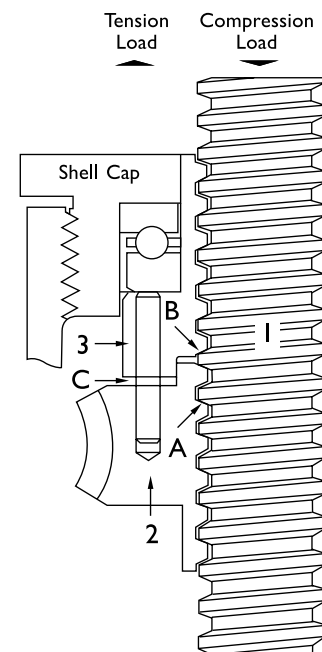
Column strength of a screw is determined by the relationship between the screw length and its diameter. For column strength charts consult product literature or Power Jacks.

Side Loads on a Screw Jack

Screw jacks are designed primarily to move and position loads and any side loads (loads not acting axially on lead screw) should be avoided. The units will withstand some side loads, depending on the diameter of the lifting screw and the extended length of the lifting screw. Where side loads are present, the loads should be guided and the guides, rather than the screw jacks, should take the side loads - particularly when long raises are involved. Even a small side load can exert great force on the housings and bearings and increase the operating torque and reduce the life expectancy.

Allowable Duty Cycle of Screw Jack

Because of the efficiency of conventional worm gear screw jacks, the duty cycle is intermittent at rated load. At reduced loading, the duty cycle may be increased. Ball screw jacks are more efficient than machine screw jacks and so can provide a higher duty cycle. In addition Power Jacks have special designs for high duty cycle screw jacks. For detailed analysis consult Power Jacks Ltd.



Maximum Operating Temperatures For E-Series Screw Jack

Normal operation at ambient temperatures of up to 90°C. Operations above 90°C will require special lubricants. For temperatures above 90°C, the life of even special lubricants is limited. Therefore consult Power Jacks on your application. For temperatures above 90°C, advise Power Jacks of full particulars of the duration of such temperatures. Power Jacks suggest that a lubricant manufacturer be consulted for type of grease and lubrication schedule. As a general rule, the screw jack unit should be shielded to keep ambient temperatures to 90°C or less.

Minimum Temperature For E-Series Screw Jacks

With the standard lubricant and materials of construction, the screw jacks are suitable for use at sustained temperatures of -20°C. Below -20°C, low temperature lubricant should be used and no shock loads are present. Power Jacks application engineers must be consulted in these instances for a recommendation. Screw Jacks with standard material of construction and lubrication may be safely stored at temperatures as low as -55°C.

Thermal / Heat Build-Up in a Screw Jack as it is operated

The duty cycle, the length of the screw, the magnitude of the load, and the efficiency of the screw jack all have a direct influence on the amount of heat generated within the screw jack. Long lifts can cause serious overheating. Note that Power Jacks have special designs with higher thermal capacities than conventional worm gear screw jacks (consult Power Jacks for more details).

Screw Jacks to Pivot a Load

A screw jack can be built to pivot a load by two methods:

1. Double Clevis Screw Jack

The screw jack can be furnished with a clevis at both ends (commonly referred to as a double clevis screw jack). The bottom clevis is welded to the bottom end of an extra strong cover pipe, which is fitted to the base of the screw jack. This cover pipe still performs its primary function of encasing the lifting screw in its retracted portion. The clevis ends can be replaced with other pivot options such as Fork End or Rod End.

2. Clevis - Trunnion Mounting

The screw jack is fitted with the pivot end fitting (e.g. Clevis, Fork or Rod End) on the lead screw and a trunnion mount adapter is bolted to the screw jacks base plate.

The design of the structure in which these types of screw jacks are to be used must be constructed so that screw jack can pivot at both ends. Use only direct compression or tension loads, thereby eliminating side load conditions.

Corrosion Resistant Properties

Screw Jacks can be supplied with alternative materials and/or paint specifications for high corrosive areas. These options include stainless steel, chrome plating, electro-nickel plating, epoxy paint, etc. Check the unit specification is suitable before installation.

Using Screw Jacks within a Rigid Structure or Press

Power Jacks recommend that the screw jack selected has a greater capacity than the rated capacity of the press or of the load capacity of the structure. We also recommend that a torque clutch or similar device be used to prevent overloading of the screw jack unit. Unless these precautions are taken, it is possible to overload the screw jack without realising it.

Screw Jack Drift after Drive Motor is Switched Off

The screw jack will drift after the motor drive is switched off unless a brake of sufficient capacity is used to prevent it. The amount of drift will depend upon the load on the screw jack and the inertia of the rotor in the motor.

For machine screw jacks with no load, the amount of drift will depend upon the size and speed of the motor. For example, a 1500 RPM input directly connected to a screw jack without a load will give on average 35mm to 60mm of drift; a 1000 RPM input will give about 1/2 as much drift. Note that the drift varies as the square of the velocity (RPM). The drift of the screw jacks screw can be controlled by using a magnetic brake on the motor. Variations of drift will also be seen if the motor drives the screw jack via a reduction gearbox.

Screw Jacks Operation where Vibration is Present

Screw Jacks will operate in areas with vibration, however the vibration may cause the lead screw to “creep” or “inch” under load. For applications involving slight vibration, select the higher of the worm gear ratios. If considerable vibration is present, use a motor equipped with a magnetic brake, which will prevent the screw jack from creep and/or back-driving.

Use of Screw Jacks Fitted With Emergency Stop Disc

To prevent over travel of the lead screw, a stop disc or nut can be fitted to a screw jack that is hand operated. It should not be used as a full power stop.

Use of Screw Jacks Fitted With Emergency Stop Nut

For motor driven units, it is possible for the full capacity of the screw jack or even a greater force (depending on the power of the motor) to be applied against the stop. These stops are called “full power stop nuts”. They must only be used as an emergency device and if such a condition occurs, an assessment made to discover why it happened in order to carry out preventative action. If the full power stop nut is used at full load in an emergency it might be driven into the unit jamming so tightly that it must be disassembled in order to free it.

It is recommended that external stops are fitted where possible, however they must only be used as a last resort (Note - limit switches are one possible solution to constrain screw jack movement safely - consult Power Jacks for system advice). Under ideal conditions where a slip clutch or torque limiting device is used, a stop pin or stop nut may be used - but Power Jacks should be consulted.

Screw Jack System Arrangements

Perhaps the greatest single advantage of Power Jacks screw jacks is that they can be linked together mechanically, to lift, lower, move or position in unison. Typical mechanical system arrangements link 2, 4, 6 or 8 screw jacks together and are driven by one motor. As an alternative, screw jacks can be individually driven by electric motors and with suitable feedback devices, such as encoders, be synchronised electronically by a control system.

Connecting Screw Jacks in Series

The number of screw jacks that can be connected in series is limited by input torque requirements on the first worm shaft in the line. For the C & E-Series the torque on the worm shaft of the first screw jack should not exceed 300% of its rated full load torque (this does not include the 200kN screw jacks which are rated at 150%).

Efficiency of a Multiple Screw Jack System

In addition to individual device efficiencies, the efficiency of the screw jack arrangement must be taken into consideration. The arrangement efficiency allows for misalignment due to slight deformation of the structure under load, for the losses in couplings, bearings, and for a normal amount of misalignment in positioning the screw jacks and gearboxes. For efficiency values consult Power Jacks product literature or engineers.

Number of Screw Jacks in System	2	3	4	6-8
Jacking System Efficiency	0.95	0.90	0.85	0.80

Screw Jack Fitted with 3rd Party Accessories

If your screw jack is fitted with a device not manufactured by Power Jacks then please consult the provided manual for this device.

Installation and Maintenance Tips

The following installation and maintenance tips are for the C & E-Series, Metric machine screw and ball screw jacks models. General care should be taken to ensure that equipment is sufficient to handle the load.

1. The structure on which the screw jack unit is mounted should have ample strength to carry the maximum load, and be rigid enough to prevent undue deflection or distortion of the screw jack unit supporting members.
2. It is essential that the screw jack be carefully aligned during installation so that the lifting screws are vertically true and the connecting shafts are exactly in line with the worm shafts. After the screw jack, shafting, and gear boxes are coupled together, it should be possible to turn the main drive shaft by hand. If there are no signs of binding or misalignment, the jacking system is then ready for normal operation.
3. The screw jack should have a greater stroke than is needed in the screw jack installation. If it is necessary to operate the screw jack at the extreme limits of travel, it should be done with caution.

CAUTION: Do not allow screw travel below catalogue closed height of the screw jack or serious damage to internal mechanism may result. Refer to table specifications for closed height of respective units.

4. The input power should not exceed the power rating shown in the specification table. Maximum RPM should not exceed 1800.
5. The lifting screw should not be permitted to accumulate dust and grit on the threads. If possible, lifting screws should be returned to closed position when not in use.
6. The ball screws in the ball screw jacks should be checked periodically for excessive backlash and spalling of raceways. A periodic check of backlash of the lifting screw thread is recommended to check wear of the worm gear internal threads on the machine screw jack models. Backlash in excess of 50% of the thread thickness indicates the need to replace the worm gear.
7. Unless otherwise specified, screw jacks are shipped packed with grease which should be sufficient for one month of normal operation. For normal operation, the screw jacks should be lubricated about once a month, using one of the following extreme pressure greases or their equivalent:

Shell	Gadus S2V220AC2 (Alvania WR2)
BP	Energrease LC2
Castrol	Spheerol EPL2
Mobil	Mobilux EP2

For severe conditions, the screw jacks should be lubricated more frequently, using one of the above greases (daily to weekly depending on conditions). If duty is heavy, an automatic lubrication system is strongly recommended. If ambient temperatures exceed 90°C (194°F) consult Power Jacks.

8. On ball screw jack applications, periodically lubricate the exposed ball screw grooves with a cloth dampened with a good grade 10W30 oil for most applications. An instrument grade oil should be used in dirty and heavy duty environments, and bearing grease for environments at extremely high temperatures. Extreme temperature and other environmental conditions should be referred to Power Jacks for recommended lubricating procedures.

CAUTION: Where ball screws are not protected from airborne dirt, dust, etc., bellows boots should be used. Inspect frequently at regular intervals to be certain a lubricating film is present. Ball screws should never be run dry.

9. Due to the high efficiency of the ball screw jack design, a brake must be used in conjunction with motor selected to position the screw jack.

Useful Formulae for Screw Jack Calculations

Lifting Screw Lead

Lifting Screw lead (mm) = Screw Pitch (mm) *Number of Starts on Lifting Screw

Calculation of the Linear Speed

When the worm shaft speed is known, the linear speed can be determined with this formula:

$$\text{Linear Speed (mm/min)} = \frac{\text{RPM of Worm Shaft} \times \text{Lifting Screw Lead (mm)}}{\text{Gear Ratio}}$$

or alternatively

$$\text{Linear Speed (mm/min)} = \frac{\text{RPM of Worm Shaft}}{\text{Turns of Worm for 1mm Travel}}$$

Calculation of Screw Jack Input Torque

$$\text{Input Torque (Nm)} = \frac{\text{Load (kN)} \times \text{Lifting Screw Lead (mm)}}{2 \times \pi \times \text{Efficiency} \times \text{Gear Ratio}}$$

or alternatively

$$\text{Input Torque (Nm)} = \frac{\text{Input Power (kW)} \times 9550}{\text{Input Speed (rpm)}}$$

Calculation of Screw Jack Input Power

$$\text{Input Power (kW)} = \frac{\text{Load (kN)} \times \text{Lifting Screw Lead (mm)} \times \text{Input Speed (rpm)}}{60000 \times \text{Efficiency} \times \text{Gear Ratio}}$$

or alternatively

$$\text{Input Power (kW)} = \frac{\text{Load (kN)} \times \text{Linear Speed (mm/min)}}{60000 \times \text{Efficiency}}$$

Useful Formulae for Screw Jack Calculations

Power

Metric

Imperial

Lifting Motion

$$P = \frac{m \times g \times v}{\eta \times 1000}$$

$$P = \frac{w \times v}{\eta \times 33000}$$

Linear Motion

$$P = \frac{F_R \times v}{1000}$$

$$P = \frac{F_R \times v}{33000}$$

$$F_R = \mu \times m \times g$$

$$F_R = \mu \times w$$

Rotary Motion

$$P = \frac{T \times n}{9550}$$

$$P = \frac{T \times n}{63000}$$

Torque

$$T = F_R \times r$$

$$T = T \times r$$

Linear Motion

$$T = \frac{P \times 9550}{n}$$

$$T = \frac{P \times 6300}{n}$$

Symbol	Quantity	Metric Units	Imperial Units
P	Power	kW	HP
T	Torque	Nm	lbf.in
F_R	Resistance due to Friction	N	lbf
m	Mass	kg	-
W	Weight	-	lb
g	Gravitational Acceleration	9.81 ms ⁻²	32.185 ft ⁻²
v	Velocity	ms ⁻¹	ft/min
η	Efficiency	decimals	decimals
μ	Coefficient of Friction	decimals	decimals
n	Rotational Speed	rpm	rpm
r	Radius	m	in

Useful Formulae for Screw Jack Calculations

Moment of Inertia

Metric

Imperial

Solid Cylinder $J = \frac{1}{2} \times m \times r_{od}^2$

$WK^2 = \frac{1}{2} \times W \times r_{od}^2$

Hollow Cylinder $J = \frac{1}{32} \times \varpi \times \rho \times d_{od}^4$

$WK^2 = \frac{\varpi}{32} \times r \times l \times d_{od}^4$

$J = 0.098 \times \rho \times l \times d_{od}^4$

$WK^2 = 0.1 \times \rho \times l \times d_{od}^4$

Hollow Cylinder $J = \frac{1}{2} \times m \times (r_{od}^2 - r_{id}^2)$

$WK^2 = \frac{1}{2} \times W \times (r_{od}^2 - r_{id}^2)$

$J = \frac{1}{32} \times \varpi \times \rho \times l \times (d_{od}^4 - d_{id}^4)$

$WK^2 = \frac{\varpi}{32} \times \rho \times l \times (d_{od}^4 - d_{id}^4)$

$J = 0.098 \times \rho \times l \times (d_{od}^4 - d_{id}^4)$

$WK^2 = 0.1 \times \rho \times l \times (d_{od}^4 - d_{id}^4)$

Acceleration or Braking Time

$T_{acc} = \frac{J \times n}{9.55 \times T_{acc}}$

$T_{acc} = \frac{WK^2 \times n}{308 \times T_{acc}}$

Symbol	Quantity	Metric Units	Imperial Units
J	Moment of Inertia (metric)	kgm ²	-
WK ²	Moment of Inertia (imperial)	-	lb.ft ²
T _{acc}	Torque due to Acceleration or Braking	Nm	lbf.ft
m	Mass	kg	-
W	Weight	m	lb
g	Outer Radius	m	ft
v	Internal Radius	m	ft
η	Outer Diameter	m	ft
μ	Internal Diameter	m	ft
n	Density	kg/m ³	kg/m ³
r	Time for Acceleration or Braking	s	s
r	Rotational Speed	rpm	rpm



Power Jacks specialises in the design and manufacture of precision linear actuation, positioning and lifting equipment.

Our products are supplied globally across many sectors including Industrial Automation, Energy, Transport, Defence and Civil.

Power Jacks Ltd
Kingshill Commercial Park
Prospect Road, Westhill
Aberdeenshire AB32 6FP
Scotland (UK)
Tel: +44 (0)1224 968968

www.powerjacks.com
sales@powerjacks.com

PJ-SJB-SS-EN-01c



All information in this document is subject to change without notice. All rights reserved by Power Jacks Limited. May not be copied in whole or in part. ©Power Jacks Limited 2022, Aberdeenshire, Scotland, United Kingdom.

Follow Us  Facebook  LinkedIn  Twitter