Screw jacks

Screw jacks overview

Screw jacks transform a rotary motion from an electric, hydraulic or pneumatic motor or even manual operation into a linear movement in a vertical (push-pull lifting) or horizontal position.

Screw jacks can be installed as a single unit or in lifting systems with different layouts connected by drive-shafts, couplings and bevel gearboxes. Screw jacks enable the synchronized constant movement of lifting systems even with a varying load.

SERVOMECH screw jacks are able to work under either push or pull load conditions and mounted vertically upward, downward or horizontally.

SERVOMECH screw jacks models are available in two models:

- travelling screw (Model A)
- travelling nut (Model B)

SERVOMECH produces two screw jacks series: MA and SJ. Both series are available in different sizes in order to obtain the most suitable size in terms of performances and costs for each application.

MA Series: high performances, acme screw, oil lubricated, high efficiency, increased duty cycle up to 40% over a 10 minute period or 30% over a 1 hour period at 25°C environment temperature.

SJ Series: standard performances, acme screw, grease lubricated, increased duty cycle up to 30% over a 10 minute period or 20% over a 1 hour period at 25°C environment temperature

MA BS Series: travelling ball screw (Mod.A) or ball screw with travelling nut (Mod.B), oil lubricated, high performances and efficiency, increased duty cycle up to 100% at 25°C environment temperature.

SJ BS Series: ball screw with travelling nut (Mod.B), grease lubricated, increased duty cycle up to 70% at 25°C environment temperature.

Manufacturing features

SERVOMECH screw jacks are totally designed and manufactured inside the company with high technology and CNC machinery.

Quality System according to ISO 9001:2008, certified by TÜV.

Control tests are carried out in-line during manufacturing processes to monitor the production quality. Final control and functional check test are carried out to ensure the total quality and reliability of the final product.

Input drive: worm gear, high efficiency design, ZI involute profile, reduced axial backlash; bronze helical wormwheel EN 1982 – CuSn12-C; true involute worm in steel 20 MnCr 5 (UNI EN 10084), with hardened and ground thread and shaft.

Housing: monobloc housing designed for a more compact and robust shape, able to carry heavy loads and ensure a high precision level of machining. High resistance materials are used:

- casting in lluminium alloy EN 1706 - AC-AlSi10Mg T6
- casting in cast iron EN-GJL-250 (UNI EN 1561)
- casting in spheroidal graphite iron EN-GJS-500-7 (UNI EN 1563)
- casting in steel Fe G 60 (UNI 4010)

Materials and components

Acme screws, profile according to ISO 2901 ... ISO 2904

- material: steel C 43 (UNI 7847)
- subjected to straightening process to ensure the regular alignment in operation
- max. pitch error ± 0.05 mm over 300 mm thread length

Threaded bars available on stock:

ROLLED								
1 start	Tr 18×4	Tr 22×5	Tr 30×6	Tr 40×7	Tr 55×9	Tr 60×12	Tr 70×12	Tr 80×12
2 starts	Tr 18×8 (P4)	Tr 22×10 (P5)	Tr 30×12 (P6)	Tr 40×14 (P7)				

WHIRLED						
1 start	Tr 30×6	Tr 40×7	Tr 55×9	Tr 60×12	Tr 70×12	Tr 80×12
	Tr 90×12	Tr 100×12	Tr 100×16	Tr 120×14	Tr 140×14	Tr 160×16
2 starts	Tr 30×12 (P6)	Tr 40×14 (P7)	Tr 55×18 (P9)	Tr 60×24 (P12)	Tr 70×24 (P12)	Tr 80×24 (P12)
	Tr 90×24 (P12)	Tr 100×24 (P12)	Tr 100×32 (P16)	Tr 120×28 (P14)	Tr 140×28 (P14)	Tr 160×32 (P16)
3 starts	Tr 30×18 (P6)	Tr 40×21 (P7)	Tr 55×27 (P9)	Tr 60×36 (P12)	Tr 70×36 (P12)	Tr 100×48 (P16)
4 starts	Tr 30×24 (P6)	Tr 40×28 (P7)	Tr 55×36 (P9)	Tr 60×48 (P12)	Tr 70×48 (P12)	Tr 100×64 (P16)

Bronze travelling nut , profile according to ISO 2901 ... ISO 2904

- material: bronze nut with 1-start thread — bronze EN 1982 - CuAl9-C
  bronze nut with multiple starts thread — bronze EN 1982 - CuSn12-C
- max. axial backlash with new travelling nut: (0.10 ... 0.12) mm

Ball screws

- material: steel 42 CrMo 4 or 50 CrMo 4 (UNI EN 10083)

Threaded bars available on stock:

ROLLED, accuracy grade IT 7					
BS 14×5	BS 16×5	BS 20×5	BS 25×5	BS 32×5	BS 40×10
BS 14×10			BS 25×6	BS 32×10	BS 40×20
			BS 25×10	BS 32×20	BS 40×40

WHIRLED, accuracy grade IT 3 - IT 5							
BS 20×5	BS 25×6	BS 32×10	BS 40×10	BS 50×10	BS 63×10	BS 80×16	BS 100×16
BS 20×20	BS 25×10	BS 32×20	BS 40×20	BS 50×20	BS 63×20		
		BS 32×32	BS 40×40				

Ball nuts with flange DIN 69051 or with cylindrical flange

- material: steel 18 NiCrMo 5 (UNI EN 10084)

Ball nuts with ZERO backlash or preloaded

Threaded shafts with machined ends and nuts at customer's drawing available on request.

Screw jacks

Acme screw jacks

SERVOMECH acme screw jacks

MA Series		SJ Series	
travelling screw (Model A) travelling nut (Model B)		travelling screw (Model A) travelling nut (Model B)	
MA 5	Tr 18 × 4	SJ 5	Tr 18 × 4
MA 10	Tr 22 × 5	SJ 10	Tr 22 × 5
MA 25	Tr 30 × 6	SJ 25	Tr 30 × 6
MA 50	Tr 40 × 7	SJ 50	Tr 40 × 7
MA 80	Tr 55 × 9	SJ 100	Tr 55 × 9
MA 100	Tr 60 × 12	SJ 150	Tr 60 × 12
MA 200	Tr 70 × 12	SJ 200	Tr 70 × 12
MA 350	Tr 100 × 16	SJ 250	Tr 80 × 12
		SJ 300	Tr 90 × 12
		SJ 350	Tr 100 × 12
		SJ 400	Tr 100 × 12
		SJ 600	Tr 120 × 14
		SJ 800	Tr 140 × 14
		SJ 1000	Tr 160 × 16

MA Series: high efficiency screw jacks	SJ Series: standard performances screw jacks
8 standard sizes with load capacity from 5 kN to 350 kN	14 standard sizes with load capacity from 5 kN to 1 000 kN
Model A: travelling screw Model B: travelling nut	
1- start acme screw from Tr 18 × 4 to Tr 100 × 16	1- start acme screw from Tr 18 × 4 to Tr 160 × 16
2-starts acme screw from Tr 18 × 8 (P4) to Tr 100 × 32 (P16)	2-starts acme screw from Tr 18 × 8 (P4) to Tr 160 × 32 (P16)
Screw jacks MA Series Model A with travelling screw: 3- or 4-starts acme screws available	
6 different input versions for each size and ratio Vers.1: single input shaft Vers.2: double free input shaft Vers.3: flange and hollow shaft input for IEC motor Vers.4: flange and hollow shaft input for IEC motor with second free input shaft Vers.5: Vers.1 + bell housing and coupling for IEC motor Vers.6: Vers.2 + bell housing and coupling for IEC motor	
long-life synthetic oil lubricated worm gear	long-life synthetic grease lubricated worm gear
operation with low noise level with input speed up to 3 000 rpm	max. input speed allowed 1 500 rpm
suitable for high linear speed and high duty cycle applications	competitive in industrial applications price/performance : excellent ratio
wide range of accessories available	

Ball screw jacks

SERVOMECH ball screw jacks

MA BS Series

travelling ball screw (Model A)		travelling ball nut (Model B)	
MA 5	BS 14×5 BS 16×5	MA 5	BS 20×5 BS 25×6
MA 10	BS 16×5 BS 20×5	MA 10	BS 25×6 BS 32×5
MA 25	BS 32×10; BS 32×20; BS 32×32	MA 25	BS 32×5; BS 32×10; BS 32×20; BS 32×32
MA 50	BS 40×10; BS 40×20; BS 40×40	MA 50	BS 40×10; BS 40×20; BS 40×40
		MA 80	BS 50×10; BS 50×20
MA 100	BS 50×10; BS 50×20; BS 63×10; BS 63×20	MA 100	BS 63×10; BS 63×20
MA 200	BS 80×16	MA 200	BS 80×16 BS 100×16
MA 350	BS 100×16	MA 350	BS 100×16

SJ BS Series

travelling ball nut (Model B)	
SJ 5	BS 20×5 BS 25×6
SJ 10	BS 25×6 BS 32×5
SJ 25	BS 32×5; BS 32×10; BS 32×20
SJ 50	BS 40×10; BS 40×20
SJ 100	BS 50×10; BS 50×20
SJ 150	BS 63×10; BS 63×20
SJ 200	BS 80×16
SJ 250	BS 100×16

MA BS Series:	SJ BS Series:
high efficiency screw jacks, suitable for continuous operation also, duty cycle up to 100 %, input speed up to 3 000 rpm	standard performances screw jacks, Model B (travelling nut) available only, duty cycle up to 70 %, input speed up to 1 500 rpm
8 standard sizes with load capacity from 5 kN to 350 kN	8 standard sizes with load capacity from 5 kN to 250 kN
Model A: travelling ball screw Model B: travelling ball nut	Model B: travelling ball nut
ball screw from BS 14 × 5 to BS 100 × 16	ball screw from BS 20 × 5 to BS 100 × 16
6 different input versions for each size and ratio Vers.1: single input shaft Vers.2: double free input shaft Vers.3: flange and hollow shaft input for IEC motor Vers.4: flange and hollow shaft input for IEC motor with second free input shaft Vers.5: Vers.1 + bell housing and coupling for IEC motor Vers.6: Vers.2 + bell housing and coupling for IEC motor	
long-life synthetic oil lubricated worm gear	long-life synthetic grease lubricated worm gear
wide range of accessories available	

NOTE: Performances, features and dimensions of ball screw jacks and ball screws are quoted in the specific catalogues:

- catalogue **Ball screw jacks**,
- catalogue **Ball screws and nuts.**

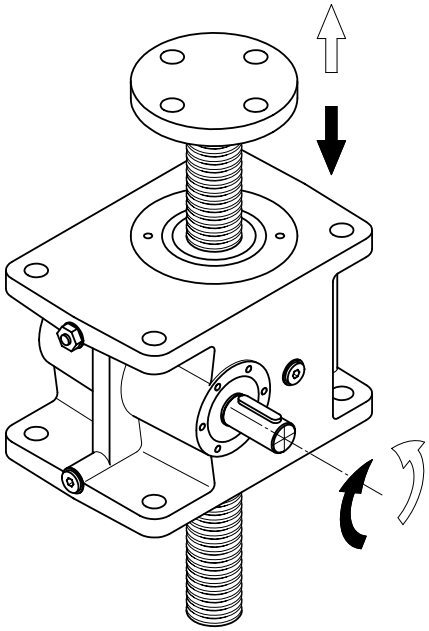
Screw jacks

Models

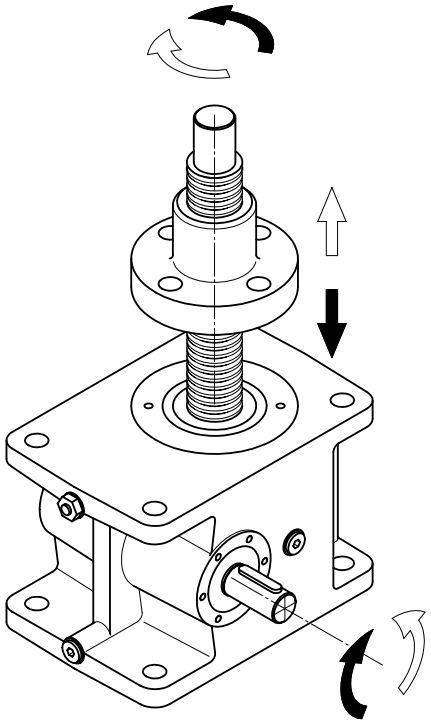
Both MA and SJ Series screw jacks are available in two models:
with travelling screw (Model A)
with travelling nut (Model B)

The choice of the model depends on the configuration and requirements of the application. The performances are in general the same for both models.

SERVOMECH screw jacks can be operated in vertical or horizontal planes, or angles in-between. Input options available: free shaft, double free shaft, motor flange with or without second shaft.



travelling ball screw (Model A)



travelling ball nut (Model B)

The bronze nut is integral with the worm wheel.

The linear motion is given by the acme screw being driven through the centre of the worm wheel. In operation, the screw does not rotate. Space must be available on both screw jacks sides for the screw to protrude below the gear housing.

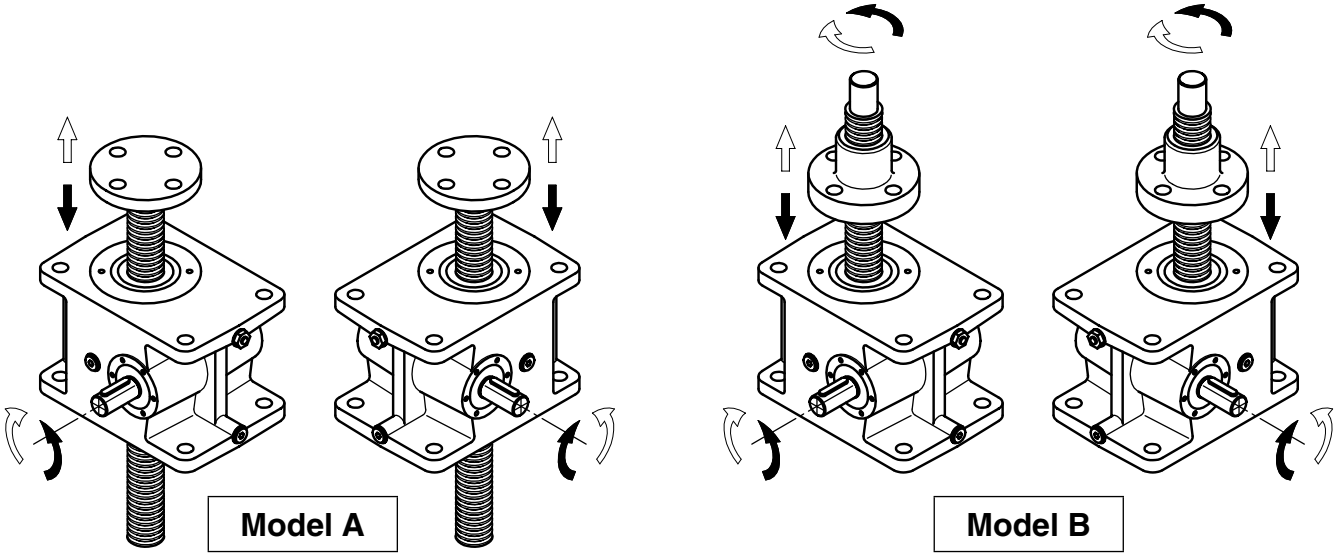
Options:
protective tube
protective bellows
safety bronze nut
various screw end fixings
stroke end switches
anti-turn device
wear indicator switch
adjustable backlash
stop nut
trunnion mounting
stainless steel acme screw
bronze guides

The acme screw is fixed to the worm wheel. In operation the screw rotates with the worm wheel at the same speed, driving the bronze nut up and down. The linear motion of the nut is possible only if the reacting torque is applied, avoiding the integral rotation with the acme screw.

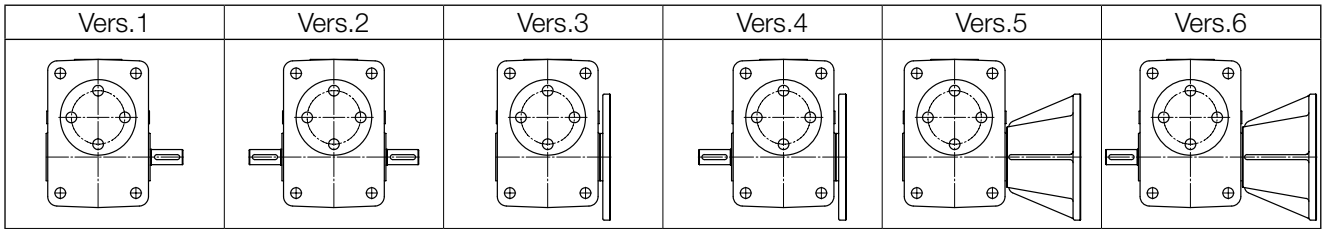
Options:
protective bellows
safety bronze nut
wear indicator switch
adjustable backlash
stainless steel acme screw
trunnion mounting travelling nut
travelling nut at customer's drawing

Versions

INPUT SHAFT ROTATION – SCREW OR NUT LIFTING DIRECTION

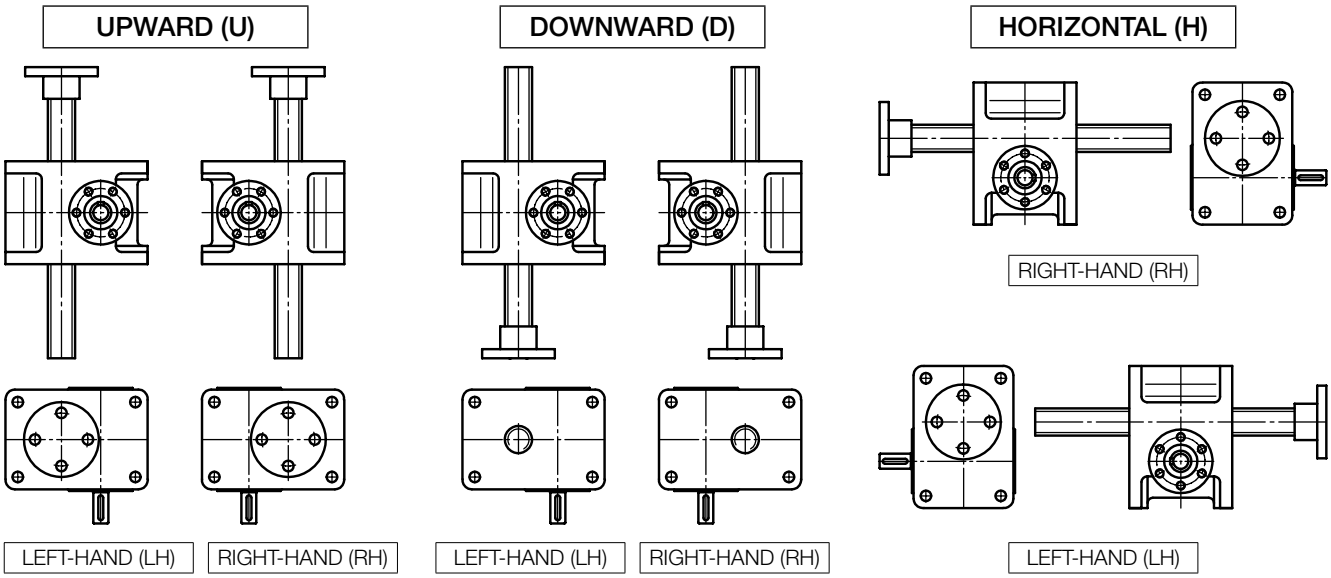


INPUT VERSIONS



Vers.1: single input shaft
Vers.2: double free input shaft
Vers.3: flange and hollow shaft input for IEC motor
Vers.4: flange and hollow shaft input for IEC motor with second free input shaft
Vers.5: Vers.1 + bell housing and coupling for IEC motor
Vers.6: Vers.2 + bell housing and coupling for IEC motor

SCREW JACK MOUNTING POSITIONS



1

Screw jacks selection criteria

Screw jacks transform a rotary movement into a linear movement. Due to the screw-nut efficiency, this transformation implies a loss of energy depending on the screw and the nut type which is in inverse relation to their efficiency. Therefore, the energy loss is higher with 1-start acme screw and nut when compared with 2- or more starts acme screw and nut.

Therefore to select the right screw jack suitable for an application, it is necessary to consider the duty cycle required by the application F_u [%] and compare it to the duty cycle that the screw jack can perform F_i [%].

The **application duty cycle F_u [%] required** is the ratio between the working time under load required by the application during a reference time period and the reference time period itself, expressed in percentage.

$$F_u\,[\%] = \frac{\text{Working time during reference time period } T_{rif}\,[\text{min}]}{\text{Reference time period } T_{rif}\,[\text{min}]} \times 100$$

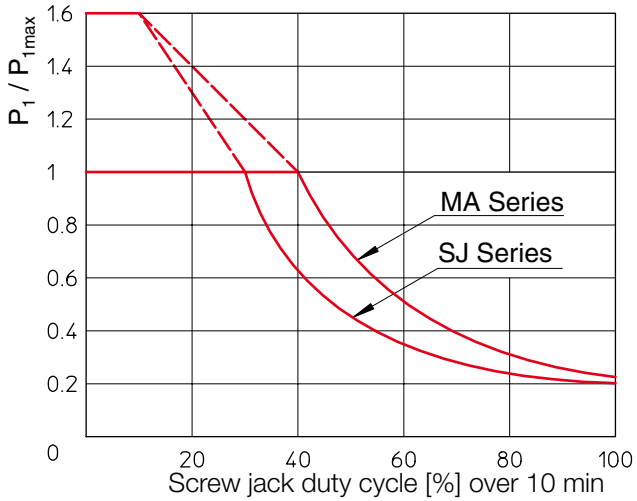
T_{rif} - reference time period, expressed in minutes:

T_{ref} = 10 minutes for short, but frequent working cycles

T_{ref} = 1 hour (60 min) for long, but infrequent working cycles

The **screw jack duty cycle F_i [%] allowed** is the percentage of time referred to the reference time period T_{ref} during which the screw jack can operate under maximum load conditions - stated in this catalogue - at 25°C environment temperature, to avoid the risk of internal parts overheating. Therefore, the main limit to the working time of screw jacks is often due to the thermal power limits and not to the maximum permissible operating mechanical power.

The screw jack duty cycle F_i [%] is related to the maximum permissible power. If the power required by the application is lower than the maximum permissible power, than the screw jack can be used with a higher duty cycle.



P_1 - Power required by the application

P_{1max} - Screw jack's max permissible power (see performances tables)

If the environment temperature is higher than 25°C, the screw jack duty cycle F_i [%] has to be reduced by applying a correction factor f_T as per the following formula:

$$f_T = \frac{80 - T\,[°C]}{55}$$

where:

T [°C] - environment temperature, expressed in degree Celsius

If the environment temperature increases, the permissible duty cycle of the screw jack F_i [%] is reduced.

In order to make a correct screw jack selection, we recommend the following selection procedure:

1. Model:
- Model A – travelling screw
- Model B – travelling nut

2. SERVOMECH screw jack series:
- MA Series: high efficiency screw jack with acme screw, oil lubricated
- SJ Series: standard performances screw jack with acme screw, grease lubricated

3. Screw jack size:
- Pull or push load
- Stroke
- Linear speed
- Power required

4. Input version:
- Vers.1: single free input shaft
- Vers.2: double free input shaft
- Vers.3: flange and hollow shaft input for IEC motor
- Vers.4: flange and hollow shaft input for IEC motor with second free input shaft
- Vers.5: Vers.1 + bell housing and coupling for IEC motor
- Vers.6: Vers.2 + bell housing and coupling for IEC motor

5. Screw jack mounting position:
- Upward U
- Downward D
- Horizontal H
- Right-hand RH
- Left-hand LH

6. Accessories required

Screw jack selection

The screw jack selection is the last step of a more complex global lifting-system selection procedure, where the overall dimensions and safety requirements of the application have to be considered as an integral part of that selection. In this section we only focus on a single screw jack selection. You will find more exhaustive comments and recommendations on the screw jacks complete lifting system chapter.

1. Screw jack model selection: all SERVOMECH screw jacks versions and sizes are available in two different models:
- Model A – travelling screw
- Model B – travelling nut

The choice between the two different models only depends on the configuration and mounting details of the application.

In case of Model B (rotating screw and external translating nut) selection, we recommend to pay attention to the following:
- screw and nut lubrication
- acme screw protection
- only axial load can be applied on the translating nut referred to the rotating acme screw axis
- rotating screw end, especially in case of long stroke length and push load
- off-set or radial load applied on the nut may lead to dangerous misalignment between screw and nut, so it is not permitted. If present, it must be supported by an appropriate, suitable solution.

2. SERVOMECH screw jacks series:

The screw jack's duty cycle and the duty cycle required by the application F_u [%] are the most important factors in choosing between the two available screw jacks series, as previously described.

The duty cycle required by the application F_u [%] has to be lower than or equal to the working duty cycle rating the screw jack can perform F_i [%], inclusive the environment temperature correction factor (f_T):

$$F_u\ [\%] \leqslant F_i\ [\%]$$

Here below are values of the max. duty cycle F_i [%] at 25°C environment temperature for the SERVOMECH screw jacks series:

Duty cycle allowed F_i [%]	MA Series	SJ Series
F_i [%] over 10 min time period	40 %	30 %
F_i [%] over 1 hour time period	30 %	20 %

Lifting Systems

Usually, a screw jack lifting system is composed of several lifting points (see examples on pages 94 - 95).

Screw jack's position and number depend on application requirements as:

- dimension and surface of the platform or plane
- required stroke length
- total lifting load (dynamic load)
- lifting system configuration, guided or not guided load

Furthermore, specific application project requirements may also influence the selection.

A new lifting system project can be very complex and therefore it requires the clever evaluation of many different technical and application details, in order to provide a functional, safe and competitive solution.

Here are some suggestions that can help the lifting system's designer on his project evaluations.

Static safety: Firstly, the required or desired safety level has to be considered. On screw jack product, there are no regulations on the matter of safety standards and technical data declared on catalogue. Many manufacturers do not use the same safety factors on their technical calculations and also the materials may be different.

We recommend a full evaluation of all screw jack components. Dimensions, outer diameter and lead of screw thread are not enough for a complete evaluation. It is also important to evaluate the worm gear in terms of:

- centre distance, overall dimensions and total weight
- axial bearings: type and size
- nut: material and dimensions

Norms and rules: In case, be sure to consider all norms and rules which the project must comply with. This can significantly affect the final solution.

Noise and vibrations: For applications which require a low and controlled noise level, we recommend a solution which allows, with same final performances, a lower input speed for the connecting shaft.

This will help to reduce or eliminate also vibrations or dangerous input speeds for the connecting shafts.

Example: lifting stages for theatres, lecture or concert hall:
- motor speed reduced to max. (300 ... 400) rpm
- use of bevel gearboxes with ratio 1 : 1
- balanced connecting shafts, well aligned and supported, max. non-supported length (2 ... 3) m
- SERVOMECH screw jacks with ratio RV (high linear speed) and multiplied starts acme screw

Hanging load: Auxiliary safety nuts are available to comply with norms and rules about hanged loads with presence of personnel for maintenance.

Self-locking: Generally, the statically self-locking condition of the lifting system can be achieved by using a 1-start acme screw jack. Sometimes, to comply with some norms and rules, a certain mechanical self-locking condition can only be achieved by a lower than 4° helix angle acme screw with a lead smaller than the standard. Those special executions are available on request.

Positioning (stopping) accuracy: The positioning (stopping) accuracy can be achieved by using brake-motors or frequency inverters to control speed and acceleration and deceleration ramps, especially in case of downward moving loads.

Operating safety: Different safety devices can also be considered or requested for the application:
- mechanical safety: safety nut, mechanical stop of the load;
- electric or electronic safety: wear control of the working nut to check the distance between working and safety nut; speed control of the connecting shaft; rotation detection of the worm wheel; control of max. power or current required for the lifting system.

Load inertia: If the load has to be rapidly accelerated or decelerated, in applications with high linear speed, we recommend to use an appropriate drive to control the acceleration and deceleration ramps (for example, frequency inverter for AC 3-phase motors or double polarity motors and soft-start devices).

Guided load: In case of applications with large dimensions, high loads and long strokes, we recommend to evaluate the possibility to guide the load.

If the load is guided, a smaller screw diameter may be selected and consequently a cheaper screw jacks can be used, whilst maintaining the same functionality and static load capability.

This means a cost effective final solution for the project.

Screw jacks with increased acme screw diameter, if the static resistance is more significant than the dynamic application conditions for lifting systems:
- long stroke with medium static push load
- medium strokes with high static push load

SERVOMECH screw jacks with increased diameter acme screw are available to offer a more cost effective solution.

For assistance in selecting lifting systems and linear motion devices, SERVOMECH Engineering Dpt. is available to support you free of charge.

Self-locking

An acme screw jack is in self-locking condition when:

- a push or pull load applied on a not working screw jack does not start the linear movement (static self-locking condition);
- by interrupting the motor power supply of a working screw jack with push or pull load, the movement stops (dynamic self-locking condition).

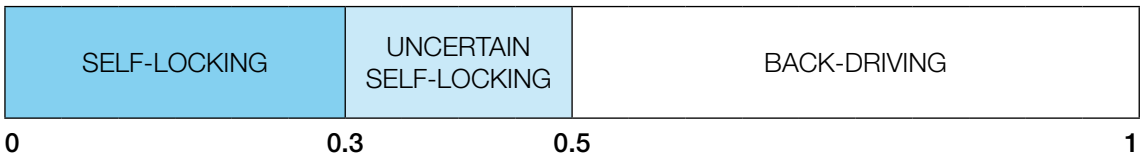
Self-locking and **back-driving** conditions are defined in the following 4 situations:

1) **Static self-locking**: not running screw jack without load vibrations; the application of a push or pull force (until the maximum allowed) does not cause the linear movement of the acme screw (Model A) or of the travelling bronze nut (Model B).
   This condition happens when the direct efficiency value[1)] is lower than 0.30.

2) **Dynamic self-locking**:
   - Working screw jack with a load opposite the motion: by interrupting the motor power supply the screw jack stops.
     This condition happens when the direct efficiency value[1)] is lower than 0.25.
   - Working screw jack with a load applied on the same direction of the motion: the screw jack's stop is not guaranteed by interrupting the motor power supply. The screw jack stops only if the direct efficiency value[1)] is lower than 0.20 and, anyway, it stops in an unrepeatable position.
     In this case, we recommend to use a brake motor to stop the load and keep it in position, avoiding the motion start in case of pushes or vibrations.

3) **Uncertain self-locking**: with direct efficiency values[1)] between 0.30 and 0.50, the screw jacks are in an uncertain self-locking condition. The self-locking depends on the load and the inertia of the system.
   In this case we recommend to use a brake motor to guarantee the self-locking condition or to contact SERVOMECH Engineering Dpt. to evaluate the application.

4) **Back-driving**: screw jacks with direct efficiency value[1)] higher than 0.50 are never self-locking.
   We remind you that, in any case, also to start a not self-locking screw jack a certain minimum load must be applied. To define this load value please contact SERVOMECH Engineering Dpt.



[1)] The direct efficiency values are shown in the relative tables (see pages 36, 61 and 67).

Acme screw buckling

One of the most important screw jack selection criteria is the buckling resistance of the acme screw. Buckling limits are relevant for push load only.

SERVOMECH considers three cases:

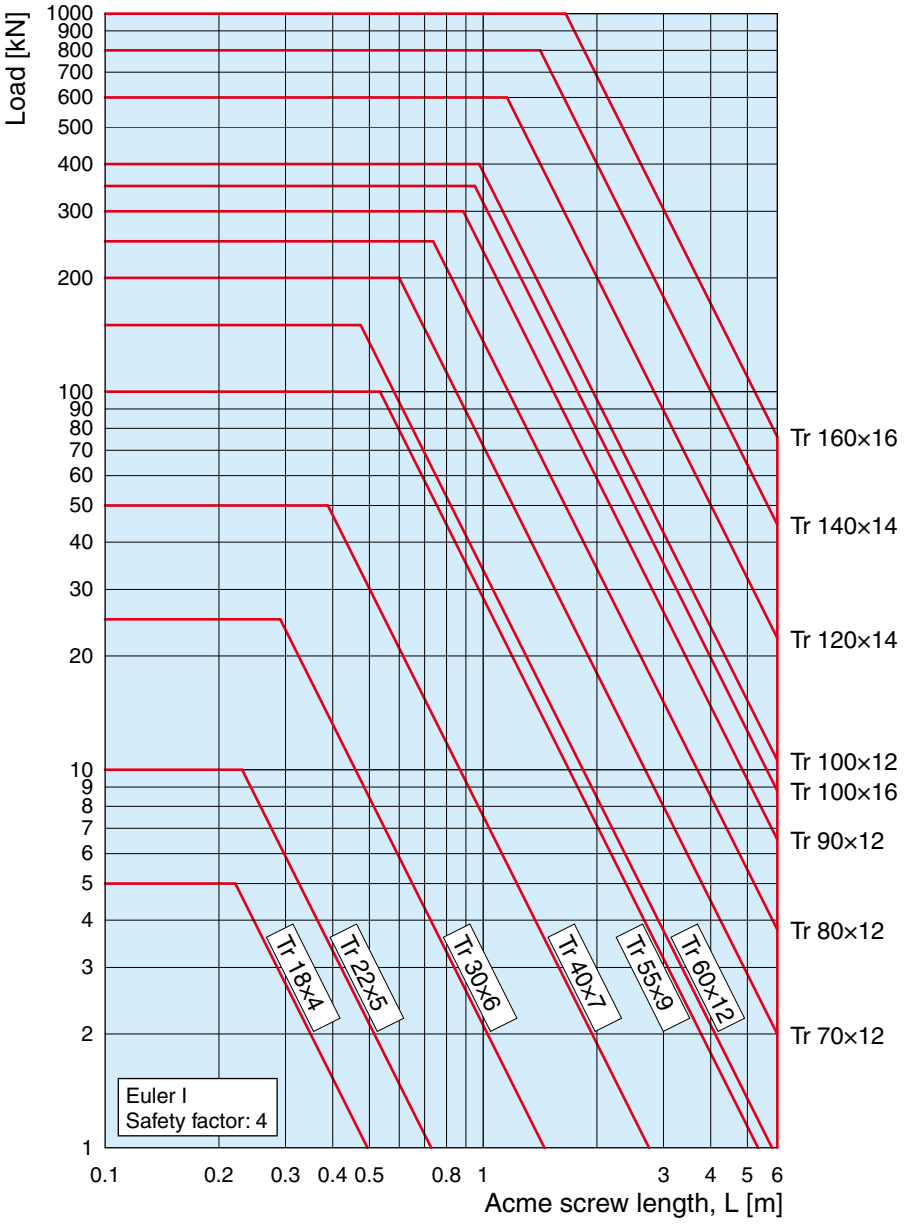
- Euler I: screw jack housing firmly fixed to the base – free travelling acme screw end
  screw jack housing firmly fixed to the base – free travelling nut
- Euler II: screw jack housing and travelling acme screw end fixed to pivoting supports
  screw jack housing and travelling nut fixed to pivoting supports
- Euler III: screw jack housing firmly fixed to the base – guided travelling acme screw end
  screw jack housing firmly fixed to the base – guided travelling nut

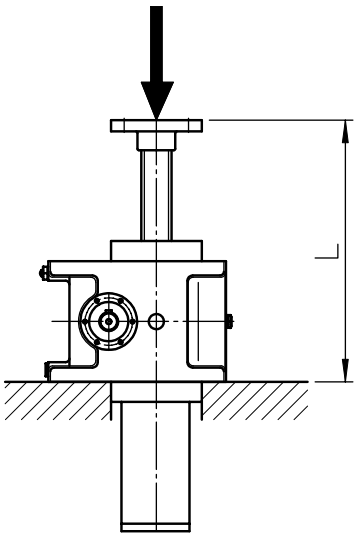
Following diagrams (known as Euler curves) show the max. push load admitted on the acme screw, considering a safety factor against buckling equal to 4.

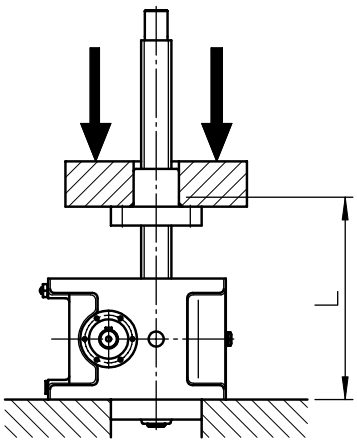
For more accurate evaluation in case of particular application requirements, critical for safety reasons (e.g. theatre lifts), contact SERVOMECH Engineering Dpt.

Euler I: screw jack housing firmly fixed to the base - free travelling acme screw end
screw jack housing firmly fixed to the base - free travelling nut

Example: To suit a push load of 60 kN applied on an acme screw 1 000 mm long, the right screw size is Tr 70×12 mounted on a screw jack MA 200 or SJ 200.



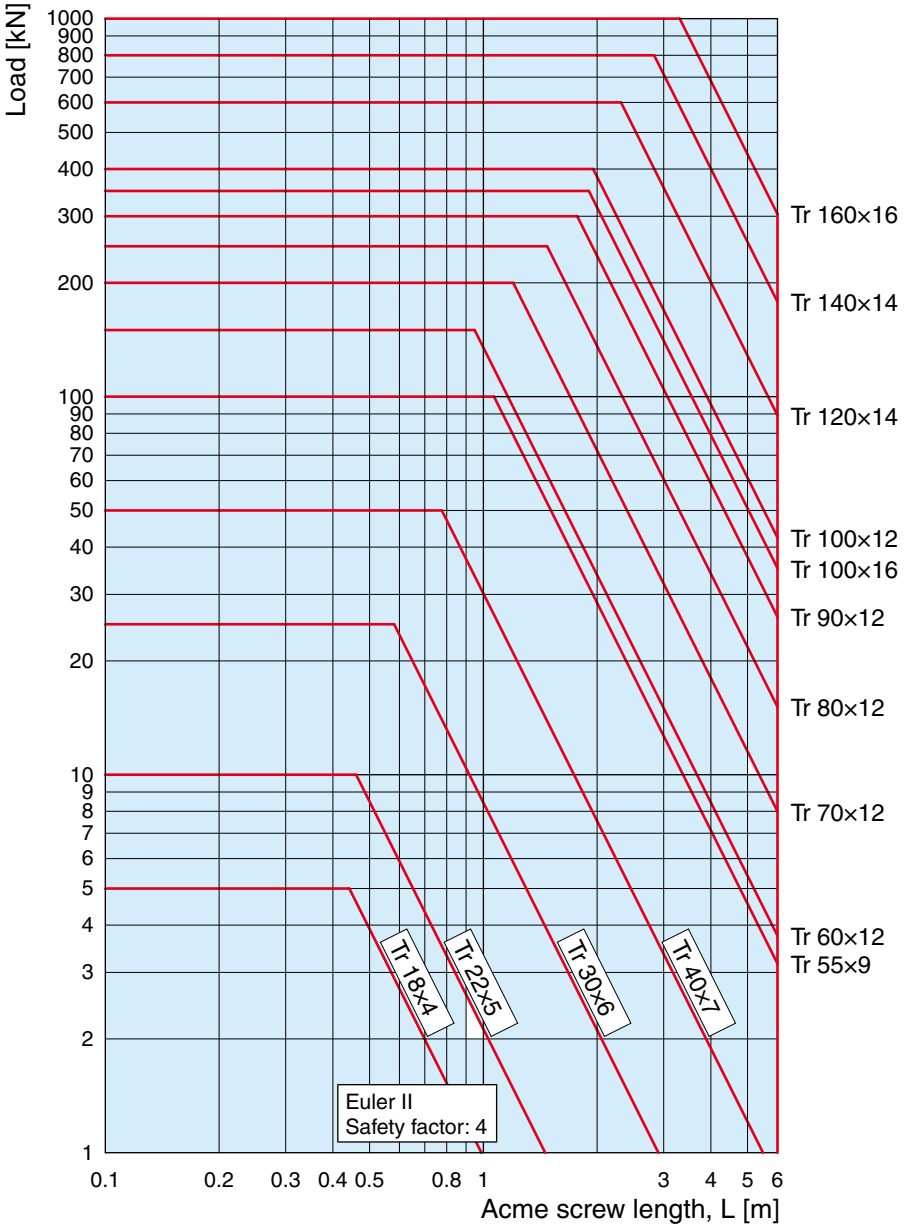


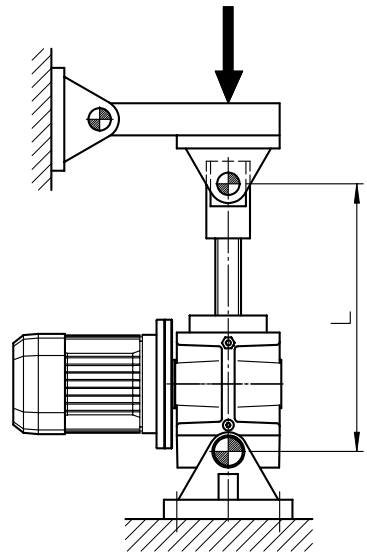


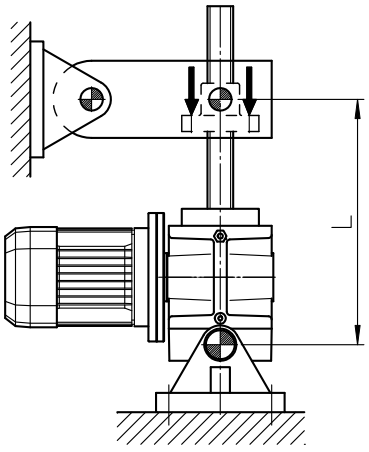
Acme screw buckling

Euler II: screw jack housing and travelling acme screw end fixed to pivoting supports
screw jack housing and travelling nut fixed to pivoting supports

Example: To suit a push load of 20 kN applied on an acme screw 1 000 mm long, the right screw size is Tr 40×7 mounted on a screw jack MA 50 or SJ 50.



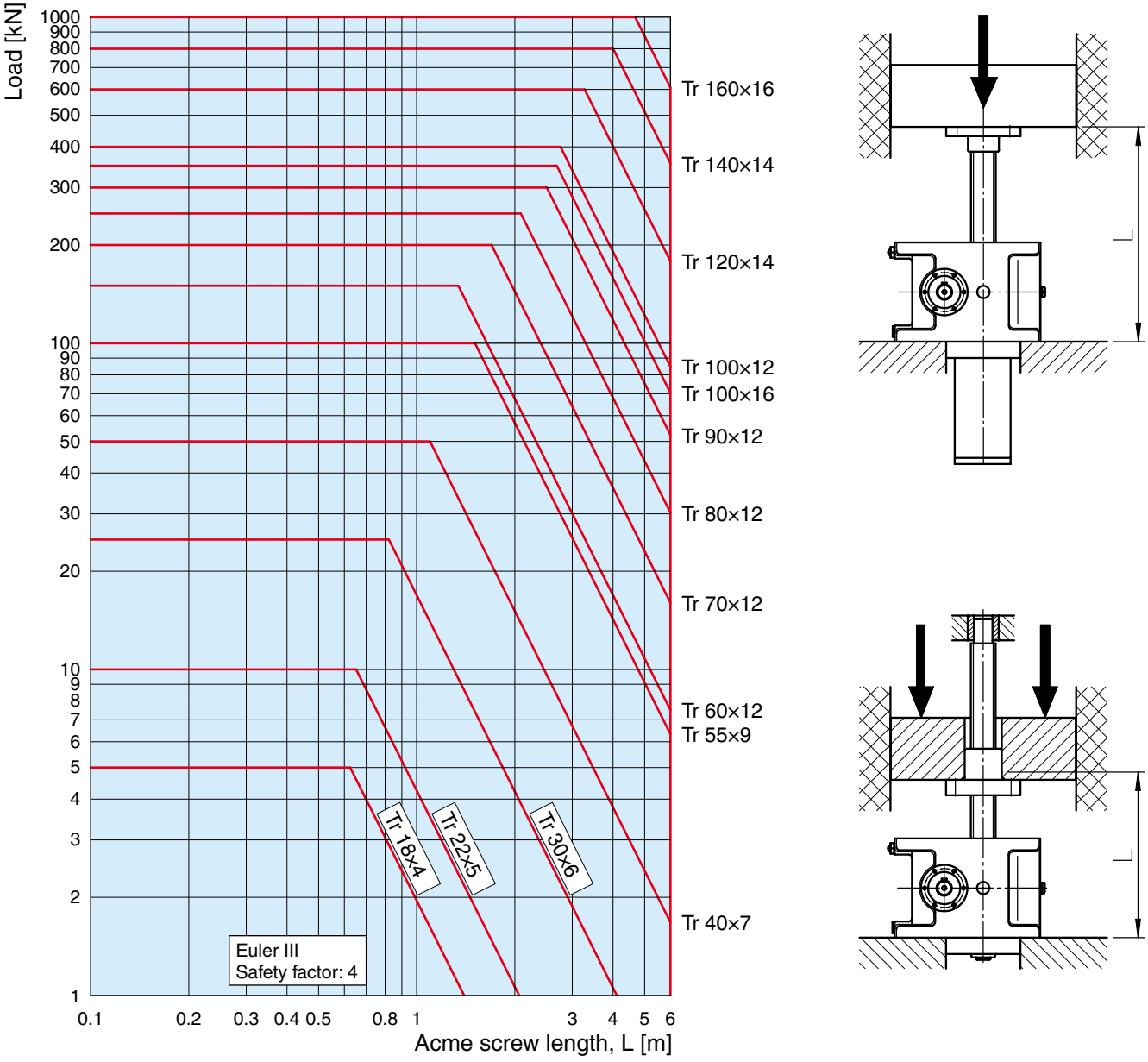




Acme screw buckling

Euler III: screw jack housing firmly fixed to the base - guided travelling acme screw end
screw jack housing firmly fixed to the base - guided travelling nut

Example: To suit a push load of 100 kN applied on an acme screw 3 000 mm long, the right screw size is Tr 80×12 mounted on a screw jack SJ 250.

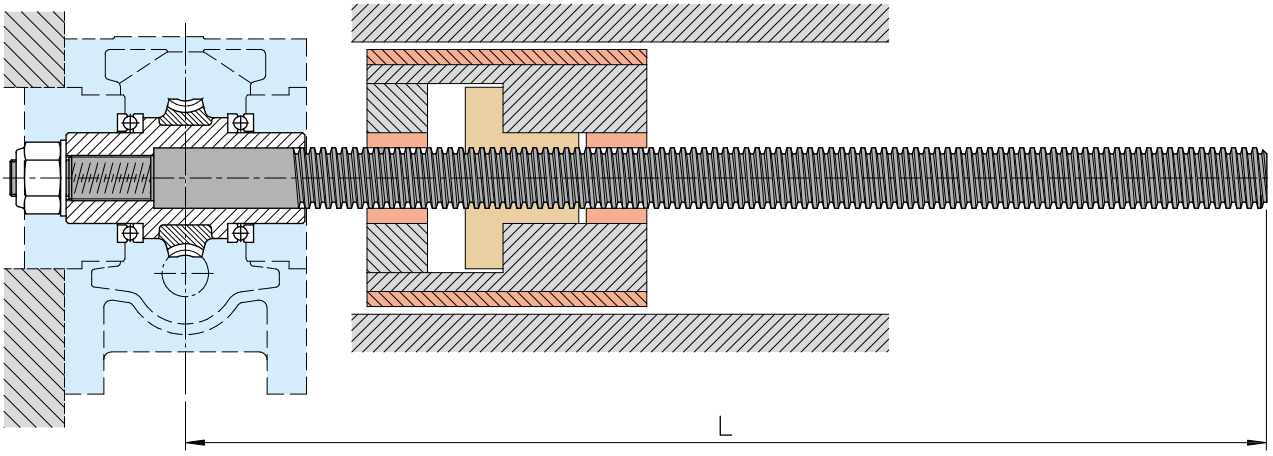


Critical rotating speed of acme screw

For travelling nut (Model B) screw jacks, the acme screw rotating speed must not reach the first critical speed of the screw itself, which depends on the thread diameter and lead, screw length and type of the screw end support.

Free acme screw end

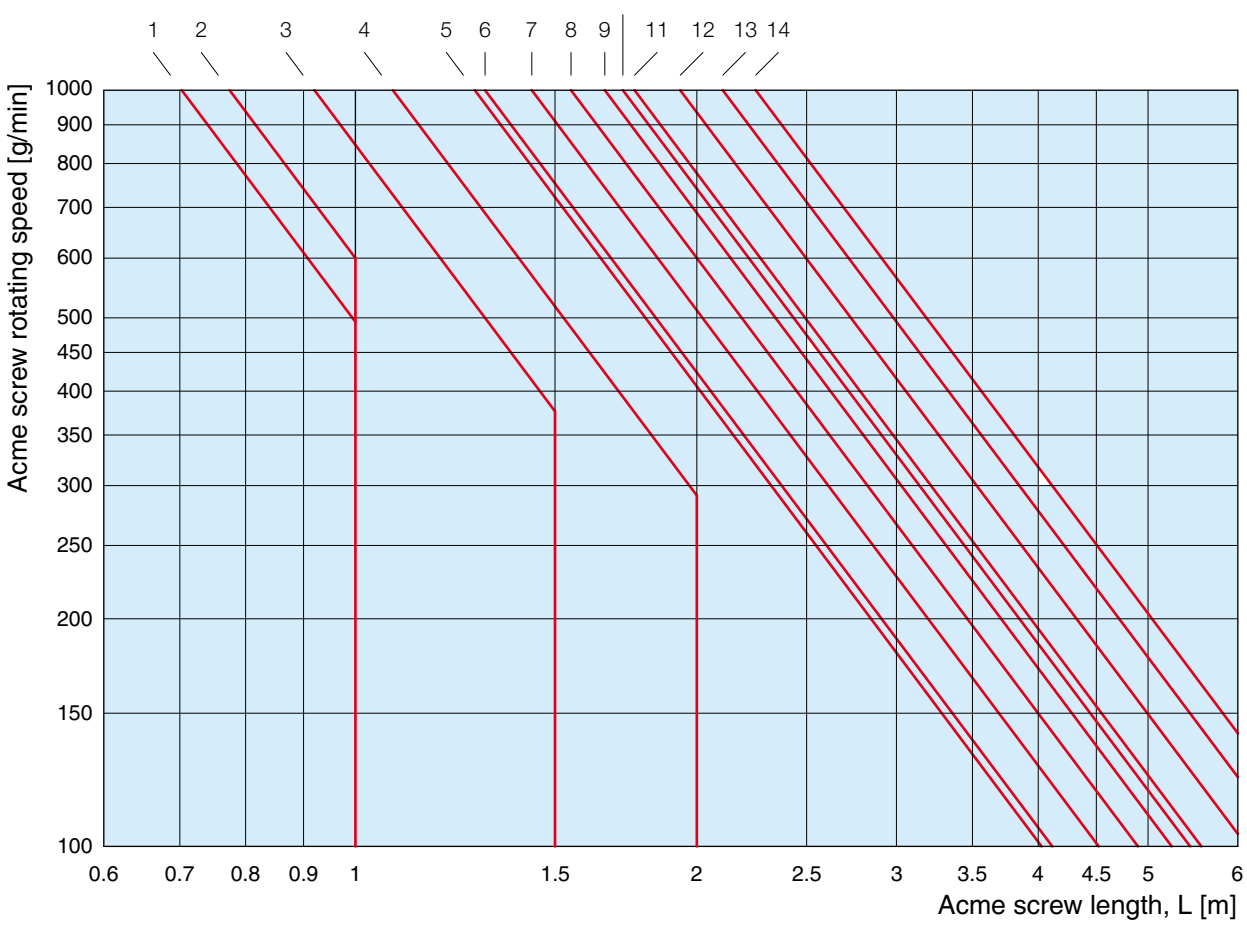
Example: For a screw jack SJ 150 with acme screw Tr 60×12 (1-start or more) 2 m long with free end, the max. allowed rotating speed is 420 rpm. With a 1-start thread, this rotating speed is equivalent to a linear speed of 85 mm/s.



$$n_{max} = 392 \cdot 10^5 \cdot \frac{0.9 \cdot d_{min}}{L^2}$$

d_{min} [mm] - min. thread diameter (for a thread Tr d×P: d_{min} = d - P)

L [mm] - acme screw length

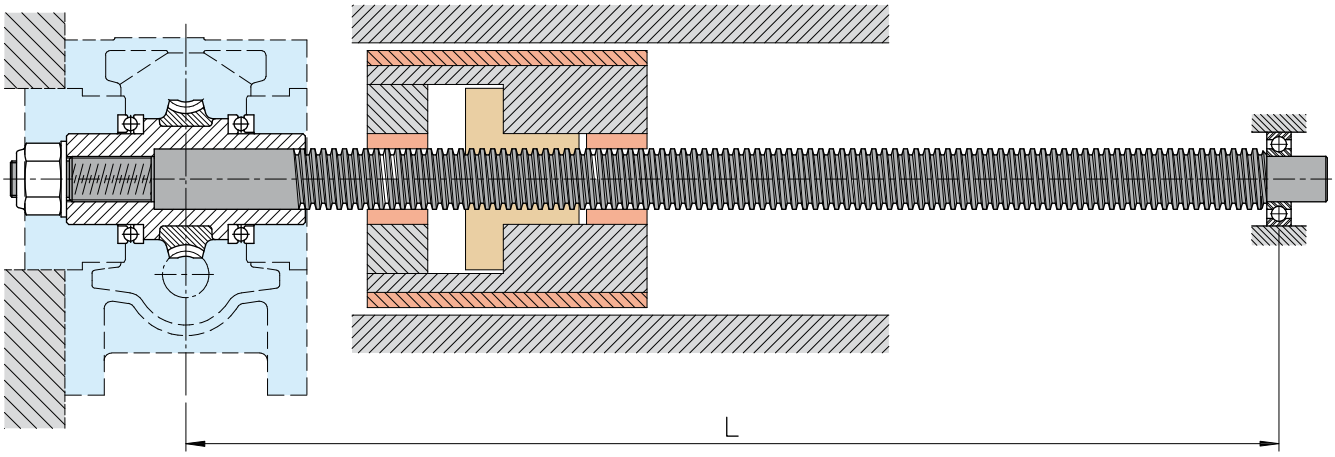


1 - Tr 18×4
2 - Tr 22×5
3 - Tr 30×6
4 - Tr 40×7
5 - Tr 55×9
6 - Tr 60×12
7 - Tr 70×12
8 - Tr 80×12
9 - Tr 90×12
10 - Tr 100×16
11 - Tr 100×12
12 - Tr 120×14
13 - Tr 140×14
14 - Tr 160×16

ATTENTION! In case of horizontal mounting, an acme screw static deflection, caused by its weight and possibly aggravated by the presence of the push load, should always be considered. Therefore, we recommend an accurate evaluation and use of a screw supporting system on two nut sides, integral and travelling with the nut itself; this will ensure the correct alignment and concentricity between the screw and the nut. In case of doubts, please contact SERVOMECH Engineering Dpt.

Supported acme screw end

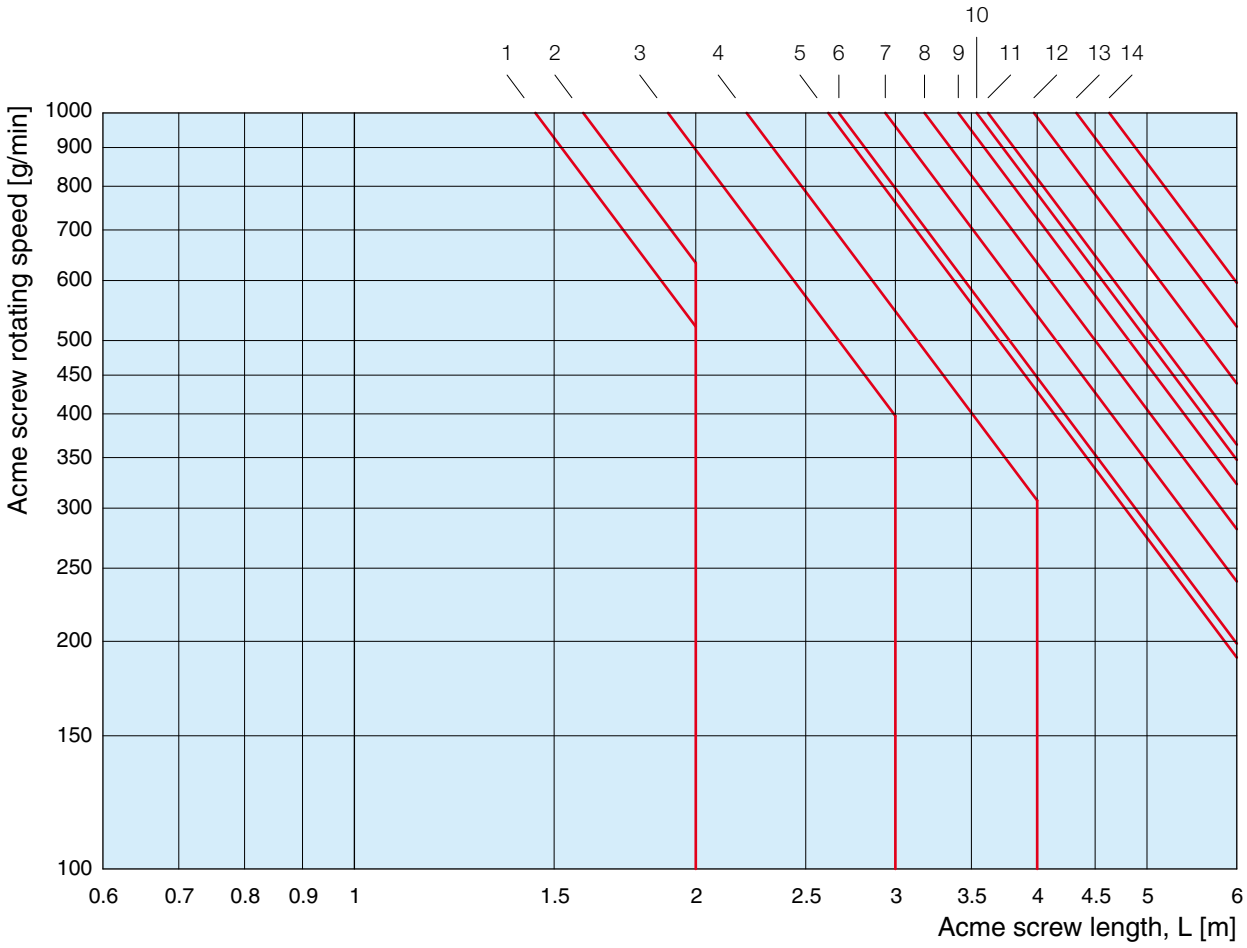
Example: For a screw jack MA 50 with acme screw Tr 40×7 (1-start or more) 3 m long with supported end, max. allowed rotating speed is 550 rpm. With a 1-start thread, this rotating speed is equivalent to a linear speed of 64 mm/s.



$$n_{max} = 392 \cdot 10^5 \cdot \frac{3.8 \cdot d_{min}}{L^2}$$

d_{min} [mm] - min. thread diameter (for a thread Tr d×P: d_{min} = d - P)

L [mm] - acme screw length



1 - Tr 18×4
2 - Tr 22×5
3 - Tr 30×6
4 - Tr 40×7
5 - Tr 55×9
6 - Tr 60×12
7 - Tr 70×12
8 - Tr 80×12
9 - Tr 90×12
10 - Tr 100×16
11 - Tr 100×12
12 - Tr 120×14
13 - Tr 140×14
14 - Tr 160×16