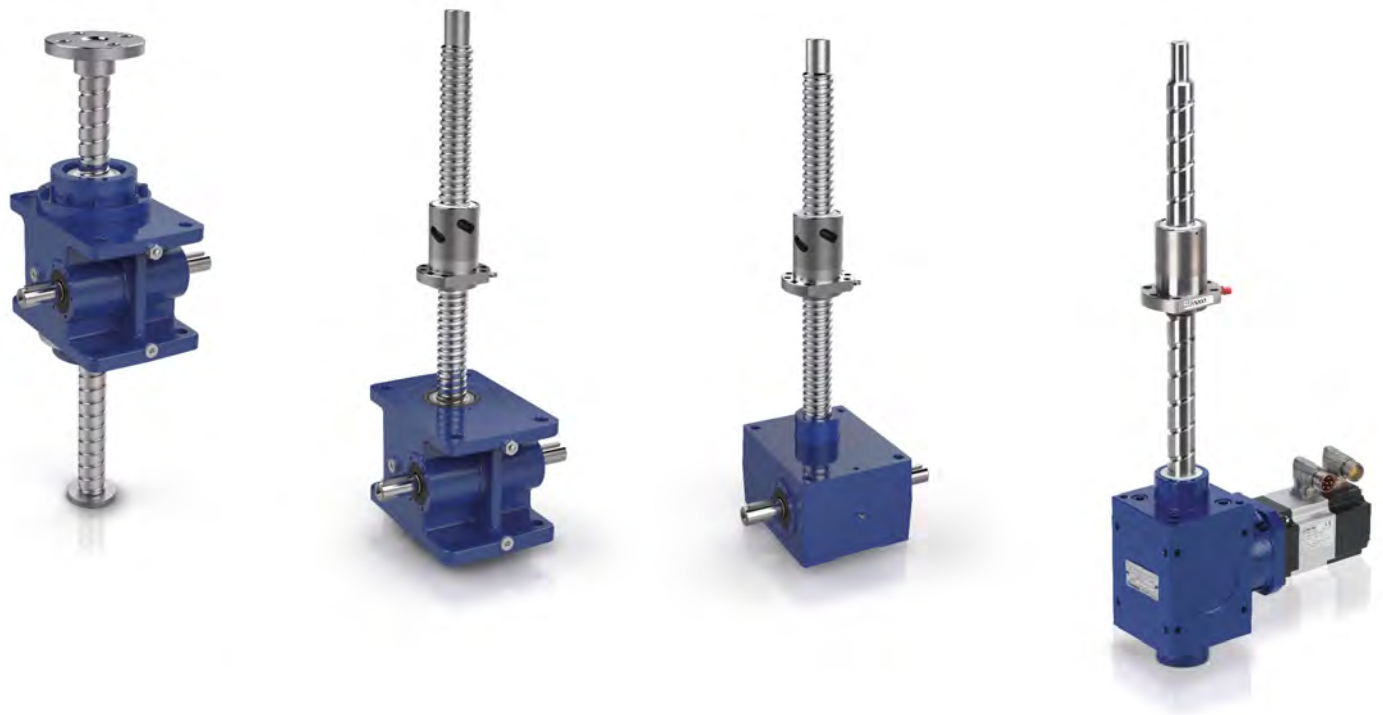
Servomech®

new ideas in linear motion



BALL SCREW JACKS

CATALOGUE

Screw jacks transform a rotary motion of an electric, hydraulic or pneumatic motor or even a manual operation into a vertical linear lifting motion (push or pull) or into a horizontal positioning motion.

Screw jacks can be installed as a single unit or in lifting systems with different layouts connected by transmission shafts, couplings and bevel gearboxes. Screw jacks enable the synchronized constant movement of lifting systems even with a not uniformly distributed load.

Ball screw jacks combine the gear unit with a linear drive performed by a ball screw that, in comparison with the traditional acme screw, offers following advantages:

- **higher efficiency**
- **longer service life** of the whole linear drive system

The following two comparative examples give an idea of the higher efficiency that can be obtained with this system:

- considering a screw jack consisting of a worm gear with linear drive performed by an acme screw, the total efficiency of the screw jack is between 10 % and 40 %
- considering a screw jack consisting of a worm gear with linear drive performed by a ball screw, the total efficiency of the screw jack is between 30 % and 70 %

With same performance requirements in both systems (speed and applied load), the second solution allows a **45 - 50 % reduction of the installed power**.

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

SERVOMECH ball screw jacks are available in two different models:

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

SERVOMECH screw jacks are **designed and manufactured inside our production factory in Anzola dell'Emilia (Bologna) - ITALY** using high technology and CNC machine tools.

All working processes inside SERVOMECH comply to its **Quality Management System**, developed according to **ISO 9001:2015** and certified by TÜV Italia. Check tests are carried out in-line during all manufacturing processes to monitor and adjust possible errors, obtaining a constant quality of the production without scraps. Final control and functional checks are carried out to ensure high quality and reliability of the final product.

Each finished product is uniquely identified by the serial number on the product identification nameplate (see Chap. 5.2 - Product nameplate). For each finished product, SERVOMECH fills a specific final test sheet which is supplied to the customer within the shipment together with the product and certifies its conformity. The final test sheet also contains important information for the correct functioning of the product.

For more information, visit our website **www.servomech.com** or contact our sales office.

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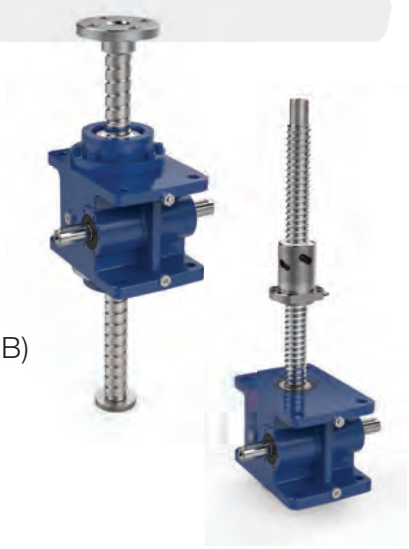
1.1 Product overview

SERVOMECH ball screw jacks range consist of three main series: MA BS Series, SJ BS Series and HS Series. Each family is designed and developed to represent a series of sizes with an adequate reciprocal gauge, to allow an easier selection of the most suitable size in terms of performances and costs for each application.

MA BS Series



High efficiency screw jacks

- Recommended for continuous operation, duty cycle up to 100%
- Lifelong synthetic oil lubricated worm gear
- High precision worm gearbox, reduced angular backlash
- Gearbox housing shape for a better heat dissipation
- Input speed up to 3000 rpm
- Ball screw drive, travelling screw (Model A) and travelling nut (Model B)
- 8 sizes standard available
- Load capacity from 5 kN to 350 kN

SJ BS Series

Compact design screw jacks

- Recommended for intermittent duty cycle (up to 70%)
- Lifelong synthetic grease lubricated worm gear
- High precision worm gearbox, reduced angular backlash
- Monobloc gearbox housing, robust and compact shape
- Input speed up to 1500 rpm
- Ball screw drive, travelling nut (Model B)
- 11 sizes standard available
- Load capacity from 5 kN to 800 kN

HS Series

High speed screw jacks

- Recommended for continuous operation, duty cycle up to 100%
- Lifelong synthetic oil lubricated bevel gear
- Bevel gear, GLEASON spiral toothing system, with high efficiency and low noise functioning
- Angular backlash on output shaft max 10' (available on request reduced backlash)
- Cubic design housing, compact and robust
- Input speed up to 3000 rpm
- Ball screw drive, travelling nut (Model B)
- 6 sizes standard available
- Load capacity from 10 kN to 200 kN

1.2 Materials and Components

MA BS Series and SJ BS Series screw jacks

Input drive with precision worm gearbox, high efficiency design, ZI involute profile, reduced angular backlash. Bronze wormwheel, hardened and ground steel wormshaft, with true involute worm thread and shaft ground. Monobloc housing designed for a more compact and robust shape, able to carry heavy loads and ensure a high precision level of machining.

- Housing:
  casting in hardened and tempered aluminium alloy EN 1706 AC-Al Si10Mg-S-T6
  casting in grey cast iron EN-GJL-250 (UNI EN 1561:2011)
  casting in spheroidal graphite iron EN-GJS-500-7 (UNI EN 1563:2018)
  welded steel S355J2 (UNI EN 10025-2:2019)
- Wormwheel: bronze EN 1982 – CuSn12-C
- Worm shaft: case-hardened steel 20MnCr5 (UNI EN ISO 683-3:2018), ground involute profile ZI

HS Series screw jacks

- Housing: casting in grey cast iron EN-GJL-250 (UNI EN 1561:2011)
- Solid shafts: quenched and tempered carbon steel C45E+H+QT (UNI EN ISO 683-1:2018)
- Input hollow shaft: case-hardened steel 20MnCr5 (UNI EN ISO 683-3:2018)
- Output hollow shaft: quenched and tempered steel 39NiCrMo3 (UNI EN 10083-3:2006)
- Bevel gears: case-hardened steel 20MnCr5 (UNI EN ISO 683-3:2018)

Ball screws and nuts, internal production made by SERVOMECH

Ball nuts made in case-hardened alloy steel, with ball tracks hardness within the range (58 … 61) HRc, with flange DIN 69051 (for Mod.B only) or with cylindrical flange designed by SERVOMECH. Radial or frontal recirculation system, with ball nut end seals and grease nipple. Available on request with preload and zero backlash.

Threaded shafts in alloy steel, with rolled (accuracy grade IT 7) or whirled thread (accuracy grade IT 5 or IT 3 on request); ball track hardness within the range (58 … 61) HRc. Grease lubricated. Wide range of diameter - thread helix lead combinations: the nominal diameter range is (16 ... 140) mm, the nominal lead range is (5 ... 40) mm.

Geometrical checks according to ISO 3408 and DIN 69051.

- Ball nuts: case-hardened alloy steel 18NiCrMo5 (UNI EN ISO 683-3:2018)
- Threaded shafts: quenched and tempered alloy steel 42CrMo4 (UNI EN ISO 683-2:2018) or
  quenched and tempered alloy steel 50CrMo4 (UNI EN ISO 683-2:2018)

Threaded bars available on stock (nominal diameter × nominal lead, in mm):

ROLLED, accuracy grade IT 7					
BS 16×5	BS 20×5	BS 25×5	BS 32×5	BS 40×5	
BS 16×10	BS 20×10	BS 25×10	BS 32×10	BS 40×10	BS 50×10
BS 16×16	BS 20×20	BS 25×25	BS 32×20	BS 40×20	BS 50×20
			BS 32×32	BS 40×40	

WHIRLED, accuracy grade IT 5 (IT 3)										
BS 16×5	BS 20×5	BS 25×5	BS 32×5	BS 40×5	BS 50×5	BS 63×10	BS 80×10	BS 100×16	BS 120×20	BS 140×32
BS 16×10	BS 20×10	BS 25×6	BS 32×10	BS 40×10	BS 50×10	BS 63×20	BS 80×16	BS 100×20	BS 120×32	
	BS 20×20	BS 25×10	BS 32×20	BS 40×20	BS 50×20	BS 63×30	BS 80×20			
			BS 32×32	BS 40×40	BS 50×40	BS 63×40	BS 80×40			

1.3 Size overview

Ball screw jacks

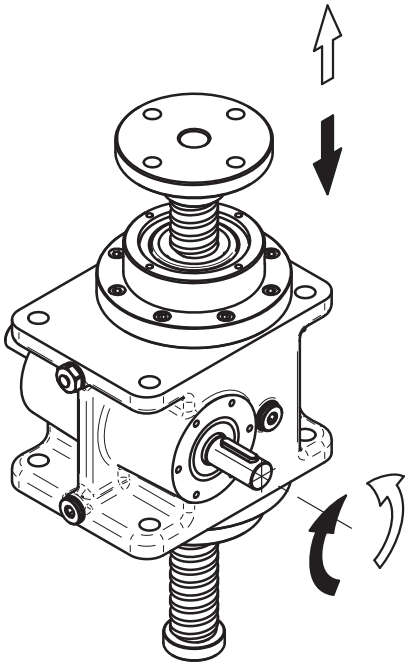
Travelling screw (Mod. A)		Travelling nut (Mod. B)					
MA BS Series		MA BS Series		SJ BS Series		HS Series	
MA 5	BS 16 × 5 BS 16 × 10 BS 16 × 16	MA 5	BS 20 × 5 BS 20 × 10 BS 20 × 20	SJ 5	BS 16 × 5 BS 16 × 10 BS 16 × 16 BS 20 × 5 BS 20 × 10 BS 20 × 20		
MA 10	BS 25 × 5 BS 25 ×10 BS 25 × 25	MA 10	BS 25 × 5 BS 25 ×10 BS 25 × 25	SJ 10	BS 25 × 5 BS 25 × 10 BS 25 × 25	HS 10	BS 25 × 5 BS 25 × 10 BS 25 × 25
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	SJ 25	BS 32 × 5 BS 32 × 10 BS 32 × 20 BS 32 × 32	HS 25	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	SJ 50	BS 40 × 10 BS 40 × 20 BS 40 × 40	HS 50	BS 40 × 10 BS 40 × 20 BS 40 × 40
MA 100	BS 50 × 10 BS 50 × 20 BS 50 × 40	MA 80	BS 50 × 5 BS 50 × 10 BS 50 × 20	SJ 100	BS 50 × 5 BS 50 × 10 BS 50 × 20	HS 100	BS 50 × 5 BS 50 × 10 BS 50 × 20
MA 150	BS 63 × 10 BS 63 × 20 BS 63 × 30 BS 63 × 40	MA 150	BS 63 × 10 BS 63 × 20 BS 63 × 40	SJ 150	BS 63 × 10 BS 63 × 20 BS 63 × 40	HS 150	BS 63 × 10 BS 63 × 20 BS 63 × 40
MA 200	BS 80 × 10 BS 80 × 16 BS 80 × 20 BS 80 × 40	MA 200	BS 80 × 10 BS 80 × 16 BS 80 × 20 BS 80 × 40	SJ 200	BS 80 × 10 BS 80 × 16 BS 80 × 20 BS 80 × 40	HS 200	BS 80 × 10 BS 80 × 16 BS 80 × 20 BS 80 × 40
MA 350	BS 100 × 16 BS 100 × 20	MA 350	BS 100 × 16 BS 100 × 20	SJ 250	BS 100 × 16 BS 100 × 20		
				SJ 300	BS 100 × 16 BS 100 × 20		
				SJ 600	BS 120 × 20 BS 120 × 32		
				SJ 800	BS 140 × 32		

MA BS Series	SJ BS Series	HS Series
high efficiency screw jacks, suitable for continuous operation, duty cycle up to 100 %, ratio from 1 : 4 to 1 : 32, input speed up to 3 000 rpm	standard performances screw jacks, duty cycle up to 70 %, ratio from 1 : 4 to 1 : 36, input speed up to 1 500 rpm	high speed screw jacks, suitable for continuous operation, duty cycle up to 100 %, ratio from 1 : 1 to 1 : 4, input speed up to 3 000 rpm
8 standard sizes with load capacity from 5 kN to 350 kN	11 standard sizes with load capacity from 5 kN to 800 kN	6 standard sizes with load capacity from 10 kN to 200 kN
Model A: travelling ball screw Model B: travelling ball nut	Model B: travelling ball nut	Model B: travelling ball nut
ball screw from BS 16 × 5 to BS 100 × 20	ball screw from BS 16 × 5 to BS 140 × 32	ball screw from BS 25 × 5 to BS 80 × 40
6 different input versions for each size and ratio: Vers.1: single input shaft Vers.2: double input shaft Vers.3: flange and hollow shaft for IEC Vers.4: flange and hollow shaft for IEC with second input shaft Vers.5: Vers.1 + bell housing and coupling for IEC / servo-motor Vers.6: Vers.2 + bell housing and coupling for IEC / servo-motor		3 different input versions for each size and ratio S: solid shaft with key, standard diameter R: solid shaft with key, larger diameter MF: flange and hollow shaft for IEC motor MA: flange and hollow shaft for servo motor additional output shaft (S or R)
lifelong synthetic oil lubricated worm gear	lifelong grease-lubricated worm gear	lifelong grease-lubricated bevel gear
wide range of accessories available		

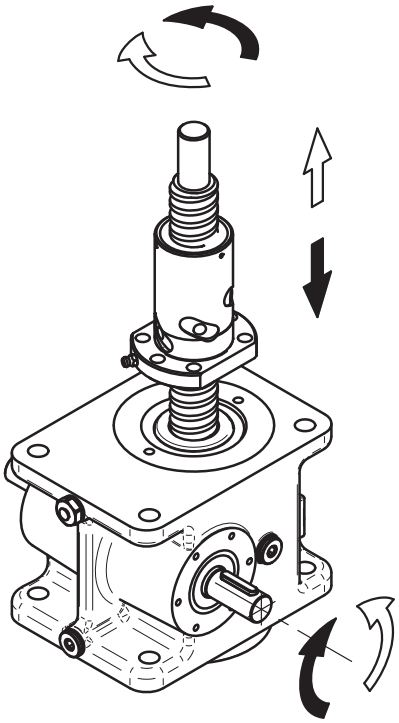
1.4 Models and design

Ball screw jacks are available in two different models:

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



Model A - travelling screw



Model B – travelling nut

The ball nut is integral with the worm wheel.

The linear motion is performed by the ball screw being driven by the nut through the screw jack housing, therefore there must be enough space on both screw jack sides. In operation, the screw does not rotate and its translation is possible only if the reacting torque is applied.

Accessories:

- protective tube
- protective bellows
- safety nut
- various screw end attachments
- limit switches
- anti-turn device
- stop nut
- trunnion mount
- bronze guides

The ball 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 along the ball screw. The linear motion of the nut is possible only if the reacting torque is applied, avoiding the integral rotation with the ball screw.

Accessories:

- protective bellows
- safety nut
- nut support with pivoting pins
- nut at customer's drawing
- trunnion mount

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1.4 Models and design

MA BS Series screw jacks are available in both models (Model A and Model B), while SJ BS Series and HS Series are available only with travelling nut (Model B).

SERVOMECH screw jacks can operate in vertical, horizontal or inclined plane. Different input options are available, such as:

- MA BS Series and SJ BS Series: single or double solid shaft, motor flange or motor flange with second input shaft.
- HS Series: single solid shaft or flange and hollow shaft

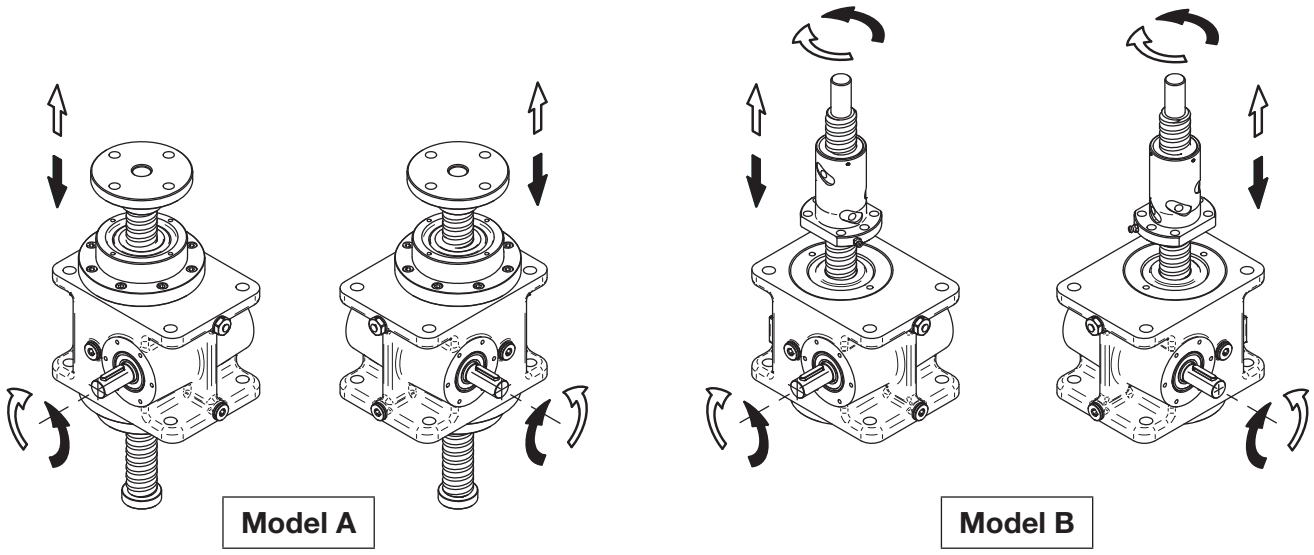
All screw jacks are available with flange + hollow shaft or bell housing + coupling for:

- AC 3-phase electric motors with IEC UNEL-MEC flange and shaft
- servo-motors (1)
- hydraulic motors (1)

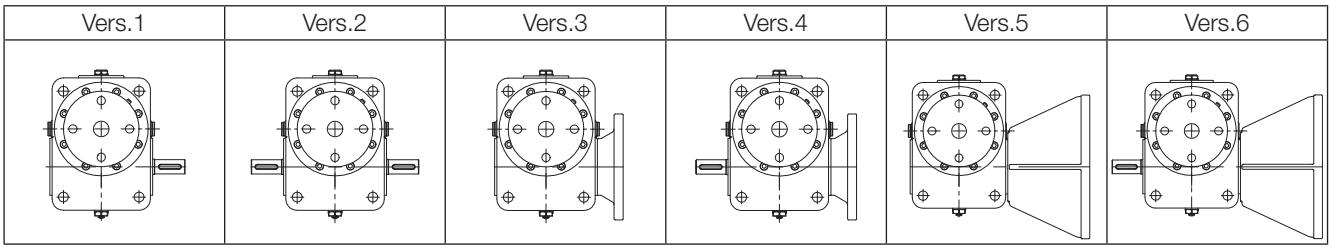
(1) *Contact SERVOMECH technical support to check execution and feasibility.*

1.5 MA BS Series and SJ BS Series - Models and Design

INPUT SHAFT ROTATION – SCREW OR NUT LIFTING DIRECTION

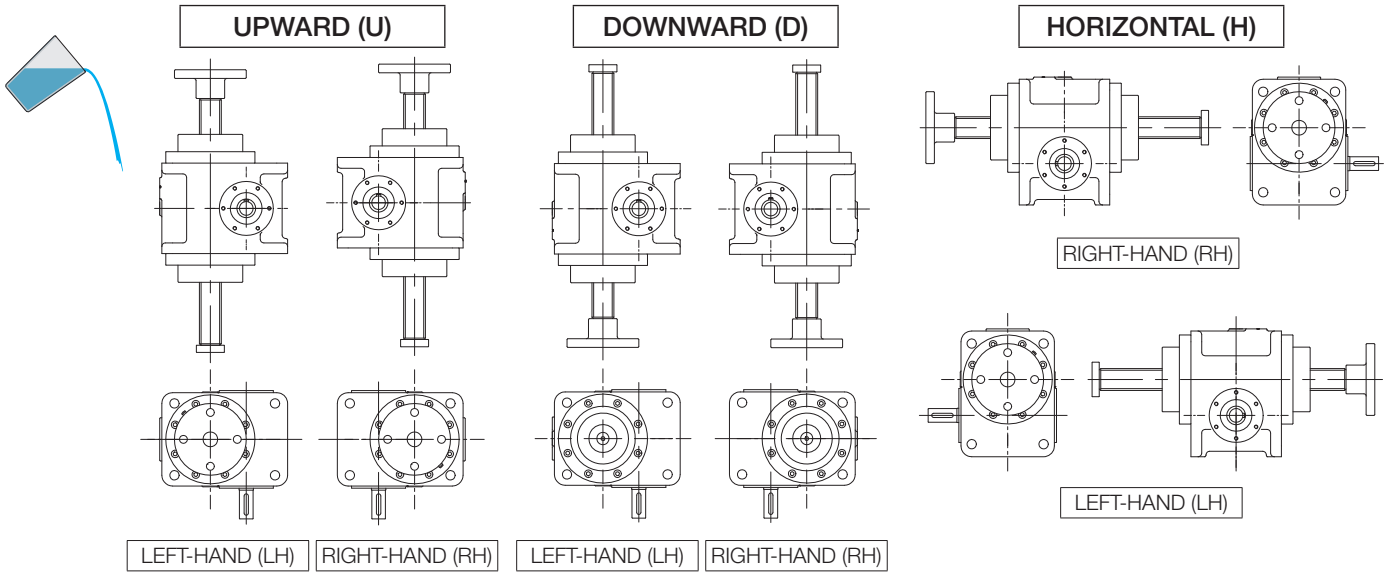


INPUT



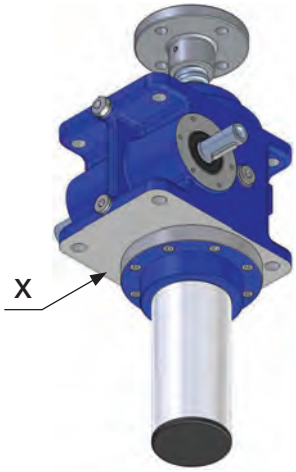
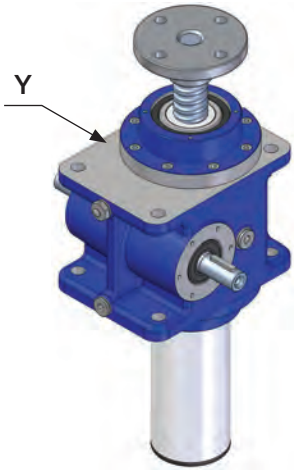
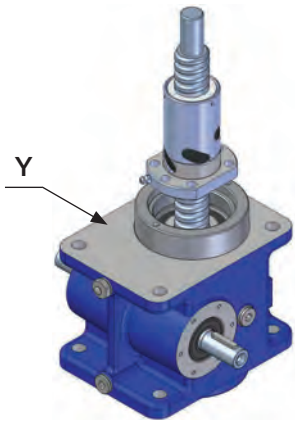
- Vers.1: single input shaft
- Vers.2: double input shaft
- Vers.3: flange and hollow shaft for IEC
- Vers.4: flange and hollow shaft for IEC + second input shaft
- Vers.5: Vers.1 + bell housing and coupling for IEC / servo-motor
- Vers.6: Vers.2 + bell housing and coupling for IEC / servo-motor

MOUNTING POSITION



FIXING PLANE

The fixing plane (code X or code Y) and the pivot will remained painted with primer only.

		Code **Y**: ball screw end side	Code **Y**: ball screw side
			
Code **X**: side opposite to ball screw end	Code **X**: side opposite to ball screw		

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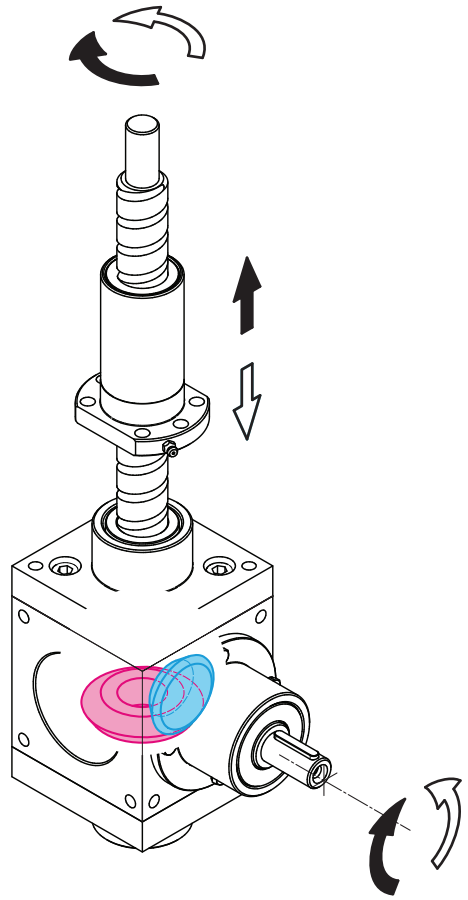
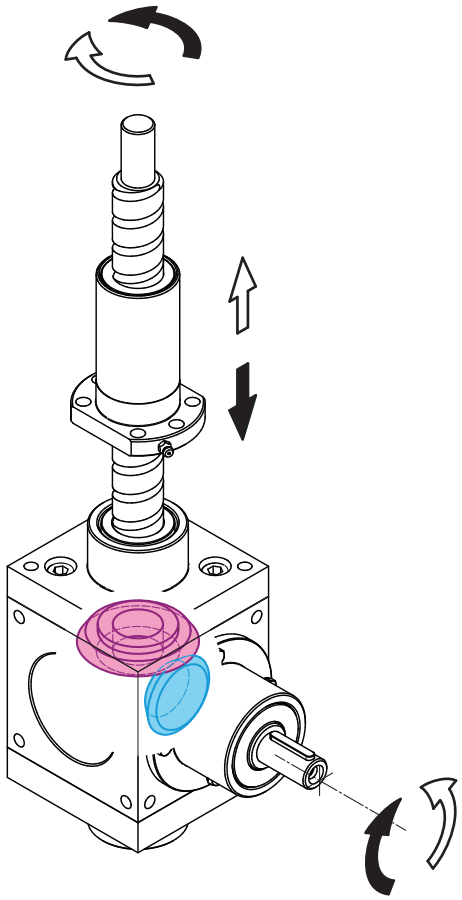
1.6 HS Series - Models and Design

KINEMATICS SCHEME

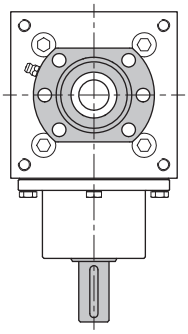


Scheme 10
Bevel gear wheel
on side opposite to nut

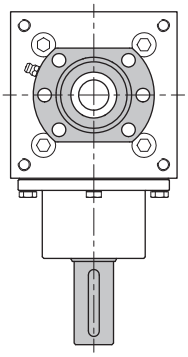


Scheme 20
Bevel gear wheel
on nut side

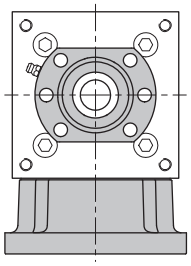
INPUT SHAFT



Code: **S**
solid shaft with key,
standard diameter



Code: **R**
solid shaft with key,
larger diameter



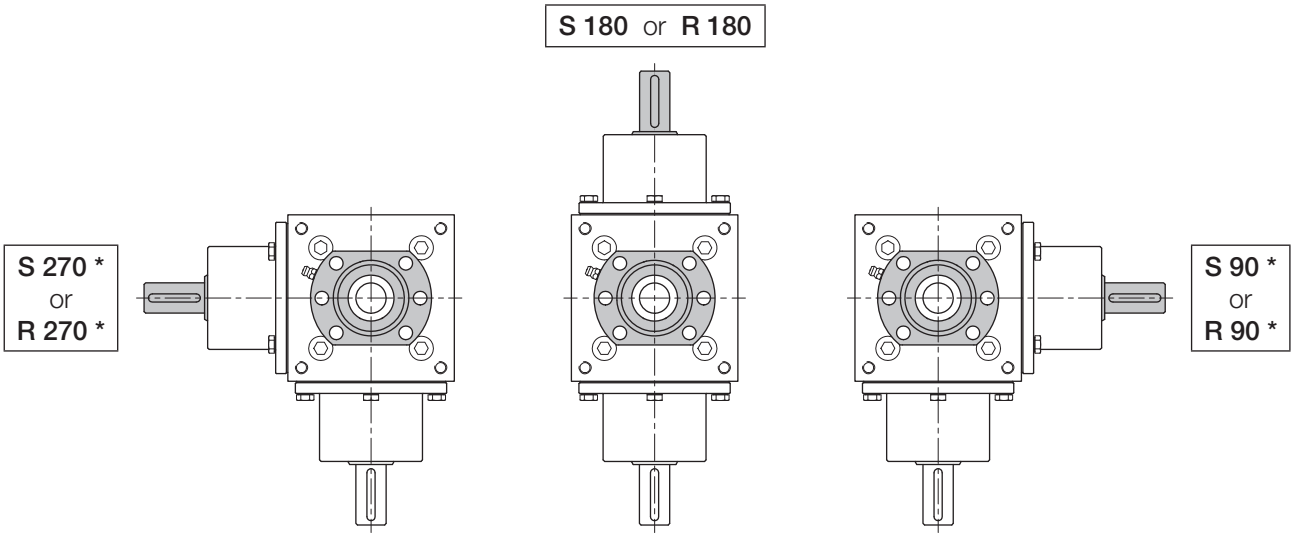
Code: **MF**
flange and hollow shaft
for IEC / servo motor

ADDITIONAL OUTPUT SHAFT

Screw jacks HS Series can be equipped with one or more additional output shafts. Available versions are:

- S: solid shaft with key, standard diameter
- R: solid shaft with key, larger diameter

The shafts position refers to the main input shaft and is expressed by an angle with counter-clockwise positive direction and screw jack top view (ball nut side).

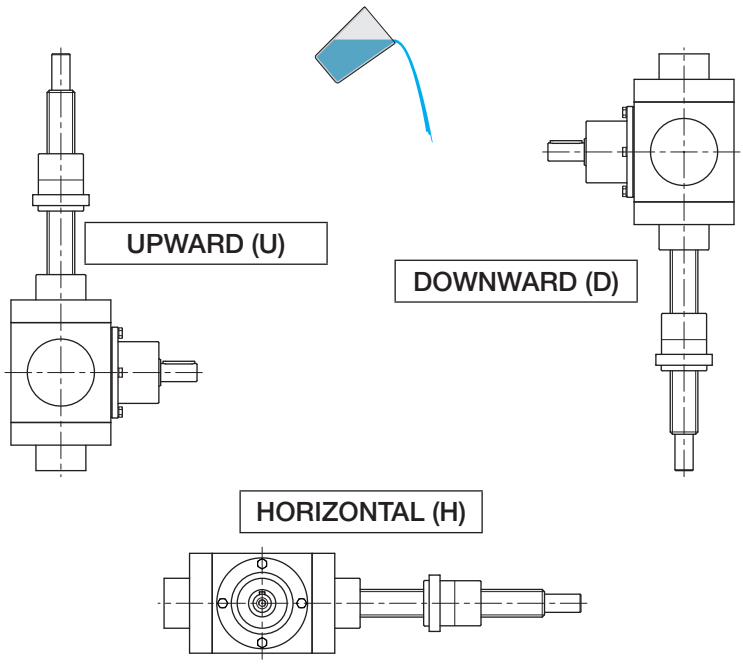


WARNING! The rotating speed of the additional output shaft is always the same as the input shaft rotating speed, independently from the screw jack ratio.

*** - not available with transmission ratio R1**

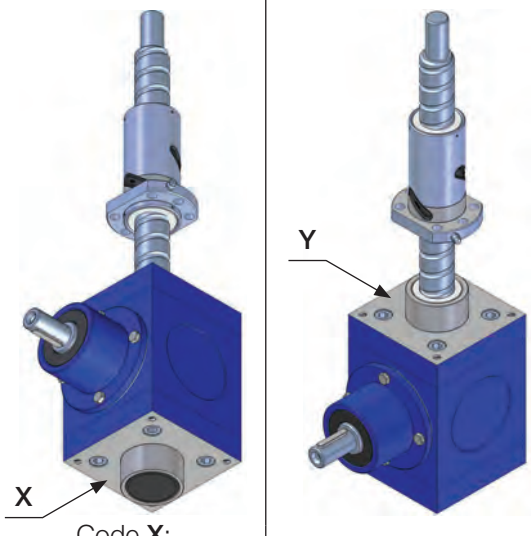
MOUNTING POSITION

The mounting position refers to the ball screw.



FIXING PLANE

The fixing plane (code X or code Y) and its pivot remain painted with the primer only.



2.1 Self-locking conditions

A ball screw jack is in self-locking condition when:

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

Due to the high efficiency of ball screw jacks, it is not possible to ensure the static or dynamic self-locking condition without using a brake motor.

According to the total direct efficiency value of the screw jack the following conditions are possible:

1) **Uncertain Self-locking**: with total direct efficiency values between 0.30 and 0.50, the screw jacks are in an uncertain condition. The self-locking condition 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 contact SERVOMECH technical support to evaluate the application.

2) **Back-driving**: with total direct efficiency values higher than 0.50 the screw jacks are always not self-locking.

UNCERTAIN SELF-LOCKING												
0.3			0.5									1
BACK-DRIVING												

Direct efficiency values and calculation formulas to determine the required braking torque to ensure a self-locking condition are stated for each screw jack in the specific chapters.

2.2 Ball screw buckling

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

Three cases are considered:

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

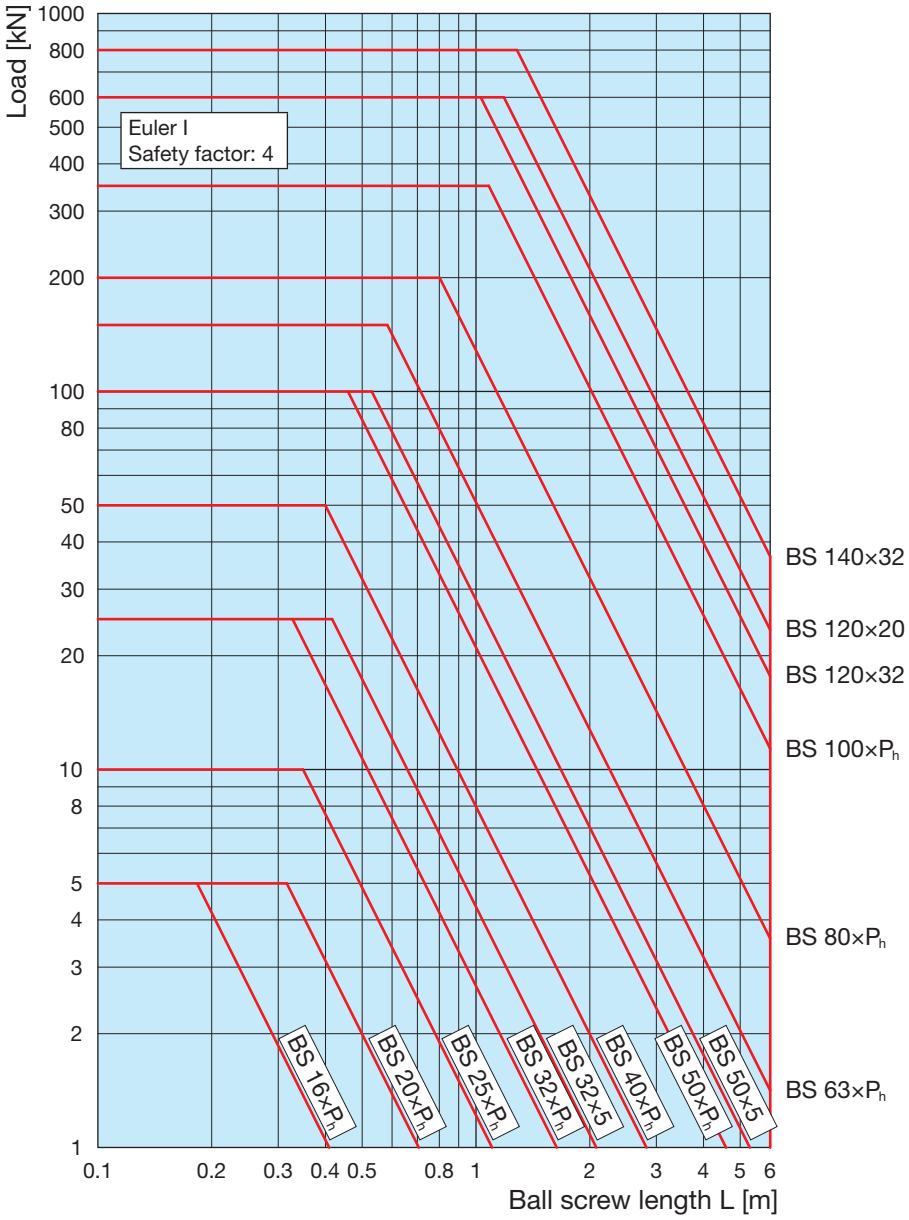
Following diagrams (known as Euler curves) show the max. push load allowed on the ball screw, considering a buckling safety factor equals to 4.

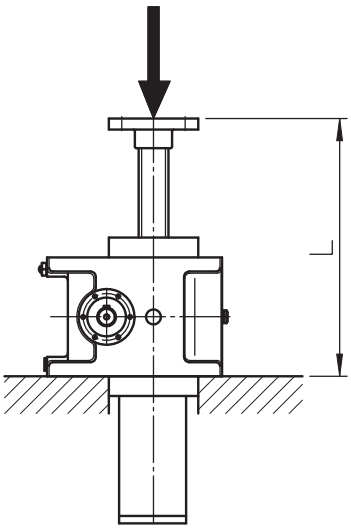
For particular or critical applications in terms of safety, please contact SERVOMECH technical support.

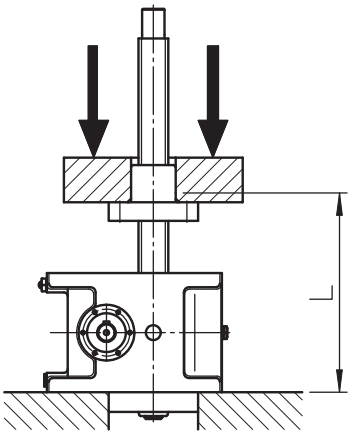
2.2 Ball screw buckling

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

Example: with a push load of 7 kN applied on a screw length of 1 000 mm, the right selection is a screw with nominal diameter 40 mm, mounted on a screw jack MA 50 BS or SJ 50 BS or HS 50.



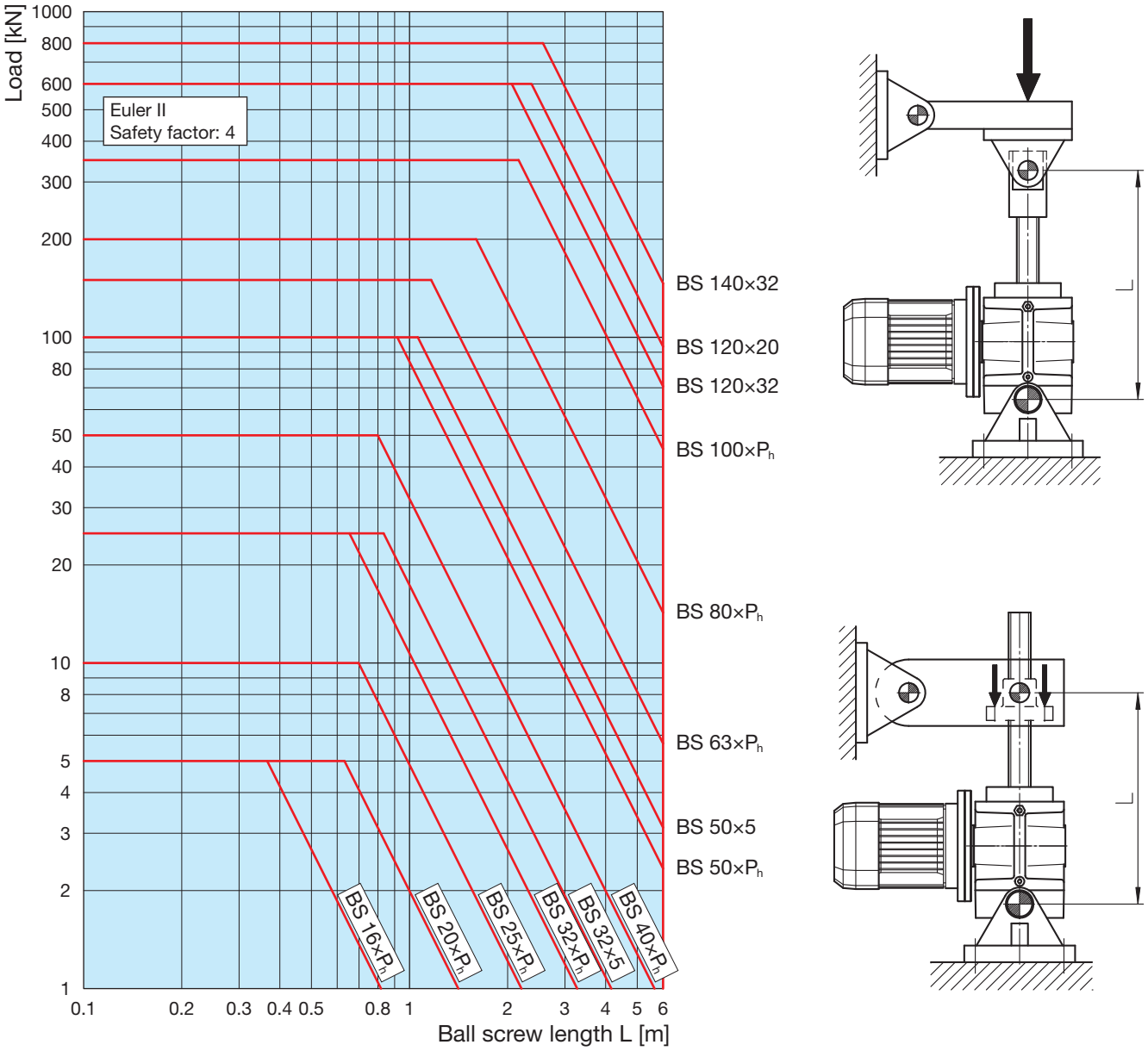




2.2 Ball screw buckling

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

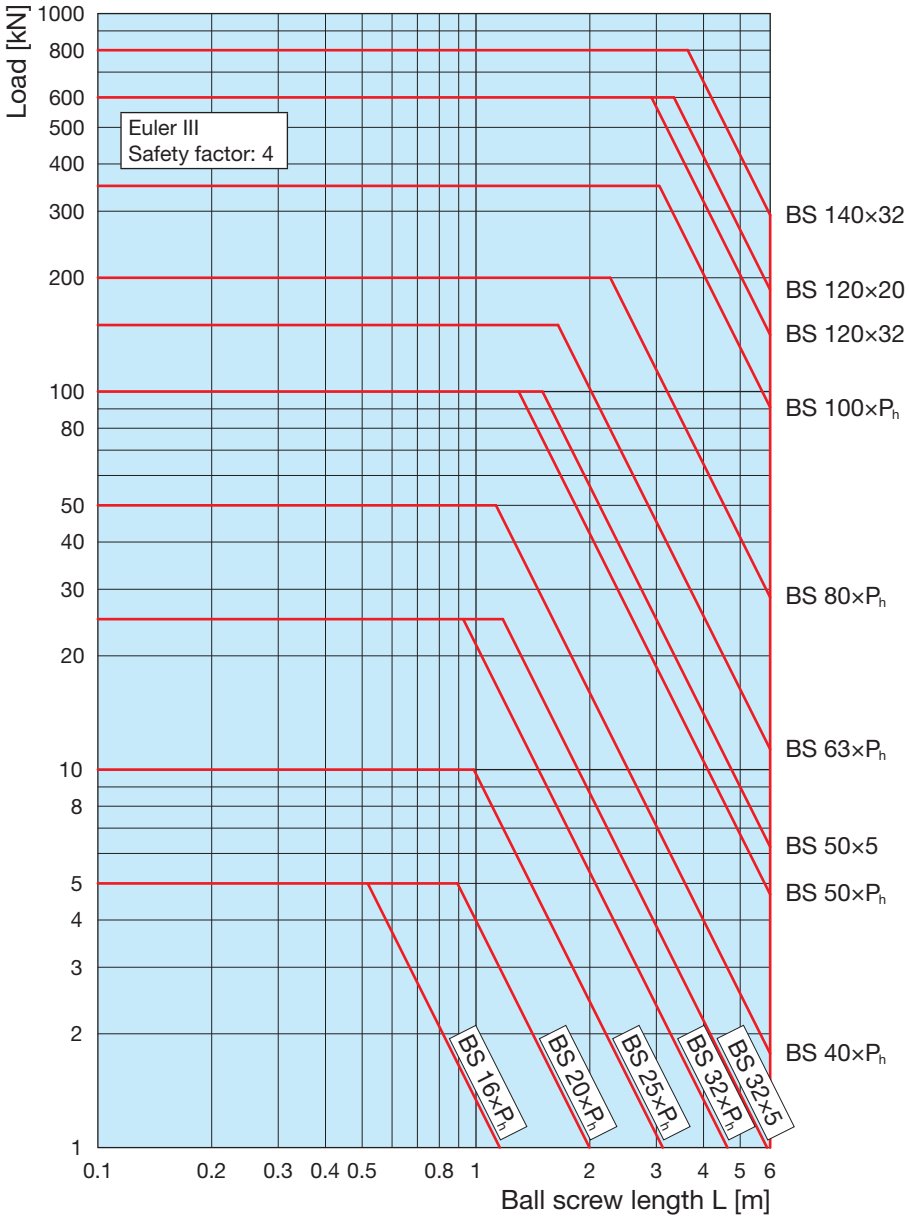
Example: with a push load of 8 kN applied on a screw length of 1 000 mm, the right selection is a screw with nominal diameter 32, mounted on a screw jack MA 25 BS or SJ 25 BS or HS 25.

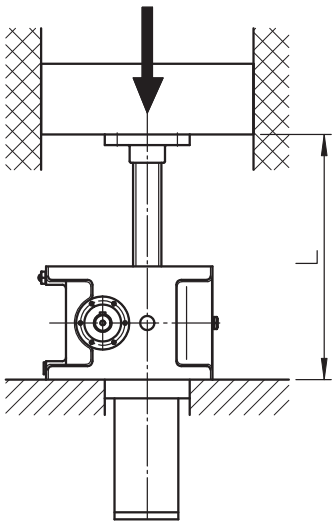


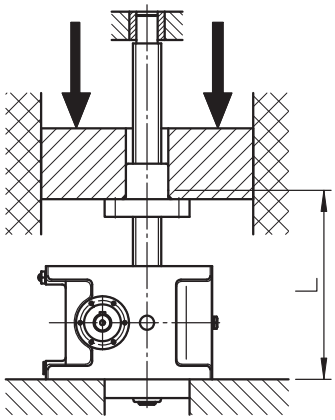
2.2 Ball screw buckling

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

Example: with push load of 40 kN applied on a screw length of 4 000 mm, the right selection is a screw with nominal diameter 80, mounted on a screw jack MA 200 BS or SJ 200 BS or HS 200.







2.3 Ball screw critical rotating speed

Following factors limit the ball screw rotating speed:
1) external factors (screw length and screw end supports)
2) internal factors (ball material, geometry and material of the recirculation elements)

1) External factors

In order to ensure a proper working of a ball screw system and to prevent imbalances which could damage the ball screw, the rotating speed must not reach the critical level. Therefore, this limit exists only for Model B screw jacks with travelling nut and rotating screw.

The critical rotating speed depends on the threaded shaft diameter, the type of screw end and the length of the free ball screw.

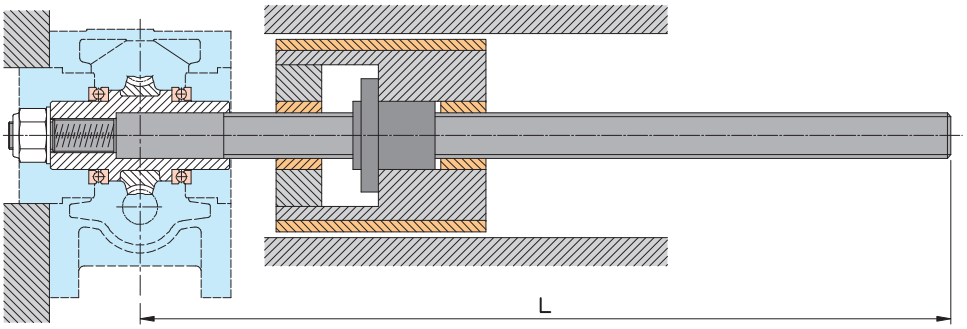
The following formulas are used to calculate the max. allowed rotating speed. They restrict the rotating speed to 80 % of the critical value and they are valid for threaded shafts without an axial through hole:

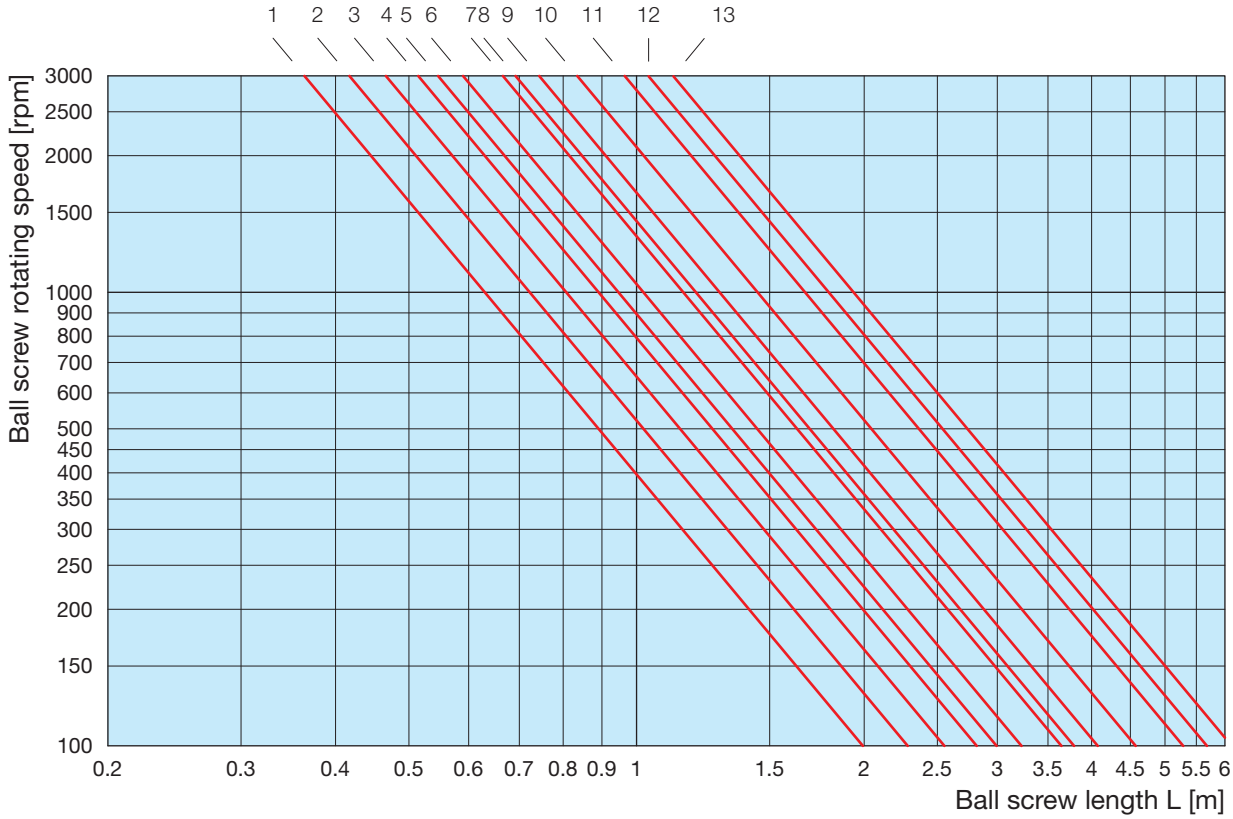
Free screw end

$$n_{max} = 2.17 \cdot 10^8 \cdot \frac{0.144 \cdot d_2}{L^2}$$

n_{max} [rpm] = max. allowed rotating speed
d_2 [mm] = ball screw shaft root diameter
L [mm] = length of screw without end support

Example: For a screw BS 40×10, 1 m long, with not supported end, the max. allowed rotating speed is 1 046 rpm. This rotating speed is equivalent to a linear speed of 175 mm/s.





1 - BS 16×5-10-16
2 - BS 20×5-10-20
3 - BS 25×5-6-10-25
4 - BS 32×10-20-32
5 - BS 32×5
6 - BS 40×10-20-40
7 - BS 50×10-20-40
8 - BS 50×5
9 - BS 63×10-20-30-40
10 - BS 80×10-16-20-40
11 - BS 100×16-20
12 - BS 120×20-32
13 - BS 140×32

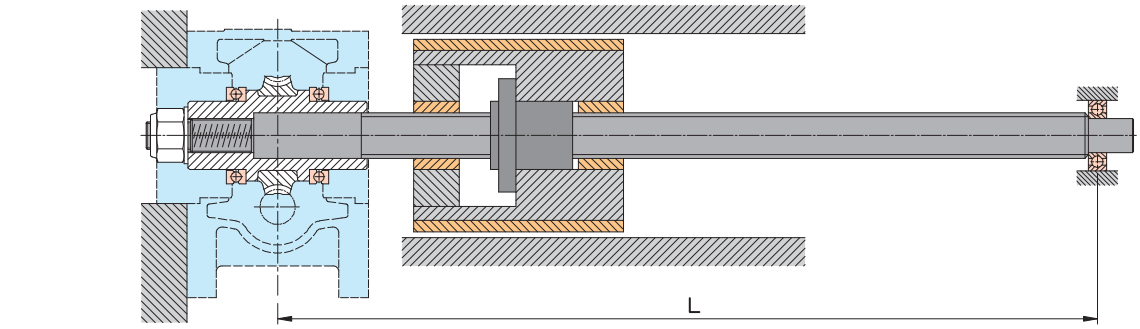
ATTENTION! By horizontal mounting a ball screw static deflection, caused by its weight and possibly aggravated by the presence of the push load, should always be considered. Therefore, we recommend an accurate evaluation and use of a screw supporting system on both nut sides, integral and travelling with the nut itself; this will ensure the correct alignment and concentricity between the screw and the nut. For more information, please contact SERVOMECH technical support.

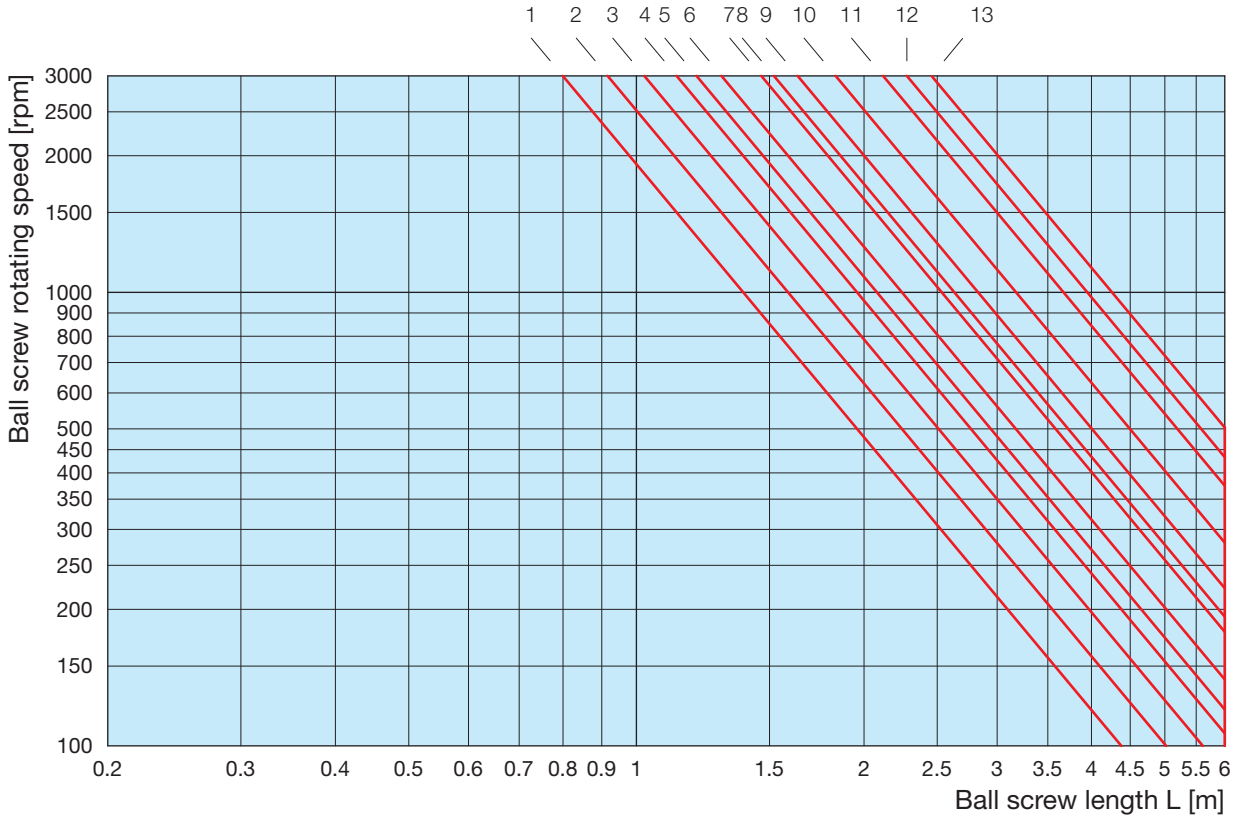
Supported screw end

$$n_{max} = 2.17 \cdot 10^8 \cdot \frac{0.694 \cdot d_2}{L^2}$$

n_{max} [rpm] = max. allowed rotating speed
d_2 [mm] = ball screw shaft root diameter
L [mm] = length of screw with end support

Example: For a screw BS 40×10, 3 m long, with end support, the max. allowed rotating speed is 560 rpm. This rotating speed is equivalent to a linear speed of 93 mm/s





1 - BS 16×5-10-16
2 - BS 20×5-10-20
3 - BS 25×5-6-10-25
4 - BS 32×10-20-32
5 - BS 32×5
6 - BS 40×10-20-40
7 - BS 50×10-20-40
8 - BS 50×5
9 - BS 63×10-20-30-40
10 - BS 80×10-16-20-40
11 - BS 100×16-20
12 - BS 120×20-32
13 - BS 140×32

2.3 Ball screw critical rotating speed

2) Internal Factors

Depending on screw material, geometry and material of the recirculation elements and screw diameter, there is a specific limit of the max. rotating speed. For ball screws used in screw jacks, SERVOMECH considers following max. rotating speed values:

Ball screw nominal diameter [mm]	Max. rotating speed [rpm]
16	5625
20	4500
25	3600
32	2810
40	2250
50	1800
63	1430
80	1125
100	875
120	730
140	615

NOTE: by travelling screw jack (Mod.A), only the limit due to internal factors (2) is effective; by screw jack with travelling nut (Mod.B), the max. allowed rotating speed is the lower speed value calculated using both criteria (1) and (2).

2.4 Ball screw life

Ball screw life corresponds to the number of revolutions that the screw can perform with regard to its nut before any sign of fatigue appears on the material of screw, nut and rolling elements.

The **nominal ball screw life** (L_{10}) is calculated with the following formula:

$$L_{10} = \left(\frac{C_a}{F_m \cdot f_{sh}}\right)^3 \cdot 10^6$$

where:
L_{10} [revolutions] = ball screw nominal life
C_a [N] = ball screw dynamic load
F_m [N] = equivalent dynamic load
f_{sh} = shocks factor

f_{sh} = 1: load without shocks
$1 < f_{sh} \leq 1.3$: load with light shocks
$1.3 < f_{sh} \leq 1.8$: load with medium shocks
$1.8 < f_{sh} \leq 3$: load with heavy shocks

The result of the calculation corresponds to the number of revolutions of the screw with regard to the nut, reached by the 90% of the ball screws, seemingly identical, subject to the same load conditions, motion laws and environment conditions.

The **equivalent dynamic load** (F_m) is defined as an hypothetical load concentric to the screw, axial only, with constant width and direction that, if applied, would have the same effects on the ball screw life as the real applied load. To determine it, the working cycle is divided in distinct and separate phases, each of them characterized by its load level, the specific rotating speed and the relevant time of load application.

$$F_m = \sqrt[3]{\sum_{i=1}^{n} F_i^{\,3} \cdot \frac{n_i}{n_m} \cdot \frac{t_i}{t_{tot}}}$$

where:

t_i = duration of each single phase

F_i = load level for each single phase

n_i = rotating speed for each single phase

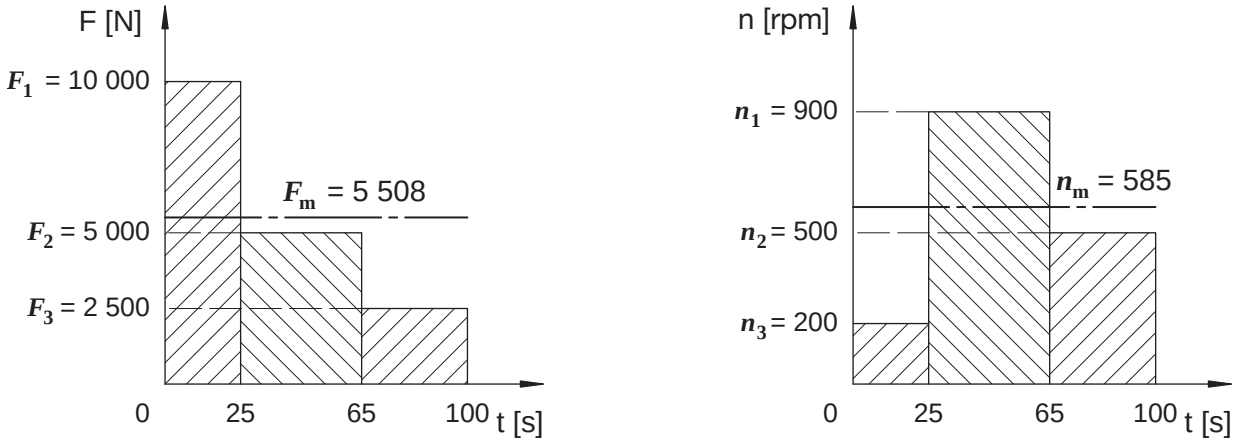
$$n_m = \sum_{i=1}^{n} n_i \cdot \frac{t_i}{t_{tot}}$$

$$t_{tot} = \sum_{i=1}^{n} t_i$$

If a preloaded nut is used, the equivalent dynamic load is determined taking into consideration also the pre-load force, adding it to the load level of each single phase of the working cycle.

Example:

i	t_i [s]	n_i [rpm]	F_i [N]	n_m [rpm]	F_m [N]
1	25	200	10 000	585	5 508
2	40	900	5 000		
3	35	500	2 500		



The ball screw life expressed in hours (L_{10h}) is calculated as follows:

$$L_{10h} = \frac{L_{10}}{60 \cdot n_m}$$

where:

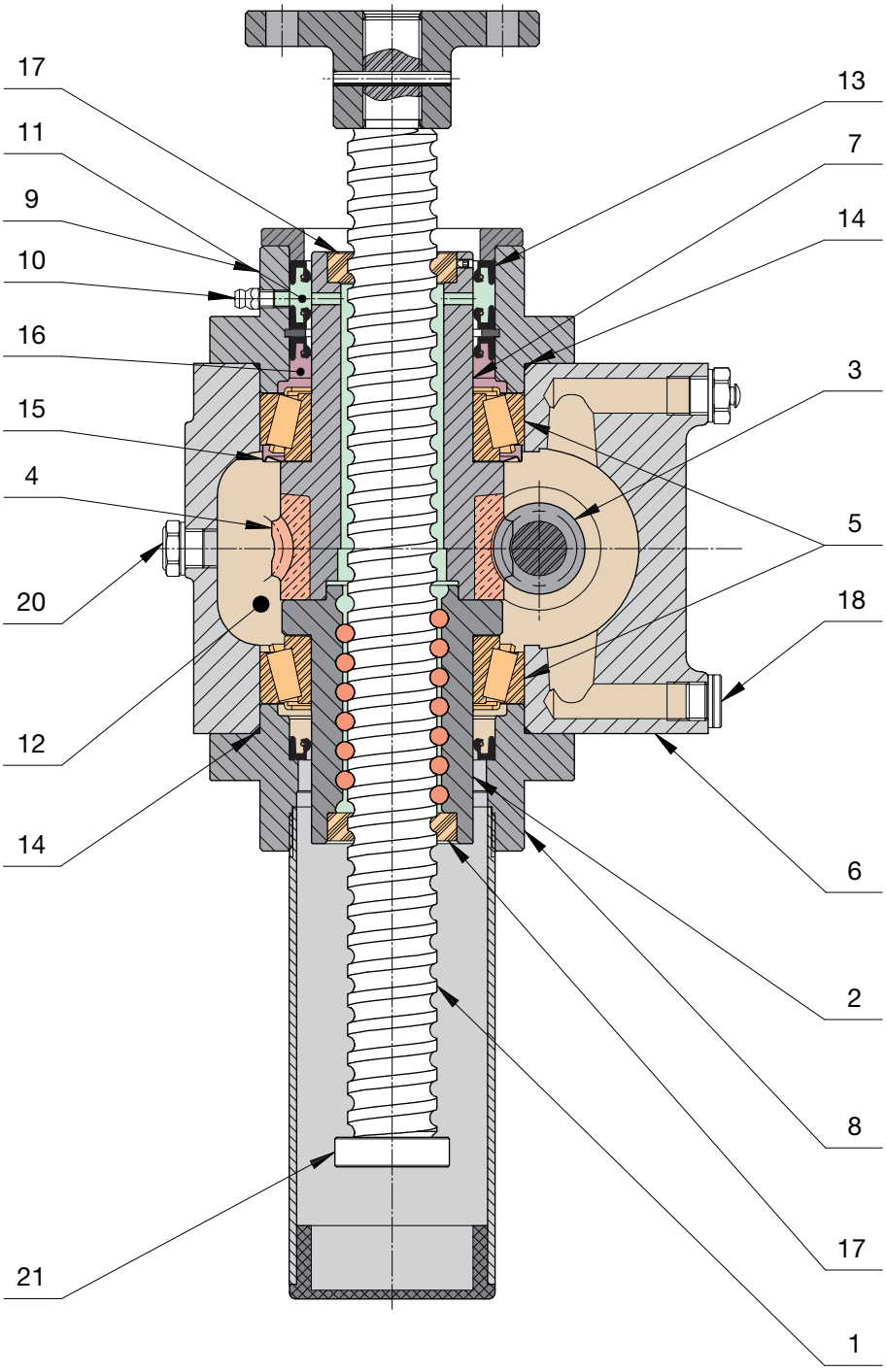
n_m [rpm] = equivalent rotating speed

The previous formulas regarding the life refer to a ball screw reliability of 90 %. If a higher life reliability is required (**modified ball screw life**, L_{10m}), the corrective factor f_a must be applied:

$$L_{10m} = L_{10} \cdot f_a$$

Reliability [%]	90	95	96	97	98	99
Factor f_a	1	0.62	0.53	0.44	0.33	0.21

3.1 MA BS Series Mod.A - Construction features



1 - Ball screw in quenched and tempered alloy steel
2 - Ball nut in case-hardened and ground steel with frontal recirculation system that ensures higher performances compared to the radial system, because of greater number of balls which transmit the load
3 - Worm with ground ZI involute thread profile (UNI 4760) in case-hardened steel
4 - Bronze wormwheel with true involute profile ZI (UNI 4760)
5 - Taper roller bearings that provide system high stiffness and allow to maximize the ball screw diameter thanks to the minimum radial size
6 - Gear box shape which allows a more effective heat dissipation and 100 % duty cycle
7 - Cast iron support of the worm wheel rim
8 - Bottom cover with outer diameter in tolerance **g7**, it can be used for the screw jack centering

3.1 MA BS Series Mod.A - Construction features

9 - Top cover with re-lubrication system for the ball screw: through the grease nipple (10) it is possible to put in grease which goes through the lubrication pipe (11) and reaches the ball nut. The radial lubricant seals (13) and the sealing scrapers (17) ensure the seal and create a lubricant reserve for the ball nut. This system allows to keep the ball nut constantly lubricated increasing its life.
10 - Grease nipple
11 - Lubrication pipe
12 - Synthetic oil lubricated worm gearbox for a better heat dissipation; this allows higher input speed, improved efficiency and longer life
13 - Radial lubricant seal
14 - O-ring as lubricant seal
15 - NILOS seal which allows to create a chamber for the lubricant (16) of the upper bearing, that would otherwise be poorly lubricated because not reached by the gear oil; the seal is used only in case of vertical mounting position
16 - Bearing lubricant chamber
17 - Sealing scraper
18 - Oil drain plug
19 - Breather
20 - Oil level plug
21 - Ball screw stop nut

SERVOMECH PATENTED DESIGN

The choice of the model depends on the selected screw jack type or on the specific requirements of the application, but in case it can be chosen between the two models (only for MA BS Series), it should be considered that, with same ball screw diameter and lead, the performances of the screw jack **MA BS Series Mod. A** are higher than those obtained with Mod.B with travelling nut.

The total integration of the various components of gearbox and ball nut, specifically designed and manufactured by SERVOMECH, grants higher performances for MA BS Series Mod.A in terms of:

- **Efficiency**
- **Load capacity**
- **Service life**
- **Stiffness**

The native integration of all the components together with the innovative Servomech production technology leads to a **significant weight reduction**, by removing all the unnecessary material with a great benefit for the costs.

Considering the several advantages obtained, SERVOMECH registered an industrial patent right for this screw jack model.

Re-lubrication system
of the ball nut with lubricant reserve chamber for easier maintenance efforts and longer service life

Tapered roller bearings
back-to-back mounted, for higher rigidity and best alignment of the ball screw and nut system

Safety nut
to prevent the accidental fall of the load in case of working nut failure. Integrated inside the system, for push and pull load, available upon request.

Ball nut
with axial recirculation of the balls for higher load capacity

3.2 MA BS Series Mod.A - Technical data

SIZE			MA 5 BS	MA 10 BS	MA 25 BS		MA 50 BS
Load capacity [kN] (push - pull)			**5**	**10**	**25**		**50**
Ball screw diameter [mm]			16	25	32		40
Worm gear centre distance [mm]			30	40	50		63
Ratio	fast	RV	1 : 4 (4 : 16)	1 : 5 (4 : 20)	1 : 6 (4 : 24)		1 : 7 (4 : 28)
	normal	RN	1 : 16 (2 : 32)	1 : 20	1 : 18 (2 : 36)		1 : 14 (2 : 28)
	slow	RL	1 : 24	1 : 25	1 : 24		1 : 28
Ball screw	Diameter × Lead		16 × 5	25 × 5	32 × 5	32 × 10	40 × 10
	Ball [mm]		3.175 (1/8")	3.175 (1/8")	3.175 (1/8")	6.35 (1/4")	6.35 (1/4")
	Accuracy grade (1)		IT 7	IT 7	IT 7	IT 7	IT 7
	Number of circuits		5	5	6	5	5
	C_a [kN]		12.9	16.9	22.9	44.8	52
	C_{0a} [kN]		20.9	36.4	60	83	111
Stroke [mm] for 1 input shaft revolution	Ratio	RV	1.25	1.00	0.83	1.67	1.43
		RN	0.31	0.25	0.28	0.56	0.71
		RL	0.21	0.20	0.42	0.21	0.36
Ball screw	Diameter × Lead		16 × 10	25 × 10	32 × 20		40 × 20
	Ball [mm]		3.175 (1/8")	3.969 (5/32")	6.35 (1/4")		6.35 (1/4")
	Accuracy grade (1)		IT 7	IT 7	IT 7		IT 7
	Number of circuits		3	3	3		3
	C_a [kN]		8.6	14.2	29.8		34.3
	C_{0a} [kN]		13.3	25.8	53		70
Stroke [mm] for 1 input shaft revolution	Ratio	RV	2.50	2	3.33		2.86
		RN	0.63	0.50	1.11		1.43
		RL	0.42	0.40	0.83		0.71
Ball screw	Diameter × Lead		16 × 16	25 × 25	32 × 32		40 × 40
	Ball [mm]		3.175 (1/8")	3.175 (1/8")	6.35 (1/4")		6.35 (1/4")
	Accuracy grade (1)		IT 7	IT 7	IT 7		IT 7
	Number of circuits		2 + 2	2 + 2	2 + 2		2 + 2
	C_a [kN]		10.0	13.1	35.0		40.3
	C_{0a} [kN]		14.5	25.2	58		77
Stroke [mm] for 1 input shaft revolution	Ratio	RV	4	5	5.33		5.71
		RN	1	1.25	1.78		2.86
		RL	0.67	1	1.33		1.43
Housing material			casting in aluminium alloy EN 1706 - AC-AlSi10Mg T6		casting in spheroidal graphite iron EN-GJS-500-7 (UNI EN 1563)		
Mass of screw jack without ball screw [kg]			2.2	4.3	13		26
Mass for every 100 mm of ball screw [kg]			0.14	0.35	0.57		0.91

(1) - on request, ball screws with accuracy grade IT 3 can be supplied

NOTE: A different thread lead is available on request. For further details, please, contact SERVOMECH technical support.

3.2 MA BS Series Mod.A - Technical data

MA 100 BS	MA 150 BS		MA 200 BS	MA 350 BS	SIZE	
100	150		200	350	Load capacity [kN] (push - pull)	
50	63		80	100	Ball screw diameter [mm]	
80	80		100	125	Worm gear centre distance [mm]	
1 : 8 (4 : 32)	1 : 8 (4 : 32)		1 : 8 (4 : 32)	3 : 32	RV fast	Ratio
1 : 24	1 : 24		1 : 24	1 : 16 (2 : 32)	RN normal	
1 : 32	1 : 32		1 : 32	1 : 32	RL slow	
50 × 10	63 × 10		80 × 10	100 × 16	Diameter × Lead	Ball screw
7.144 (9/32")	7.144 (9/32")		7.144 (9/32")	9.525 (3/8")	Ball [mm]	
IT 7	IT 5		IT 5	IT 5	Accuracy grade (1)	
7	6		7	6	Number of circuits	
107	117		132	189	C_a [kN]	
271	340		448	638	C_{0a} [kN]	
1.25	1.25		1.25	1.50	RV	Stroke [mm] for 1 input shaft revolution
0.42	0.42		0.42	1.00	RN Ratio	
0.31	0.31		0.31	0.50	RL	
50 ×20	63 × 20	63 × 20	80 × 20	100 × 20	Diameter × Lead	Ball screw
7.144 (9/32")	9.525 (3/8")	9.525 (3/8")	12.7 (1/2")	12.7 (1/2")	Ball [mm]	
IT 7	IT 5	IT 5	IT 5	IT 5	Accuracy grade (1)	
1	5	6	5	1 × 6	Number of circuits	
64	122	148	228	312	C_a [kN]	
147	292	370	585	963	C_{0a} [kN]	
2.50	2.50		2.50	1.87	RV	Stroke [mm] for 1 input shaft revolution
0.83	0.83		0.83	1.25	RN Ratio	
0.63	0.63		0.63	0.62	RL	
50 × 40	63 × 30	63 × 40	80 × 40		Diameter × Lead	Ball screw
7.144 (9/32")	9.525 (3/8")	9.525 (3/8")	12.7 (1/2")		Ball [mm]	
IT 5	IT 5	IT 5	IT 5		Accuracy grade (1)	
2	3	2	2		Number of circuits	
33	81	54	103		C_a [kN]	
68	184	115	232		C_{0a} [kN]	
5	3.75	5	5		RV	Stroke [mm] for 1 input shaft revolution
1.67	1.25	1.67	1.67		RN Ratio	
1.25	0.94	1.25	1.25		RL	
casting in spheroidal graphite iron EN-GJS-500-7 (UNI EN 1563)					Housing material	
48	48		75	145	Mass of screw jack without ball screw [kg]	
1.44	2.26		3.70	6.16	Mass for every 100 mm of ball screw [kg]	

(1) - on request, ball screws with accuracy grade IT 3 can be supplied

NOTE: A different thread lead is available on request. For further details, please, contact SERVOMECH technical support.

3.3 Technical data - MA 5 BS Mod.A

Performances

Following tables show the screw jack LINEAR SPEED v [mm/s] and relative TORQUE T_1 [Nm] and POWER P_1 [kW] on input shaft, with reference to the INPUT SPEED n_1 [rpm], the RATIO (RV, RN, RL) and the LOAD [kN] applied on the screw jack.

Intermediate figures for linear speed v, torque T_1 and power P_1 corresponding to different input speeds can be calculated by linear interpolation of the figures stated in the table.

BS 16 × 5				LOAD																	
				5 kN						4 kN						3 kN					
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	62.5	15.6	10.4	1.45	0.46	0.41	0.13	0.30	0.09	1.16	0.37	0.33	0.10	0.24	0.08	0.87	0.27	0.24	0.08	0.18	0.06
1 500	31.3	7.8	5.2	1.50	0.24	0.43	0.07	0.33	0.05	1.20	0.19	0.34	0.05	0.26	0.04	0.90	0.14	0.26	0.04	0.20	0.03
1 000	20.8	5.2	3.5	1.52	0.16	0.44	0.05	0.34	0.04	1.21	0.13	0.36	0.04	0.27	0.03	0.91	0.10	0.27	0.03	0.20	0.02
750	15.6	3.9	2.6	1.54	0.12	0.46	0.04	0.35	0.03	1.23	0.10	0.37	0.03	0.28	0.02	0.92	0.07	0.27	0.02	0.21	0.02
500	10.4	2.6	1.7	1.55	0.08	0.47	0.02	0.36	0.02	1.24	0.07	0.38	0.02	0.29	0.02	0.93	0.05	0.28	0.01	0.22	0.01
300	6.3	1.6	1.0	1.59	0.05	0.48	0.02	0.38	0.01	1.27	0.04	0.39	0.01	0.31	0.01	0.95	0.03	0.29	0.01	0.23	0.01
100	2.1	0.5	0.3	1.67	0.02	0.52	0.01	0.42	0.00	1.33	0.01	0.42	0.00	0.34	0.00	1.00	0.01	0.31	0.00	0.25	0.00
START.	-	-	-	1.79	-	0.57	-	0.49	-	1.43	-	0.46	-	0.39	-	1.07	-	0.34	-	0.29	-

BS 16 × 10				LOAD																	
				5 kN						4 kN						3 kN					
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	125	31.3	20.8	2.82	0.89	0.79	0.25	0.58	0.18	2.26	0.71	0.63	0.20	0.47	0.15	1.69	0.53	0.47	0.15	0.35	0.11
1 500	62.5	15.6	10.4	2.92	0.46	0.83	0.13	0.63	0.10	2.33	0.37	0.66	0.10	0.51	0.08	1.75	0.27	0.50	0.08	0.38	0.06
1 000	41.7	10.4	6.9	2.95	0.31	0.86	0.09	0.65	0.07	2.36	0.25	0.69	0.07	0.52	0.05	1.77	0.19	0.52	0.05	0.39	0.04
750	31.3	7.8	5.2	2.98	0.23	0.89	0.07	0.68	0.05	2.39	0.19	0.71	0.06	0.55	0.04	1.79	0.14	0.53	0.04	0.41	0.03
500	20.8	5.2	3.5	3.02	0.16	0.91	0.05	0.71	0.04	2.41	0.13	0.73	0.04	0.56	0.03	1.81	0.09	0.55	0.03	0.42	0.02
300	12.5	3.1	2.1	3.09	0.10	0.94	0.03	0.74	0.02	2.47	0.08	0.75	0.02	0.59	0.02	1.85	0.06	0.56	0.02	0.44	0.01
100	4.2	1.0	0.7	3.24	0.03	1.01	0.01	0.83	0.01	2.59	0.03	0.81	0.01	0.66	0.01	1.94	0.02	0.61	0.01	0.50	0.01
START.	-	-	-	3.47	-	1.11	-	0.95	-	2.78	-	0.89	-	0.76	-	2.08	-	0.67	-	0.57	-

BS 16 × 16				LOAD																	
				5 kN						4 kN						3 kN					
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	200	50	33.3					0.92	0.29	3.58	1.12	1.00	0.31	0.74	0.23	2.68	0.84	0.75	0.24	0.55	0.17
1 500	100	25	16.7	4.62	0.73	1.32	0.21	1.00	0.16	3.69	0.58	1.05	0.17	0.80	0.13	2.77	0.44	0.79	0.12	0.60	0.09
1 000	66.7	16.7	11.1	4.67	0.49	1.37	0.14	1.03	0.11	3.74	0.39	1.09	0.11	0.83	0.09	2.80	0.29	0.82	0.09	0.62	0.06
750	50	12.5	8.3	4.72	0.37	1.40	0.11	1.08	0.09	3.78	0.30	1.12	0.09	0.87	0.07	2.83	0.22	0.84	0.07	0.65	0.05
500	33.3	8.3	5.6	4.78	0.25	1.44	0.08	1.12	0.06	3.82	0.20	1.15	0.06	0.89	0.05	2.87	0.15	0.87	0.05	0.67	0.04
300	20	5	3.3	4.89	0.15	1.48	0.05	1.17	0.04	3.91	0.12	1.19	0.04	0.94	0.03	2.93	0.09	0.89	0.03	0.70	0.02
100	6.7	1.7	1.1	5.13	0.05	1.60	0.02	1.31	0.01	4.11	0.04	1.28	0.01	1.05	0.01	3.08	0.03	0.96	0.01	0.78	0.01
START.	-	-	-	5.50	-	1.76	-	1.51	-	4.40	-	1.41	-	1.20	-	3.30	-	1.06	-	0.90	-

Screw jack total efficiency

The screw jack total efficiency is calculated as follows:

$$\eta_{tot} = \eta_{BS} \cdot \eta_R \cdot \eta_{CT}$$

where:
η_{BS} : ball screw efficiency
η_R : worm - wormwheel efficiency
η_{CT} : bearings and seals total efficiency

η_{tot}	BS 16 × 5			BS 16 × 10			BS 16 × 16		
n_1 [rpm]	RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL
3 000	0.68	0.61	0.55	0.70	0.63	0.57	0.71	0.64	0.57
1 500	0.66	0.58	0.51	0.68	0.60	0.52	0.69	0.60	0.53
1 000	0.66	0.56	0.49	0.67	0.58	0.51	0.68	0.58	0.51
750	0.65	0.54	0.47	0.67	0.56	0.48	0.67	0.57	0.49
500	0.64	0.53	0.46	0.66	0.55	0.47	0.67	0.55	0.47
300	0.63	0.52	0.43	0.64	0.53	0.45	0.65	0.54	0.45
100	0.60	0.48	0.39	0.61	0.49	0.40	0.62	0.50	0.41
START.	0.56	0.43	0.34	0.57	0.45	0.35	0.58	0.45	0.35

Max input power (P_{max}) and max input torque (T_{max})

n_1 [rpm]	RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	1.20	3.83	0.38	1.22	0.32	1.03
1 500	0.87	5.53	0.25	1.61	0.23	1.45
1 000	0.67	6.39	0.20	1.89	0.17	1.66
750	0.57	7.27	0.17	2.16	0.15	1.91
500	0.43	8.23	0.13	2.56	0.12	2.30
300	0.33	10.6	0.09	2.96	0.09	2.76
100	0.15	14.7	0.04	3.97	0.04	3.64

Max. screw jack input power is calculated for worm - wormwheel life of 10 000 hours.

Static braking torque on input shaft

The next table show the static braking torques, i.e. the braking torques necessary to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft and it is calculated for an applied load equal to the max. supportable load (5 kN).

Static braking torque T_F [Nm] with 5 kN			
RATIO	BS 16 × 5	BS 16 × 10	BS 16 × 16
RV	0.8	1.6	2.6
RN	0.2	0.2	0.2
RL	0.2	0.2	0.2

For braking torques with loads lower than the maximum one, it is possible to make a linear proportion with the values stated in the table and the required load.

The resulting braking torque value shall then be compared to the min. threshold value $T_{F\,min}$ which considers vibrations and shocks that could increase the not self-locking condition of the system. It is equal to:

$$T_{F\,min} = 0.2\ Nm$$

The real braking torque to be applied on the input shaft for the generic load applied on the screw jack (lower than the maximum one) is therefore the highest of the two values.

3.3 Technical data - MA 10 BS Mod.A

Performances

Following tables show the screw jack LINEAR SPEED v [mm/s] and relative TORQUE T_1 [Nm] and POWER P_1 [kW] on input shaft, with reference to the INPUT SPEED n_1 [rpm], the RATIO (RV, RN, RL) and the LOAD [kN] applied on the screw jack.

Intermediate figures for linear speed v, torque T_1 and power P_1 corresponding to different input speeds can be calculated by linear interpolation of the figures stated in the table.

BS 25 × 5				LOAD																	
				10 kN						8 kN						6 kN					
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	50	12.5	10	2.40	0.75	0.69	0.22	0.56	0.18	1.92	0.60	0.55	0.17	0.45	0.14	1.44	0.45	0.41	0.13	0.34	0.11
1 500	25	6.3	5	2.45	0.39	0.73	0.12	0.61	0.10	1.96	0.31	0.59	0.09	0.49	0.08	1.47	0.23	0.44	0.07	0.37	0.06
1 000	16.7	4.2	3.3	2.48	0.26	0.77	0.08	0.64	0.07	1.98	0.21	0.62	0.06	0.51	0.05	1.49	0.16	0.46	0.05	0.38	0.04
750	12.5	3.1	2.5	2.51	0.20	0.79	0.06	0.66	0.05	2.01	0.16	0.63	0.05	0.53	0.04	1.50	0.12	0.47	0.04	0.39	0.03
500	8.3	2.1	1.7	2.56	0.13	0.82	0.04	0.69	0.04	2.05	0.11	0.66	0.03	0.55	0.03	1.54	0.08	0.49	0.03	0.41	0.02
300	5	1.3	1	2.59	0.08	0.87	0.03	0.72	0.02	2.08	0.07	0.70	0.02	0.58	0.02	1.56	0.05	0.52	0.02	0.43	0.01
100	1.7	0.4	0.3	2.72	0.03	0.96	0.01	0.80	0.01	2.18	0.02	0.77	0.01	0.64	0.01	1.63	0.02	0.58	0.01	0.48	0.01
START.	-	-	-	2.94	-	1.09	-	0.91	-	2.35	-	0.88	-	0.73	-	1.76	-	0.66	-	0.55	-

BS 25 × 10				LOAD																	
				10 kN						8 kN						6 kN					
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	100	25	20	4.59	1.44	1.32	0.41	1.08	0.34	3.67	1.15	1.05	0.33	0.86	0.27	2.75	0.87	0.79	0.25	0.65	0.20
1 500	50	12.5	10	4.69	0.74	1.40	0.22	1.17	0.18	3.75	0.59	1.12	0.18	0.94	0.15	2.81	0.44	0.84	0.13	0.70	0.11
1 000	33.3	8.3	6.7	4.74	0.50	1.48	0.16	1.22	0.13	3.79	0.40	1.19	0.12	0.98	0.10	2.85	0.30	0.89	0.09	0.73	0.08
750	25	6.3	5	4.80	0.38	1.50	0.12	1.26	0.10	3.84	0.30	1.20	0.09	1.00	0.08	2.88	0.23	0.90	0.07	0.75	0.06
500	16.7	4.2	3.3	4.91	0.26	1.57	0.08	1.31	0.07	3.93	0.21	1.26	0.07	1.05	0.06	2.94	0.15	0.94	0.05	0.79	0.04
300	10	2.5	2	4.96	0.16	1.67	0.05	1.38	0.04	3.97	0.12	1.33	0.04	1.10	0.03	2.98	0.09	1.00	0.03	0.83	0.03
100	3.3	0.8	0.7	5.21	0.05	1.84	0.02	1.52	0.02	4.16	0.04	1.47	0.02	1.22	0.01	3.12	0.03	1.10	0.01	0.91	0.01
START.	-	-	-	5.62	-	2.09	-	1.74	-	4.49	-	1.67	-	1.39	-	3.37	-	1.26	-	1.05	-

BS 25 × 25				LOAD																	
				10 kN						8 kN						6 kN					
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	250	62.5	50									2.57	0.81	2.10	0.66			1.92	0.60	1.58	0.50
1 500	125	31.3	25			3.42	0.54	2.85	0.45	9.14	1.44	2.73	0.43	2.28	0.36	6.85	1.08	2.05	0.32	1.71	0.27
1 000	83.3	20.8	16.7			3.61	0.38	2.97	0.31	9.24	0.97	2.89	0.30	2.38	0.25	6.93	0.73	2.16	0.23	1.78	0.19
750	62.5	15.6	12.5	11.7	0.92	3.66	0.29	3.06	0.24	9.34	0.73	2.93	0.23	2.45	0.19	7.01	0.55	2.20	0.17	1.83	0.14
500	41.7	10.4	8.3	12.0	0.63	3.82	0.20	3.20	0.17	9.56	0.50	3.06	0.16	2.56	0.13	7.17	0.38	2.29	0.12	1.92	0.10
300	25	6.3	5	12.1	0.38	4.06	0.13	3.35	0.11	9.67	0.30	3.25	0.10	2.68	0.08	7.25	0.23	2.44	0.08	2.01	0.06
100	8.3	2.1	1.7	12.7	0.13	4.48	0.05	3.71	0.04	10.2	0.11	3.58	0.04	2.97	0.03	7.60	0.08	2.69	0.03	2.23	0.02
START.	-	-	-	13.7	-	5.09	-	4.24	-	11.0	-	4.08	-	3.39	-	8.20	-	3.06	-	2.54	-

Screw jack total efficiency

The screw jack total efficiency is calculated as follows:

$$\eta_{tot} = \eta_{BS} \cdot \eta_R \cdot \eta_{CT}$$

where:
η_{BS} : ball screw efficiency
η_R : worm - wormwheel efficiency
η_{CT} : bearings and seals total efficiency

η_{tot}	BS 25 × 5			BS 25 × 10			BS 25 × 25		
n_1 [rpm]	RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL
3 000	0.66	0.58	0.56	0.69	0.60	0.59	0.71	0.62	0.60
1 500	0.65	0.54	0.52	0.68	0.57	0.54	0.70	0.58	0.56
1 000	0.64	0.51	0.50	0.67	0.54	0.52	0.69	0.55	0.54
750	0.63	0.51	0.49	0.66	0.53	0.51	0.68	0.54	0.52
500	0.62	0.49	0.46	0.65	0.51	0.48	0.67	0.52	0.50
300	0.61	0.46	0.44	0.64	0.48	0.46	0.66	0.49	0.47
100	0.58	0.41	0.40	0.61	0.43	0.42	0.63	0.44	0.43
START.	0.54	0.36	0.35	0.57	0.38	0.37	0.58	0.39	0.38

Max input power (P_{max}) and max input torque (T_{max})

n_1 [rpm]	RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	2.05	6.52	0.85	2.71	0.67	2.14
1 500	1.49	9.49	0.60	3.79	0.48	3.04
1 000	1.15	11.0	0.47	4.49	0.38	3.63
750	1.08	13.7	0.40	5.07	0.31	3.97
500	0.78	14.9	0.32	6.08	0.25	4.75
300	0.55	17.4	0.22	7.13	0.18	5.84
100	0.26	25.3	0.10	9.83	0.08	7.77

Max. screw jack input power is calculated for worm - wormwheel life of 10 000 hours.

Static braking torque on input shaft

The next table show the static braking torques, i.e. the braking torques necessary to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft and it is calculated for an applied load equal to the max. supportable load (10 kN).

Static braking torque T_F [Nm] with 10 kN			
RATIO	BS 25 × 5	BS 25 × 10	BS 25 × 25
RV	1.2	2.5	6.5
RN	0.4	0.4	0.4
RL	0.4	0.4	0.4

For braking torques with loads lower than the maximum one, it is possible to make a linear proportion with the values stated in the table and the required load.

The resulting braking torque value shall then be compared to the min. threshold value $T_{F\,min}$ which considers vibrations and shocks that could increase the not self-locking condition of the system. It is equal to:

$$T_{F\,min} = 0.35\ Nm$$

The real braking torque to be applied on the input shaft for the generic load applied on the screw jack (lower than the maximum one) is therefore the highest of the two values.

3.3 Technical data - MA 25 BS Mod.A

Performances

Following tables show the screw jack LINEAR SPEED v [mm/s] and relative TORQUE T_1 [Nm] and POWER P_1 [kW] on input shaft, with reference to the INPUT SPEED n_1 [rpm], the RATIO (RV, RN, RL) and the LOAD [kN] applied on the screw jack.

Intermediate figures for linear speed v, torque T_1 and power P_1 corresponding to different input speeds can be calculated by linear interpolation of the figures stated in the table.

BS 32 × 5	LOAD																			
	25 kN								20 kN						15 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO											RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	41.7	13.9	10.4	5.10	1.60	1.86	0.58	1.48	0.46	4.08	1.28	1.49	0.47	1.18	0.37	3.06	0.96	1.12	0.35	0.89	0.28
1 500	20.8	6.9	5.2	5.22	0.82	1.96	0.31	1.59	0.25	4.18	0.66	1.57	0.25	1.27	0.20	3.13	0.49	1.18	0.19	0.95	0.15
1 000	13.9	4.6	3.5	5.30	0.56	2.02	0.21	1.65	0.17	4.24	0.44	1.62	0.17	1.32	0.14	3.18	0.33	1.21	0.13	0.99	0.10
750	10.4	3.5	2.6	5.37	0.42	2.08	0.16	1.69	0.13	4.30	0.34	1.66	0.13	1.35	0.11	3.22	0.25	1.25	0.10	1.02	0.08
500	6.9	2.3	1.7	5.47	0.29	2.16	0.11	1.79	0.09	4.37	0.23	1.73	0.09	1.43	0.07	3.28	0.17	1.30	0.07	1.07	0.06
300	4.2	1.4	1.0	5.58	0.18	2.22	0.07	1.87	0.06	4.46	0.14	1.78	0.06	1.49	0.05	3.35	0.11	1.33	0.04	1.12	0.04
100	1.4	0.5	0.3	5.86	0.06	2.43	0.03	2.07	0.02	4.69	0.05	1.94	0.02	1.66	0.02	3.51	0.04	1.46	0.02	1.24	0.01
START.	-	-	-	6.32	-	2.77	-	2.42	-	5.06	-	2.21	-	1.94	-	3.79	-	1.66	-	1.45	-

BS 32 × 10	LOAD																			
	25 kN								20 kN						15 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO											RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	83.3	27.8	20.8	9.65	3.03	3.52	1.11	2.80	0.88	7.72	2.43	2.82	0.88	2.24	0.70	5.79	1.82	2.11	0.66	1.68	0.53
1 500	41.7	13.9	10.4	9.88	1.55	3.72	0.58	3.00	0.47	7.90	1.24	2.97	0.47	2.40	0.38	5.93	0.93	2.23	0.35	1.80	0.28
1 000	27.8	9.3	6.9	10.1	1.05	3.83	0.40	3.12	0.33	8.02	0.84	3.06	0.32	2.49	0.26	6.02	0.63	2.30	0.24	1.87	0.20
750	20.8	6.9	5.2	10.2	0.80	3.93	0.31	3.20	0.25	8.12	0.64	3.14	0.25	2.56	0.20	6.09	0.48	2.36	0.19	1.92	0.15
500	13.9	4.6	3.5	10.4	0.54	4.08	0.21	3.39	0.18	8.27	0.43	3.27	0.17	2.71	0.14	6.20	0.32	2.45	0.13	2.03	0.11
300	8.3	2.8	2.1	10.6	0.33	4.20	0.13	3.53	0.11	8.44	0.27	3.36	0.11	2.82	0.09	6.33	0.20	2.52	0.08	2.12	0.07
100	2.8	0.9	0.7	11.1	0.12	4.59	0.05	3.92	0.04	8.86	0.09	3.67	0.04	3.13	0.03	6.65	0.07	2.75	0.03	2.35	0.02
START.	-	-	-	12.0	-	5.23	-	4.58	-	9.57	-	4.18	-	3.66	-	7.18	-	3.14	-	2.75	-

BS 32 × 20	LOAD																			
	20 kN								15 kN						12.5 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO											RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	167	55.6	41.7											3.26	1.02	9.38	2.95	3.42	1.07	2.72	0.85
1 500	83.3	27.8	20.8					4.66	0.73	11.5	1.81	4.33	0.68	3.50	0.55	9.60	1.51	3.61	0.57	2.91	0.46
1 000	55.6	18.5	13.9	15.6	1.63	5.95	0.62	4.85	0.51	11.7	1.22	4.46	0.47	3.64	0.38	9.75	1.02	3.72	0.39	3.03	0.32
750	41.7	13.9	10.4	15.8	1.24	6.11	0.48	4.98	0.39	11.9	0.93	4.58	0.36	3.73	0.29	9.87	0.77	3.82	0.30	3.11	0.24
500	27.8	9.3	6.9	16.1	0.84	6.35	0.33	5.26	0.28	12.1	0.63	4.76	0.25	3.95	0.21	10.1	0.53	3.97	0.21	3.29	0.17
300	16.7	5.6	4.2	16.4	0.52	6.53	0.21	5.49	0.17	12.3	0.39	4.90	0.15	4.11	0.13	10.3	0.32	4.08	0.13	3.43	0.11
100	5.6	1.9	1.4	17.2	0.18	7.14	0.07	6.09	0.06	12.9	0.14	5.35	0.06	4.57	0.05	10.8	0.11	4.46	0.05	3.80	0.04
START.	-	-	-	18.6	-	8.13	-	7.11	-	14.0	-	6.10	-	5.34	-	11.6	-	5.08	-	4.45	-

BS 32 × 32	LOAD																			
	15 kN								12.5 kN						10 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO											RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	267	88.9	66.7																	3.44	1.08
1 500	133	44.4	33.3											4.61	0.72	12.2	1.91	4.57	0.72	3.69	0.58
1 000	88.9	29.6	22.2					5.76	0.60	15.5	1.62	5.89	0.62	4.80	0.50	12.4	1.29	4.71	0.49	3.84	0.40
750	66.7	22.2	16.7	18.7	1.47	7.25	0.57	5.91	0.46	15.6	1.23	6.05	0.47	4.93	0.39	12.5	0.98	4.84	0.38	3.94	0.31
500	44.4	14.8	11.1	19.1	1.00	7.54	0.39	6.25	0.33	15.9	0.83	6.28	0.33	5.21	0.27	12.8	0.67	5.03	0.26	4.17	0.22
300	26.7	8.9	6.7	19.5	0.61	7.75	0.24	6.52	0.20	16.2	0.51	6.46	0.20	5.43	0.17	13.0	0.41	5.17	0.16	4.34	0.14
100	8.9	3.0	2.2	20.5	0.21	8.47	0.09	7.23	0.08	17.1	0.18	7.06	0.07	6.02	0.06	13.7	0.14	5.65	0.06	4.82	0.05
START.	-	-	-	22.1	-	9.66	-	8.45	-	18.4	-	8.05	-	7.04	-	14.7	-	6.44	-	5.63	-

Screw jack total efficiency

The screw jack total efficiency is calculated as follows:

$$\eta_{tot} = \eta_{BS} \cdot \eta_R \cdot \eta_{CT}$$

where:
η_{BS} : ball screw efficiency
η_R : worm - wormwheel efficiency
η_{CT} : bearings and seals total efficiency

η_{tot}	BS 32 × 5			BS 32 × 10			BS 32 × 20			BS 32 × 32		
n_1 [rpm]	RATIO			RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL
3 000	0.65	0.59	0.56	0.69	0.63	0.59	0.71	0.65	0.61	0.71	0.65	0.62
1 500	0.63	0.56	0.52	0.67	0.59	0.55	0.69	0.61	0.57	0.70	0.62	0.58
1 000	0.63	0.55	0.50	0.66	0.58	0.53	0.68	0.59	0.55	0.69	0.60	0.55
750	0.62	0.53	0.49	0.65	0.56	0.52	0.67	0.58	0.53	0.68	0.59	0.54
500	0.61	0.51	0.46	0.64	0.54	0.49	0.66	0.56	0.50	0.67	0.56	0.51
300	0.59	0.50	0.44	0.63	0.53	0.47	0.65	0.54	0.48	0.65	0.55	0.49
100	0.57	0.46	0.40	0.60	0.48	0.42	0.62	0.50	0.44	0.62	0.50	0.44
START.	0.52	0.40	0.34	0.55	0.42	0.36	0.57	0.43	0.37	0.58	0.44	0.38

Max input power (P_{max}) and max input torque (T_{max})

n_1 [rpm]	RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	3.31	10.5	1.19	3.79	1.22	3.89
1 500	2.36	15.0	0.80	5.09	0.80	5.08
1 000	1.89	18.0	0.64	6.09	0.69	6.61
750	1.54	19.6	0.57	6.93	0.58	7.37
500	1.23	23.6	0.43	8.20	0.46	8.81
300	0.87	27.7	0.30	9.66	0.34	10.7
100	0.43	41.3	0.14	13.0	0.15	14.2

Max. screw jack input power is calculated for worm - wormwheel life of 10 000 hours.

Static braking torque on input shaft

The next table show the static braking torques, i.e. the braking torques necessary to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft and it is calculated for an applied load equal to the max. supportable load (25 kN).

Static braking torque T_F [Nm] with 25 kN				
RATIO	BS 32 × 5	BS 32 × 10	BS 32 × 20	BS 32 × 32
RV	2.4	5.1	10.4	16.9
RN	1.5	1.5	1.5	1.8
RL	1.5	1.5	1.5	1.5

For braking torques with loads lower than the maximum one, it is possible to make a linear proportion with the values stated in the table and the required load.

The resulting braking torque value shall then be compared to the min. threshold value $T_{F\,min}$ which considers vibrations and shocks that could increase the not self-locking condition of the system. It is equal to:

$$T_{F\,min} = 1.5\ Nm$$

The real braking torque to be applied on the input shaft for the generic load applied on the screw jack (lower than the maximum one) is therefore the highest of the two values.

3.3 Technical data - MA 50 BS Mod.A

Performances

Following tables show the screw jack LINEAR SPEED v [mm/s] and relative TORQUE T_1 [Nm] and POWER P_1 [kW] on input shaft, with reference to the INPUT SPEED n_1 [rpm], the RATIO (RV, RN, RL) and the LOAD [kN] applied on the screw jack.

Intermediate figures for linear speed v, torque T_1 and power P_1 corresponding to different input speeds can be calculated by linear interpolation of the figures stated in the table.

BS 40 × 10				LOAD															
				50 kN						35 kN						25 kN			
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO			
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	71.4	35.7	17.9			8.80	2.76	4.89	1.54	11.7	3.66	6.16	1.93	3.43	1.08	8.33	2.62	4.40	1.38	2.45	0.77
1 500	35.7	17.9	8.9	17.0	2.67	9.11	1.43	5.15	0.81	11.9	1.87	6.37	1.00	3.61	0.57	8.51	1.34	4.55	0.72	2.58	0.40
1 000	23.8	11.9	6.0	17.4	1.82	9.43	0.99	5.51	0.58	12.2	1.28	6.60	0.69	3.86	0.40	8.70	0.91	4.72	0.49	2.76	0.29
750	17.9	8.9	4.5	17.4	1.37	9.67	0.76	5.67	0.45	12.2	0.96	6.77	0.53	3.97	0.31	8.70	0.68	4.83	0.38	2.84	0.22
500	11.9	6.0	3.0	17.8	0.93	9.79	0.51	5.84	0.31	12.5	0.65	6.85	0.36	4.09	0.21	8.90	0.47	4.89	0.26	2.92	0.15
300	7.1	3.6	1.8	18.2	0.57	10.2	0.32	6.21	0.20	12.8	0.40	7.12	0.22	4.35	0.14	9.11	0.29	5.08	0.16	3.11	0.10
100	2.4	1.2	0.6	19.1	0.20	11.1	0.12	6.87	0.07	13.4	0.14	7.72	0.08	4.81	0.05	9.55	0.10	5.51	0.06	3.43	0.04
START.	-	-	-	20.6	-	12.5	-	7.39	-	14.4	-	8.70	-	5.17	-	10.3	-	6.21	-	3.69	-

BS 40 × 20				LOAD															
				40 kN						30 kN						20 kN			
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO			
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	143	71.4	35.7											5.67	1.78	12.9	4.04	6.79	2.13	3.78	1.19
1 500	71.4	35.7	17.9					7.95	1.25	19.7	3.10	10.6	1.66	5.96	0.94	13.2	2.06	7.03	1.10	3.98	0.62
1 000	47.6	23.8	11.9	26.9	2.81	14.6	1.53	8.51	0.89	20.2	2.11	10.9	1.14	6.38	0.67	13.5	1.41	7.28	0.76	4.26	0.45
750	35.7	17.9	8.9	26.9	2.11	14.9	1.17	8.76	0.69	20.2	1.58	11.2	0.88	6.57	0.52	13.5	1.05	7.46	0.59	4.38	0.34
500	23.8	11.9	6.0	27.5	1.44	15.1	0.79	9.02	0.47	20.6	1.08	11.4	0.59	6.77	0.35	13.8	0.72	7.56	0.40	4.51	0.24
300	14.3	7.1	3.6	28.1	0.88	15.7	0.49	9.59	0.30	21.1	0.66	11.8	0.37	7.20	0.23	14.1	0.44	7.85	0.25	4.80	0.15
100	4.8	2.4	1.2	29.5	0.31	17.1	0.18	10.6	0.11	22.1	0.23	12.8	0.13	7.95	0.08	14.8	0.15	8.51	0.09	5.30	0.06
START.	-	-	-	31.8	-	19.2	-	11.4	-	23.9	-	14.4	-	8.55	-	15.9	-	9.59	-	5.70	-

BS 40 × 40				LOAD															
				25 kN						20 kN						15 kN			
	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO			
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
n_1 [rpm]	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	286	143	71.4																	5.57	1.75
1 500	143	71.4	35.7									13.8	2.17	7.81	1.23	19.4	3.04	10.4	1.63	5.86	0.92
1 000	95.2	47.6	23.8					10.5	1.09	26.4	2.76	14.3	1.50	8.36	0.88	19.8	2.07	10.8	1.12	6.27	0.66
750	71.4	35.7	17.9			18.4	1.44	10.8	0.84	26.4	2.07	14.7	1.15	8.61	0.68	19.8	1.55	11.0	0.86	6.45	0.51
500	47.6	23.8	11.9	33.8	1.77	18.6	0.97	11.1	0.58	27.0	1.41	14.9	0.78	8.86	0.46	20.3	1.06	11.2	0.58	6.65	0.35
300	28.6	14.3	7.1	34.5	1.08	19.3	0.61	11.8	0.37	27.6	0.87	15.4	0.48	9.43	0.30	20.7	0.65	11.6	0.36	7.07	0.22
100	9.5	4.8	2.4	36.2	0.38	20.9	0.22	13.0	0.14	29.0	0.30	16.8	0.18	10.4	0.11	21.7	0.23	12.6	0.13	7.81	0.08
START.	-	-	-	39.1	-	23.6	-	14.0	-	31.3	-	18.9	-	11.2	-	23.5	-	14.2	-	8.40	-

Screw jack total efficiency

The screw jack total efficiency is calculated as follows:

$$\eta_{tot} = \eta_{BS} \cdot \eta_R \cdot \eta_{CT}$$

where:
η_{BS} : ball screw efficiency
η_R : worm - wormwheel efficiency
η_{CT} : bearings and seals total efficiency

η_{tot}	BS 40 × 10			BS 40 × 20			BS 40 × 40		
n_1 [rpm]	RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL
3 000	0.68	0.65	0.58	0.71	0.67	0.60	0.72	0.68	0.61
1 500	0.67	0.62	0.55	0.69	0.65	0.57	0.70	0.66	0.58
1 000	0.65	0.60	0.52	0.68	0.62	0.53	0.69	0.64	0.54
750	0.65	0.59	0.50	0.68	0.61	0.52	0.69	0.62	0.53
500	0.64	0.58	0.49	0.66	0.60	0.50	0.67	0.61	0.51
300	0.62	0.56	0.46	0.65	0.58	0.47	0.66	0.59	0.48
100	0.60	0.52	0.41	0.62	0.53	0.43	0.63	0.54	0.44
START.	0.55	0.46	0.38	0.57	0.47	0.40	0.58	0.48	0.41

Max input power (P_{max}) and max input torque (T_{max})

n_1 [rpm]	RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	5.10	16.2	3.04	9.69	1.99	6.34
1 500	3.76	23.9	2.19	14.0	1.43	9.08
1 000	2.99	28.6	1.73	16.5	1.14	10.9
750	2.42	30.9	1.45	18.5	0.95	12.1
500	1.87	35.7	1.11	21.1	0.74	14.1
300	1.40	44.4	0.82	26.1	0.54	17.2
100	0.66	62.7	0.38	36.0	0.25	23.5

Max. screw jack input power is calculated for worm - wormwheel life of 10 000 hours.

Static braking torque on input shaft

The next table show the static braking torques, i.e. the braking torques necessary to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft and it is calculated for an applied load equal to the max. supportable load (50 kN).

Static braking torque T_F [Nm] with 50 kN			
RATIO	BS 40 × 10	BS 40 × 20	BS 40 × 40
RV	8.6	17.9	36.5
RN	2.4	4.9	10.1
RL	2.4	2.4	2.4

For braking torques with loads lower than the maximum one, it is possible to make a linear proportion with the values stated in the table and the required load.

The resulting braking torque value shall then be compared to the min. threshold value $T_{F\,min}$ which considers vibrations and shocks that could increase the not self-locking condition of the system. It is equal to:

$$T_{F\,min} = 2.4\ Nm$$

The real braking torque to be applied on the input shaft for the generic load applied on the screw jack (lower than the maximum one) is therefore the highest of the two values.

3.3 Technical data - MA 100 BS Mod.A

Performances

Following tables show the screw jack LINEAR SPEED v [mm/s] and relative TORQUE T_1 [Nm] and POWER P_1 [kW] on input shaft, with reference to the INPUT SPEED n_1 [rpm], the RATIO (RV, RN, RL) and the LOAD [kN] applied on the screw jack.

Intermediate figures for linear speed v, torque T_1 and power P_1 corresponding to different input speeds can be calculated by linear interpolation of the figures stated in the table.

BS 50 × 10				LOAD 100 kN						75 kN						50 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	62.5	20.8	15.6			11.1	3.48	8.61	2.70	22.3	6.99	8.30	2.61	6.46	2.03	14.9	4.66	5.53	1.74	4.30	1.35
1 500	31.3	10.4	7.8	30.3	4.76	11.5	1.80	9.18	1.44	22.8	3.57	8.61	1.35	6.88	1.08	15.2	2.38	5.74	0.90	4.59	0.72
1 000	20.8	6.9	5.2	31.0	3.25	12.1	1.26	9.68	1.01	23.3	2.43	9.06	0.95	7.26	0.76	15.5	1.62	6.04	0.63	4.84	0.51
750	15.6	5.2	3.9	31.4	2.46	12.4	0.97	9.82	0.77	23.5	1.85	9.30	0.73	7.37	0.58	15.7	1.23	6.20	0.49	4.91	0.39
500	10.4	3.5	2.6	31.7	1.66	12.8	0.67	10.3	0.54	23.8	1.24	9.55	0.50	7.69	0.40	15.9	0.83	6.37	0.33	5.13	0.27
300	6.3	2.1	1.6	32.5	1.02	13.5	0.42	11.1	0.35	24.3	0.76	10.1	0.32	8.30	0.26	16.2	0.51	6.74	0.21	5.53	0.17
100	2.1	0.7	0.5	34.0	0.36	14.8	0.15	12.3	0.13	25.5	0.27	11.1	0.12	9.18	0.10	17.0	0.18	7.38	0.08	6.12	0.06
START.	-	-	-	37.7	-	17.9	-	14.9	-	28.3	-	13.4	-	11.2	-	18.9	-	8.94	-	7.42	-

BS 50 × 20				LOAD 80 kN						60 kN						40 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	125	41.7	31.3									12.7	3.99	9.88	3.10	22.7	7.13	8.47	2.66	6.59	2.07
1 500	62.5	20.8	15.6			17.6	2.76	14.1	2.21	34.8	5.47	13.2	2.07	10.6	1.65	23.2	3.64	8.78	1.38	7.02	1.10
1 000	41.7	13.9	10.4	47.5	4.97	18.5	1.94	14.8	1.55	35.6	3.73	13.9	1.45	11.1	1.16	23.7	2.48	9.24	0.97	7.41	0.78
750	31.3	10.4	7.8	48.0	3.77	19.0	1.49	15.1	1.18	36.0	2.83	14.3	1.12	11.3	0.89	24.0	1.88	9.49	0.75	7.52	0.59
500	20.8	6.9	5.2	48.5	2.54	19.5	1.02	15.7	0.82	36.4	1.91	14.6	0.77	11.8	0.62	24.3	1.27	9.75	0.51	7.85	0.41
300	12.5	4.2	3.1	49.7	1.56	20.6	0.65	17.0	0.53	37.3	1.17	15.5	0.49	12.7	0.40	24.8	0.78	10.3	0.32	8.47	0.27
100	4.2	1.4	1.0	52.1	0.55	22.6	0.24	18.7	0.20	39.1	0.41	17.0	0.18	14.1	0.15	26.1	0.27	11.3	0.12	9.36	0.10
START.	-	-	-	57.7	-	27.4	-	22.7	-	43.3	-	20.5	-	17.1	-	28.9	-	13.7	-	11.4	-

BS 50 × 40				LOAD 50 kN						40 kN						30 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	250	83.3	62.5															12.4	3.90	9.7	3.04
1 500	125	41.7	31.3									17.2	2.70			34.0	5.35	12.9	2.02	10.3	1.62
1 000	83.3	27.8	20.8			22.6	2.37			46.4	4.86	18.1	1.89	14.5	1.52	34.8	3.64	13.6	1.42	10.9	1.14
750	62.5	20.8	15.6			23.2	1.82			46.9	3.68	18.6	1.46	14.7	1.15	35.2	2.76	13.9	1.09	11.0	0.87
500	41.7	13.9	10.4	59.3	3.10	23.8	1.25	19.2	1.00	47.4	2.48	19.1	1.00	15.3	0.80	35.6	1.86	14.3	0.75	11.5	0.60
300	25	8.3	6.3	60.7	1.91	25.2	0.79	20.7	0.65	48.5	1.52	20.2	0.63	16.6	0.52	36.4	1.14	15.1	0.48	12.4	0.39
100	8.3	2.8	2.1	63.6	0.67	27.6	0.29	22.9	0.24	50.9	0.53	22.1	0.23	18.3	0.19	38.2	0.40	16.6	0.17	13.7	0.14
START.	-	-	-	70.5	-	33.5	-	27.8	-	56.4	-	26.8	-	22.2	-	42.3	-	20.1	-	16.7	-

Screw jack total efficiency

The screw jack total efficiency is calculated as follows:

$$\eta_{tot} = \eta_{BS} \cdot \eta_R \cdot \eta_{CT}$$

where:
η_{BS} : ball screw efficiency
η_R : worm - wormwheel efficiency
η_{CT} : bearings and seals total efficiency

η_{tot}	BS 50 × 10			BS 50 × 20			BS 50 × 40		
n_1 [rpm]	RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL
3 000	0.67	0.60	0.58	0.70	0.63	0.60	0.72	0.64	0.62
1 500	0.66	0.58	0.54	0.69	0.60	0.57	0.70	0.62	0.58
1 000	0.64	0.55	0.51	0.67	0.57	0.54	0.69	0.59	0.55
750	0.63	0.53	0.51	0.66	0.56	0.53	0.68	0.57	0.54
500	0.63	0.52	0.49	0.66	0.54	0.51	0.67	0.56	0.52
300	0.61	0.49	0.45	0.64	0.51	0.47	0.66	0.53	0.48
100	0.58	0.45	0.41	0.61	0.47	0.43	0.63	0.48	0.43
START.	0.53	0.37	0.34	0.55	0.39	0.35	0.56	0.40	0.36

Max input power (P_{max}) and max input torque (T_{max})

n_1 [rpm]	RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	9.10	29.0	4.36	13.9	3.06	9.75
1 500	6.32	40.2	2.90	18.5	2.08	13.2
1 000	5.16	49.2	2.38	22.8	1.70	16.3
750	4.21	53.6	2.04	26.0	1.41	17.9
500	3.23	61.8	1.53	29.3	1.10	21.0
300	2.42	76.9	1.15	36.5	0.82	26.0
100	1.16	110	0.52	50.1	0.39	37.1

Max. screw jack input power is calculated for worm - wormwheel life of 10 000 hours.

Static braking torque on input shaft

The next table show the static braking torques, i.e. the braking torques necessary to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft and it is calculated for an applied load equal to the max. supportable load (100 kN).

Static braking torque T_F [Nm] with 100 kN			
RATIO	BS 50 × 10	BS 50 × 20	BS 50 × 40
RV	14.2	29.8	61.1
RN	4.0	4.0	4.0
RL	4.0	4.0	4.0

For braking torques with loads lower than the maximum one, it is possible to make a linear proportion with the values stated in the table and the required load.

The resulting braking torque value shall then be compared to the min. threshold value $T_{F\,min}$ which considers vibrations and shocks that could increase the not self-locking condition of the system. It is equal to:

$$T_{F\,min} = 4.0\ Nm$$

The real braking torque to be applied on the input shaft for the generic load applied on the screw jack (lower than the maximum one) is therefore the highest of the two values.

3.3 Technical data - MA 150 BS Mod.A

Performances

Following tables show the screw jack LINEAR SPEED v [mm/s] and relative TORQUE T_1 [Nm] and POWER P_1 [kW] on input shaft, with reference to the INPUT SPEED n_1 [rpm], the RATIO (RV, RN, RL) and the LOAD [kN] applied on the screw jack.

Intermediate figures for linear speed v, torque T_1 and power P_1 corresponding to different input speeds can be calculated by linear interpolation of the figures stated in the table.

BS 63 × 10				LOAD																	
				150 kN						120 kN						80 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	62.5	20.8	15.6									13.6	4.27	10.6	3.32	24.3	7.63	9.06	2.84	7.04	2.21
1 500	31.3	10.4	7.8			17.6	2.77	14.1	2.21	37.2	5.84	14.1	2.21	11.3	1.77	24.8	3.90	9.39	1.48	7.51	1.18
1 000	20.8	6.9	5.2	47.6	4.98	18.5	1.94	14.9	1.56	38.1	3.98	14.8	1.55	11.9	1.24	25.4	2.66	9.88	1.03	7.92	0.83
750	15.6	5.2	3.9	48.1	3.78	19.0	1.49	15.1	1.18	38.5	3.02	15.2	1.19	12.1	0.95	25.7	2.01	10.2	0.80	8.04	0.63
500	10.4	3.5	2.6	48.6	2.55	19.6	1.02	15.8	0.82	38.9	2.04	15.7	0.82	12.6	0.66	26.0	1.36	10.4	0.55	8.39	0.44
300	6.3	2.1	1.6	49.8	1.56	20.7	0.65	17.0	0.53	39.8	1.25	16.6	0.52	13.6	0.43	26.6	0.83	11.0	0.35	9.06	0.28
100	2.1	0.7	0.5	52.2	0.55	22.7	0.24	18.8	0.20	41.8	0.44	18.1	0.19	15.0	0.16	27.9	0.29	12.1	0.13	10.0	0.10
START.	-	-	-	57.8	-	27.5	-	22.8	-	46.3	-	22.0	-	18.2	-	30.9	-	14.7	-	12.2	-

BS 63 × 20				LOAD																	
				100 kN						80 kN						50 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	125.0	41.7	31.3													28.7	9.02	10.7	3.37	8.33	2.62
1 500	62.5	20.8	15.6									17.8	2.79	14.2	2.23	29.4	4.61	11.1	1.75	8.88	1.39
1 000	41.7	13.9	10.4							48.0	5.03	18.7	1.96	15.0	1.57	30.0	3.14	11.7	1.22	9.37	0.98
750	31.3	10.4	7.8			24.0	1.88	19.0	1.49	48.6	3.81	19.2	1.51	15.2	1.19	30.4	2.38	12.0	0.94	9.51	0.75
500	20.8	6.9	5.2	61.4	3.21	24.7	1.29	19.9	1.04	49.1	2.57	19.7	1.03	15.9	0.83	30.7	1.61	12.4	0.65	9.92	0.52
300	12.5	4.2	3.1	62.8	1.97	26.1	0.82	21.4	0.67	50.2	1.58	20.9	0.66	17.2	0.54	31.4	0.99	13.1	0.41	10.7	0.34
100	4.2	1.4	1.0	65.9	0.69	28.6	0.30	23.7	0.25	52.7	0.55	22.9	0.24	19.0	0.20	32.9	0.34	14.3	0.15	11.9	0.12
START.	-	-	-	73.0	-	34.6	-	28.7	-	58.4	-	27.7	-	23.0	-	36.5	-	17.3	-	14.4	-

BS 63 × 30				LOAD																	
				70 kN						60 kN						50 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	188	62.5	46.9																		
1 500	93.8	31.3	23.4															16.4	2.57	13.1	2.05
1 000	62.5	20.8	15.6									20.7	2.16			44.2	4.62	17.2	1.80	13.8	1.44
750	46.9	15.6	11.7			24.7	1.94			53.6	4.21	21.2	1.66	16.8	1.32	44.7	3.51	17.7	1.39	14.0	1.10
500	31.3	10.4	7.8			25.4	1.33	20.5	1.07	54.2	2.84	21.8	1.14	17.6	0.92	45.2	2.36	18.2	0.95	14.6	0.76
300	18.8	6.3	4.7	64.7	2.03	26.9	0.84	22.1	0.69	55.5	1.74	23.1	0.72	19.0	0.59	46.2	1.45	19.2	0.60	15.8	0.50
100	6.3	2.1	1.6	67.9	0.71	29.5	0.31	24.4	0.26	58.2	0.61	25.3	0.26	21.0	0.22	48.5	0.51	21.0	0.22	17.5	0.18
START.	-	-	-	75.2	-	35.7	-	29.6	-	64.4	-	30.6	-	25.4	-	53.7	-	25.5	-	21.2	-

BS 63 × 40				LOAD																	
				60 kN						50 kN						40 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO						RATIO						RATIO					
				RV		RN		RL		RV		RN		RL		RV		RN		RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	250	83.3	62.5																		
1 500	125	41.7	31.3															17.3	2.71		
1 000	83.3	27.8	20.8									22.7	2.38			46.7	4.89	18.2	1.90	14.6	1.53
750	62.5	20.8	15.6									23.3	1.83			47.2	3.71	18.7	1.47	14.8	1.16
500	41.7	13.9	10.4			28.8	1.51			59.6	3.12	24.0	1.25	19.3	1.01	47.7	2.50	19.2	1.00	15.4	0.81
300	25.0	8.3	6.3	73.2	2.30	30.4	0.96	25.0	0.79	61.0	1.92	25.4	0.80	20.8	0.65	48.8	1.53	20.3	0.64	16.7	0.52
100	8.3	2.8	2.1	76.8	0.80	33.3	0.35	27.6	0.29	64.0	0.67	27.8	0.29	23.0	0.24	51.2	0.54	22.2	0.23	18.4	0.19
START.	-	-	-	85.1	-	40.4	-	33.5	-	70.9	-	33.6	-	27.9	-	56.7	-	26.9	-	22.3	-

Screw jack total efficiency

The screw jack total efficiency is calculated as follows:

$$\eta_{tot} = \eta_{BS} \cdot \eta_R \cdot \eta_{CT}$$

where:
η_{BS} : ball screw efficiency
η_R : worm - wormwheel efficiency
η_{CT} : bearings and seals total efficiency

η_{tot}	BS 63 × 10			BS 63 × 20			BS 63 × 30			BS 63 × 40		
n_1 [rpm]	RATIO			RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL
3 000	0.66	0.59	0.56	0.69	0.62	0.60	0.71	0.63	0.61	0.71	0.64	0.61
1 500	0.64	0.56	0.53	0.68	0.60	0.56	0.69	0.61	0.57	0.70	0.61	0.58
1 000	0.63	0.54	0.50	0.66	0.57	0.53	0.68	0.58	0.54	0.68	0.58	0.55
750	0.62	0.52	0.50	0.66	0.55	0.52	0.67	0.56	0.53	0.67	0.57	0.54
500	0.61	0.51	0.47	0.65	0.54	0.50	0.66	0.55	0.51	0.67	0.55	0.52
300	0.60	0.48	0.44	0.63	0.51	0.46	0.65	0.52	0.47	0.65	0.52	0.48
100	0.57	0.44	0.40	0.60	0.46	0.42	0.62	0.47	0.43	0.62	0.48	0.43
START.	0.52	0.36	0.33	0.55	0.38	0.35	0.56	0.39	0.35	0.56	0.39	0.36

Max input power (P_{max}) and max input torque (T_{max})

n_1 [rpm]	RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	9.10	29.0	4.36	13.9	3.06	9.75
1 500	6.32	40.2	2.90	18.5	2.08	13.2
1 000	5.16	49.2	2.38	22.8	1.70	16.3
750	4.21	53.6	2.04	26.0	1.41	17.9
500	3.23	61.8	1.53	29.3	1.10	21.0
300	2.42	76.9	1.15	36.5	0.82	26.0
100	1.16	110	0.52	50.1	0.39	37.1

Max. screw jack input power is calculated for worm - wormwheel life of 10 000 hours.

Static braking torque on input shaft

The next table show the static braking torques, i.e. the braking torques necessary to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft and it is calculated for an applied load equal to the max. supportable load (150 kN).

Static braking torque T_F [Nm] with 150 kN				
RATIO	BS 63 × 10	BS 63 × 20	BS 63 × 20	BS 63 × 40
RV	19.0	40.6	62.2	83.7
RN	5.3	5.3	5.3	5.3
RL	5.3	5.3	5.3	5.3

For braking torques with loads lower than the maximum one, it is possible to make a linear proportion with the values stated in the table and the required load.

The resulting braking torque value shall then be compared to the min. threshold value $T_{F\,min}$ which considers vibrations and shocks that could increase the not self-locking condition of the system. It is equal to:

$$T_{F\,min} = 5.3\ Nm$$

The real braking torque to be applied on the input shaft for the generic load applied on the screw jack (lower than the maximum one) is therefore the highest of the two values.

3.3 Technical data - MA 200 BS Mod.A

Performances

Following tables show the screw jack LINEAR SPEED v [mm/s] and relative TORQUE T_1 [Nm] and POWER P_1 [kW] on input shaft, with reference to the INPUT SPEED n_1 [rpm], the RATIO (RV, RN, RL) and the LOAD [kN] applied on the screw jack.

Intermediate figures for linear speed v, torque T_1 and power P_1 corresponding to different input speeds can be calculated by linear interpolation of the figures stated in the table.

BS 80 × 10				LOAD 200 kN						LOAD 150 kN						LOAD 100 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	62.5	20.8	15.6			23.0	7.22	17.9	5.61	46.8	14.7	17.3	5.42	13.4	4.21	31.2	9.80	11.5	3.61	8.94	2.81
1 500	31.3	10.4	7.8	63.1	9.90	23.9	3.74	18.6	2.91	47.3	7.43	17.9	2.81	13.9	2.19	31.5	4.95	11.9	1.87	9.28	1.46
1 000	20.8	6.9	5.2	64.4	6.75	24.8	2.59	19.6	2.05	48.3	5.06	18.6	1.94	14.7	1.53	32.2	3.37	12.4	1.30	9.77	1.02
750	15.6	5.2	3.9	65.2	5.12	25.4	1.99	20.4	1.60	48.9	3.84	19.1	1.49	15.3	1.20	32.6	2.56	12.7	1.00	10.2	0.80
500	10.4	3.5	2.6	65.9	3.45	26.8	1.40	21.0	1.10	49.4	2.59	20.1	1.05	15.7	0.82	33.0	1.72	13.4	0.70	10.5	0.55
300	6.3	2.1	1.6	67.4	2.12	27.9	0.88	22.2	0.70	50.6	1.59	21.0	0.66	16.7	0.52	33.7	1.06	14.0	0.44	11.1	0.35
100	2.1	0.7	0.5	70.7	0.74	30.6	0.32	24.9	0.26	53.0	0.55	22.9	0.24	18.7	0.20	35.3	0.37	15.3	0.16	12.4	0.13
START.	-	-	-	78.2	-	37.6	-	30.6	-	58.6	-	28.2	-	22.9	-	39.1	-	18.8	-	15.3	-

BS 80 × 20				LOAD 150 kN						LOAD 100 kN						LOAD 75 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	125	41.7	31.3									21.5	6.75	16.7	5.25	43.8	13.8	16.1	5.06	12.6	3.94
1 500	62.5	20.8	15.6			33.4	5.25	26.0	4.09	59.0	9.26	22.3	3.50	17.4	2.72	44.2	6.94	16.7	2.63	13.0	2.04
1 000	41.7	13.9	10.4			34.7	3.63	27.4	2.87	60.3	6.31	23.2	2.42	18.3	1.91	45.2	4.73	17.4	1.82	13.7	1.44
750	31.3	10.4	7.8	91.4	7.18	35.6	2.80	28.6	2.24	60.9	4.78	23.8	1.86	19.1	1.49	45.7	3.59	17.8	1.40	14.3	1.12
500	20.8	6.9	5.2	92.4	4.84	37.6	1.97	29.4	1.54	61.6	3.22	25.1	1.31	19.6	1.03	46.2	2.42	18.8	0.98	14.7	0.77
300	12.5	4.2	3.1	94.5	2.97	39.2	1.23	31.2	0.98	63.0	1.98	26.1	0.82	20.8	0.65	47.3	1.48	19.6	0.62	15.6	0.49
100	4.2	1.4	1.0	99.1	1.04	42.8	0.45	34.9	0.36	66.	0.69	28.6	0.30	23.3	0.24	49.6	0.52	21.4	0.22	17.4	0.18
START.	-	-	-	110	-	52.7	-	42.8	-	73.1	-	35.2	-	28.6	-	54.8	-	26.4	-	21.4	-

BS 80 × 40				LOAD 100 kN						LOAD 75 kN						LOAD 50 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	250	83.3	62.5															20.7	6.52	16.1	5.07
1 500	125	41.7	31.3									32.2	5.07			56.9	8.93	21.5	3.38	16.7	2.63
1 000	83.3	27.8	20.8									33.5	3.51	26.4	2.77	58.1	6.09	22.3	2.34	17.6	1.85
750	62.5	20.8	15.6							88.1	6.92	34.3	2.70	27.5	2.16	58.8	4.62	22.9	1.80	18.4	1.44
500	41.7	13.9	10.4			48.3	2.53	37.8	1.98	89.1	4.67	36.2	1.90	28.3	1.48	59.4	3.11	24.1	1.26	18.9	0.99
300	25.0	8.3	6.3	122	3.82	50.4	1.58	40.1	1.26	91.2	2.86	37.8	1.19	30.0	0.94	60.8	1.91	25.2	0.79	20.0	0.63
100	8.3	2.8	2.1	128	1.33	55.1	0.58	44.8	0.47	95.6	1.00	41.3	0.43	33.6	0.35	63.7	0.67	27.5	0.29	22.4	0.23
START.	-	-	-	141	-	67.8	-	55.1	-	106	-	50.9	-	41.3	-	70.5	-	33.9	-	27.5	-

Screw jack total efficiency

The screw jack total efficiency is calculated as follows:

$$\eta_{tot} = \eta_{BS} \cdot \eta_R \cdot \eta_{CT}$$

where:
η_{BS} : ball screw efficiency
η_R : worm - wormwheel efficiency
η_{CT} : bearings and seals total efficiency

η_{tot}	BS 80 × 10			BS 80 × 20			BS 80 × 40		
n_1 [rpm]	RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL
3 000	0.64	0.58	0.56	0.68	0.62	0.60	0.71	0.64	0.62
1 500	0.63	0.56	0.54	0.68	0.60	0.57	0.70	0.62	0.59
1 000	0.62	0.54	0.51	0.66	0.57	0.54	0.68	0.59	0.56
750	0.61	0.52	0.49	0.65	0.56	0.52	0.68	0.58	0.54
500	0.60	0.50	0.48	0.65	0.53	0.51	0.67	0.55	0.53
300	0.59	0.48	0.45	0.63	0.51	0.48	0.65	0.53	0.50
100	0.56	0.43	0.40	0.60	0.46	0.43	0.62	0.48	0.44
START.	0.51	0.35	0.33	0.54	0.38	0.35	0.56	0.39	0.36

Max input power (P_{max}) and max input torque (T_{max})

n_1 [rpm]	RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	15.9	50.6	7.82	24.9	5.84	18.6
1 500	11.4	72.3	5.29	33.7	3.91	24.9
1 000	8.76	83.7	4.27	40.7	3.12	29.8
750	7.44	94.8	3.59	45.7	2.72	34.6
500	5.95	114	2.79	53.4	2.14	41.0
300	4.20	134	1.98	63.0	1.56	49.7
100	2.08	199	0.95	90.3	0.72	68.7

Max. screw jack input power is calculated for worm - wormwheel life of 10 000 hours.

Static braking torque on input shaft

The next table show the static braking torques, i.e. the braking torques necessary to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft and it is calculated for an applied load equal to the max. supportable load (200 kN).

Static braking torque T_F [Nm] with 200 kN			
RATIO	BS 80 × 10	BS 80 × 20	BS 80 × 40
RV	24.7	53.7	112
RN	6.8	6.8	6.8
RL	6.8	6.8	6.8

For braking torques with loads lower than the maximum one, it is possible to make a linear proportion with the values stated in the table and the required load.

The resulting braking torque value shall then be compared to the min. threshold value $T_{F\,min}$ which considers vibrations and shocks that could increase the not self-locking condition of the system. It is equal to:

$$T_{F\,min} = 6.8\ Nm$$

The real braking torque to be applied on the input shaft for the generic load applied on the screw jack (lower than the maximum one) is therefore the highest of the two values.

3.3 Technical data - MA 350 BS Mod.A

Performances

Following tables show the screw jack LINEAR SPEED v [mm/s] and relative TORQUE T_1 [Nm] and POWER P_1 [kW] on input shaft, with reference to the INPUT SPEED n_1 [rpm], the RATIO (RV, RN, RL) and the LOAD [kN] applied on the screw jack.

Intermediate figures for linear speed v, torque T_1 and power P_1 corresponding to different input speeds can be calculated by linear interpolation of the figures stated in the table.

BS 100 × 16				LOAD 350 kN						LOAD 250 kN						LOAD 200 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	75	50	25															50.3	15.8	27.2	8.55
1 500	37.5	25	12.5							93.2	14.7	64.2	10.1	35.7	5.61	74.6	11.7	51.4	8.07	28.6	4.49
1 000	25	16.7	8.3							94.2	9.87	65.7	6.88	36.7	3.84	75.4	7.89	52.6	5.50	29.3	3.07
750	18.8	12.5	6.3			94.2	7.39	53.4	4.19	96.4	7.57	67.3	5.28	38.1	2.99	77.1	6.05	53.8	4.22	30.5	2.39
500	12.5	8.3	4.2	138	7.22	96.4	5.05	55.6	2.91	98.6	5.16	68.9	3.61	39.7	2.08	78.9	4.13	55.1	2.88	31.8	1.66
300	7.5	5	2.5	140	4.38	98.8	3.10	58.0	1.82	99.7	3.13	70.6	2.22	41.4	1.30	79.8	2.51	56.5	1.77	33.2	1.04
100	2.5	1.7	0.8	145	1.51	107	1.12	65.6	0.69	104	1.08	76.2	0.80	46.9	0.49	82.7	0.87	61.0	0.64	37.5	0.39
START.	-	-	-	167	-	123	-	81.7	-	119	-	88.0	-	58.3	-	95.3	-	70.4	-	46.7	-

BS 100 × 20				LOAD 300 kN						LOAD 200 kN						LOAD 150 kN					
n_1 [rpm]	LINEAR SPEED v [mm/s]			RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL		RATIO RV		RATIO RN		RATIO RL	
	RV	RN	RL	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW	T_1 Nm	P_1 kW
3 000	93.8	62.5	31.3													67.7	21.3	46.1	14.5	25.0	7.84
1 500	46.9	31.3	15.6							91.2	14.3	62.8	9.87	35.0	5.49	68.4	10.8	47.1	7.40	26.2	4.12
1 000	31.3	20.8	10.4							92.2	9.65	64.3	6.73	35.9	3.75	69.1	7.24	48.2	5.05	26.9	2.81
750	23.4	15.6	7.8					55.9	4.39	94.2	7.40	65.8	5.17	37.3	2.93	70.7	5.55	49.4	3.87	28.0	2.20
500	15.6	10.4	5.2	145	7.57	101	5.29	58.3	3.05	96.4	5.05	67.4	3.53	38.8	2.03	72.3	3.79	50.5	2.65	29.1	1.52
300	9.4	6.3	3.1	147	4.60	104	3.25	60.8	1.91	97.5	3.06	69.0	2.17	40.5	1.27	73.2	2.30	51.8	1.63	30.4	0.95
100	3.1	2.1	1.0	152	1.59	112	1.17	68.8	0.72	101	1.06	74.6	0.78	45.8	0.48	75.8	0.79	55.9	0.59	34.4	0.36
START.	-	-	-	175	-	129	-	85.6	-	117	-	86.0	-	57.1	-	87.4	-	64.5	-	42.8	-

Screw jack total efficiency

The screw jack total efficiency is calculated as follows:

$$\eta_{tot} = \eta_{BS} \cdot \eta_R \cdot \eta_{CT}$$

where:
η_{BS} : ball screw efficiency
η_R : worm - wormwheel efficiency
η_{CT} : bearings and seals total efficiency

η_{tot}	BS 100 × 16			BS 100 × 20		
n_1 [rpm]	RATIO			RATIO		
	RV	RN	RL	RV	RN	RL
3 000	0.70	0.69	0.64	0.72	0.70	0.65
1 500	0.70	0.67	0.61	0.71	0.69	0.62
1 000	0.69	0.66	0.59	0.70	0.67	0.60
750	0.67	0.64	0.57	0.69	0.66	0.58
500	0.66	0.63	0.54	0.67	0.64	0.56
300	0.65	0.61	0.52	0.67	0.63	0.53
100	0.63	0.57	0.46	0.64	0.58	0.47
START.	0.54	0.49	0.37	0.56	0.50	0.38

Max input power (P_{max}) and max input torque (T_{max})

n_1 [rpm]	RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	22.9	73.0	16.1	51.3	9.87	31.4
1 500	15.6	99.6	11.4	72.3	6.57	41.8
1 000	12.7	121	8.81	84.1	5.27	50.3
750	10.2	130	7.57	96.4	4.53	57.6
500	8.28	158	5.98	114	3.60	68.7
300	5.97	190	4.20	134	2.57	81.9
100	2.76	263	1.93	185	1.23	118

Max. screw jack input power is calculated for worm - wormwheel life of 10 000 hours.

Static braking torque on input shaft

The next table show the static braking torques, i.e. the braking torques necessary to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft and it is calculated for an applied load equal to the max. supportable load (350 kN).

Static braking torque T_F [Nm] with 350 kN		
RATIO	BS 100 × 16	BS 100 × 20
RV	48.2	62.0
RN	22.9	29.4
RL	13.4	13.4

For braking torques with loads lower than the maximum one, it is possible to make a linear proportion with the values stated in the table and the required load.

The resulting braking torque value shall then be compared to the min. threshold value $T_{F\,min}$ which considers vibrations and shocks that could increase the not self-locking condition of the system. It is equal to:

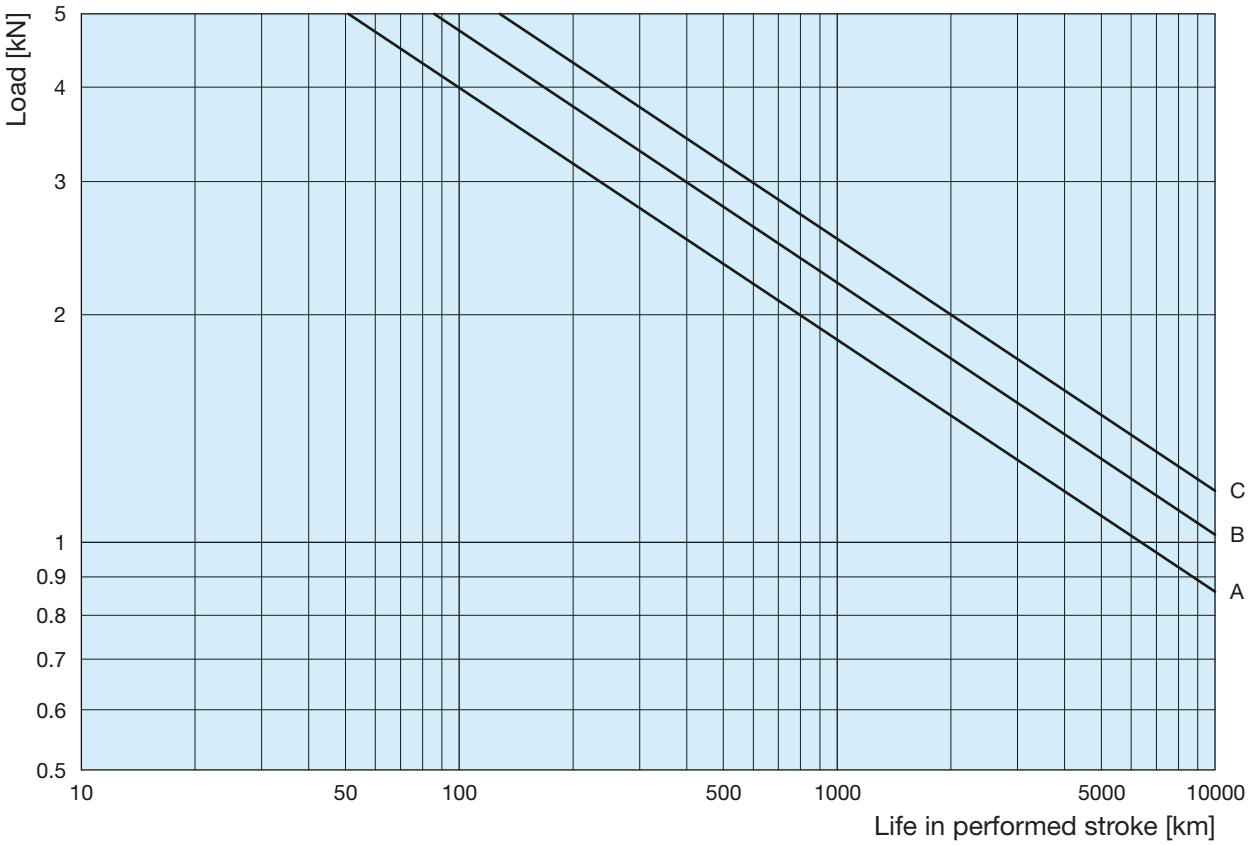
$$T_{F\,min} = 13.4\ Nm$$

The real braking torque to be applied on the input shaft for the generic load applied on the screw jack (lower than the maximum one) is therefore the highest of the two values.

3.4 Ball screw life

MA 5 BS Mod.A

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screws life” on page 18 or contact SERVOMECH technical support.

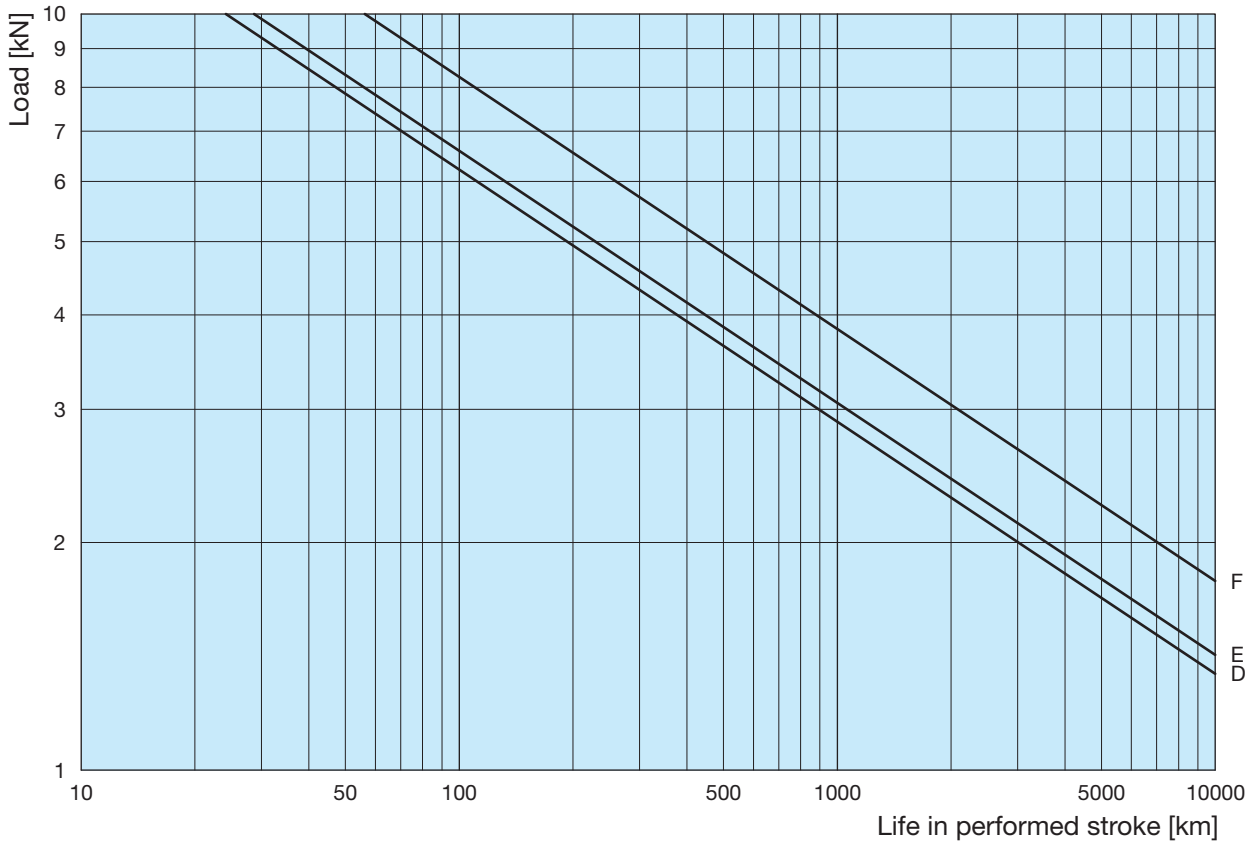


BALL SCREW	Ball [mm]	n° of circuits	C_a [kN]	C_{0a} [kN]	CURVE
BS 16×5	3.175	5	12.9	20.9	**B**
BS 16×10	3.175	3	8.6	13.3	**A**
BS 16×16	3.175	2 + 2	10.0	14.5	**C**

3.4 Ball screw life

MA 10 BS Mod.A

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screws life” on page 18 or contact SERVOMECH technical support.

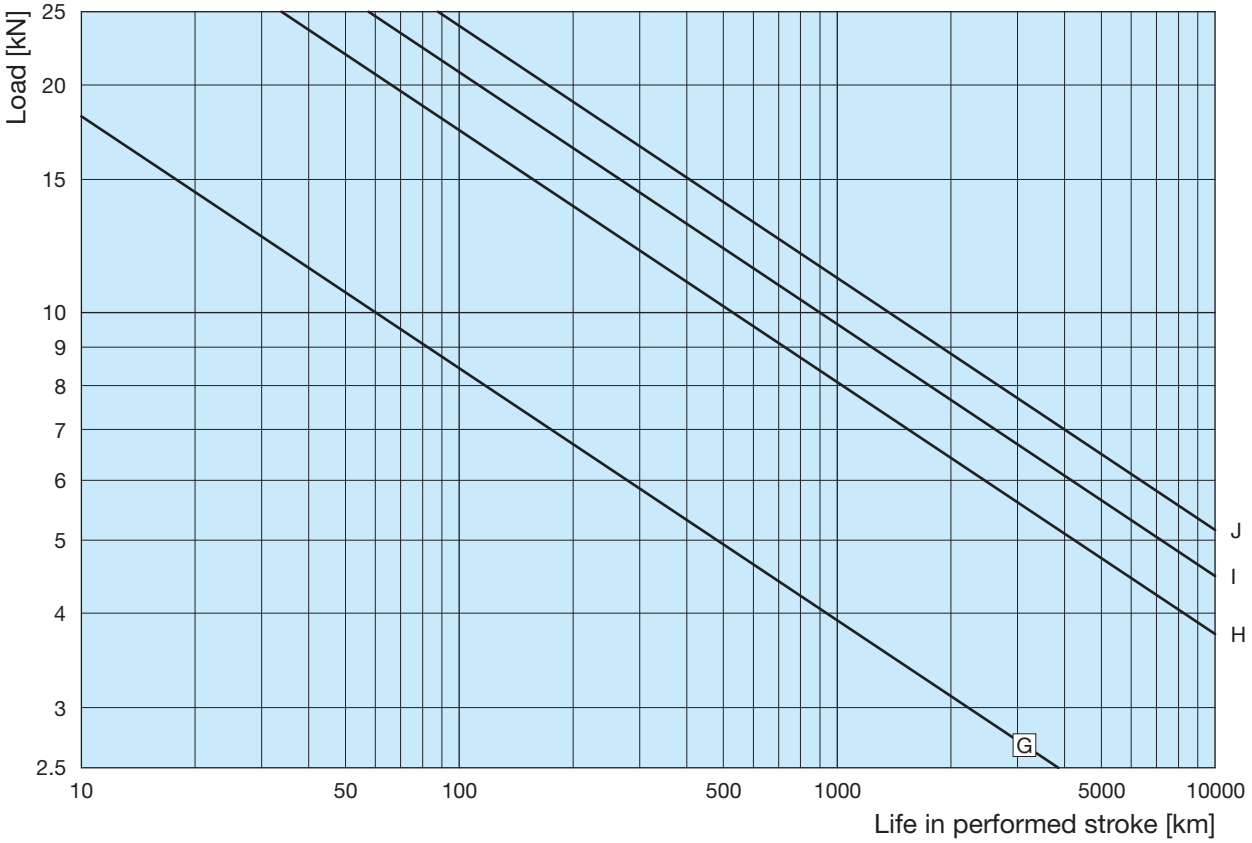


BALL SCREW	Ball [mm]	n° of circuits	C_a [kN]	C_{0a} [kN]	CURVE
BS 25×5	3.175	5	16.9	36.4	**D**
BS 25×10	3.969	3	14.2	25.8	**E**
BS 25×25	3.175	2 + 2	13.1	25.2	**F**

3.4 Ball screw life

MA 25 BS Mod.A

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screws life” on page 18 or contact SERVOMECH technical support.

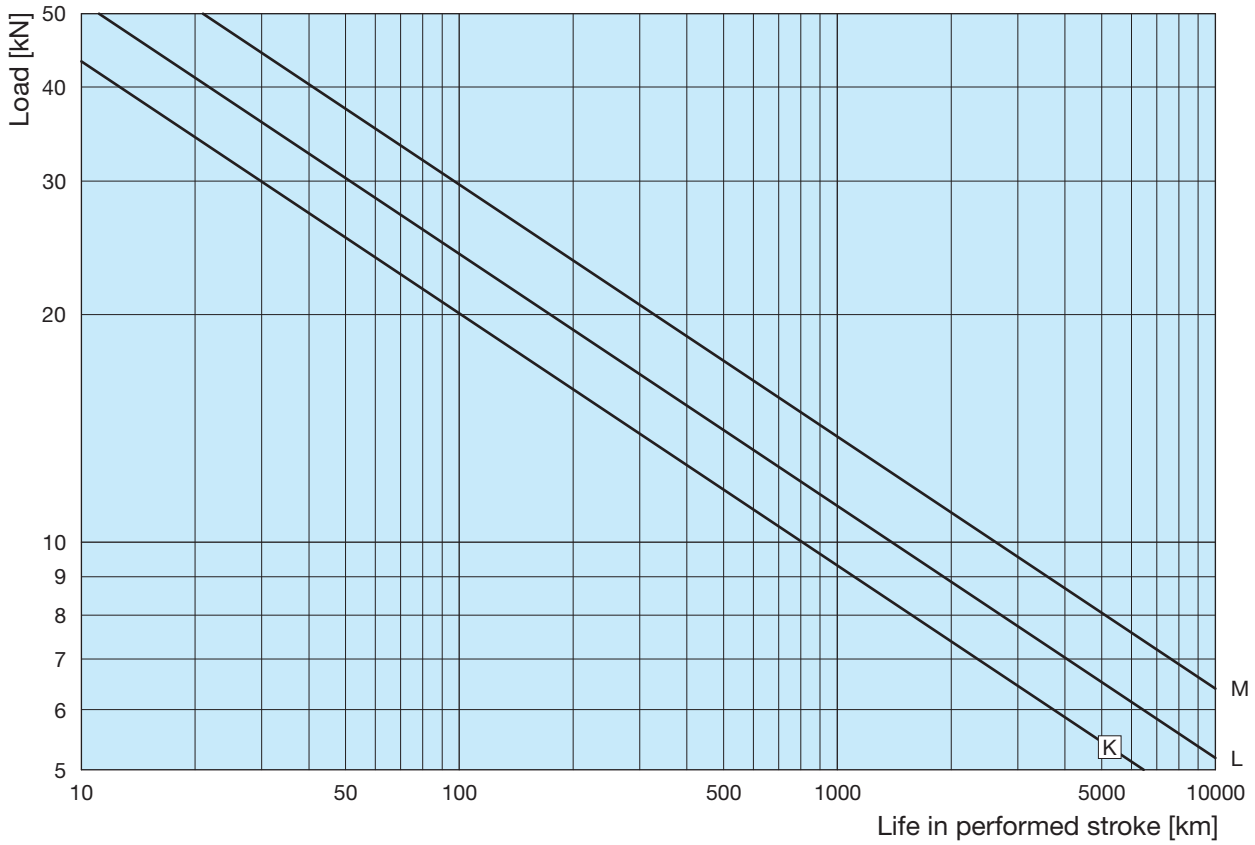


BALL SCREW	Ball [mm]	n° of circuits	C_a [kN]	C_{0a} [kN]	CURVE
BS 32×5	6.35	6	22.9	60	**G**
BS 32×10	6.35	5	44.8	83	**I**
BS 32×20	6.35	3	29.8	53	**H**
BS 32×32	6.35	2 + 2	35.0	58	**J**

3.4 Ball screw life

MA 50 BS Mod.A

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screws life” on page 18 or contact SERVOMECH technical support.

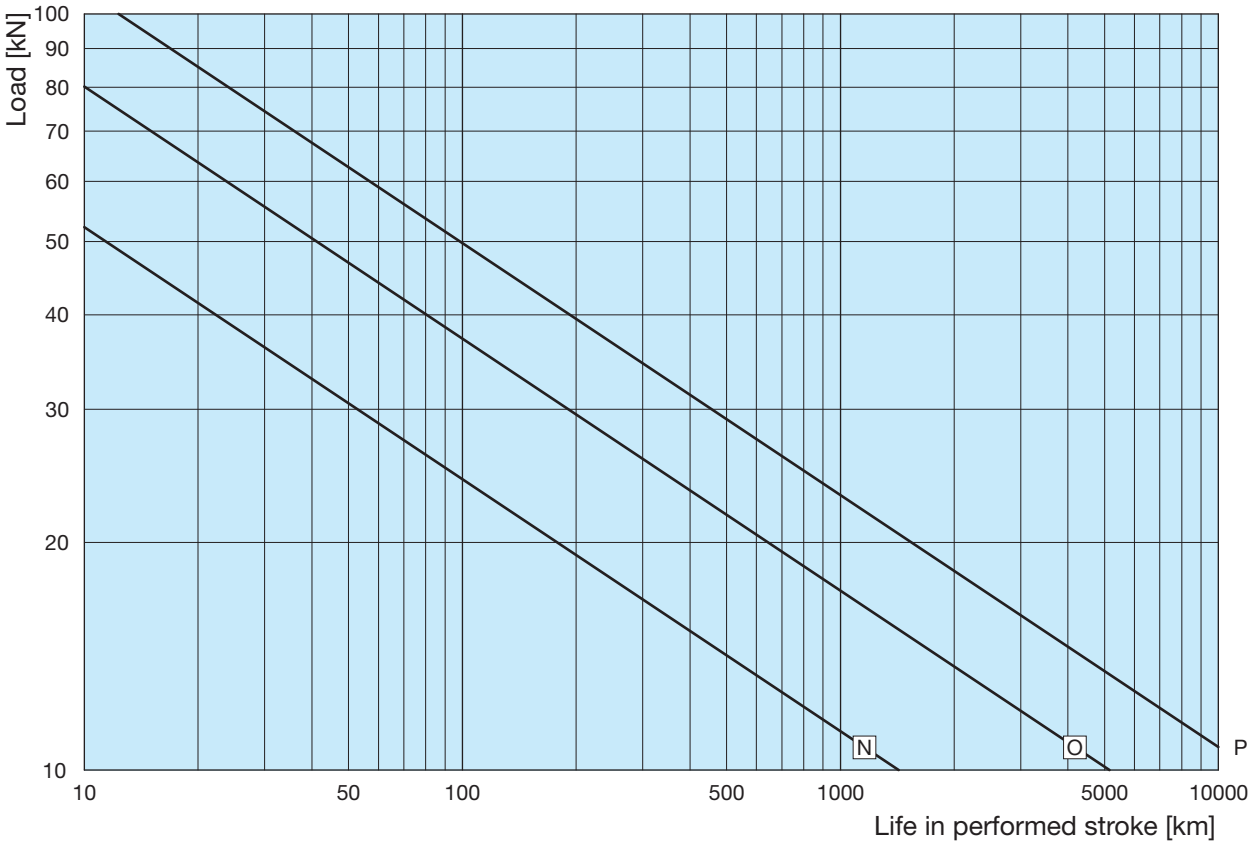


BALL SCREW	Ball [mm]	n° of circuits	C_a [kN]	C_{0a} [kN]	CURVE
BS 40×10	6.35	5	52	111	**L**
BS 40×20	6.35	3	34.3	70	**K**
BS 40×40	6.35	2 + 2	40.3	77	**M**

3.4 Ball screw life

MA 100 BS Mod.A

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screws life” on page 18 or contact SERVOMECH technical support.

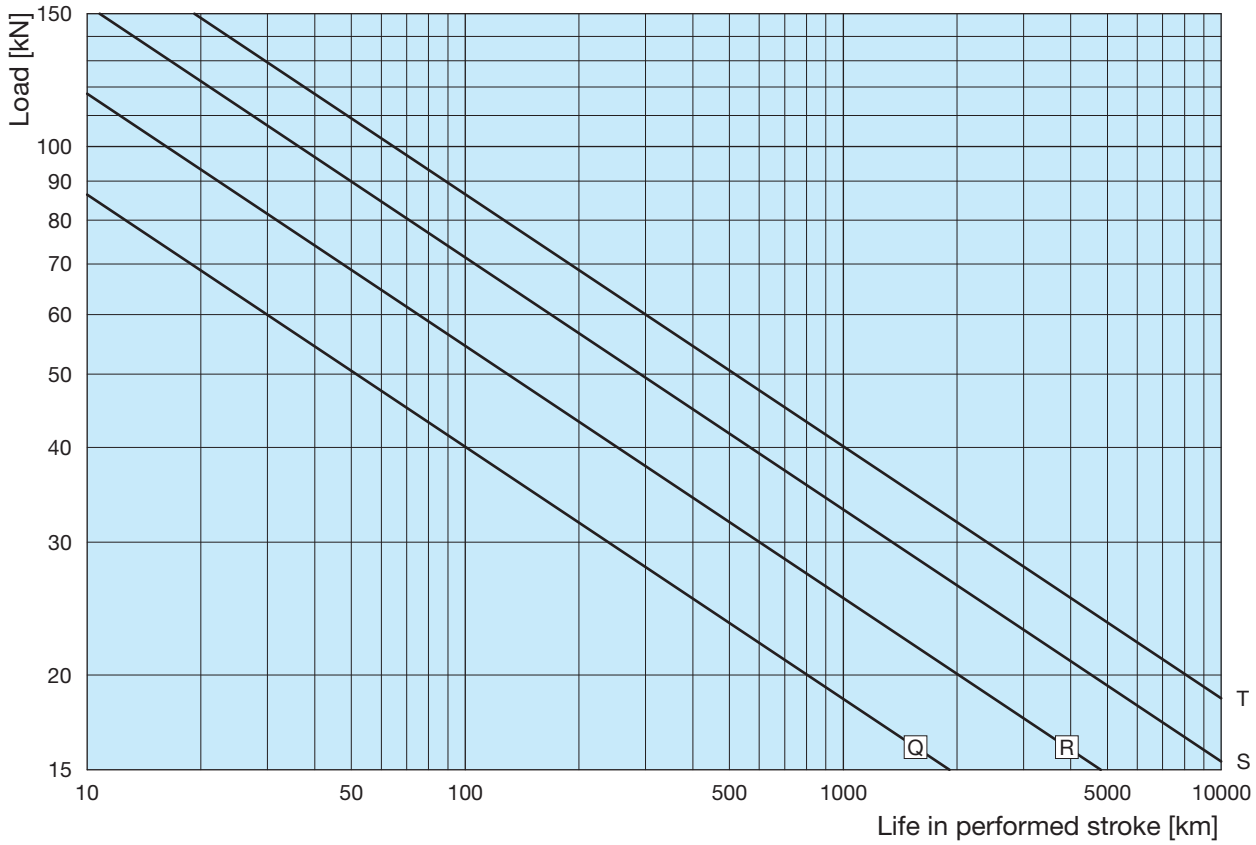


BALL SCREW	Ball [mm]	n° of circuits	C_a [kN]	C_{0a} [kN]	CURVE
BS 50×10	7.144	7	107	271	**P**
BS 50×20	7.144	4	64	147	**O**
BS 50×40	7.144	2	33	68	**N**

3.4 Ball screw life

MA 150 BS Mod.A

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screws life” on page 18 or contact SERVOMECH technical support.

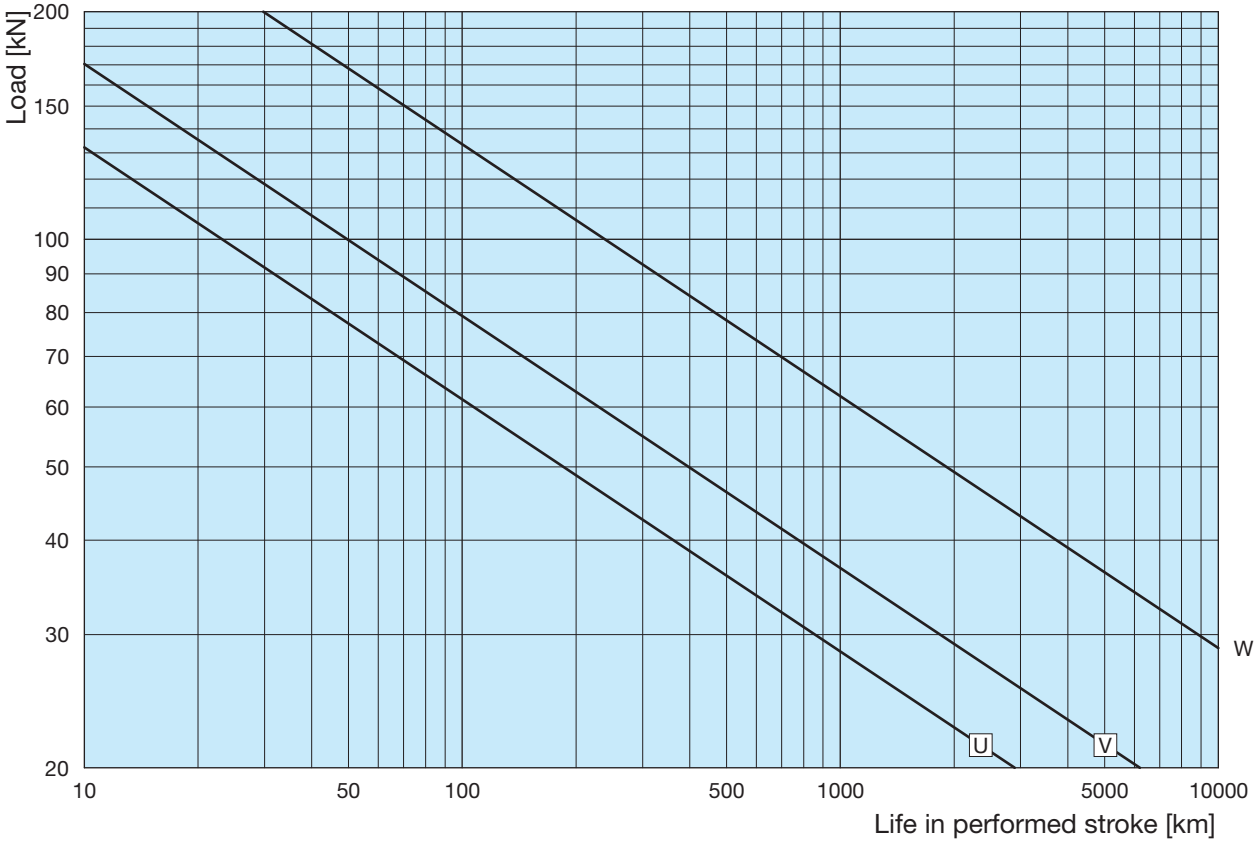


BALL SCREW	Ball [mm]	n° of circuits	C_a [kN]	C_{0a} [kN]	CURVE
BS 63×10	7.144	6	117	340	**R**
BS 63×20	9.525	5	122	292	**S**
BS 63×20	9.525	6	148	370	**T**
BS 63×30	9.525	3	81	184	**R**
BS 63×40	9.525	2	54	115	**Q**

3.4 Ball screw life

MA 200 BS Mod.A

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screws life” on page 18 or contact SERVOMECH technical support.

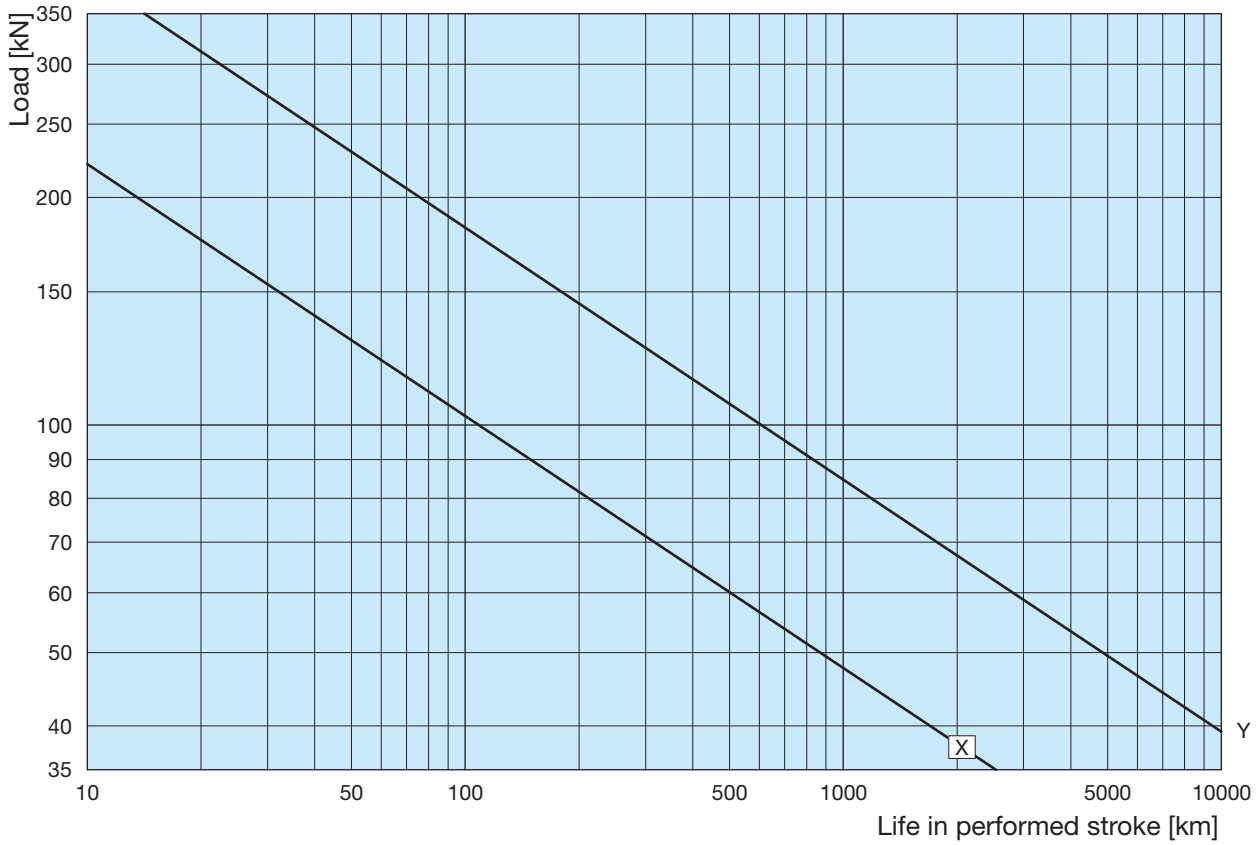


BALL SCREW	Ball [mm]	n° of circuits	C_a [kN]	C_{0a} [kN]	CURVE
BS 80×10	7.144	7	132	448	**U**
BS 80×20	12.7	5	228	585	**W**
BS 80×40	12.7	2	103	232	**V**

3.4 Ball screw life

MA 350 BS Mod.A

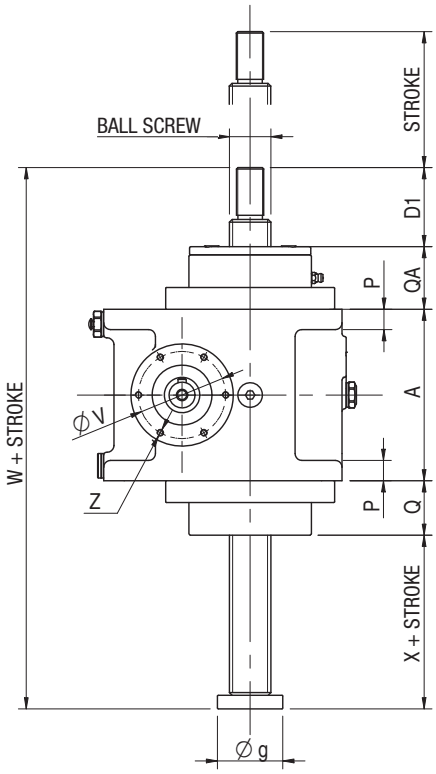
The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screws life” on page 18 or contact SERVOMECH technical support.

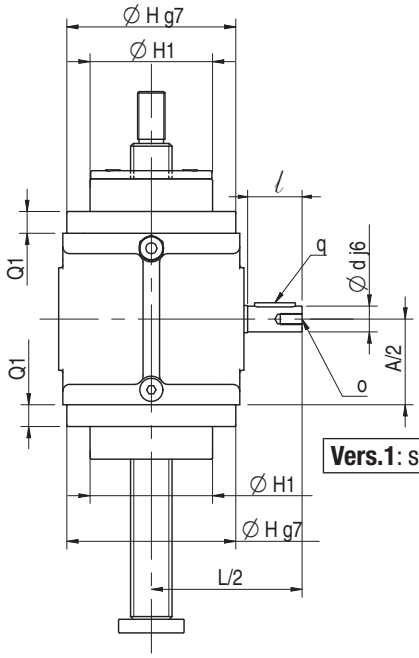


BALL SCREW	Ball [mm]	n° of circuits	C_a [kN]	C_{0a} [kN]	CURVE
BS 100×16	9.525	6	189	638	**X**
BS 100×20	12.7	6	312	963	**Y**

3.5 Overall dimensions

MA BS Series Mod.A, size 5 - 10 - 25 - 50 - 100 - 150

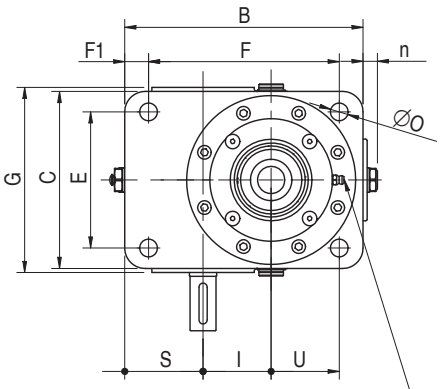


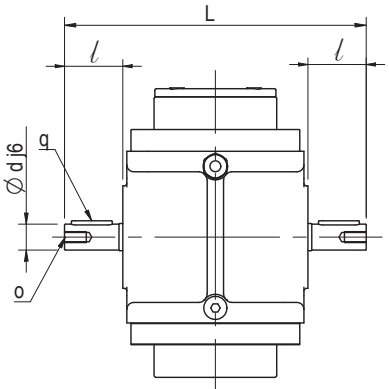


Vers.1: single input shall

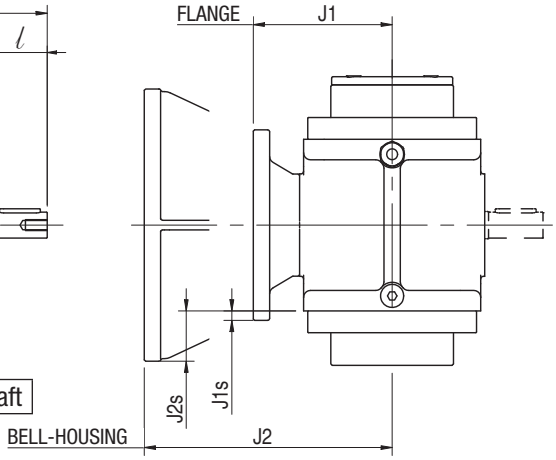
Vers.3: flange and hollow shaft IEC

Vers.4: flange and hollow shaft IEC + 2nd shaft





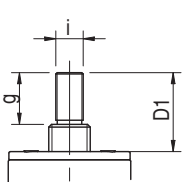
Vers.2: double input shall



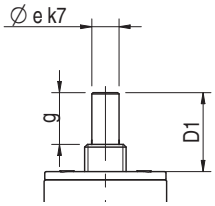
Vers.5: Vers.1 with bell-housing and coupling IEC

Vers.6: Vers.2 with bell-housing and coupling IEC

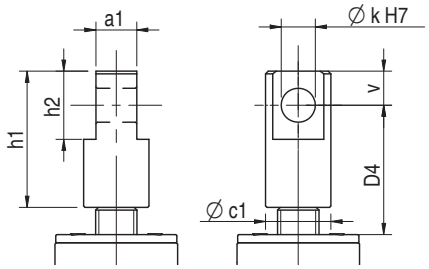
NOTE: angular position of ball screw grease nipple (different angular position on request)



THREADED END
NF

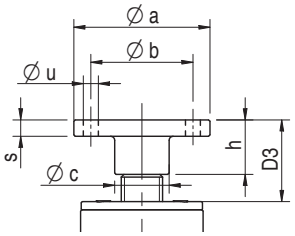


CYLINDRICAL END
N



ROD END
TF

(Not available with anti-rotation device Code AR)



FLANGE END
P

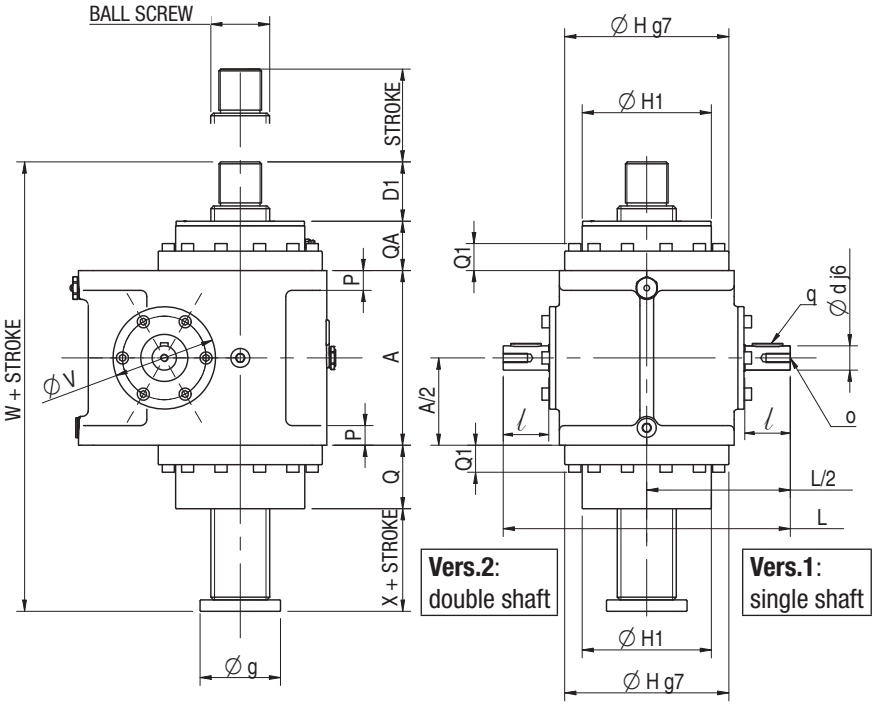
3.5 Overall dimensions

MA BS Series Mod.A, size 5 - 10 - 25 - 50 - 100 - 150

SIZE	MA 5 BS	MA 10 BS	MA 25 BS	MA 50 BS	MA 100 BS	MA 150 BS
BALL SCREW	BS 16 × P_h	BS 25 × P_h	BS 32 × P_h	BS 40 × P_h	BS 50 × P_h	BS 63 × P_h
A	80	100	126	160	200	200
B	124	140	175	235	276	276
C	80	105	130	160	200	200
D1 (min.)	39	44	58	58	68	68
D3 (min.)	40	45	60	60	70	70
D4 (min.)	65	75	95	105	150	150
E	62	80	100	120	150	150
F	95	110	140	190	220	220
F1	12.5	14	17.5	23	26	26
G	100	114	136	165	205	205
∅ H	75	95	124	145	185	185
∅ H1	54	65	90	109	150	150
I	30	40	50	63	80	80
L	149	179	221.5	269	330	330
∅ O	9	9	13	17	21	21
P	10	12	15	19	22	22
Q	29.5	32	40	41.5	64	64
Q1	11	12	16	25	29	29
QA	38.5	41	46	47.5	70	70
S	46.5	46	57.5	80	91	91
U	31	38	50	70	75	75
∅ V	42	46	64	63	74	74
W	191.5	229	291.5	330.5	394.5	424.5
X	13.5	21	27.5	29.5	-1.5	28.5
Z	M5, depth 10	M5, depth 12	M5, depth 10	M6, depth 14	M6, depth 14	M6, depth 14
∅ a	68	75	100	120	150	150
a1	20	25	30	40	60	60
∅ b	45	55	75	85	110	110
∅ c	25	30	40	50	70	70
∅ c1	32	38	48	68	90	90
∅ d	10	14	19	24	28	28
∅ e	12	15	20	30	40	40
∅ g	30	38	48	70	82	96
g	19	24	38	38	48	48
h	20	25	40	40	50	50
h1	60	75	100	120	180	180
h2	30	40	50	70	100	100
i	M12×1.75	M16×1.5	M20×1.5	M30×2	M42×3	M42×3
∅ k	14	20	25	35	50	50
l	22	30	40	50	60	60
n	—	—	10	10	12	12
o	M5, depth 10	M6, depth 14	M8, depth 16	M8, depth 16	M8, depth 16	M8, depth 16
q	3×3×15	5×5×20	6×6×30	8×7×40	8×7×40	8×7×40
s	8	10	12	15	20	20
∅ u, n° of holes	∅ 7, 4 holes	∅ 9, 4 holes	∅ 11, 4 holes	∅ 17, 4 holes	∅ 21, 4 holes	∅ 21, 4 holes
v	15	20	25	35	50	50
J1	63 B5/B14: 62	63 B5/B14: 69	63/71 B5: 102	80 B5: 100	80/90 B5: 120	80/90 B5: 120
J1s	63 B5: 30 63 B14: 5	63 B5: 20 63 B14: —	63 B5: 7 71 B5: 17	80 B5: 20	80/90 B5: —	80/90 B5: —
J2	71 B5: 122 71 B14: 131	71 B5: 129 71 B14: 138	80 B5: 182 80 B14: 176 90 B5: 182 90 B14: 182	90 B5: 200 90 B14: 200 100 B5: 220 100 B14: 220	100/112 B5 240 100/112 B14: 240	100/112 B5 240 100/112 B14: 240
J2s	71 B5: 40 71 B14: 12.5	71 B5: 30 71 B14: 3	80 B5: 37 80 B14: — 90 B5: 37 90 B14: 7	90 B5: 20 90 B14: — 100 B5: 45 100 B14: —	100/112 B5 25 100/112 B14: —	100/112 B5 25 100/112 B14: —

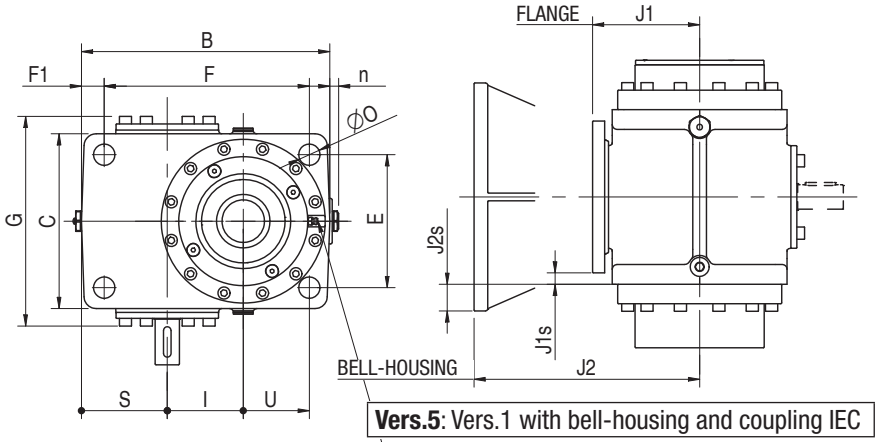
3.5 Overall dimensions

MA BS Series Mod.A, size 200 - 350



Vers.3: flange and hollow shaft IEC

Vers.4: flange and hollow shaft IEC + 2nd shaft

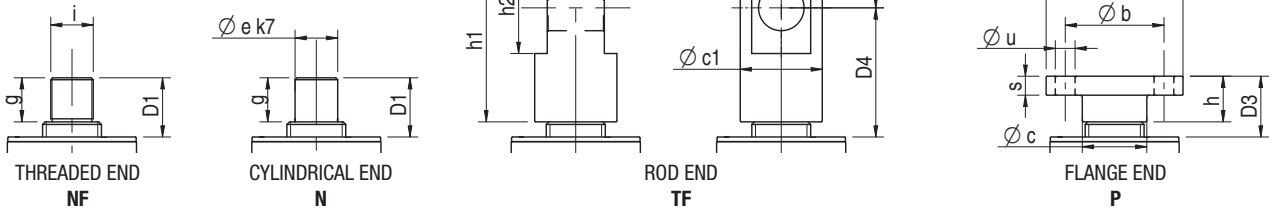


Vers.5: Vers.1 with bell-housing and coupling IEC

Vers.6: Vers.2 with bell-housing and coupling IEC

NOTE: angular position of ball screw grease nipple (different angular position on request)

SIZE	MA 200 BS	MA 350 BS
BALL SCR.	BS 80 × P_h	BS 100 × P_h
A	230	280
B	330	415
C	230	300
D1 (min.)	78	98
D3 (min.)	80	100
D4 (min.)	170	220
E	175	230
F	270	330
F1	30	42
G	256	326
∅ H	216	290
∅ H1	170	220
I	100	125
L	378	490
∅ O	28	34
P	26	30
Q	63.5	84
Q1	35.5	46
QA	65	93
S	113	121
U	87	126
∅ V	110	118
W	471	578
X	34.5	23
Z	M10, depth 20	M10, depth 25
∅ a	180	250
a1	75	100
∅ b	130	180
∅ c	85	115
∅ c1	108	138
∅ d	32	38
∅ e	50	70
∅ g	106	146
g	58	78
h	60	80
h1	210	280
h2	120	160
i	M56×3	M80×3
∅ k	60	80
l	60	80
n	10	10
o	M10, depth 24	M12, depth 32
q	10×8×40	10×8×60
s	25	35
∅ u, n° holes	∅ 26, 6 holes	∅ 30, 6 holes
v	60	80
J1	90 B5: 142 100/112 B5: 142	—
J1s	90 B5: — 100/112 B5: 10	—
J2	132 B5: 297	132 B5: 353 160 B5: 365
J2s	132 B5: 35	132 B5: 10 160 B5: 35



THREADED END **NF**

CYLINDRICAL END **N**

ROD END **TF**

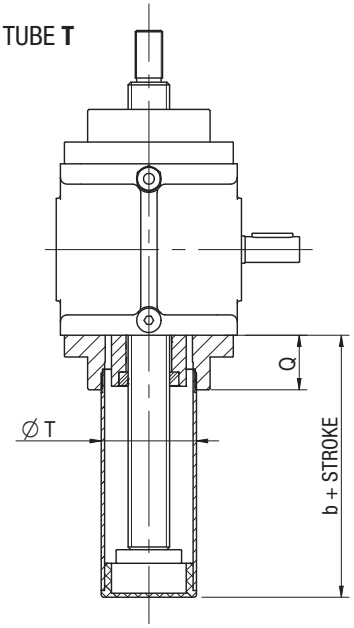
(Not available with anti-rotation device Code AR)

FLANGE END **P**

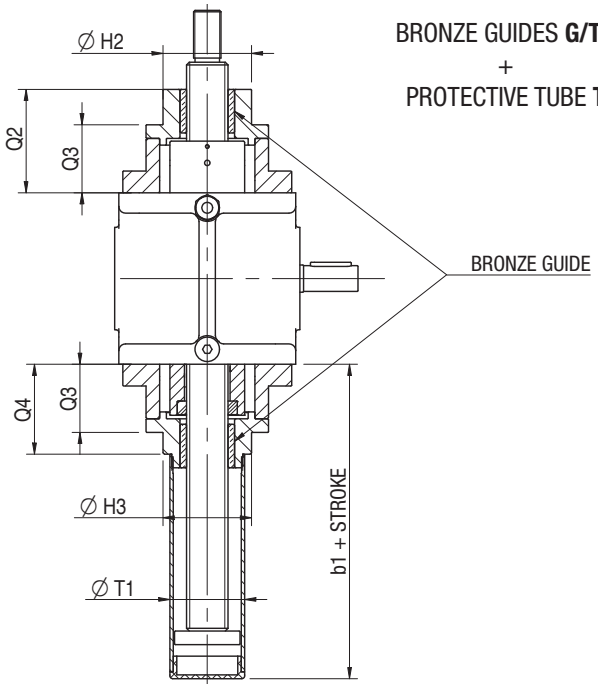
3.5 Overall dimensions

MA BS Series Mod.A with protective tube T

PROTECTIVE TUBE **T**



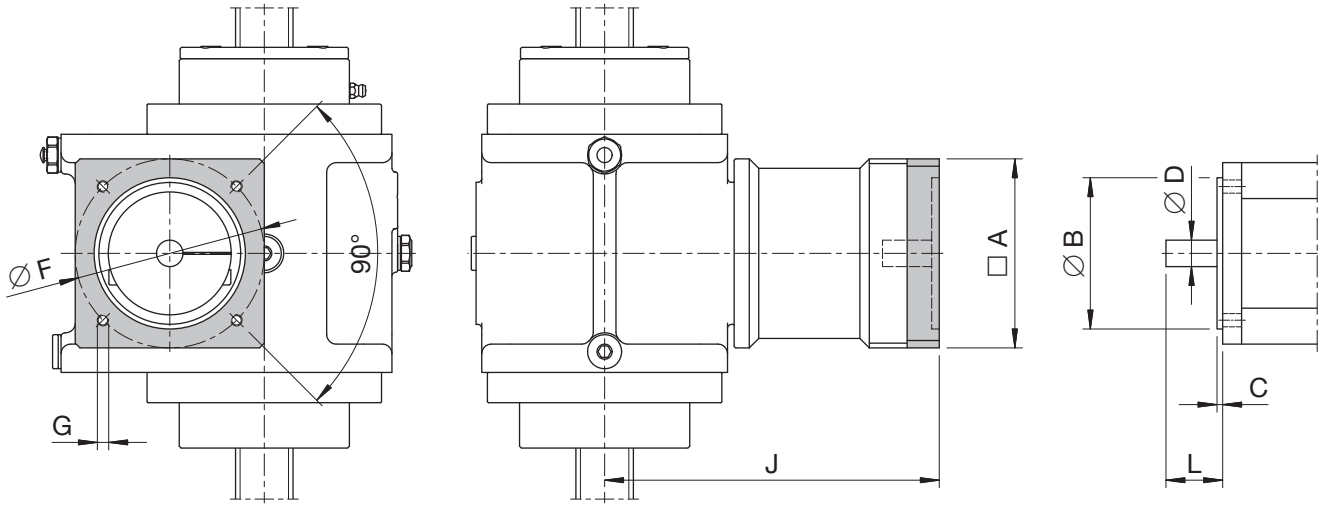
BRONZE GUIDES **G/TG**
+
PROTECTIVE TUBE **T**



SIZE		MA 5 BS	MA 10 BS	MA 25 BS	MA 50 BS	MA 100 BS	MA 150 BS	MA 200 BS	MA 350 BS
BALL SCREW		BS 16 × P_h	BS 25 × P_h	BS 32 × P_h	BS 40 × P_h	BS 50 × P_h	BS 63 × P_h	BS 80 × P_h	BS 100 × P_h
∅ H2		34	48	65	85	100	100	135	160
Q2		47.5	60	76	82.5	114	128	146	184
Q3		37.5	41	50	58.5	84	98	88	123
Q4		–	50	66	72.5	103	117	126	123
∅ T	exec. T	45	55	70	90	110	110	150	180
	exec. T+SN								
	exec. T+AR								
	exec. T+FCP								
	exec. T+AR+FCP								
	exec. T+FCM	45	55	55	55	–	–	–	–
Q	exec. T	29.5	32	40	41.5	64	64	63.5	84
	exec. T+SN								
	exec. T+AR								
	exec. T+FCP								
	exec. T+AR+FCP								
	exec. T+FCM	29.5	32	50	54.5	–	–	–	–
b	exec. T	68	78	92.5	96	107.5	137.5	143	152
	exec. T+SN	74	84	127.5	136	132.5	162.5	168	182
	exec. T+AR	97	110	132.5	136	127.5	157	164	178
	exec. T+FCP	103.5	106	112.5	116	139	137	161.5	161
	exec. T+AR+FCP	107.5	110	132.5	136	152	157	177.5	190
	exec. T+FCM	96.5	100	140	144.5	–	–	–	–
∅ T1	exec. TG	36	45	55	55	90	90	130	170
	exec. TG+FCM					–	–	–	–
	exec. TG+FCP	40	50	55	60	100	100	130	170
	exec. TG+AR	40	55	70	90	110	110	150	180
∅ H3	exec. TG	36	48	65	85	100	100	135	170
	exec. TG+FCP								
	exec. TG+FCM					–	–	–	–
	exec. TG+AR	40	55	70	90	110	110	150	180
b1	exec. TG	98.5	113	131	157.5	169	183	226	269
	exec. TG+FCP	122.5	135	151	157.5	188	202	231	269
	exec. TG+FCM	122.5	135	156	162.5	–	–	–	–
	exec. TG+AR	132.5	145	171	177.5	209	223	241	294

3.6 Electric motor attachment

Servomotor attachment



SIZE	FLANGE ON SCREW JACK							MOTOR SHAFT
	CODE	□ A	∅ B	C	∅ F	G	J	∅ D×L
MA 5 BS	F1	65	40	2.5	63	M5	104	∅9×20
							129	∅11×23, ∅14×30
	F2	65	50	3	70	M5	106	∅8×25
							129	∅11×30, ∅14×30, ∅14×31
MA 10 BS	F1	75	60	3	75	M5	148	∅11×23, ∅14×30
	F2	80	70	3	90	M6	148	∅11×30, ∅14×30, ∅16×40, ∅19×35, ∅19×40
	F3	82	50	3	95	M6	148	∅14×30
MA 25 BS	F1	100	80	3	100	M6	177	∅14×30, ∅14×37, ∅16×35, ∅16×40, ∅19×35, ∅19×40
	F2	105	95	3	115	M8	177	∅19×40, ∅19×45, ∅22×45, ∅24×45
							187	∅19×50, ∅19×55, ∅24×50
MA 50 BS	F1	116	95	3	130	M8	219	∅24×50
	F2	126	110	3.5	130	M8	219	∅19×40, ∅24×50
	F3	130	110	3.5	145	M8	219	∅16×40, ∅19×40, ∅19×58, ∅22×55, ∅22×58, ∅24×58, ∅28×55
							226	∅24×65, ∅28×63
MA 100 BS MA 150 BS	F1	140	110	3.5	165	M10	244	∅24×50
	F2	155	130	3.5	165	M10	244	∅24×50, ∅28×60, ∅32×58
							264	∅32×80
MA 200 BS	F1	165	155	4	190	M10	284	∅32×60
	F2	180	114.3	3.5	200	M12	284	∅35×65, ∅35×70
							296	∅35×79, ∅35×80, ∅42×79
							327	∅42×113
	F3	205	180	5	215	M12	284	∅28×60, ∅32×58
							296	∅38×80, ∅42×82
MA 350 BS	F1	205	180	5	215	M12	330	∅28×60, ∅32×58
							340	∅38×80, ∅42×82
	F2	220	200	5	235	M12	376	∅42×110, ∅55×110
	F3	250	230	5	265	M16	413	∅65×130
	F4	264	250	5	300	M16	393	∅48×110, ∅55×110

Code: **Vers._(screw jack flange code - motor shaft dimensions _**)**
** - in case of shaft **with key** DIN 6885 Part 1, add code **K**
example: **Vers.5(F2 24-50)** or **Vers.6(F2 24-50 K)**

NOTE: In case of servomotor with dimensions not specified in the table, please contact SERVOMECH technical support to check feasibility of a suitable fitting.

3.6 Electric motor attachment

IEC motor attachment

		MA 5 BS	MA 10 BS	MA 25 BS	MA 50 BS	MA 100 BS	MA 150 BS	MA 200 BS	MA 350 BS
63	B5	F	F	F					
	B14	F	F						
71	B5	B	B	F	F				
	B14	B	B	F					
80	B5			B	F	F	F		
	B14			B					
90	B5			B	B	F	F	F	
	B14			B	B				
100 - 112	B5				B	B	B	F	
	B14				B	B	B		
132	B5							B	B
160	B5								B

F: flange + hollow shaft B: bell-housing + coupling

Code: **Vers._(IEC motor size flange)**
example: **Vers.3(IEC 71 B14)** or **Vers.6(IEC 132 B5)**

3.7 Accessories

Bronze guides

The bronze guide ensures the coaxial position of the ball screw within its nut. This is extremely important to have the optimal contact between balls and ball tracks for a longer screw life. Guides are mounted **on both sides** of the screw jack housing.

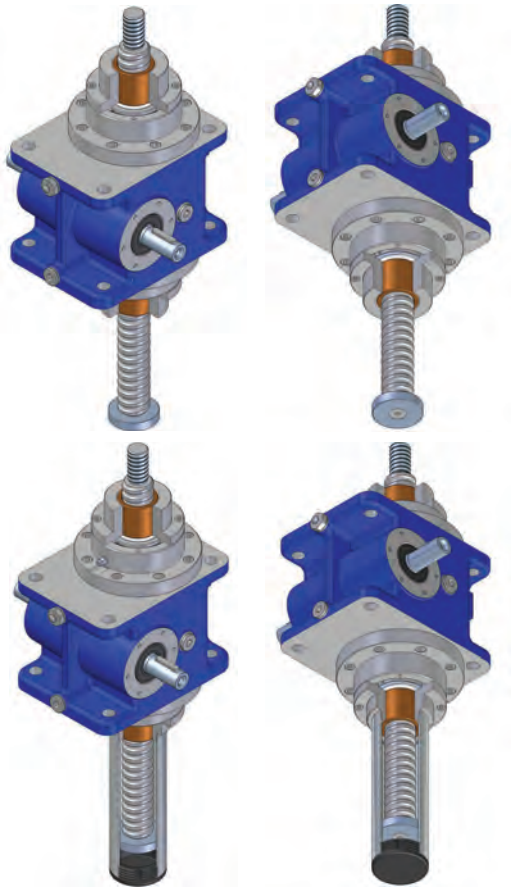
Bronze guides are strongly recommended in case of absence of other external guidance system.

Ordering code: **G-G**

If the screw jack needs a protective tube in addition to the bronze guides, it is possible to have a combination of the two accessories.

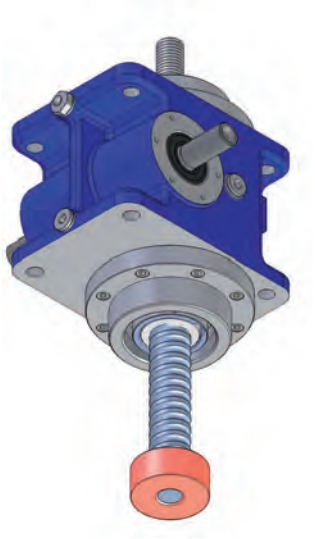
Ordering code: **G-TG**

ATTENTION! In applications with trunnion mount (code SC), bronze guides are mandatory.



3.7 Accessories

Stop nut



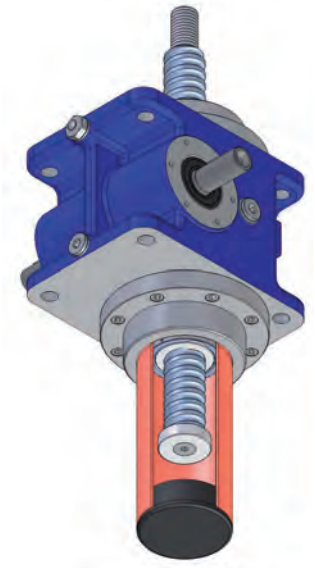
The stop nut prevents the ball screw travelling out of the screw jack housing. It is a washer pinned at the screw end (opposite the attachment side) that blocks the screw translation when reaching the related stop. Unlike the standard washer, made of tecnopolimer, which prevents unscrewing, the stop nut is made of steel and can sustain the load in case it should reach the related mechanical stop.

The ball screw length is defined to have, during normal working condition, at its extreme position (extended or retracted) an extra-stroke (safety stroke) of at least 20 mm.

If the stop nut reaches accidentally the related stop, the components of the screw jack must be inspected to verify the presence of possible damages.

Ordering code: **SN**

Protective tube

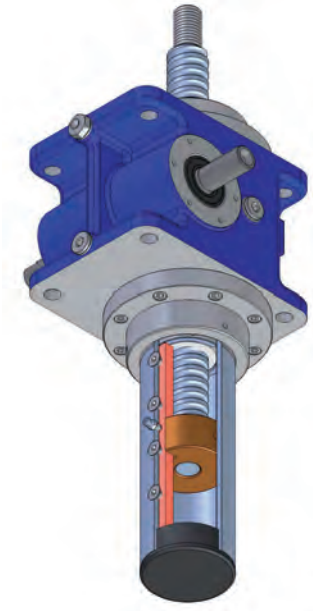


The protective tube is screwed in the cover and protects the ball screw from damages and/or environment pollution such as dust, water, etc. Furthermore, it allows the fitting of other options such as limit switches and/or anti-turn device.

The protective tube is made of aluminium alloy. When the accessory anti-turn device is present, protective tube is made of steel.

Ordering code: **T**

Anti-turn device



The anti-turn device is necessary when the load to be lifted is not guided and therefore the ball screw rotation is not prevented, or in case the application does not properly allow the screw reaction to permit the translation.

Functioning: a steel key is fitted along the protective tube, and a keyed bronze washer is fixed at the end of the ball screw; this prevents the screw rotation and forces the screw translation.

Up to screw jack size 50 (ball screw BS 40 × P_h) included, the anti-turn device has only one key; from size 100 (ball screw BS 50 × P_h) onwards, it has two keys mounted on opposite sides.

The bronze washer also acts as a stop nut against ball screw unthreading.

ATTENTION! When the accessory anti-turn device is present, screw rod end (Code TF) is not available.

Ordering code: **AR**

3.7 Accessories

Magnetic limit switches

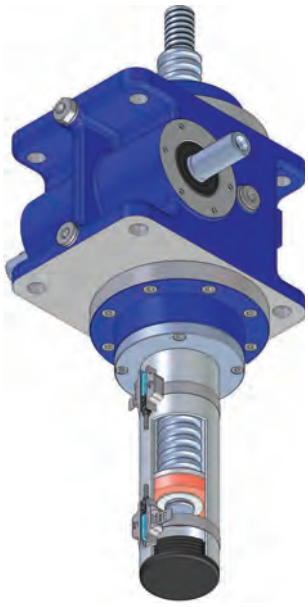
Available for screw jacks size 5, 10 or 25 only.

ATTENTION! Not available with anti-turn device AR.

Functioning: magnetic limit switches are sensors with reed contact and are fitted with a clamp on the aluminum, or other non-magnetic metal, protective tube (code T). They are activated by the magnetic field generated by a magnetic ring fitted on the travelling ball screw end.

In case the screw jack is not stopped after the sensor activation, without magnetic field the sensor restores the original state. In case the limit switches are used to stop the screw jack, we recommend to provide an electric connection in order to latch the signal and prevent the screw jack from moving again in the same direction.

Screw jacks with magnetic limit switches are supplied with two sensors for the ball screw extreme positions. On request, extra switches for intermediate positions can be supplied.



The position of the sensors along the tube is adjustable.

Technical details:

Contact:	normaly CLOSED (NC)	normally OPEN (NO)
Switching output:	reed	
Supply voltage:	(5 ... 120) V ac/dc	(5 ... 230) V ac/dc
Voltage drop:	⩽ 0.35 V	
Continuous switching current:	⩽ 100 mA	
Switching capacity:	⩽ 6 W	
Protection class:	II	
Enclosure rating:	IP 65	
Housing material:	technopolymer	
Bracket material:	zinc-cast, stainless steel	
Connection:	PVC cable, 2 × 0.12 mm^2, 2 m length	

Ordering code: **FCM-NC** normally closed magnetic switches FCM

Ordering code: **FCM-NO** normally open magnetic switches FCM

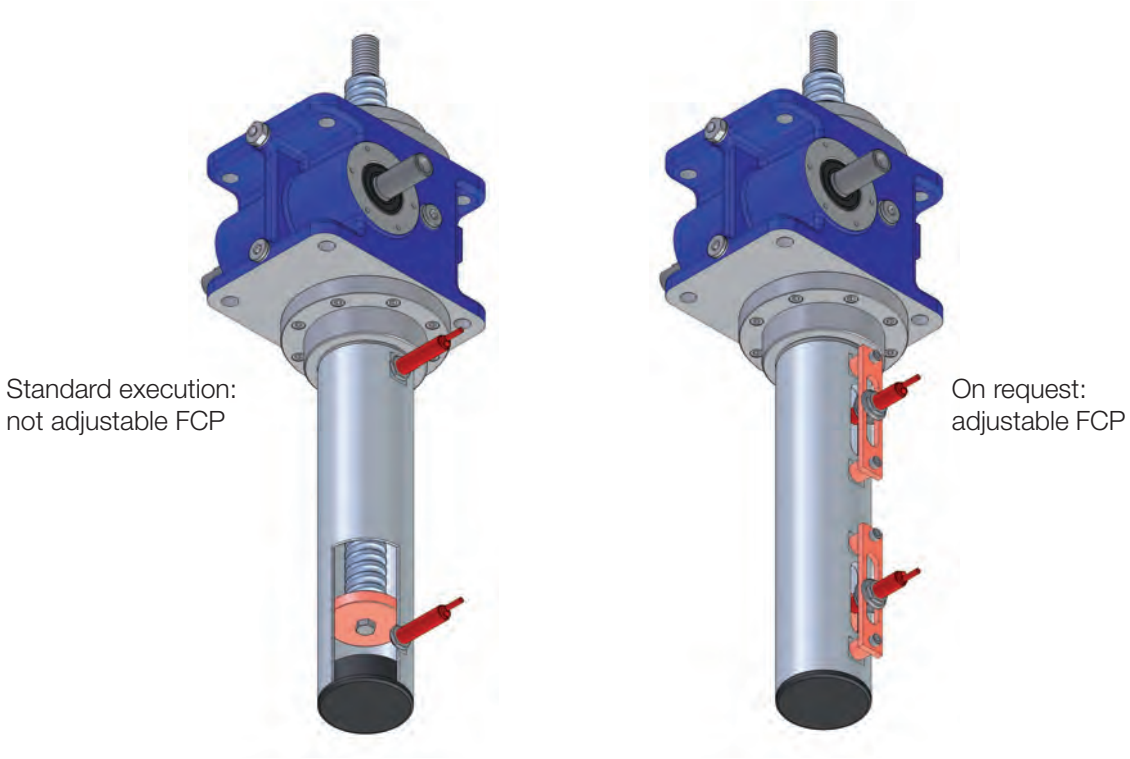
3.7 Accessories

Inductive proximity limit switches

Functioning: the limit switches are proximity sensors fixed on the protective tube and activated by the metallic ring placed on the ball screw end.

In case the screw jack is not stopped after the sensor activation, when the metallic ring moves away the sensor restores the original state (is deactivated). In case the limit switches are used to stop the screw jack, we recommend to provide an electric connection in order to latch the signal and to prevent the screw jack from moving again in the same direction.

Screw jacks with proximity limit switches are supplied with two sensors for the ball screw extreme positions. Extra switches for intermediate positions are available on request.



Standard execution:
not adjustable FCP

On request:
adjustable FCP

By **standard execution**, the sensors position along the tube **is not adjustable and is not angularly fixed**. On request, it can be supplied with angular position at customer's requirement.

Execution with possibility to adjust the sensors position along the tube is available on request. In that case, it is necessary to specify the length of the adjusting field.

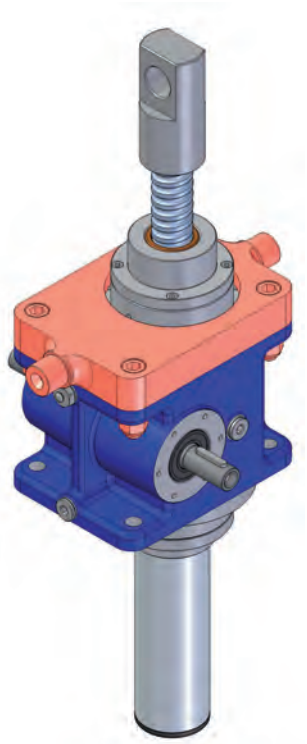
Technical details:

Type:	inductive, PNP
Contact:	normally CLOSED (NC)
Voltage range:	(10 ... 30) Vdc
Max. output current:	200 mA
Voltage drop (activated sensor):	< 1.8 V
Wires:	3 × 0.2 mm^2
Cable length:	2 m

Ordering code: **FCP** (standard, not adjustable)
FCPR50 (on request, 50 mm adjustable)

3.7 Accessories

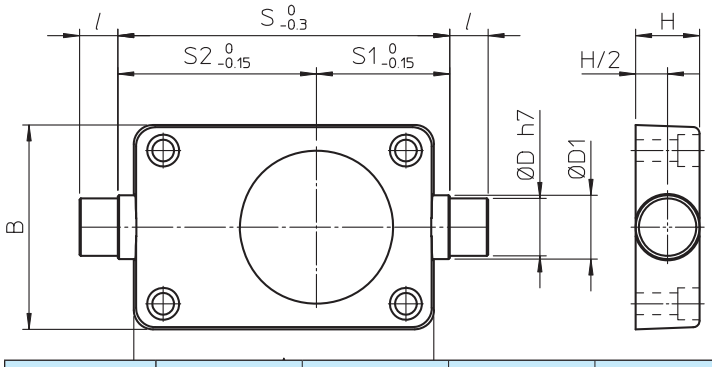
Trunnion mount



The trunnion mount is bolted to either the top or the bottom of the screw jack housing and allows the screw jack pivoting around the axis defined by the trunnion mount's lateral pins.

NOTE: the attachment of the travelling ball screw must have a cylindrical hole with axes parallel to the trunnion mount pivots axis.

ATTENTION! With trunnion mount option, bronze guides are mandatory.

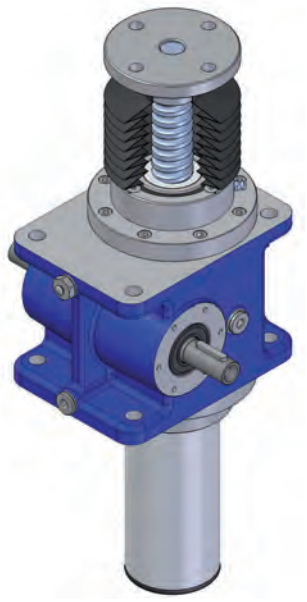


	MA 5 BS	MA 10 BS	MA 25 BS	MA 50 BS	MA 100 BS	MA 150 BS	MA 200 BS	MA 350 BS
A	134	155	199	260	301	301	354	465
B	90	120	154	185	225	225	260	350
∅D	15	20	25	45	50	50	70	80
$∅D_1$	20	25	30	50	60	60	80	90
H	20	25	30	50	60	60	80	90
ℓ	15	20	20	30	40	40	45	60
S	140	160	225	285	330	330	390	490
S_1	55.5	64	92	117	132	132	147	206.5
S_2	84.5	96	132	168	198	198	243	283.5
mass [kg]	1.4	2.6	5.1	14.8	23.5	23.5	45.5	81.9

Ordering code: **SC (TF side)** screw jacks with SC fixed on the screw attachment side

Ordering code: **SC (opposite TF side)** screw jacks with SC fixed on side opposite to the screw attachment

Bellows



In applications with particular environment conditions, bellows protect the screw from contaminants.

The usually supplied bellows are circular, sewn (double seam), in NYLON with a PVC outside and inside coating. For special application requirements, different executions or materials can be supplied on request.

The bellows cause changes to the retracted and extended lengths and screw jack overall dimensions stated in the catalogue. On request, orders will be acknowledged with a screw jack drawing giving exact dimensions.

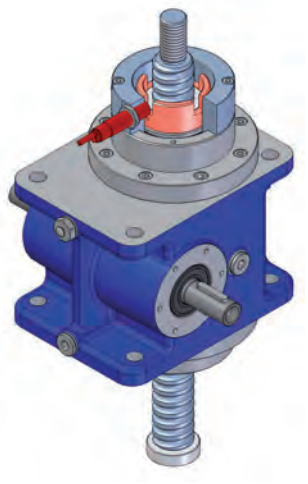
Usually, bellows are fitted between the screw jack housing and the ball screw attachment and the protective tube is fitted on the opposite side.

In case the screw jack shall have a ball screw without attachment, it is recommended to order it with a sketch of the required bellows attachment dimensions.

Codice: **B**

3.7 Accessories

Worm wheel rotation detector



Some applications require the possibility to verify if the worm wheel rotates while the worm shaft is moving in order to get information about the good condition and functioning of the worm wheel toothing.

A cylindrical element, machined in order to have a “crown” of empty and full spaces, is fixed to the worm wheel creating a phonic wheel that, while rotating, activates a corresponding proximity switches. As output of such proximity switch, activated and deactivated by the alternation of empty and full spaces, a “train” of impulses is generated which confirms the rotation of the worm wheel. On the contrary, the constant output signal of the proximity switch means the stop of the worm wheel.

The pulse generator can be mounted on the screw end side or on the opposite side.

For more information, contact SERVOMECH technical support.

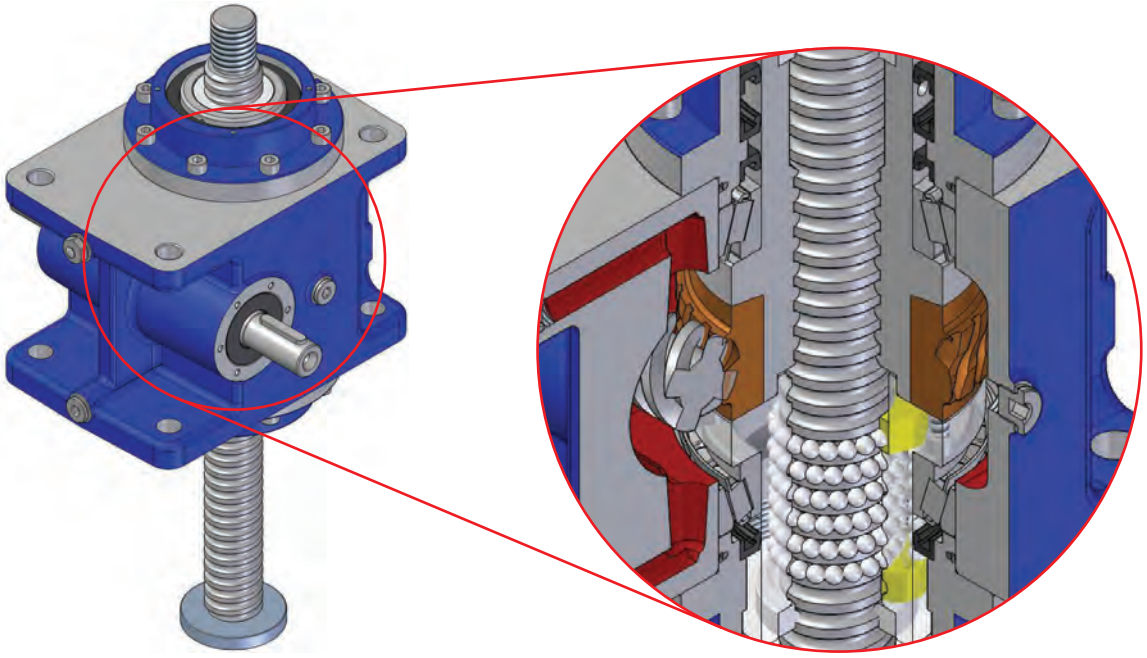
Safety nut

The safety nut is a back-up feature to prevent the load dropping in case of working nut balls failure, which can be caused by overload or by overcoming a fatigue limit.

The safety nut is an extension to the main nut, realized in the wormwheel axial bore. It does not have balls inside, but a helix that traces the shape of the ball truck on the screw. As long as the main nut is working properly, the “thread” of the safety nut does not touch the ball truck; in case the balls of the main nut should fail, the “thread” of the safety nut will touch the ball truck and sustain the load, with a consequent slithering in the contact area. The safety nut is made in cast iron, therefore the slithering between the two parts would damage the ball truck on the screw. So, in case the safety nut is activated, it is necessary to replace both ball screw and the main nut.

The safety nut works in **both** load direction and does not change the screw jack overall dimensions.

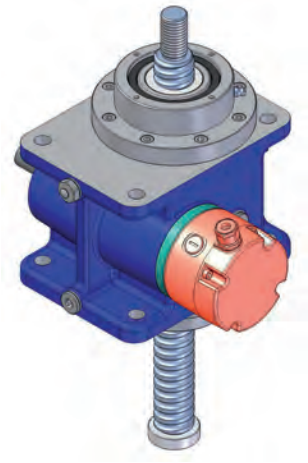
Ordering code: **MSA**

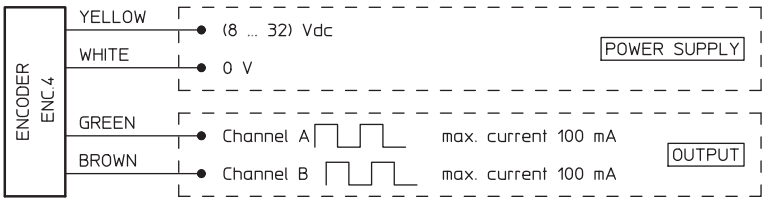


3.7 Accessories

ROTARY ENCODER Code ENC.4

Hall-effect encoder, incremental, bi-directional
Resolution: 4 pulses per revolution
Output: PUSH-PULL
2 channels (A and B, phase difference 90°)
Input voltage: (8 ... 32) Vdc
Max. commutable current (I_{out}): 100 mA
Max output voltage drop:
with load connected to 0 and I_{out} = 100 mA: 4.6 V
with load connected to + V and I_{out} = 100 mA: 2 V
Protection:
against short circuit
against input polarity inversion
against any incorrect output connection
Cable length: 1.3 m
Protection: IP 55

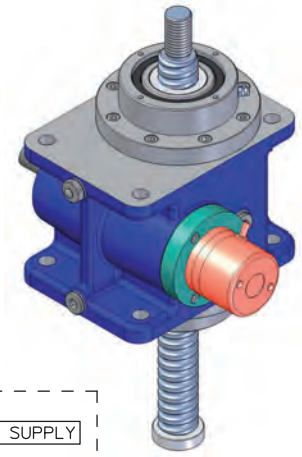


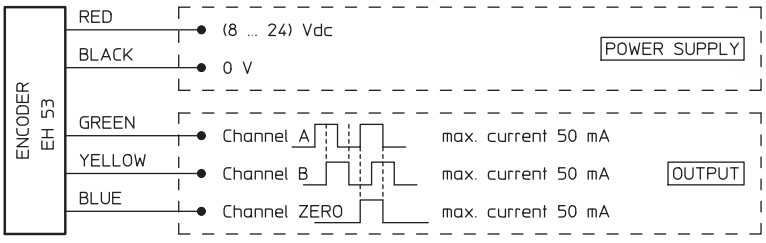


Ordering code: **ENC.4**

ROTARY ENCODER Code EH53

Optical encoder, incremental, bi-directional
Resolution: 100 or 500 pulses per revolution
Output: PUSH-PULL
2 channels (A and B, phase difference 90°)
channel ZERO
Input voltage: (8 ... 24) Vcc
No-load current: 100 mA
Max. commutable current: 50 mA
Cable length: 0.5 m
Protection: IP 54





Ordering code: **EH 53**

3.8 Ordering code MA BS Series Mod.A

MA	50	BS 40 × 10	Mod.A	RL	Vers. 3 (80 B5)	U-RH	X	C300
1	2	3	4	5	6	7	8	9

TF	B	G	/	MSA	/	G	T	AR	FCP	SC
10										

...
11

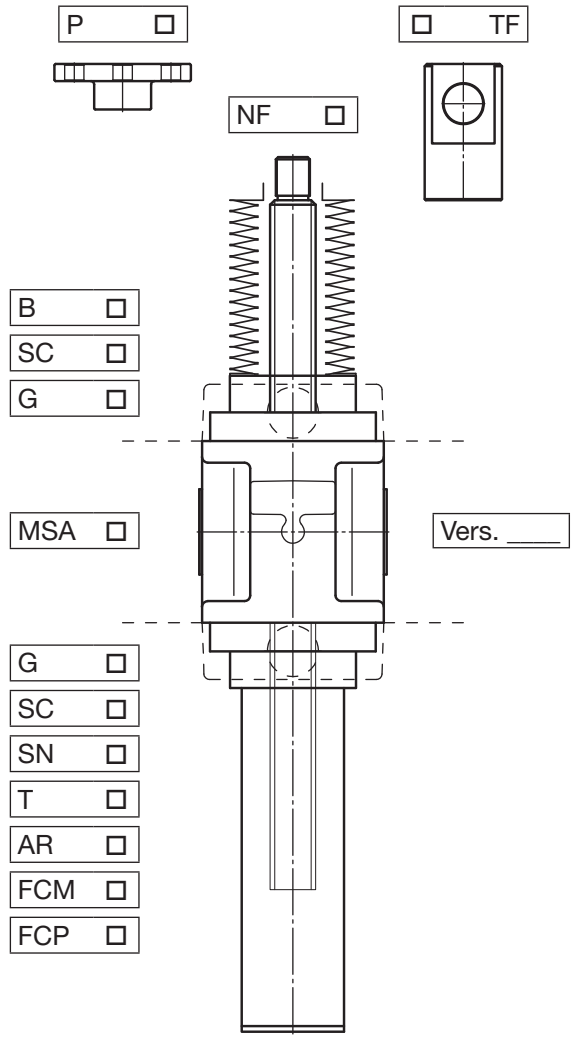
...
12

AC	3-phase	brake motor	0.75 kW	4-pole	230/400 V	50 Hz	IP 55	Ins. F
13								

1	MA (screw jack MA BS Series)		
2	Screw jack size		
	5 ... 350		page 22 - 23
3	Ball screw		
	BS diameter × lead		
4	Mod.A (model: travelling screw)		
5	Worm gear ratio		
	RV , RN , RL		page 22 - 23
6	Input version		
	Vers.1, Vers.2, Vers.3, Vers.4, Vers.5, Vers.6		page 8, 48 - 50
7	Screw jack mounting and input shaft position		
	U-RH, U-LH, D-RH, D-LH, H-RH, H-LH		page 9
8	Fixing plane		
	X, Y		page 9
8	Screw jack stroke length (example: C300 = 300 mm stroke)		
9	Accessories		
	NF, P, TF, N	Screw end	page 48 - 50
	B	Bellows	page 57
	G, TG	Bronze guides	page 53
	MSA	Safety nut	page 58
	SN	Stop nut	page 54
	T	Protective tube	page 54
	AR	Anti-turn device	page 54
	FCM-NC	Magnetic limit switches (normally closed)	page 55
	FCP-NC	Proximity limit switches (PNP, normally closed)	page 56
	SC	Trunnion mount	page 57
		Worm wheel rotation detector	page 58
10	Other accessories		
	example: encoder (with all relevant data)		page 59
11	Other specifications		
	example: lubricant for low temperature		
12	Motor data		
13	Product configuration sheet		page 61
14	Application layout		

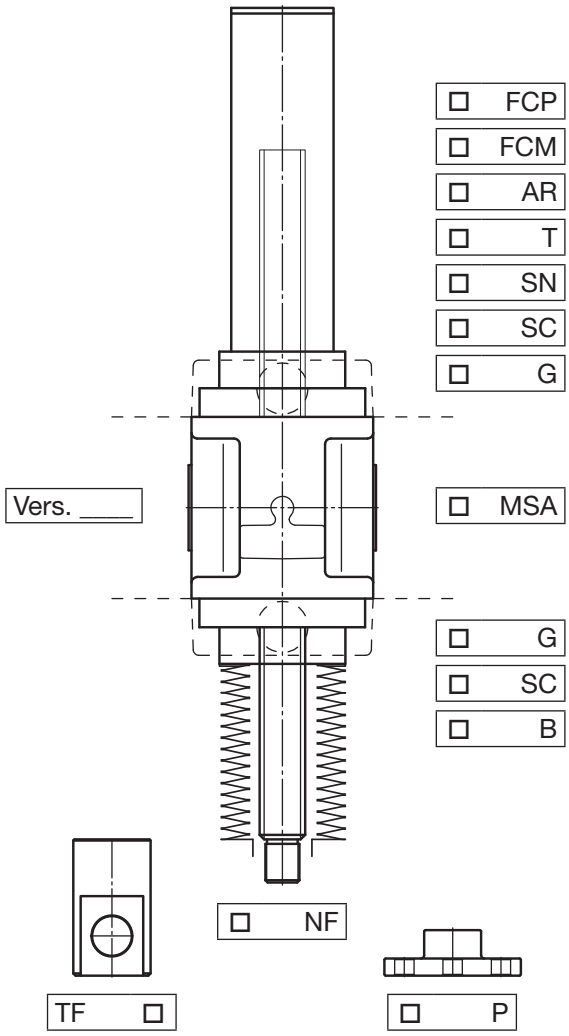
Product configuration sheet

UPWARD mounting ☐



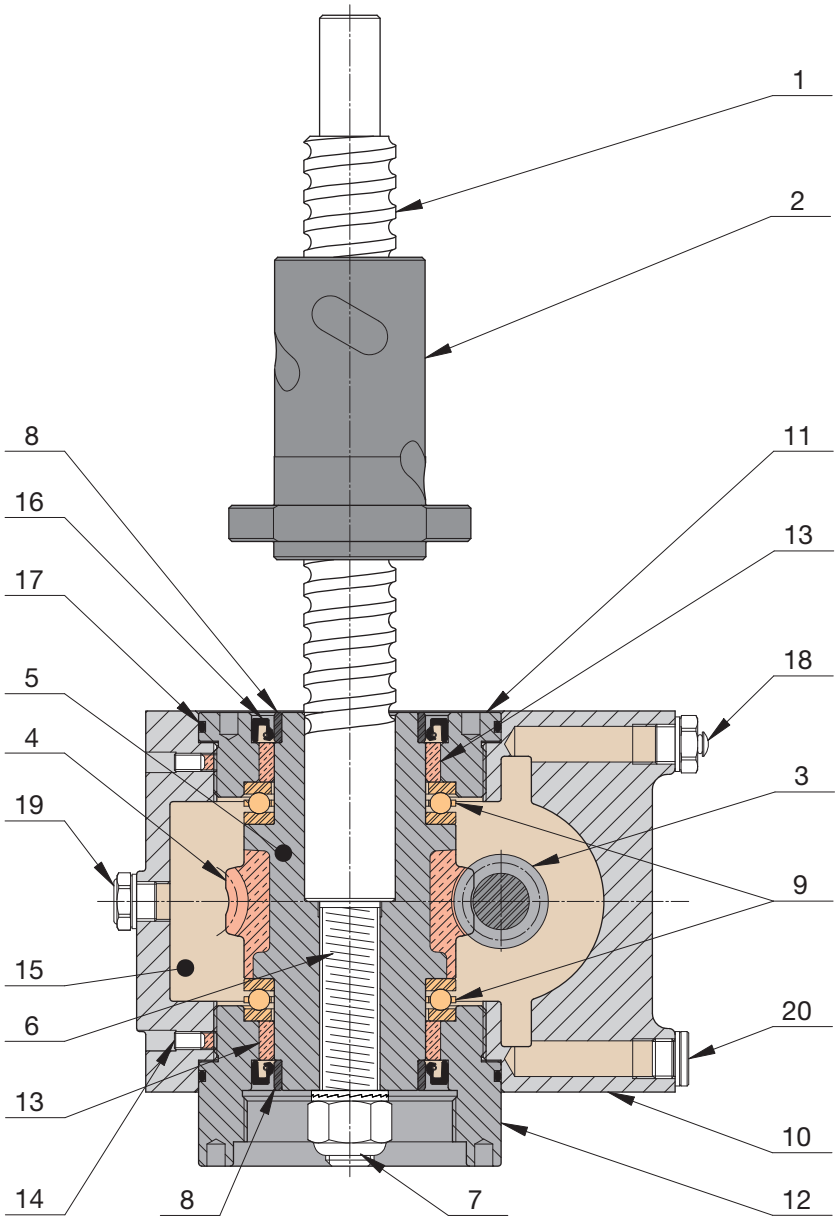
UPWARD mounting ☐

DOWNWARD mounting ☐



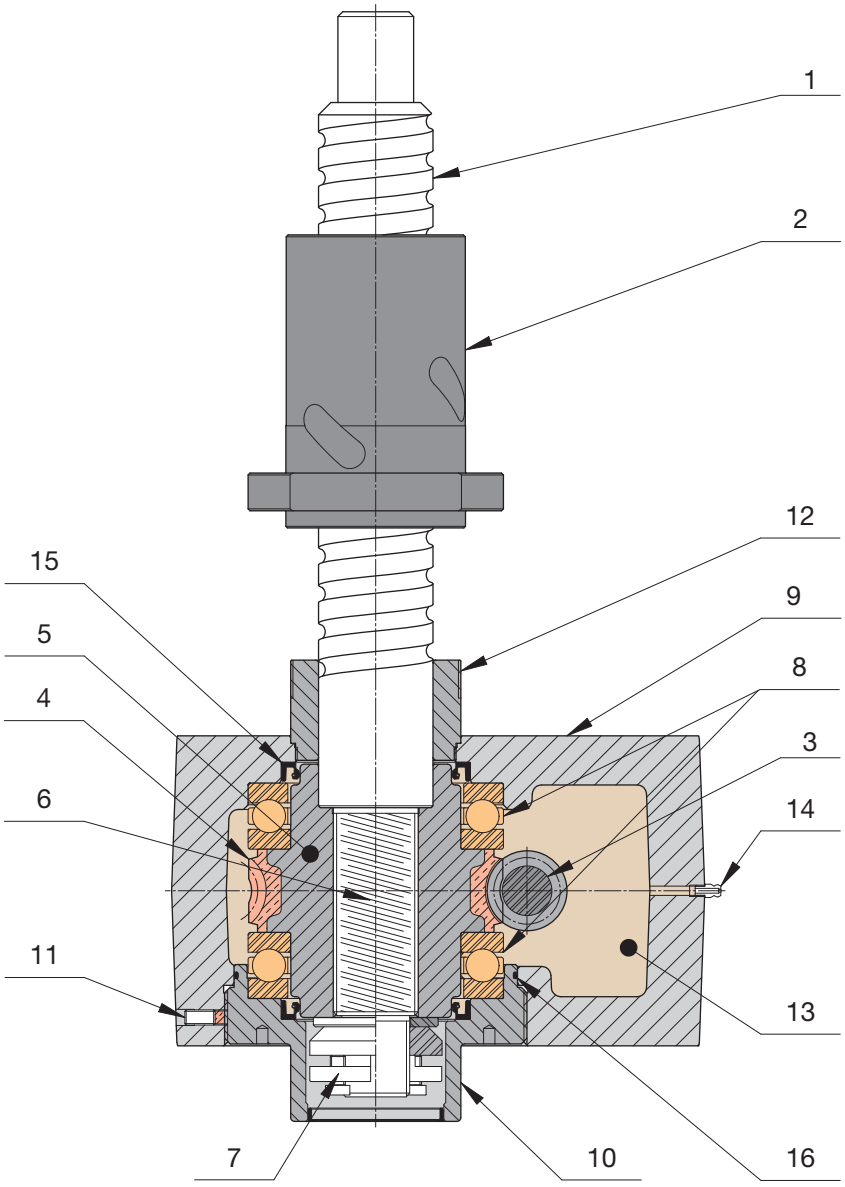
DOWNWARD mounting ☐

4.1 MA Series Mod.B - Construction features



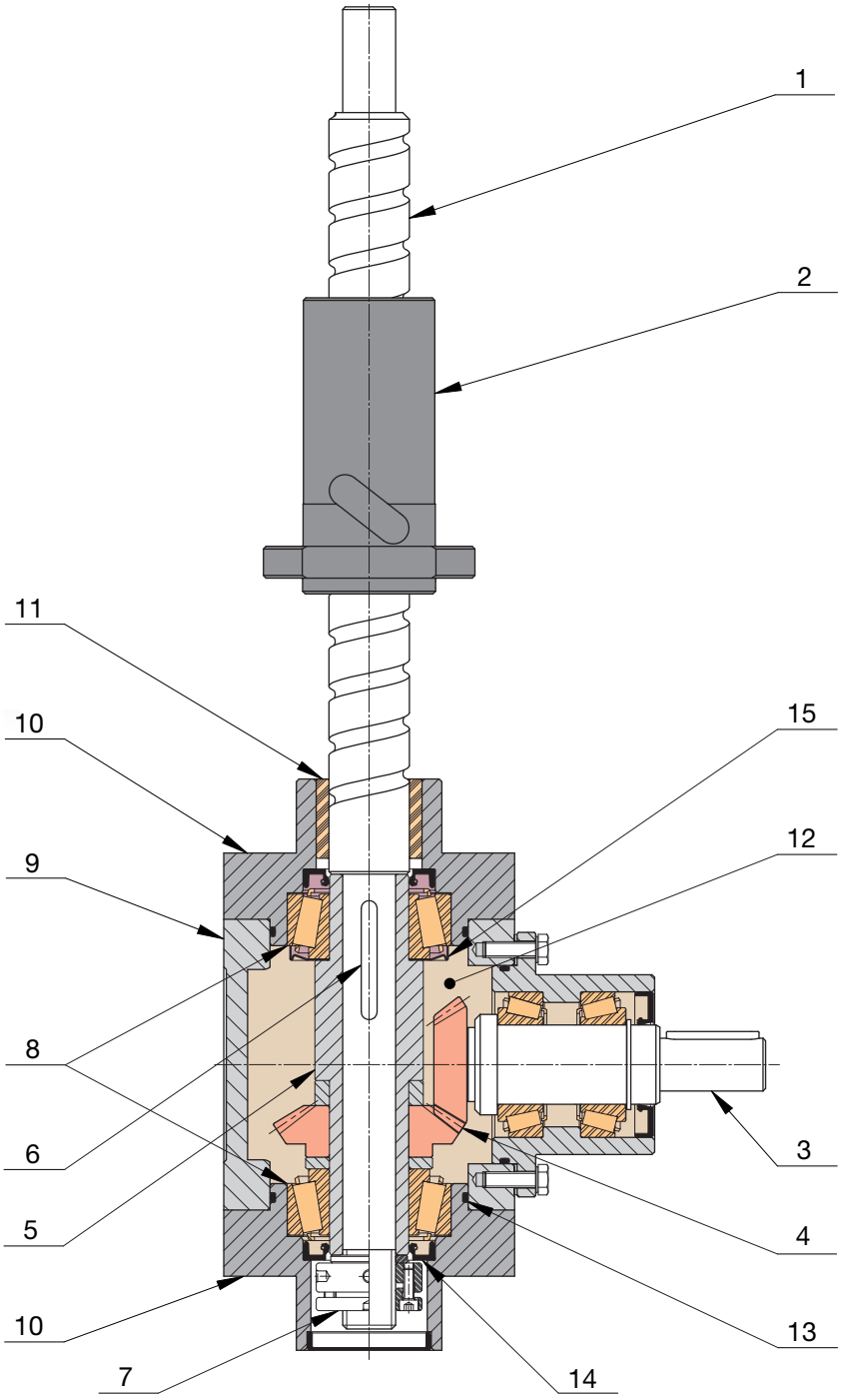
1 - Ball screw in quenched and tempered alloy steel
2 - Ball nut in case-hardened steel with flange according to DIN 69051 (available also with cylindrical flange), with grease nipple and end seals
3 - Worm with ground ZI involute thread profile (UNI 4760) in case-hardened steel
4 - Bronze worm wheel with true involute profile ZI (UNI 4760)
5 - Cast iron support of the bronze worm wheel rim (size 5 and 10: entire wormwheel in bronze)
6 - Ball screw fixed to the worm wheel through the cylindrical centring part and metric thread LEFT-HAND for PUSH load or RIGHT-HAND for PULL load
7 - Lock nut with wedge lock washer (sizes 5, 10 and 25) or locking nut (bigger sizes)
8 - Hardened steel ring as oil seal track
9 - Thrust ball bearing for high load capacity
10- Gear box
11 - Low cover
12 - Raised cover; may also be used as a centring diameter
13 - Wormwheel radial bronze guide for higher stiffness and better efficiency
14 - Grub screw to prevent the threaded cover unscrewing
15 - Lifelong synthetic oil lubricated worm gearbox
16 - Radial lubricant seal
17 - O-ring
18 - Breather
19 - Oil level plug
20 - Oil drain plug

4.2 SJ Series Mod.B - Construction features



1 - Ball screw in quenched and tempered alloy steel
2 - Ball nut in case-hardened steel with flange according to DIN 69051 (available also with cylindrical flange), with grease nipple and end seals
3 - Worm with ground ZI involute thread profile (UNI 4760) in case-hardened steel
4 - Bronze worm wheel with true involute profile ZI (UNI 4760)
5 - Cast iron support of the bronze worm wheel rim (size 5 ... 100: entire wormwheel in bronze)
6 - Ball screw fixed to the worm wheel through the cylindrical centring part and metric thread LEFT-HAND for PUSH load or RIGHT-HAND for PULL load
7 - Lock nut with wedge lock washer (size 5 ... 100) or lock nut (bigger sizes)
8 - Thrust ball bearing for high load capacity
9 - Gear box
10 - Threaded cover; may also be used as a centring diameter
11 - Grub screw to prevent the threaded cover unscrewing
12 - Guide bush for ball screw, may be used as a spigot diameter
13 - Lifelong grease lubricated worm gearbox
14 - Grease nipple
15 - Radial lubricant seal
16 - O-ring

4.3 HS Series - Construction features



1 - Ball screw in quenched and tempered alloy steel
2 - Ball nut in case-hardened steel with flange according to DIN 69051 (available also with cylindrical flange), with grease nipple and end seals
3 - Solid input shaft with key (or flange and hollow shaft for motor coupling)
4 - Bevel gear in case-hardened and tempered steel
5 - Output hollow shaft in hardened and tempered steel
6 - Key to transmit the torque to the output shaft
7 - Locking nut
8 - Thrust ball bearing for high load capacity
9 - Gear box
10 - Square covers with pivot for screw jack positioning
11 - Plastic guide bush
12 - Lifelong grease-lubricated bevel gear and bearings
13 - O-ring
14 - Radial lubricant seal
15 - NILOS seal which allows to create a chamber for the lubricant of the upper bearing; used only in case of vertical mounting position

4.4 Standard ball screw – gearbox matching

The table below shows STANDARD ball screw - gearbox matching available.
Upon request, different combinations with larger ball screw diameter are available.
For a feasibility check and to get further information, please contact SERVOMECH technical support.

Gearbox		Ball screw (diameter - lead)																														
		16			20			25				32				40			50			63			80				100		120		140
		5	10	16	5	10	20	5	6	10	25	5	10	20	32	10	20	40	10	20	40	10	20	40	10	16	20	40	16	20	20	32	32
MA	5				•	•	•																										
	10							•	•	•	•																						
	25											•	•	•	•																		
	50															•	•	•															
	80																		•	•	•												
	150																					•	•	•									
	200																								•	•	•	•					
	350																												•	•			
SJ	5	•	•	•	•	•	•																										
	10							•	•	•	•																						
	25											•	•	•	•																		
	50															•	•	•															
	100																		•	•	•												
	150																					•	•	•									
	200																								•	•	•	•					
	300																												•	•			
	600																														•	•	
	800																																•
HS	10							•	•	•	•																						
	25											•	•	•	•																		
	50															•	•	•															
	100																		•	•	•												
	150																					•	•	•									
	200																								•	•	•	•					

4.5 Max. input power and max. input torque

Following tables show the MAX. INPUT POWER P_{max} [kW] and MAX. INPUT TORQUE T_{max} [Nm] to the gearbox at different speed, calculated for a gear life of 10 000 hours. For different life requirements, please contact SERVOMECH technical support.

n_1 [rpm]	Serie MA BS																							
	MA 5 BS						MA 10 BS						MA 25 BS						MA 50 BS					
	RV		RN		RL		RV		RN		RL		RV		RN		RL		RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	1.20	3.83	0.38	1.22	0.32	1.03	2.05	6.52	0.85	2.71	0.67	2.14	3.31	10.5	1.19	3.79	1.22	3.89	5.10	16.2	3.04	9.69	1.99	6.34
1 500	0.87	5.53	0.25	1.61	0.23	1.45	1.49	9.49	0.60	3.79	0.48	3.04	2.36	15.0	0.80	5.09	0.80	5.08	3.76	23.9	2.19	14.0	1.43	9.08
1 000	0.67	6.39	0.20	1.89	0.17	1.66	1.15	11.0	0.47	4.49	0.38	3.63	1.89	18.0	0.64	6.09	0.69	6.61	2.99	28.6	1.73	16.5	1.14	10.9
750	0.57	7.27	0.17	2.16	0.15	1.91	1.08	13.7	0.40	5.07	0.31	3.97	1.54	19.6	0.54	6.93	0.58	7.37	2.42	30.9	1.45	18.5	0.95	12.1
500	0.43	8.23	0.13	2.56	0.12	2.30	0.78	14.9	0.32	6.08	0.25	4.75	1.23	23.6	0.43	8.20	0.46	8.81	1.87	35.7	1.11	21.1	0.74	14.1
300	0.33	10.6	0.09	2.96	0.09	2.76	0.55	17.4	0.22	7.13	0.18	5.84	0.87	27.7	0.30	9.66	0.34	10.7	1.40	44.4	0.82	26.1	0.54	17.2
100	0.15	14.7	0.04	3.97	0.04	3.64	0.26	25.3	0.10	9.83	0.08	7.77	0.43	41.3	0.14	13.0	0.15	14.2	0.66	62.7	0.38	36.0	0.25	23.5

n_1 [rpm]	Serie MA BS																							
	MA 80 BS						MA 150 BS						MA 200 BS						MA 350 BS					
	RV		RN		RL		RV		RN		RL		RV		RN		RL		RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	5.10	16.2	3.04	9.69	1.99	6.34	9.10	29.0	4.36	13.9	3.06	9.75	15.9	50.6	7.82	24.9	5.84	18.6	23.0	73.0	16.1	51.3	9.87	31.4
1 500	3.76	23.9	2.19	14.0	1.43	9.08	6.32	40.2	2.90	18.5	2.08	13.2	11.4	72.3	5.29	33.7	3.91	24.9	15.7	99.6	11.4	72.3	6.57	41.8
1 000	2.99	28.6	1.73	16.5	1.14	10.9	5.16	49.2	2.38	22.8	1.70	16.3	8.76	83.7	4.27	40.7	3.12	29.8	12.7	121	8.81	84.1	5.27	50.3
750	2.42	30.9	1.45	18.5	0.95	12.1	4.21	53.6	2.04	26.0	1.41	17.9	7.44	94.8	3.59	45.7	2.72	34.6	10.2	130	7.57	96	4.53	57.6
500	1.87	35.7	1.11	21.1	0.74	14.1	3.23	61.8	1.53	29.3	1.10	21.0	5.95	114	2.79	53.4	2.14	41.0	8.28	158	5.98	114	3.60	68.7
300	1.40	44.4	0.82	26.1	0.54	17.2	2.42	76.9	1.15	36.5	0.82	26.0	4.20	134	1.98	63.0	1.56	49.7	5.97	190	4.20	134	2.57	81.9
100	0.66	62.7	0.38	36.0	0.25	23.5	1.16	110	0.52	50.1	0.39	37.1	2.08	199	0.95	90.3	0.72	68.7	2.76	263	1.93	185	1.23	118

n_1 [rpm]	Serie SJ BS																							
	SJ 5 BS								SJ 10 BS						SJ 25 BS						SJ 50 BS			
	RH		RV		RN		RL		RV		RN		RL		RV		RN		RL		RV		RN		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
1 500	0.48	3.05	0.35	2.20	0.21	1.33	0.13	0.85	0.82	5.25	0.24	1.53	0.22	1.37	2.24	14.3	0.76	4.84	0.76	4.83	3.57	22.7	2.08	13.3	1.35	8.63
1 000	0.37	3.54	0.28	2.71	0.16	1.57	0.11	1.03	0.64	6.07	0.19	1.79	0.16	1.57	1.79	17.1	0.61	5.79	0.66	6.28	2.84	27.2	1.65	15.7	1.08	10.3
750	0.33	4.17	0.24	3.08	0.14	1.81	0.09	1.14	0.54	6.90	0.16	2.05	0.14	1.82	1.47	18.7	0.52	6.58	0.55	7.00	2.30	29.3	1.38	17.6	0.90	11.5
500	0.26	5.02	0.19	3.67	0.11	2.12	0.07	1.38	0.41	7.82	0.13	2.44	0.11	2.19	1.17	22.4	0.41	7.79	0.44	8.37	1.78	33.9	1.05	20.1	0.70	13.4
300	0.19	6.08	0.14	4.44	0.08	2.53	0.05	1.61	0.32	10.1	0.09	2.81	0.08	2.62	0.83	26.3	0.29	9.18	0.32	10.1	1.33	42.2	0.78	24.7	0.51	16.4
100	0.09	8.65	0.06	5.71	0.03	3.28	0.02	2.08	0.15	13.9	0.04	3.77	0.04	3.45	0.41	39.3	0.13	12.4	0.14	13.5	0.62	59.6	0.36	34.2	0.23	22.3

n_1 [rpm]	Serie SJ BS																							
	SJ 100 BS						SJ 150 BS						SJ 200 BS				SJ 300 BS				SJ 600 BS				SJ 800 BS			
	RV		RN		RL		RV		RN		RL		RV		RL		RV		RL		RV		RL		RV		RL	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
1 500	3.57	22.7	2.08	13.3	1.35	8.63	6.00	38.2	2.76	17.6	1.97	12.6	9.66	61.5	3.09	19.7	11.7	74.6	4.65	29.6	22.0	140	8.67	55.2	41.3	263	16.1	103
1 000	2.84	27.2	1.65	15.7	1.08	10.3	4.90	46.8	2.26	21.6	1.62	15.4	7.14	68.2	2.44	23.4	9.40	89.7	3.74	35.7	17.0	162	6.86	65.5	34.7	331	13.1	125
750	2.30	29.3	1.38	17.6	0.90	11.5	4.00	50.9	1.94	24.7	1.33	17.0	6.33	80.7	2.15	27.3	7.84	99.9	3.23	41.1	14.5	184	5.79	73.7	28.5	363	11.1	142
500	1.78	33.9	1.05	20.1	0.70	13.4	3.07	58.7	1.46	27.8	1.04	19.9	4.89	93.4	1.61	30.8	6.15	117	2.50	47.7	11.7	224	4.56	87.2	22.3	426	8.87	169
300	1.33	42.2	0.78	24.7	0.51	16.4	2.29	73.0	1.09	34.7	0.78	24.7	3.51	112	1.23	39.1	4.46	142	1.77	56.3	8.38	267	3.27	104	16.4	523	6.43	205
100	0.62	59.6	0.36	34.2	0.23	22.3	1.10	105	0.50	47.6	0.37	35.3	1.73	165	0.57	54.2	2.14	204	0.89	84.8	3.98	380	1.58	151	7.87	752	3.11	297

4.5 Max. input power and max. input torque

Following tables show the MAX. INPUT POWER P_{max} [kW] and MAX. INPUT TORQUE T_{max} [Nm] to the gearbox at different speed, calculated for a gear life of 10 000 hours. For different life requirements, please contact SERVOMECH technical support.

n_1 [rpm]	Serie HS																													
	HS 10										HS 25										HS 50									
	R 1		R 1.5		R 2		R 3		R 4		R 1		R 1.5		R 2		R 3		R 4		R 1		R 1.5		R 2		R 3		R 4	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	5.18	16.5	3.89	12.4	3.24	10.3	2.16	6.88	1.62	5.16	22.7	72.3	15.1	48.1	12.1	38.5	5.94	18.9	3.24	10.3	45.6	145	33.4	106	23.4	74.5	10.3	32.8	5.63	17.9
2 000	3.89	18.6	2.88	13.8	2.38	11.4	1.58	7.54	1.19	5.68	16.2	77.3	11.5	54.9	9.18	43.8	4.07	19.4	2.26	10.8	34.3	164	25.2	120	16.7	79.7	7.30	34.9	3.98	19.0
1 500	3.24	20.6	2.48	15.8	2.02	12.9	1.40	8.91	0.93	5.92	13.0	82.8	9.18	58.4	7.29	46.4	3.16	20.1	1.75	11.1	28.1	179	20.6	131	13.0	82.8	5.66	36.0	3.08	19.6
1 000	2.70	25.8	1.80	17.2	1.62	15.5	1.01	9.64	0.65	6.21	10.3	98.4	6.84	65.3	5.13	49.0	2.19	20.9	1.21	11.6	21.1	201	14.7	140	9.02	86.1	3.91	37.3	2.12	20.2
500	1.62	30.9	1.08	20.6	0.94	18.0	0.54	10.3	0.34	6.49	6.21	119	4.32	82.5	2.70	51.6	1.17	22.3	0.67	12.8	13.0	248	7.75	148	4.71	90.0	2.04	39.0	1.11	21.2
250	0.94	35.9	0.72	27.5	0.54	20.6	0.29	11.1	0.18	6.88	3.78	144	2.25	85.9	1.42	54.2	0.63	24.1	0.37	14.1	7.85	300	3.95	151	2.44	93.2	1.07	40.9	0.59	22.5
50	0.32	61.1	0.23	43.9	0.15	28.6	0.06	11.5	0.04	7.64	0.97	185	0.49	93.6	0.31	59.2	0.14	26.7	0.09	17.2	1.62	309	0.81	155	0.51	97.4	0.23	43.9	0.14	26.7

n_1 [rpm]	Serie HS																													
	HS 100										HS 150										HS 200									
	R 1		R 1.5		R 2		R 3		R 4		R 1		R 1.5		R 2		R 3		R 4		R 1		R 1.5		R 2		R 3		R 4	
	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm	P_{max} kW	T_{max} Nm
3 000	64.8	206	47.5	151	37.3	119	20.0	63.7	11.4	36.3	126	401	92.8	295	72.9	232	35.6	113	19.4	61.8	214	681	160	509	125	398	74.5	237	42.1	134
2 000	50.0	239	36.0	172	28.1	134	14.0	66.8	7.83	37.4	95.0	454	70.5	337	55.1	263	25.2	120	13.5	64.5	160	764	119	568	93.9	448	52.5	251	29.1	139
1 500	40.5	258	29.2	186	22.7	145	10.8	68.8	6.07	38.6	77.7	495	57.2	364	44.5	283	19.4	124	10.5	66.8	131	834	98.2	625	76.9	490	40.5	258	22.7	145
1 000	30.2	288	21.6	206	17.3	165	7.56	72.2	4.18	39.9	59.4	567	43.2	413	30.8	294	13.3	127	7.29	69.6	98.2	938	73.4	701	57.8	552	28.1	268	15.7	150
500	18.4	351	13.3	254	9.18	175	3.96	75.6	2.16	41.3	36.2	691	24.8	474	16.2	309	7.02	134	3.78	72.2	60.5	1155	45.3	865	33.2	634	14.6	279	8.10	155
250	11.4	435	7.38	282	4.72	180	2.07	79.1	1.15	43.9	22.1	844	13.0	497	8.23	314	3.60	138	1.96	74.9	37.2	1421	26.1	997	17.0	649	7.42	283	4.18	160
50	3.02	577	1.51	288	0.97	185	0.43	82.1	0.27	51.6	5.24	1001	2.63	502	1.67	319	0.76	145	0.46	87.9	10.7	2044	5.33	1018	3.45	659	1.53	292	0.94	180

4.6 Technical data - Screw jacks

MA BS Series Mod.B			MA 5 BS	MA 10 BS	MA 25 BS	MA 50 BS
Load capacity [kN] (push - pull)			5	10	25	50
Worm gear centre distance [mm]			30	40	50	63
Ratio	fast	RV	1 : 4 (4 : 16)	1 : 5 (4 : 20)	1 : 6 (4 : 24)	1 : 7 (4 : 28)
	normal	RN	1 : 16 (2 : 32)	1 : 20	1 : 18 (2 : 36)	1 : 14 (2 : 28)
	slow	RL	1 : 24	1 : 25	1 : 24	1 : 28
Gear box material			casting in aluminium alloy EN 1706 - AC-AlSi10Mg T6		casting in spheroidal graphite iron EN-GJS-500-7 (UNI EN 1563)	
Mass of gear box without ball screw [kg]			2.2	4.3	13	26

SJ BS Series Mod.B			SJ 5 BS	SJ 10 BS	SJ 25 BS	SJ 50 BS	SJ 100 BS	SJ 150 BS
Load capacity [kN] (push - pull)			5	10	25	50	100	150
Worm gear centre distance [mm]			25	30	50	63	63	80
Ratio	high	RH	1 : 4 (5 : 20)	-	-	-	-	-
	fast	RV	1 : 6.25 (4 : 25)	1 : 4 (4 : 16)	1 : 6 (4 : 24)	1 : 7 (4 : 28)	1 : 7 (4 : 28)	1 : 8 (4 : 32)
	normal	RN	1 : 12.5 (2 : 25)	1 : 16 (2 : 32)	1 : 18 (2 : 36)	1 : 14 (2 : 28)	1 : 14 (2 : 28)	1 : 24
	slow	RL	1 : 25	1 : 24	1 : 24	1 : 28	1 : 28	1 : 32
Gear box material			casting in aluminium alloy EN 1706 - AC-AlSi10Mg T6		casting in grey cast iron EN-GJL-250 (UNI EN 1561)			
Mass of gear box without ball screw [kg]			1.5	2.3	10.4	25	35	55

Serie HS		HS 10	HS 25	HS 50
Load capacity [kN] (push - pull)		10	20	40
Housing side dimensions [mm]		86	110	134
Ratio	R1	1 : 1	1 : 1	1 : 1
	R1.5	1 : 1.5	1 : 1.5	1 : 1.5
	R2	1 : 2	1 : 2	1 : 2
	R3	1 : 3	1 : 3	1 : 3
	R4	1 : 4	1 : 4	1 : 4
Gear box material		casting in grey cast iron EN-GJL-250 (UNI EN 1561)		
Mass of gear box without ball screw [kg]		5.9	11.3	20

4.6 Technical data - Screw jacks

MA 80 BS	MA 150 BS	MA 200 BS	MA 350 BS	MA BS Series Mod.B
80	150	200	350	Load capacity [kN] (push - pull)
63	80	100	125	Worm gear centre distance [mm]
1 : 7 (4 : 28)	1 : 8 (4 : 32)	1 : 8 (4 : 32)	3 : 32	RV fast
1 : 14 (2 : 28)	1 : 24	1 : 24	1 : 16 (2 : 32)	RN normal — Ratio
1 : 28	1 : 32	1 : 32	1 : 32	RL slow
casting in spheroidal graphite iron EN-GJS-500-7 (UNI EN 1563)				Gear box material
26	48	75	145	Mass of gear box without ball screw [kg]

SJ 200 BS	SJ 250 BS	SJ 300 BS	SJ 600 BS	SJ 800 BS	SJ BS Series Mod.B
200	250	300	600	800	Load capacity [kN] (push - pull)
90	90	110	140	200	Worm gear centre distance [mm]
-		-	-	-	RH high
1 : 7 (4 : 28)	1 : 7 (4 : 28)	3 : 29	3 : 28	3 : 35	RV fast — Ratio
-	-	-	-	-	RN normal
1 : 28	1 : 28	1 : 30	1 : 29	1 : 36	RL slow
casting in grey cast iron EN-GJL-250 (UNI EN 1561)			welded steel S355 J2 (UNI EN 10025)		Gear box material
75	75	120	260	800	Mass of gear box without ball screw [kg]

HS 100	HS 150	HS 200	Serie HS
60	100	150	Load capacity [kN] (push - pull)
166	200	250	Housing side dimensions [mm]
1 : 1	1 : 1	1 : 1	R1
1 : 1.5	1 : 1.5	1 : 1.5	R1.5
1 : 2	1 : 2	1 : 2	R2 — Ratio
1 : 3	1 : 3	1 : 3	R3
1 : 4	1 : 4	1 : 4	R4
casting in grey cast iron EN-GJL-250 (UNI EN 1561)			Gear box material
38	67	120	Mass of gear box without ball screw [kg]

4.7 Technical data - Ball screws and nuts

Whirled ball screws, accuracy grade IT 5 (1)

Ball screw BS $d_0 \times P_h$	Ball nut code (2)	Ball $D_w\,[mm]$	n° of circuits i	Dynamic load $C_a\,[kN]$	Static load $C_{0a}\,[kN]$
BS 16 × 5	SFN-_.16.05.3R	3.175	3	9	13.5
BS 16 × 5	SFN-_.16.05.6R	3.175	6	15.9	25.7
BS 16 × 10	SFN-_.16.10.3R-A	3.175	3	9.1	13.7
BS 20 × 5	SFN-_.20.05.3R	3.175	3	10.4	18.4
	SFN-_.20.05.5R	3.175	5	15.7	28.5
	SFN-_.20.05.8R	3.175	8	23.8	46.3
BS 20 × 10	SFN-_.20.10.3R-A	3.175	3	10.5	18.3
BS 20 × 20	SFN-_.20.20.2R	3.175	2	7	11.6
	SFN-_.20.20.2R-A	3.175	2	7	11.6
BS 25 × 5	SFN-_.25.05.3R	3.175	3	12	24.4
	SFN-_.25.05.5R	3.175	5	18.6	41.5
BS 25 × 6	SFN-_.25.06.5R	3.969	5	23.4	44.3
BS 25 × 10	SFN-_.25.10.3R	3.969	3	15.6	28.6
BS 32 × 5	SFN-_.32.05.4R	3.175	4	17.6	43.9
BS 32 × 10	SFN-_.32.10.3R	6.35	3	28.3	49.6
	SFN-_.32.10.4R	6.35	4	36.3	63
	SFN-_.32.10.5R	6.35	5	44	77
BS 32 × 20	SFN-_.32.20.3R	6.35	3	27.9	45.6
	SFN-_.32.20.3R-A	6.35	3	34.3	62.9
BS 32 × 32	SFN-_.32.32.2R-A	6.35	2	21.2	34.9
BS 40 × 10	SFN-_.40.10.5R	6.35	5	52	107
BS 40 × 20	SFN-_.40.20.3R	6.35	3	33.4	64
	SFN-_.40.20.3R-A	6.35	3	39.3	82.5
BS 40 × 40	SFN-_.40.40.2R-A	6.35	2	24.3	46.2
BS 50 × 5	SFN-_.50.05.5R	3.175	5	30.5	93
BS 50 × 10	SFN-_.50.10.5R	7.144	5	72	163
	SFN-_.50.10.6R	7.144	6	84	191
BS 50 × 20	SFN-_.50.20.4R	7.144	4	56	121
BS 50 × 40	SFN-_.50.40.2R-A	7.144	2	33.8	72
BS 63 × 10	SFN-_.63.10.5R	7.144	5	80	209
BS 63 × 20	SFN-_.63.20.4R	9.525	4	88	191
BS 63 × 40	SFN-_.63.40.3R-A	9.525	3	83	193
BS 80 × 10	SFN-_.80.10.6R	7.144	6	112	370
BS 80 × 16	SFN-_.80.16.5R	9.525	5	129	341
BS 80 × 20	SFN-_.80.20.5R-A	9.525	5	145	419
	SFN-_.80.20.4R	12.7	4	185	462
	SFN-_.80.20.6R	12.7	6	262	654
BS 80 × 40	SFN-_.80.40.2R-A	12.7	2	103	232
BS 100 × 16	SFN-_.100.16.5R	9.525	5	147	454
BS 100 × 20	SFN-_.100.20.5R	12.7	5	251	732
BS 120 × 20	SFN-_.120.20.7R	15.875	7	500	1578
BS 120 × 32	SFN-_.120.32.6R-A	25.4	6	832	2162
BS 140 × 32	SFN-_.140.32.7R	25.4	7	1145	3472

(1) - ball screws with accuracy grade IT 3 can be supplied on request

(2) - the nut code in the table is not complete; to complete it refer to Ch. 4.8 “Ball nuts dimensions”

4.7 Technical data - Ball screws and nuts

Rolled ball screws, accuracy grade IT 7

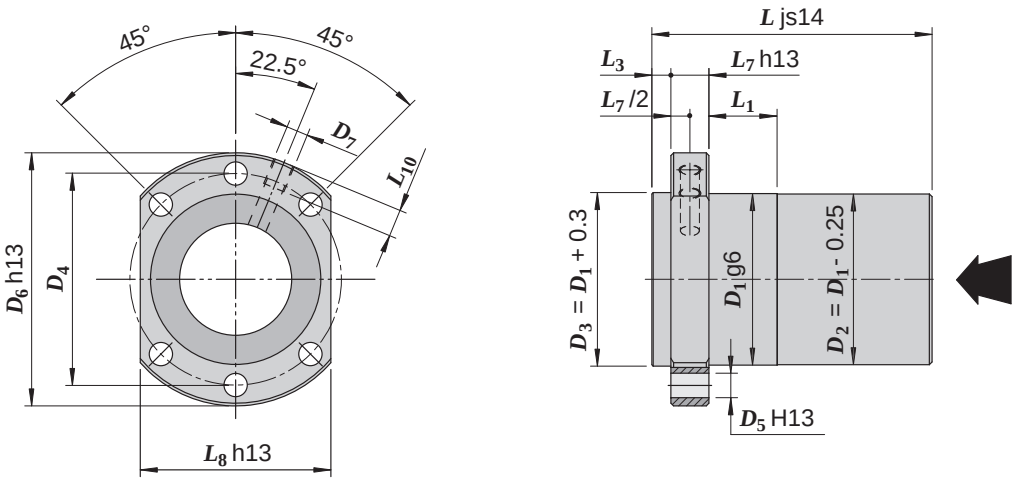
Ball screw BS $d_0 \times P_h$	Ball nut code (2)	Ball $D_w\,[mm]$	n° of circuits i	Dynamic load $C_a\,[kN]$	Static load $C_{0a}\,[kN]$
BS 16 × 5	SFN-_.16.05.3R	3.175	3	8.1	12.2
	SFN-_.16.05.6R	3.175	6	14.3	23.1
BS 16 × 10	SFN-_.16.10.3R-A	3.175	3	8.1	12.3
BS 16 × 16	SFN-_.16.16.2R-2A	3.175	2 + 2	10.0	14.5
BS 20 × 5	SFN-_.20.05.3R	3.175	3	9.1	16.5
	SFN-_.20.05.5R	3.175	5	14.1	25.6
	SFN-_.20.05.8R	3.175	8	21.4	41.7
BS 20 × 10	SFN-_.20.10.3R-A	3.175	3	9.5	16.5
BS 20 × 20	SFN-_.20.20.2R	3.175	2	6.3	10.5
	SFN-_.20.20.2R-A	3.175	2	6.3	10.5
	SFN-_.20.20.2R-2A	3.175	2 + 2	12.1	20.9
BS 25 × 5	SFN-_.25.05.3R	3.175	3	10.8	22
	SFN-_.25.05.5R	3.175	5	16.8	37.3
BS 25 × 6	SFN-_.25.06.5R	3.969	5	21.1	39.9
BS 25 × 10	SFN-_.25.10.3R	3.969	3	14	25.7
BS 25 × 25	SFN-_.25.25.2R-2A	3.175	2 + 2	13.6	27.3
BS 32 × 5	SFN-_.32.05.4R	3.175	4	15.8	39.5
BS 32 × 10	SFN-_.32.10.3R	6.35	3	25.5	44.6
	SFN-_.32.10.4R	6.35	4	32.7	57
	SFN-_.32.10.5R	6.35	5	39.7	69
BS 32 × 20	SFN-_.32.20.3R-A	6.35	3	30.9	57
BS 32 × 32	SFN-_.32.32.2R-2A	6.35	2 + 2	35.0	58
BS 40 × 10	SFN-_.40.10.5R	6.35	5	47.1	96
BS 40 × 20	SFN-_.40.20.3R-A	6.35	3	35.4	74
BS 40 × 40	SFN-_.40.40.2R-2A	6.35	2 + 2	40.3	77
BS 50 × 10	SFN-_.50.10.5R	7.144	5	65	147
	SFN-_.50.10.6R	7.144	6	76	172
BS 50 × 20	SFN-_.50.20.4R-A	7.144	4	50	109

(2) - the nut code in the table is not complete; to complete it refer to Ch. 4.8 “Ball nuts dimensions”

4.8 Ball nuts dimensions

Ball nuts with flange according to DIN 69051

Ball screw BS $d_0 \times P_h$	Ball nut code	Flange type	Dimensions [mm]										
			D_1	D_4	D_5	D_6	D_7	L_1	L_3	L_7	L_8	L_{10}	L
BS 16 × 5	SFN-D.16.05.3R	1	28	38	5.5	48	M6	10	5	10	40	8	48
	SFN-D.16.05.6R												65
BS 16 × 10	SFN-D.16.10.3R-A	1	32	42	5.5	52	M6	10	5	10	40	8	50
BS 16 × 16	SFN-D.16.16.2R-2A	1	32	42	5.5	52	M6	10	5	10	40	8	53
BS 20 × 5	SFN-D.20.05.3R	1	36	47	6.6	58	M6	10	5	10	44	8	48
	SFN-D.20.05.5R												63
	SFN-D.20.05.8R												80
BS 20 × 10	SFN-D.20.10.3R-A	1	36	47	6.6	58	M6	10	5	10	44	8	47
	SFN-D.20.10.4R-A												57
BS 20 × 20	SFN-D.20.20.2R	1	36	47	6.6	58	M6	10	5	10	44	8	70
	SFN-D.20.20.2R-A												58
	SFN-D.20.20.2R-2A												70
BS 25 × 5	SFN-D.25.05.3R	1	40	51	6.6	62	M6	10	6	10	48	8	48
	SFN-D.25.05.5R												59
BS 25 × 6	SFN-D.25.06.5R	1	40	51	6.6	62	M6	10	6	10	48	8	67
BS 25 × 10	SFN-D.25.10.3R	1	40	51	6.6	62	M6	10	6	10	48	8	69
BS 25 × 25	SFN-D.25.25.2R-2A	1	40	51	6.6	62	M6	10	6	10	48	8	69
BS 32 × 5	SFN-D.32.05.4R	1	50	65	9	80	M6	10	6	12	62	8	57
BS 32 × 10	SFN-D.32.10.3R	1	50	65	9	80	M6	16	6	12	62	8	79
	SFN-D.32.10.4R												89
	SFN-D.32.10.5R												100
BS 32 × 20	SFN-D.32.20.3R	1	50	65	9	80	M6	16	6	12	62	8	112
	SFN-D.32.20.3R-A	1	56	71	9	86	M6	16	6	14	65	8	88
BS 32 × 32	SFN-D.32.32.2R-2A	1	56	71	9	86	M6	20	6	14	65	8	91

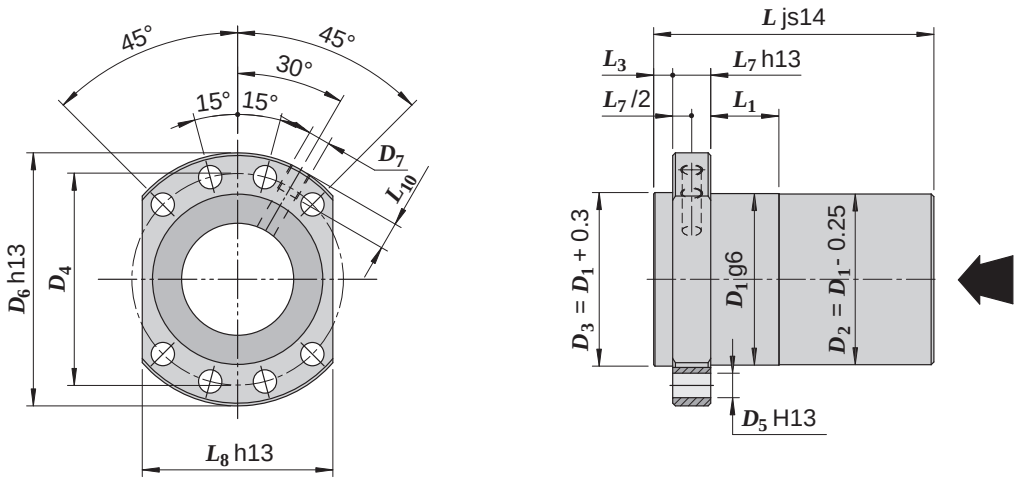


Flange type: 1
(d_0 < 40 mm)

4.8 Ball nuts dimensions

Ball nuts with flange according to DIN 69051

Ball screw BS $d_0 \times P_h$	Ball nut code	Flange type	Dimensions [mm]										
			D_1	D_4	D_5	D_6	D_7	L_1	L_3	L_7	L_8	L_{10}	L
BS 40 × 10	SFN-D.40.10.5R	2	63	78	9	93	M8×1	16	7	14	70	10	103
BS 40 × 20	SFN-D.40.20.3R	2	63	78	9	93	M8×1	16	7	14	70	10	115
	SFN-D.40.20.3R-A												96
BS 40 × 40	SFN-D.40.40.2R-A	2	63	78	9	93	M8×1	25	7	14	70	10	107
	SFN-D.40.40.2R-2A												
BS 50 × 5	SFN-D.50.05.5R	2	75	93	11	110	M8×1	16	7	16	85	10	68
BS 50 × 10	SFN-D.50.10.5R	2	75	93	11	110	M8×1	16	7	16	85	10	106
	SFN-D.50.10.6R												116
BS 50 × 20	SFN-D.50.20.4R	2	75	93	11	110	M8×1	16	7	16	85	10	142
	SFN-D.50.20.4R-A	2	82	100	11	118	M8×1	25	7	16	92	10	115
BS 50 × 40	SFN-D.50.40.2R-A	2	82	100	11	118	M8×1	25	7	16	92	10	113
BS 63 × 10	SFN-D.63.10.5R	2	90	108	11	125	M8×1	16	7	18	95	10	108
BS 63 × 20	SFN-D.63.20.4R	2	95	115	13.5	135	M8×1	25	9	20	100	10	155
BS 63 × 40	SFN-D.63.40.3R-A	2	105	125	13.5	145	M8×1	25	9	20	110	10	160
BS 80 × 10	SFN-D.80.10.6R	2	105	125	13.5	145	M8×1	16	9	20	110	10	121
BS 80 × 16	SFN-D.80.16.5R	2	125	145	13.5	165	M8×1	25	9	25	130	10	157
BS 80 × 20	SFN-D.80.20.5R-A	2	125	145	13.5	165	M8×1	25	9	25	130	10	142
	SFN-D.80.20.4R	2											161
	SFN-D.80.20.6R	2											203
BS 80 × 40	SFN-D.80.40.2R-A	2	135	155	13.5	175	M8×1	25	9	25	140	10	130
BS 100 × 16	SFN-D.100.16.5R	2	150	176	17.5	202	M8×1	25	9	30	155	10	165
BS 100 × 20	SFN-D.100.20.5R	2	150	176	17.5	202	M8×1	25	9	30	155	10	190
BS 120 × 20	SFN-D.120.20.7R	2	170	196	17.5	222	M8×1	30	11	30	175	10	240
BS 120 × 32	SFN-D.120.32.6R	2	200	233	22	265	M8×1	40	11	30	205	10	318
BS 140 × 32	SFN-D.140.32.7R-A	2	240	273	22	305	M8×1	40	11	30	245	10	303

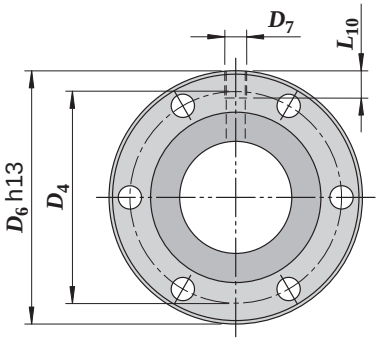


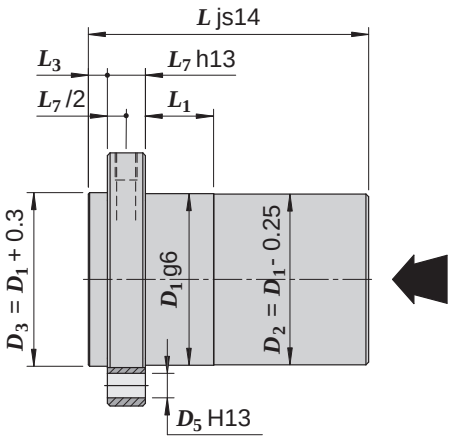
Flange type: 2
($d_0 \geq 40$ mm)

4.8 Ball nuts dimensions

Ball nuts with flange at SERVOMECH drawing

Ball screw BS $d_0 \times P_h$	Ball nut code	Flange type	Dimensions [mm]										
			D_1	D_4	D_5	D_6	D_7	L_1	L_3	L_7	L_8	L_{10}	L
BS 16 × 5	SFN-S.16.05.3R	1	28	38	5.5	48	M6	10	5	10	40	8	48
	SFN-S.16.05.6R												65
BS 16 × 10	SFN-S.16.10.3R-A	1	32	42	5.5	52	M6	10	5	10	40	8	50
BS 16 × 16	SFN-S.16.16.2R-2A	1	32	42	5.5	52	M6	10	5	10	40	8	53
BS 20 × 5	SFN-S.20.05.3R	1	36	47	6.6	58	M6	10	5	10	44	8	48
	SFN-S.20.05.5R												63
	SFN-S.20.05.8R												80
BS 20 × 10	SFN-S.20.10.3R-A	1	36	47	6.6	58	M6	10	5	10	44	8	47
	SFN-S.20.10.4R-A												57
BS 20 × 20	SFN-S.20.20.2R	1	36	47	6.6	58	M6	10	5	10	44	8	70
	SFN-S.20.20.2R-A												58
	SFN-S.20.20.2R-2A												70
BS 25 × 5	SFN-S.25.05.3R	1	40	51	6.6	62	M6	10	6	10	48	8	48
	SFN-S.25.05.5R												59
BS 25 × 6	SFN-S.25.06.5R	1	40	51	6.6	62	M6	10	6	10	48	8	67
BS 25 × 10	SFN-S.25.10.3R	1	40	51	6.6	62	M6	10	6	10	48	8	69
BS 25 × 25	SFN-S.25.25.2R-2A	1	40	51	6.6	62	M6	10	6	10	48	8	69
BS 32 × 5	SFN-S.32.05.4R	1	50	65	9	80	M6	10	6	12	62	8	57
BS 32 × 10	SFN-S.32.10.3R	1	50	65	9	80	M6	16	6	12	62	8	79
	SFN-S.32.10.4R												89
	SFN-S.32.10.5R												100
BS 32 × 20	SFN-S.32.20.3R	1	50	65	9	80	M6	16	6	12	62	8	112
	SFN-S.32.20.3R-A	1	56	71	9	86	M6	16	6	14	65	8	88
BS 32 × 32	SFN-S.32.32.2R-2A	1	56	71	9	86	M6	20	6	14	65	8	91



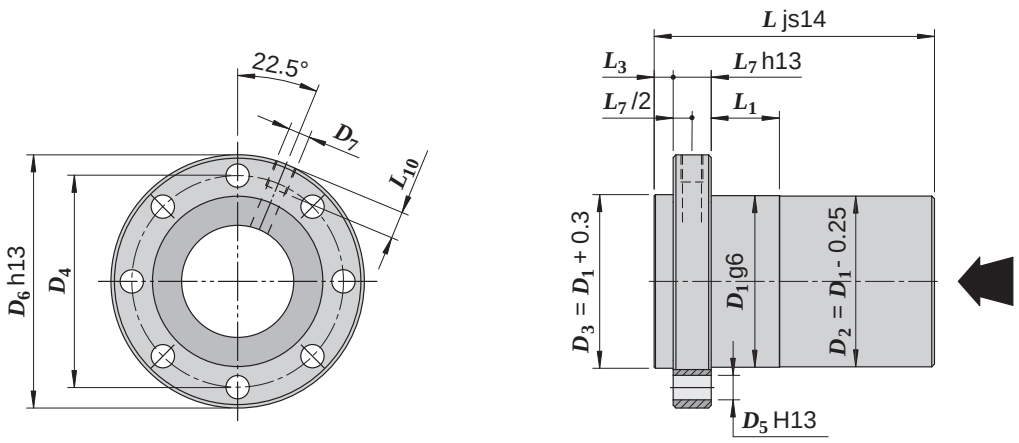


Flange type: 1
6 holes at 60°
($d_0 < 40$ mm)

4.8 Ball nuts dimensions

Ball nuts with flange at SERVOMECH drawing

Ball screw BS $d_0 \times P_h$	Ball nut code	Flange type	Dimensions [mm]										
			D_1	D_4	D_5	D_6	D_7	L_1	L_3	L_7	L_8	L_{10}	L
BS 40 × 10	SFN-S.40.10.5R	2	63	78	9	93	M8×1	16	7	14	70	10	103
BS 40 × 20	SFN-S.40.20.3R	2	63	78	9	93	M8×1	16	7	14	70	10	115
	SFN-S.40.20.3R-A												96
BS 40 × 40	SFN-S.40.40.2R-A	2	63	78	9	93	M8×1	25	7	14	70	10	107
	SFN-S.40.40.2R-2A												
BS 50 × 5	SFN-S.50.05.5R	2	75	93	11	110	M8×1	16	7	16	85	10	68
BS 50 × 10	SFN-S.50.10.5R	2	75	93	11	110	M8×1	16	7	16	85	10	106
	SFN-S.50.10.6R												116
BS 50 × 20	SFN-S.50.20.4R	2	75	93	11	110	M8×1	16	7	16	85	10	142
	SFN-S.50.20.4R-A	2	82	100	11	118	M8×1	25	7	16	92	10	115
BS 50 × 40	SFN-S.50.40.2R-A	2	82	100	11	118	M8×1	25	7	16	92	10	113
BS 63 × 10	SFN-S.63.10.5R	2	90	108	11	125	M8×1	16	7	18	95	10	108
BS 63 × 20	SFN-S.63.20.4R	2	95	115	13.5	135	M8×1	25	9	20	100	10	155
BS 63 × 40	SFN-S.63.40.3R-A	2	105	125	13.5	145	M8×1	25	9	20	110	10	160
BS 80 × 10	SFN-S.80.10.6R	2	105	125	13.5	145	M8×1	16	9	20	110	10	121
BS 80 × 16	SFN-S.80.16.5R	2	125	145	13.5	165	M8×1	25	9	25	130	10	157
BS 80 × 20	SFN-S.80.20.5R-A	2	125	145	13.5	165	M8×1	25	9	25	130	10	142
	SFN-S.80.20.4R	2											161
	SFN-S.80.20.6R	2											203
BS 80 × 40	SFN-S.80.40.2R-A	2	135	155	13.5	175	M8×1	25	9	25	140	10	130
BS 100 × 16	SFN-S.100.16.5R	2	150	176	17.5	202	M8×1	25	9	30	155	10	165
BS 100 × 20	SFN-S.100.20.5R	2	150	176	17.5	202	M8×1	25	9	30	155	10	190
BS 120 × 20	SFN-S.120.20.7R	2	170	196	17.5	222	M8×1	30	11	30	175	10	240
BS 120 × 32	SFN-S.120.32.6R	2	200	233	22	265	M8×1	40	11	30	205	10	318
BS 140 × 32	SFN-S.140.32.7R-A	2	240	273	22	305	M8×1	40	11	30	245	10	303

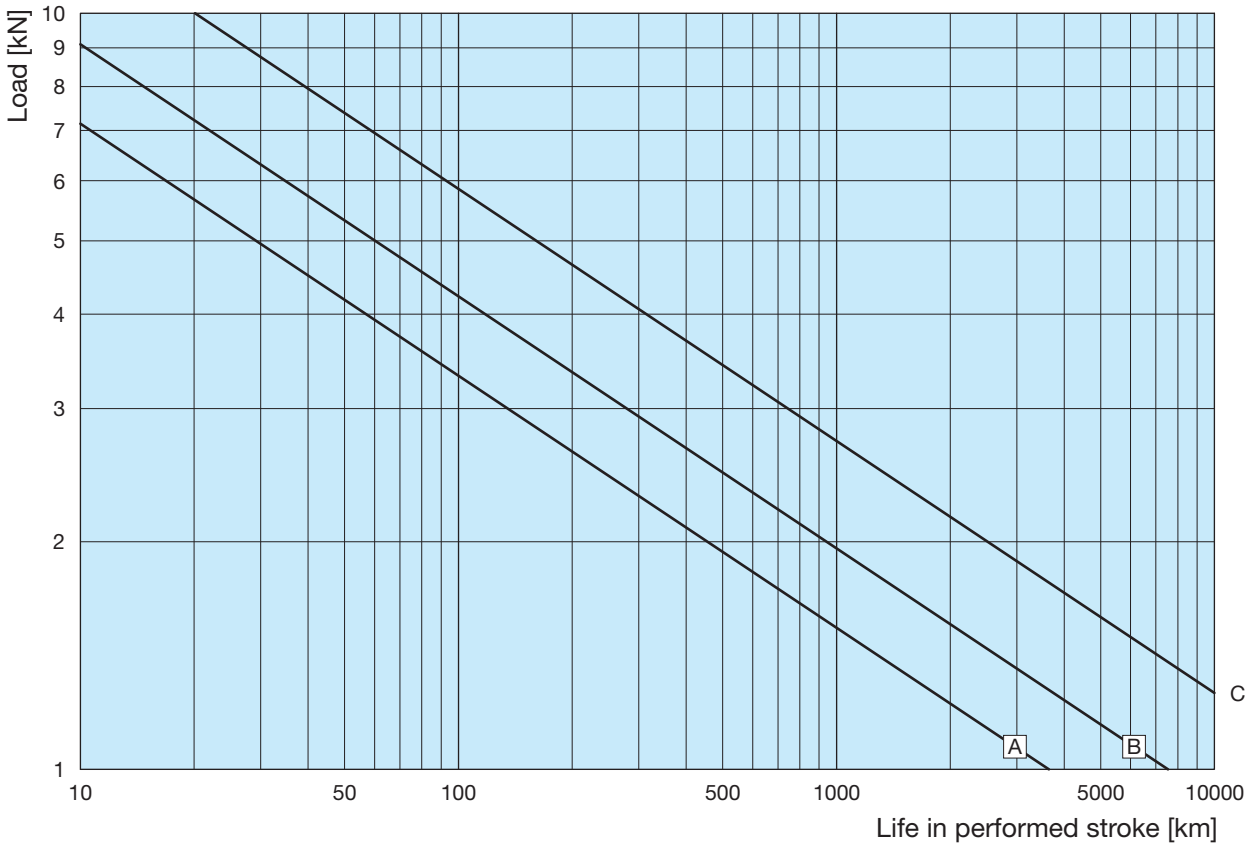


Flange type: 2
8 holes at 45°
($d_0 \geq 40$ mm)

4.9 Ball screw life

Ball screw diameter 16, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

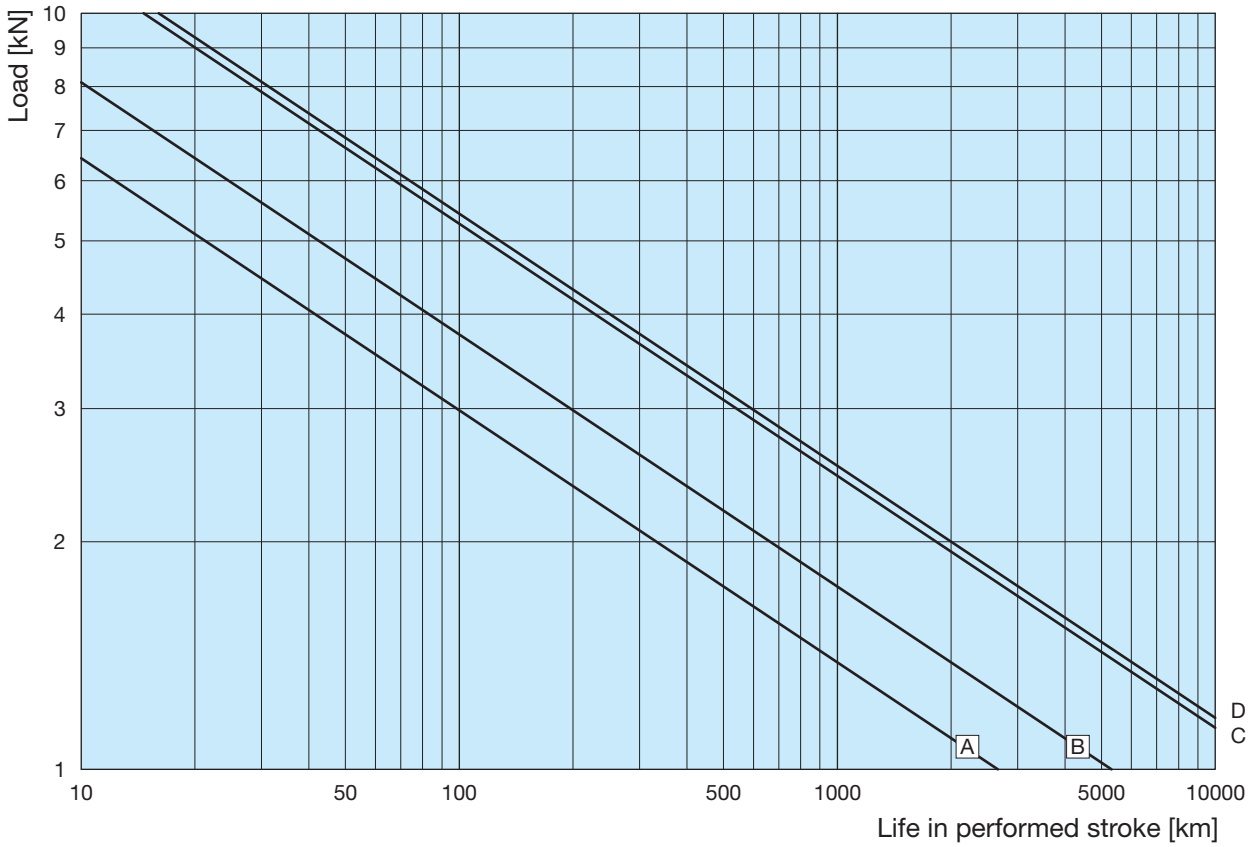


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 16×5	3.175	3	9.0	13.5	**SFN-_.16.05.3R**	**A**
BS 16×5	3.175	6	15.9	25.7	**SFN-_.16.05.6R**	**C**
BS 16×10	3.175	3	9.1	13.7	**SFN-_.16.10.3R**	**B**

4.9 Ball screw life

Ball screw diameter 16, accuracy grade IT 7

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

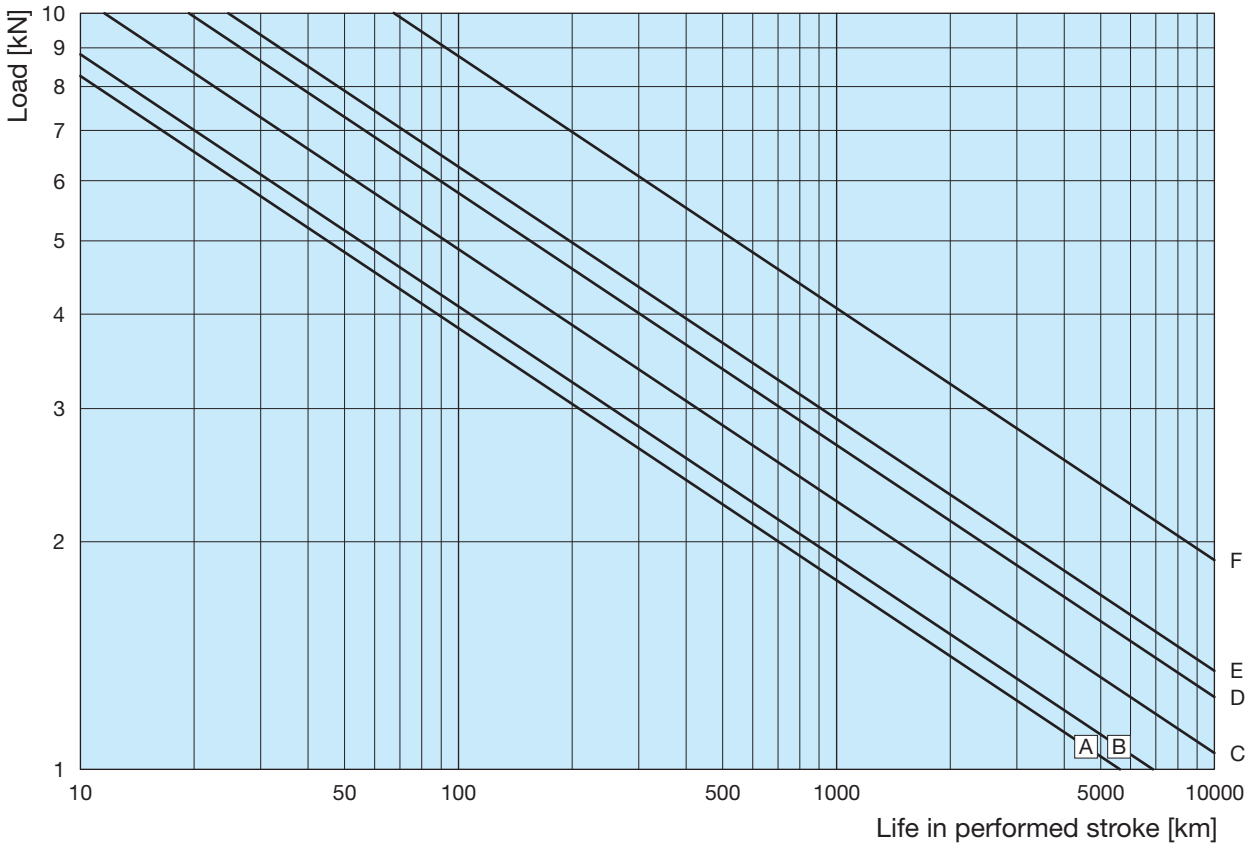


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 16×5	3.175	3	8.1	12.2	**SFN-_.16.05.3R**	**A**
BS 16×5	3.175	6	14.3	23.1	**SFN-_.16.05.6R**	**C**
BS 16×10	3.175	3	8.1	12.3	**SFN-_.16.10.3R**	**B**
BS 16×16	3.175	2 + 2	10.0	14.5	**SFN-_.16.16.2R-2**	**D**

4.9 Ball screw life

Ball screw diameter 20, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

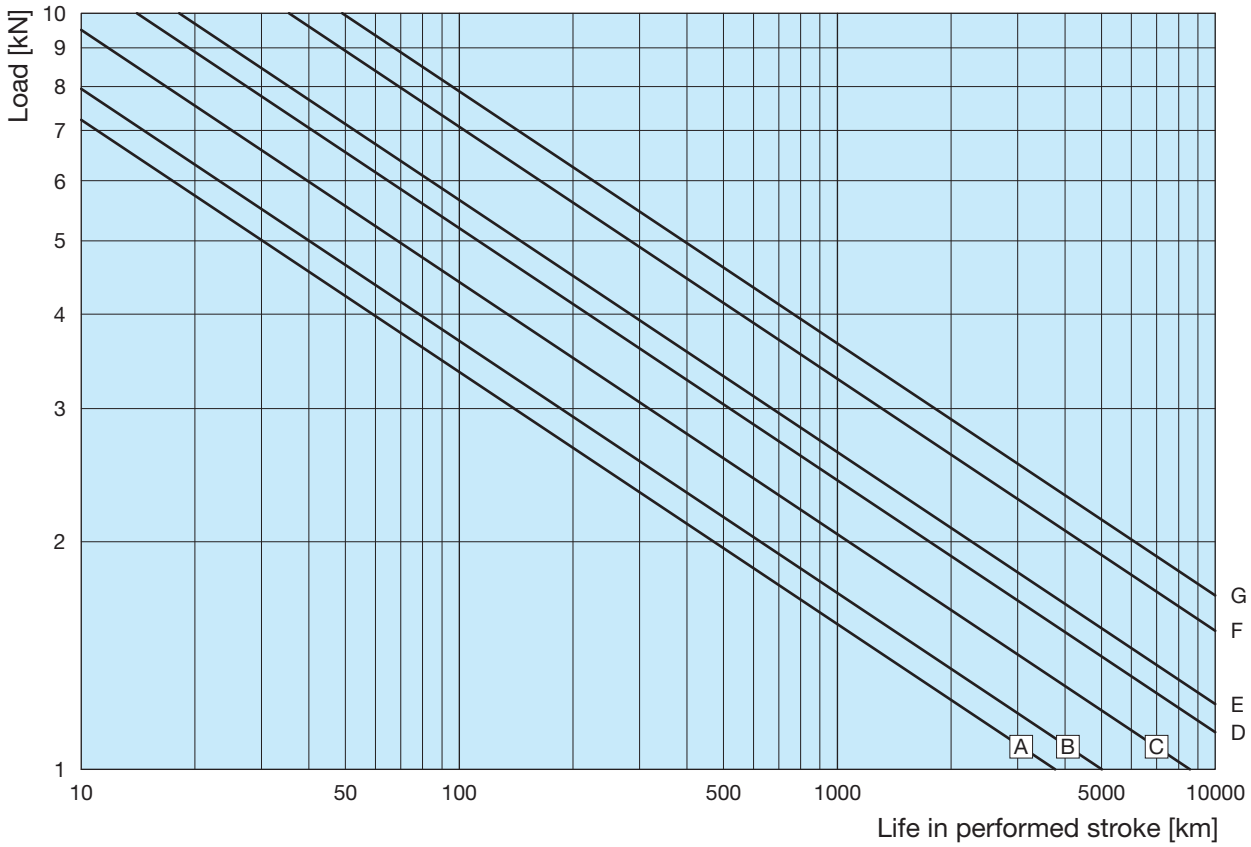


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 20×5	3.175	3	10.4	18.4	**SFN-_.20.05.3R**	**A**
BS 20×5	3.175	5	15.7	28.5	**SFN-_.20.05.5R**	**D**
BS 20×5	3.175	8	23.8	46.3	**SFN-_.20.05.8R**	**F**
BS 20×10	3.175	3	10.5	18.3	**SFN-_.20.10.3R-A**	**C**
BS 20×10	3.175	4	13.5	24.3	**SFN-_.20.10.4R-A**	**E**
BS 20×20	3.175	2	7.0	11.6	**SFN-_.20.20.2R**	**B**
BS 20×20	3.175	2	7.0	11.6	**SFN-_.20.20.2R-A**	**B**

4.9 Ball screw life

Ball screw diameter 20, accuracy grade IT 7

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

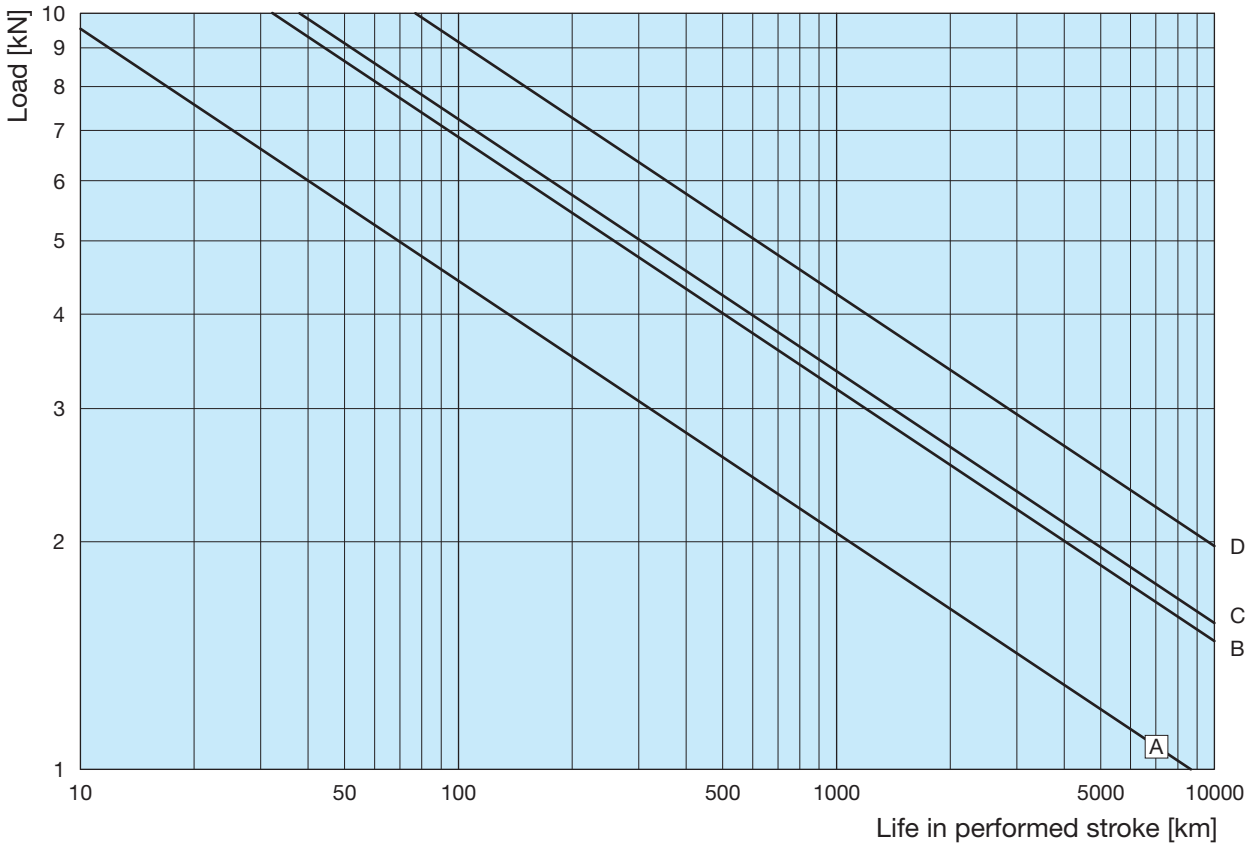


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 20×5	3.175	3	9.1	16.5	**SFN-_.20.05.3R**	**A**
BS 20×5	3.175	5	14.1	25.6	**SFN-_.20.05.5R**	**D**
BS 20×5	3.175	8	21.4	41.7	**SFN-_.20.05.8R**	**G**
BS 20×10	3.175	3	9.5	16.5	**SFN-_.20.10.3R**	**C**
BS 20×10	3.175	4	12.2	21.9	**SFN-_.20.10.4R**	**E**
BS 20×20	3.175	2	6.3	10.5	**SFN-_.20.20.2R**	**B**
BS 20×20	3.175	2	6.3	10.5	**SFN-_.20.20.2R-A**	**B**
BS 20×20	3.175	2 + 2	12.1	20.9	**SFN-_.20.20.2R-2A**	**F**

4.9 Ball screw life

Ball screw diameter 25, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

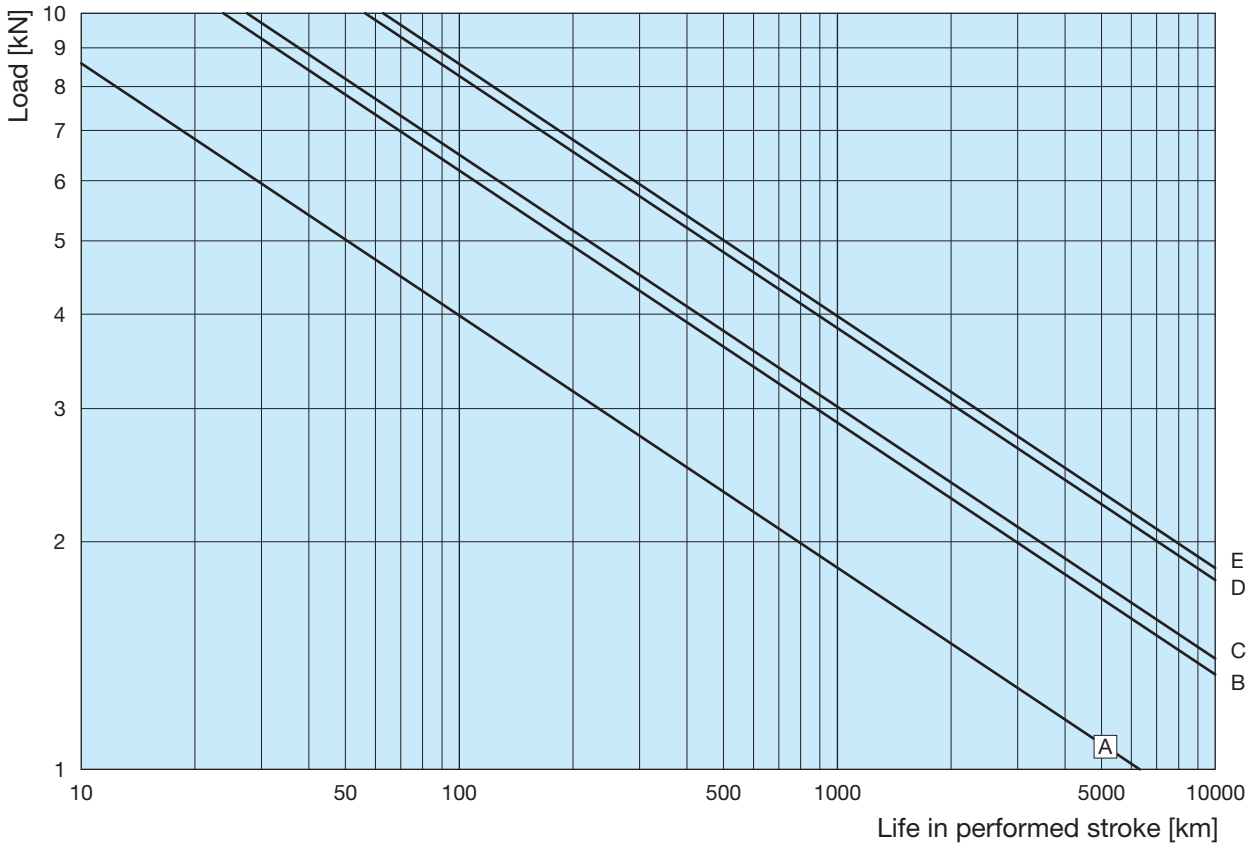


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 25×5	3.175	3	12.0	24.4	**SFN-_.25.05.3R**	**A**
BS 25×5	3.175	5	18.6	41.5	**SFN-_.25.05.5R**	**B**
BS 25×6	3.969	5	23.4	44.3	**SFN-_.25.06.5R**	**D**
BS 25×10	3.969	3	15.6	28.6	**SFN-_.25.10.3R**	**C**

4.9 Ball screw life

Ball screw diameter 25, accuracy grade IT 7

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

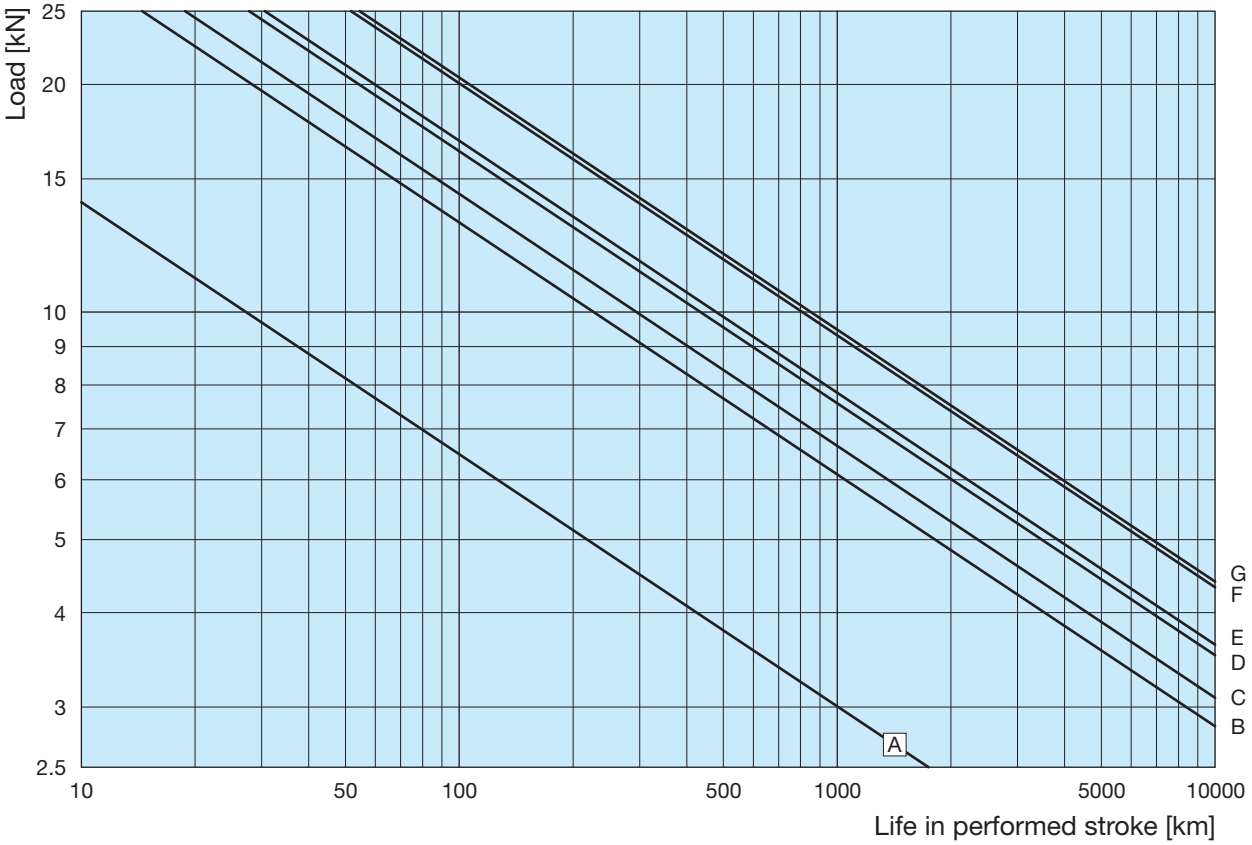


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 25×5	3.175	3	10.8	22.0	**SFN-_.25.05.3R**	**A**
BS 25×5	3.175	5	16.8	37.3	**SFN-_.25.05.5R**	**B**
BS 25×6	3.969	5	21.1	39.9	**SFN-_.25.06.5R**	**D**
BS 25×10	3.969	3	14.0	25.7	**SFN-_.25.10.3R**	**C**
BS 25×25	3.175	2 + 2	13.6	27.3	**SFN-_25.25.2R-2A**	**E**

4.9 Ball screw life

Ball screw diameter 32, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

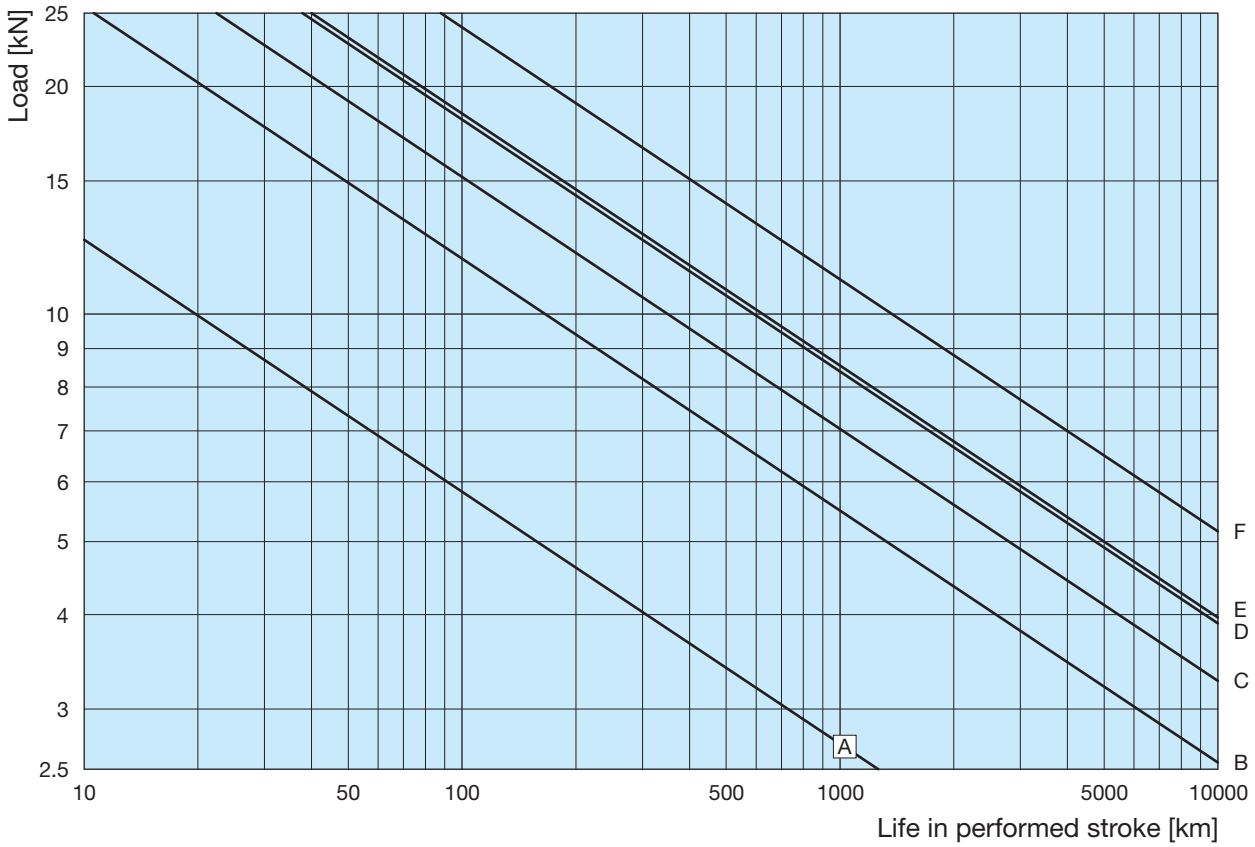


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 32×5	3.175	4	17.6	43.9	**SFN-_.32.05.4R**	**A**
BS 32×10	6.35	3	28.3	49.6	**SFN-_.32.10.3R**	**B**
BS 32×10	6.35	4	36.3	63	**SFN-_.32.10.4R**	**E**
BS 32×10	6.35	5	44.0	77	**SFN-_.32.10.5R**	**G**
BS 32×20	6.35	3	27.9	45.6	**SFN-_32.20.3R**	**D**
BS 32×20	6.35	3	34.3	62.9	**SFN-_32.20.3R-A**	**F**
BS 32×32	6.35	2	21.2	34.9	**SFN-_32.32.2R-A**	**C**

4.9 Ball screw life

Ball screw diameter 32, accuracy grade IT 7

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

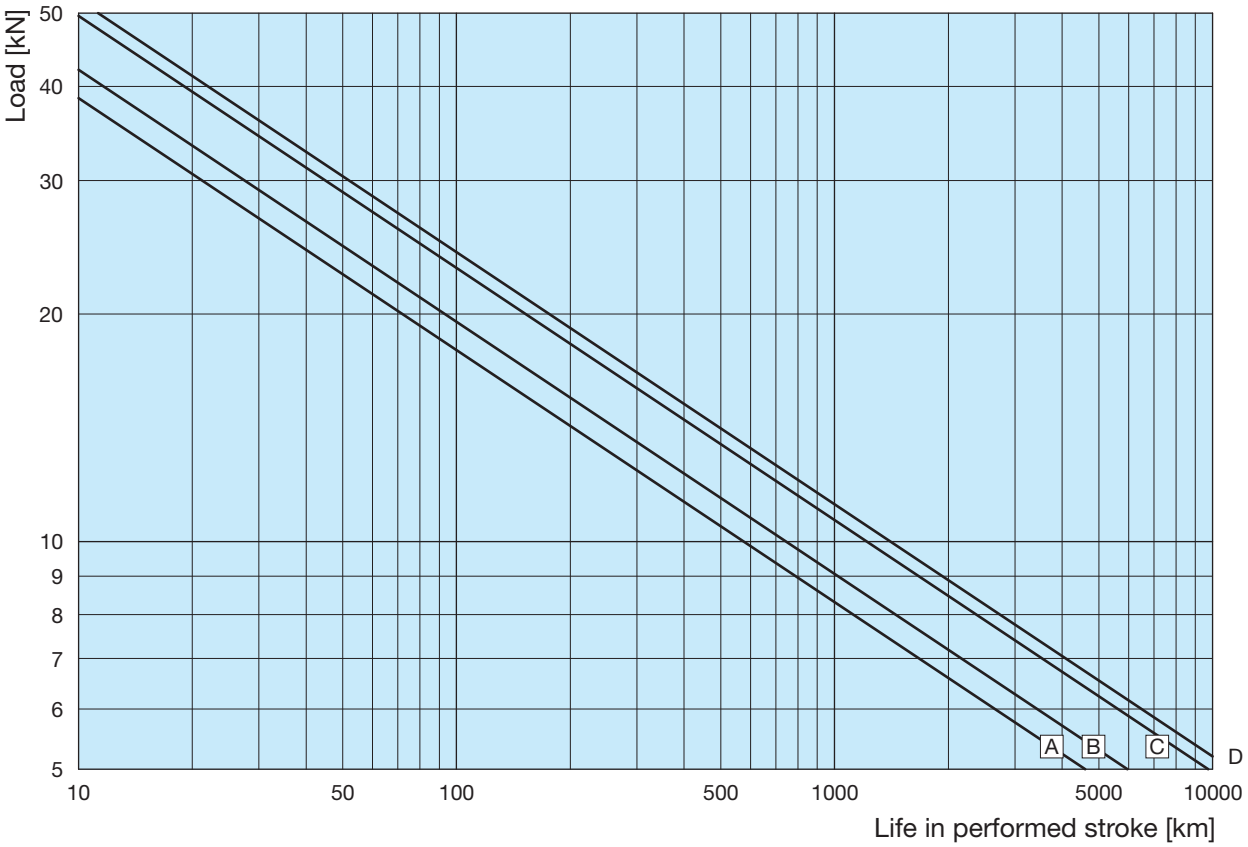


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 32×5	3.175	4	15.8	39.5	**SFN-_.32.05.4R**	**A**
BS 32×10	6.35	3	25.5	44.6	**SFN-_.32.10.3R**	**B**
BS 32×10	6.35	4	32.7	57	**SFN-_.32.10.4R**	**C**
BS 32×10	6.35	5	39.7	69	**SFN-_.32.10.5R**	**E**
BS 32×20	6.35	3	30.9	57	**SFN-_32.20.3R-A**	**D**
BS 32×32	6.35	2 + 2	35.0	58	**SFN-_32.32.2R-2A**	**F**

4.9 Ball screw life

Ball screw diameter 40, accuracy grade IT 3 or IT 5, IT 7

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

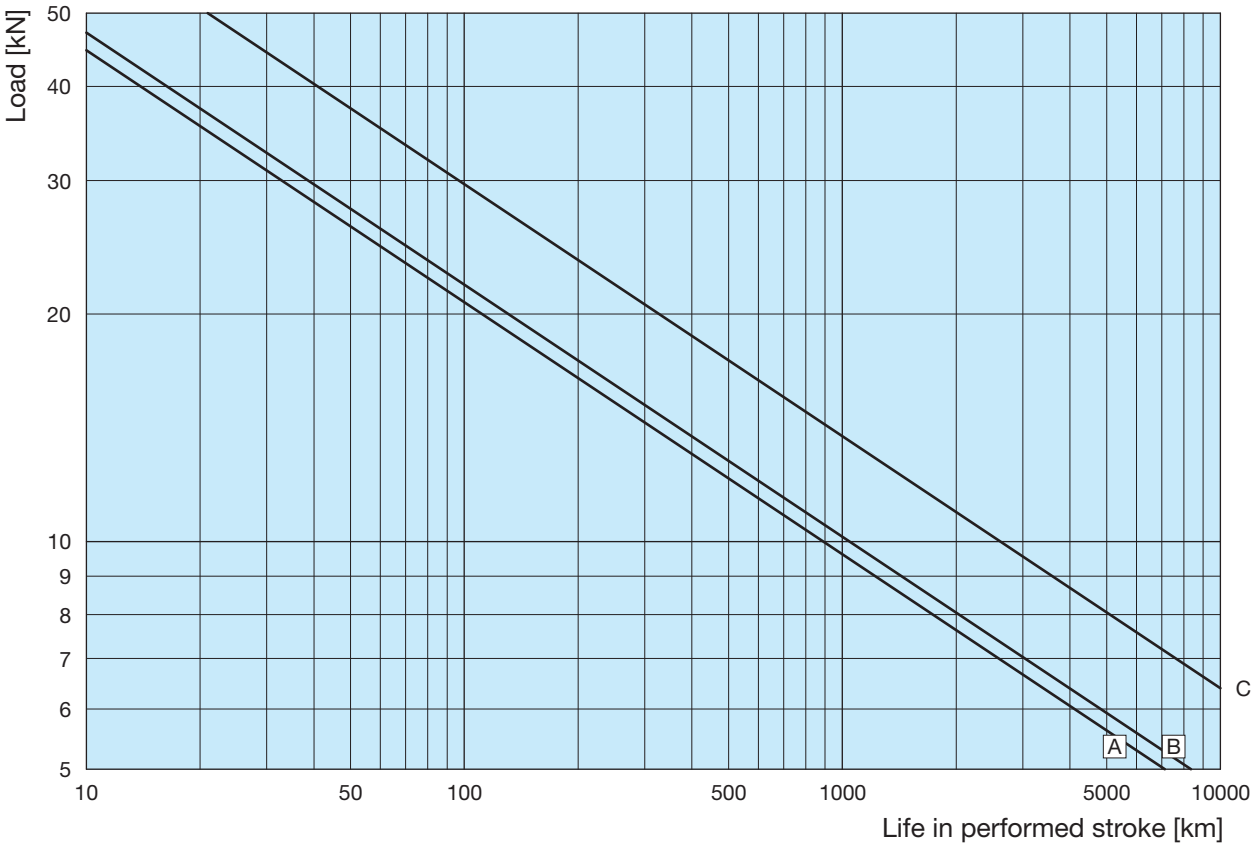


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 40×10	6.35	5	52	107	**SFN-_.40.10.5R**	**D**
BS 40×20	6.35	3	33.4	64	**SFN-_.40.20.3R**	**B**
BS 40×20	6.35	3	39.3	82	**SFN-_.40.20.3R-A**	**C**
BS 40×40	6.35	2	24.3	46.2	**SFN-_.40.40.2R-A**	**A**

4.9 Ball screw life

Ball screw diameter 40, accuracy grade IT 7

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

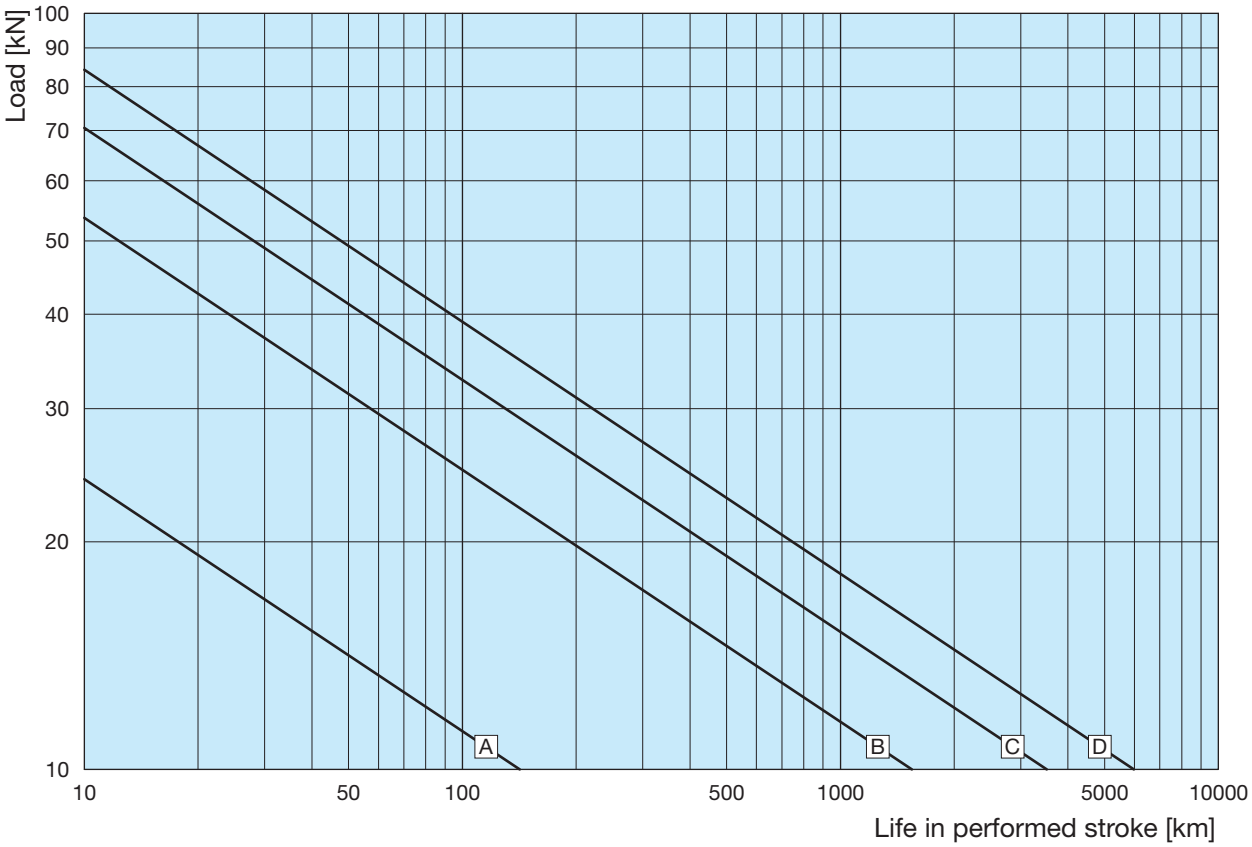


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 40×10	6.35	5	47.1	96	**SFN-_.40.10.5R**	**B**
BS 40×20	6.35	3	35.4	74	**SFN-_.40.20.3R-A**	**A**
BS 40×40	6.35	2 + 2	40.3	77	**SFN-_.40.40.2R-2A**	**C**

4.9 Ball screw life

Ball screw diameter 50, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

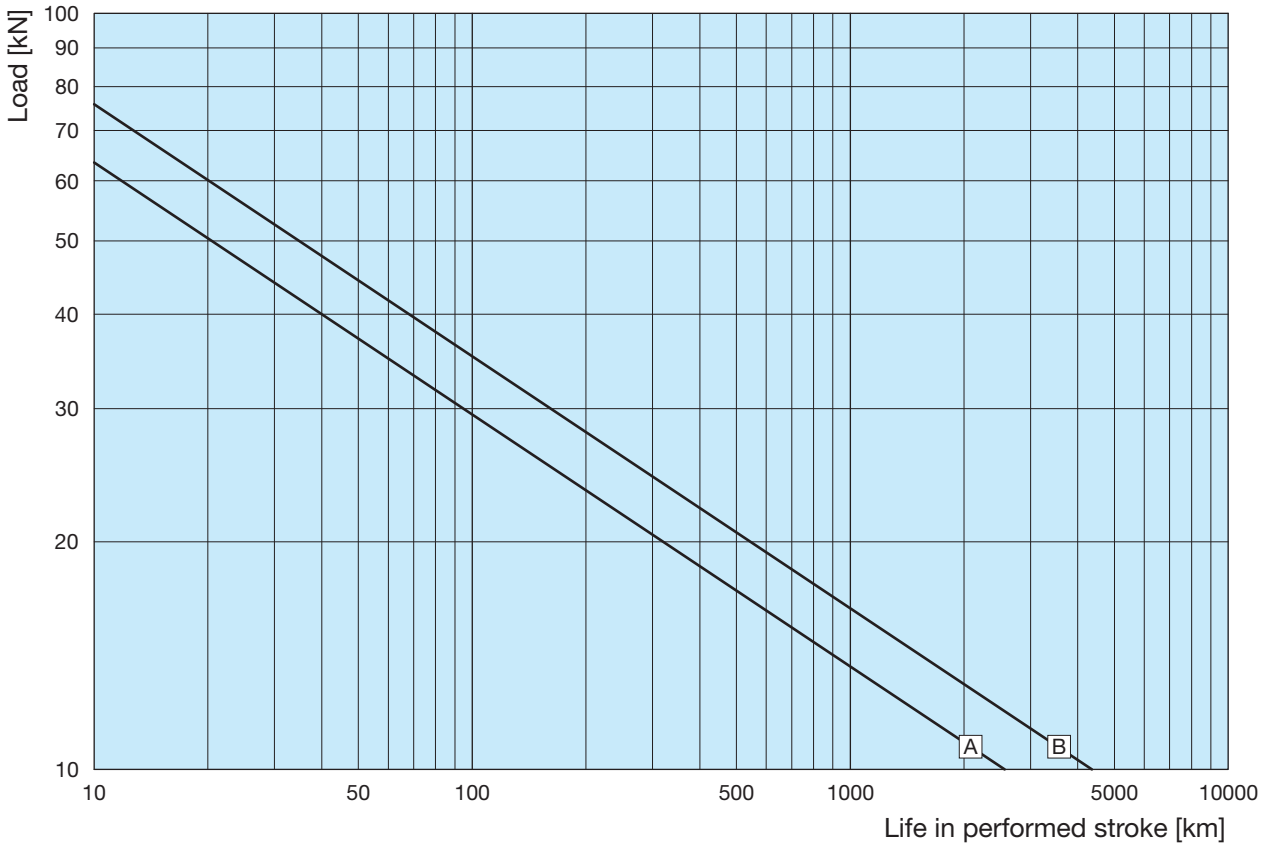


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 50×5	3.175	5	30.5	93	**SFN-_.50.05.5R**	**A**
BS 50×10	7.144	5	72	163	**SFN-_.50.10.5R**	**C**
BS 50×10	7.144	6	84	191	**SFN-_.50.10.6R**	**D**
BS 50×20	7.144	4	56	121	**SFN-_.50.20.4R**	**C**
BS 50×40	7.144	2	37.8	72	**SFN-_.50.40.2R-A**	**B**

4.9 Ball screw life

Ball screw diameter 50, accuracy grade IT 7

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

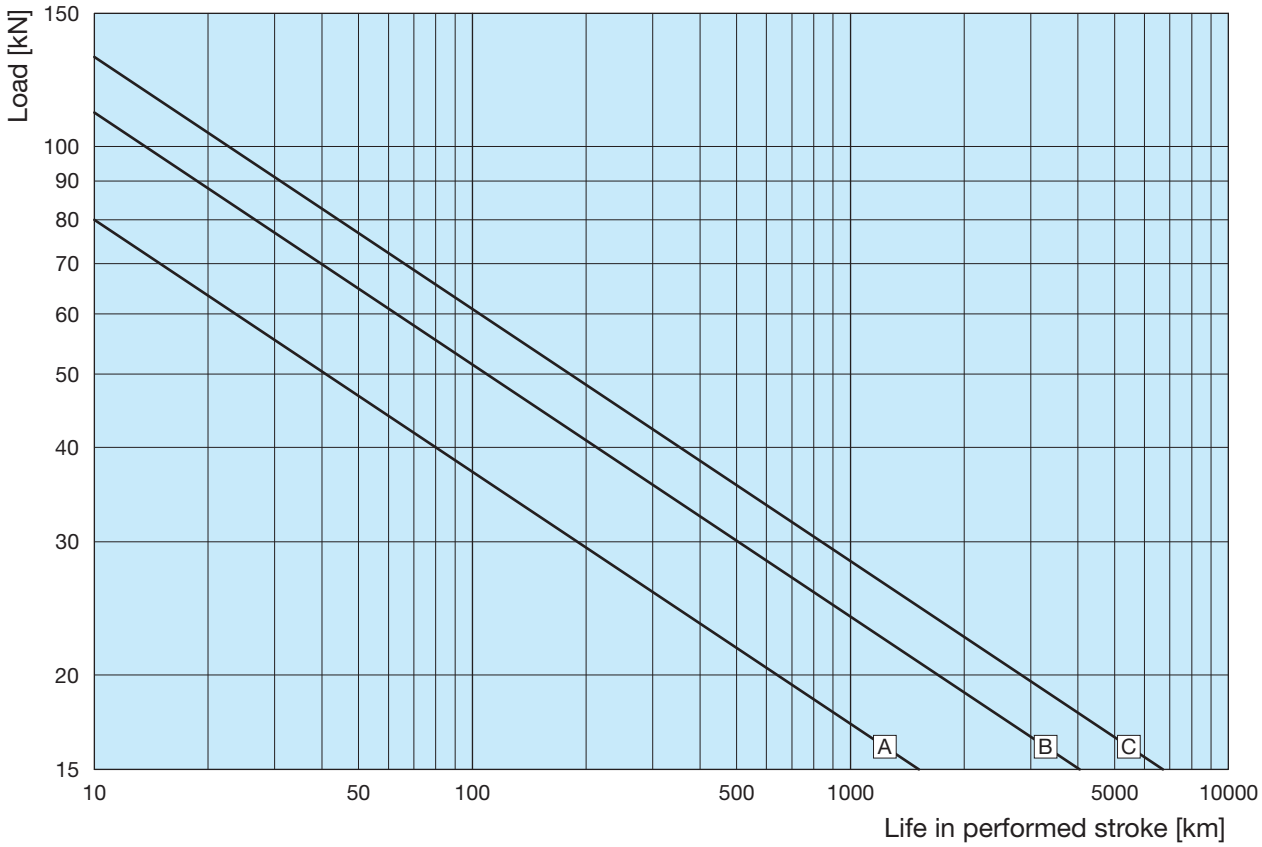


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 50×10	7.144	5	65	147	**SFN-_.50.10.5R**	**A**
BS 50×10	7.144	6	76	172	**SFN-_.50.10.6R**	**B**
BS 50×20	7.144	4	50	109	**SFN-_.50.20.4R-A**	**A**

4.9 Ball screw life

Ball screw diameter 63, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

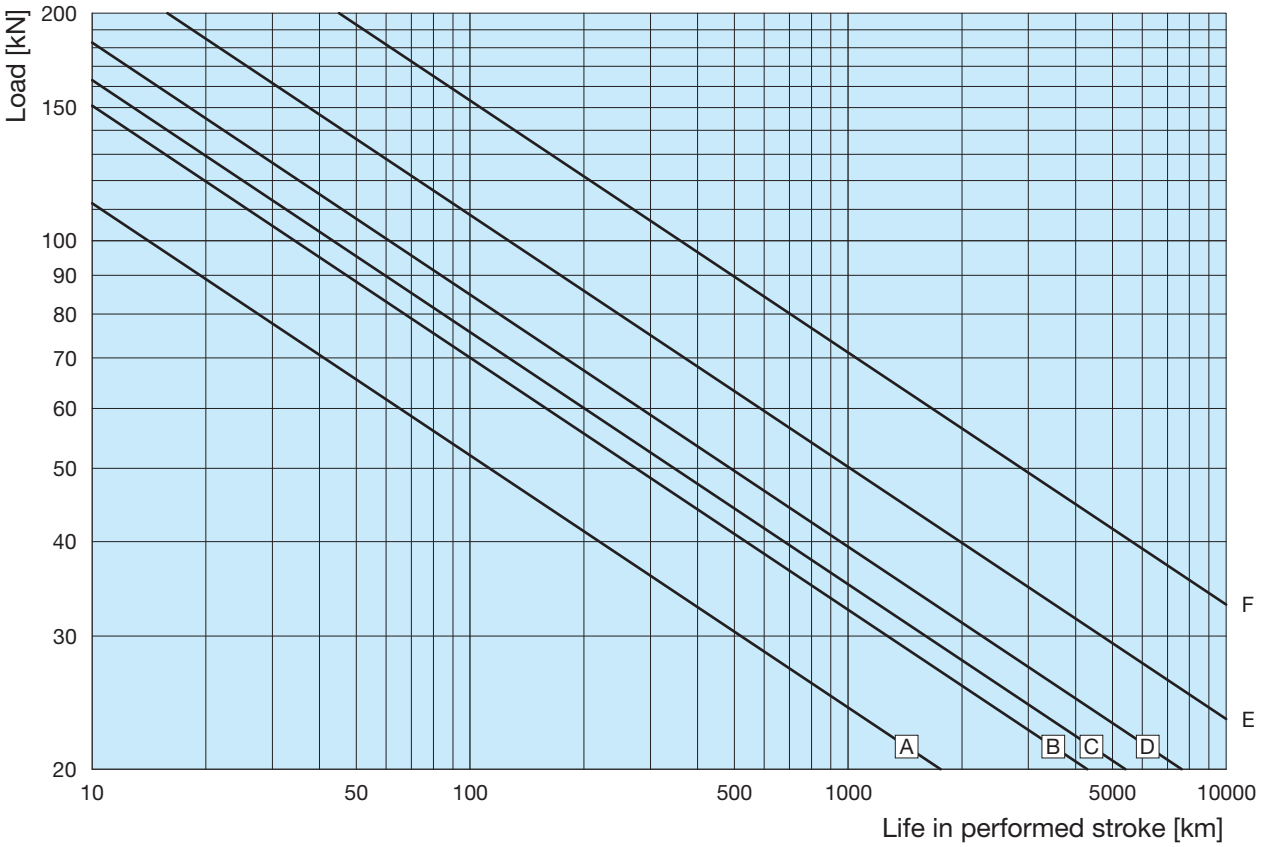


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 63×10	7.144	5	80	209	**SFN-_.63.10.5R**	**A**
BS 63×20	9.525	4	88	191	**SFN-_.63.20.4R**	**B**
BS 63×40	9.525	3	83	193	**SFN-_.63.40.3R-A**	**C**

4.9 Ball screw life

Ball screw diameter 80, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

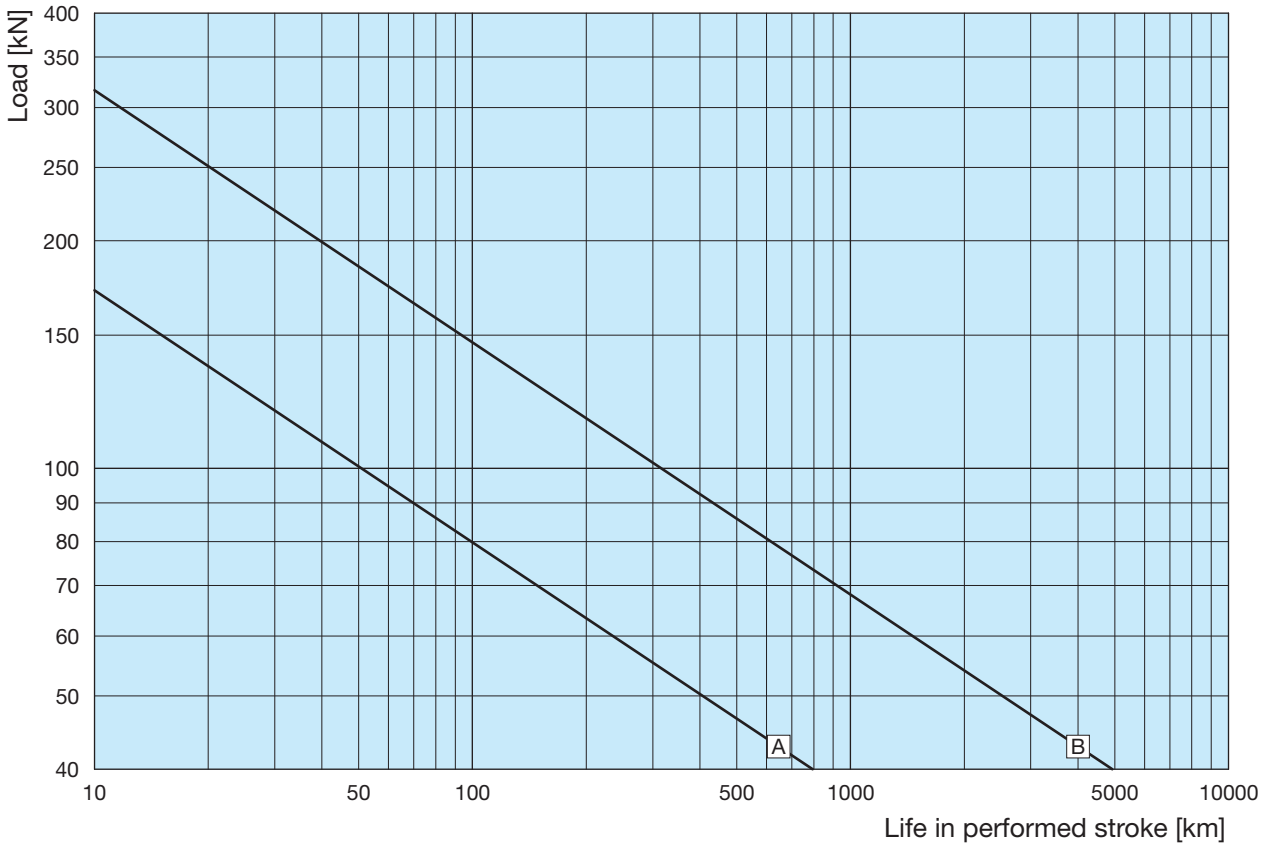


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 80×10	7.144	6	112	370	**SFN-_.80.10.6R**	**A**
BS 80×16	9.525	5	129	341	**SFN-_.80.16.5R**	**B**
BS 80×20	9.525	5	145	419	**SFN-_.80.20.5R-A**	**D**
BS 80×20	12.7	4	185	462	**SFN-_.80.20.4R**	**E**
BS 80×20	12.7	6	262	654	**SFN-_.80.20.6R**	**F**
BS 80×40	12.7	2	103	232	**SFN-_.80.40.2R-A**	**C**

4.9 Ball screw life

Ball screw diameter 100, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.

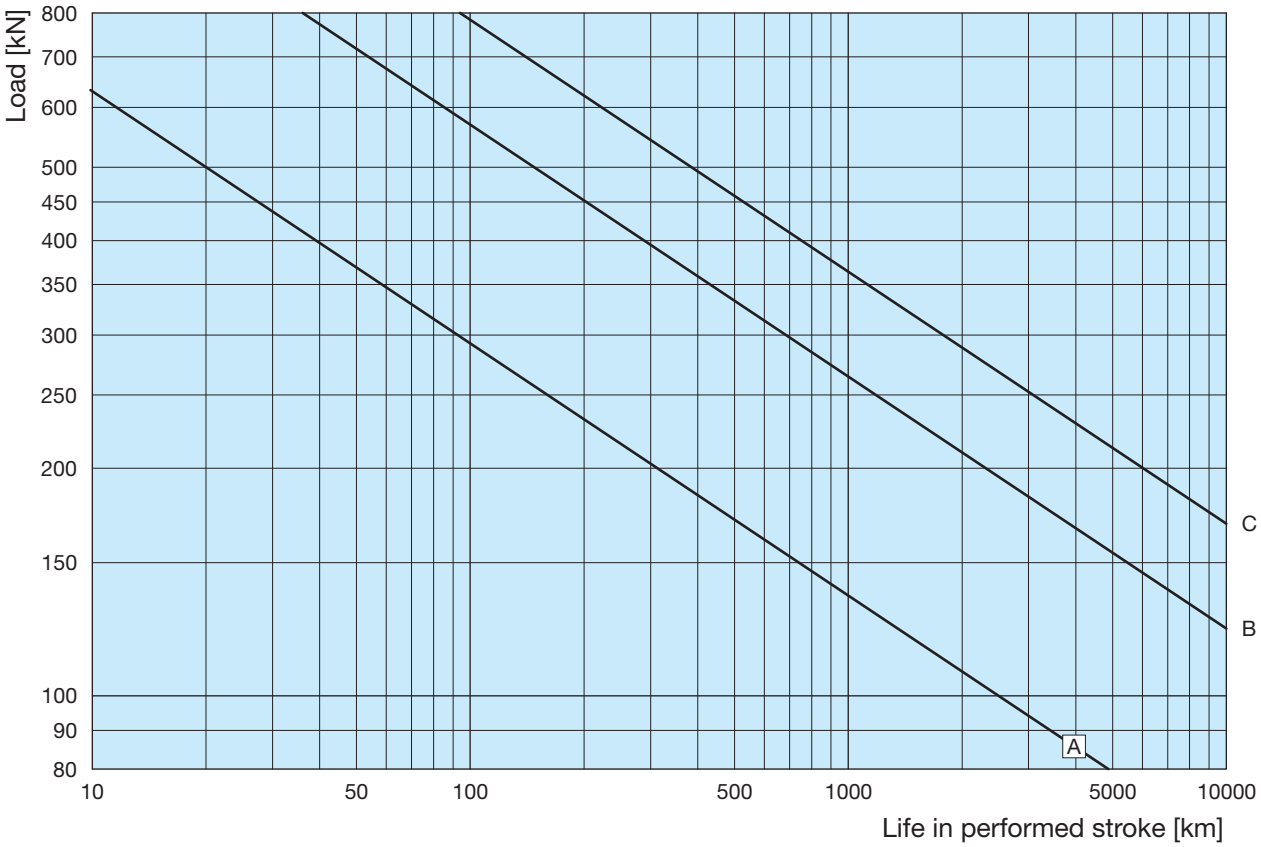


BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 100×16	9.525	5	147	454	**SFN-_.100.16.5R**	**A**
BS 100×20	12.7	5	251	732	**SFN-_.100.20.5R**	**B**

4.9 Ball screw life

Ball screw diameter 120 - 140, accuracy grade IT 3 or IT 5

The life graphs below refer to constant applied load, without shocks, with ball screws reliability of 90%. For different load and/or reliability conditions, see ch. 2.4 “Ball screw life” on page 18 or contact SERVOMECH technical support.



BALL SCREW	Ball [mm]	Nr of circuits	C_a [kN]	C_{0a} [kN]	NUT	CURVE
BS 120×20	15.875	7	500	1578	**SFN-_.120.20.7R**	**A**
BS 120×32	25.4	6	832	2162	**SFN-_.120.32.6R**	**B**
BS 140×32	25.4	7	1145	3472	**SFN-_.140.32.7R-A**	**C**

4.10 Ball screw efficiency

Thanks to balls interposed between the threaded shaft and nut, the friction coefficient between balls and tracks is constant also in case of speed and load variations. This implies that also the ball screw efficiency can be considered as constant by varying working conditions and it is called theoretical ball screw efficiency.

The following tables show the theoretical efficiency of all ball screws available for screw jacks Mod.B with rotating screw and travelling nut.

d_0	16		20			25				32				40		
P_h	5	10	5	10	20	5	6	10	25	5	10	20	32	10	20	40
η_{BS}	0.86	0.89	0.86	0.88	0.90	0.84	0.86	0.87	0.90	0.82	0.86	0.89	0.90	0.86	0.88	0.90

d_0	50				63			80				100		120		140
P_h	5	10	20	40	10	20	40	10	16	20	40	16	20	20	32	32
η_{BS}	0.77	0.84	0.87	0.90	0.82	0.86	0.89	0.80	0.84	0.86	0.89	0.82	0.84	0.83	0.85	0.85

4.11 Worm gear efficiency

η_{RID}	MA 5			MA 10			MA 25			MA 50 MA 80			MA 150			MA 200			MA 350		
n_1 [rpm]	RATIO			RATIO			RATIO			RATIO			RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL
3 000	0.84	0.75	0.68	0.84	0.73	0.71	0.84	0.77	0.72	0.85	0.80	0.72	0.85	0.76	0.73	0.85	0.77	0.74	0.84	0.82	0.76
1 500	0.81	0.71	0.62	0.82	0.68	0.66	0.82	0.73	0.68	0.83	0.77	0.68	0.83	0.73	0.68	0.84	0.74	0.71	0.83	0.80	0.72
1 000	0.80	0.68	0.60	0.81	0.65	0.63	0.81	0.71	0.65	0.81	0.75	0.64	0.81	0.69	0.65	0.82	0.71	0.68	0.82	0.78	0.70
750	0.79	0.67	0.58	0.80	0.64	0.61	0.80	0.69	0.63	0.81	0.73	0.62	0.80	0.68	0.64	0.81	0.69	0.65	0.80	0.77	0.68
500	0.78	0.65	0.56	0.78	0.61	0.59	0.78	0.66	0.60	0.79	0.72	0.60	0.79	0.66	0.61	0.80	0.66	0.63	0.78	0.75	0.65
300	0.77	0.63	0.53	0.77	0.58	0.56	0.77	0.64	0.57	0.77	0.69	0.57	0.77	0.62	0.57	0.78	0.63	0.59	0.77	0.73	0.62
100	0.73	0.59	0.48	0.74	0.52	0.50	0.73	0.59	0.52	0.74	0.64	0.51	0.74	0.57	0.51	0.75	0.58	0.53	0.75	0.68	0.55
START.	0.68	0.53	0.41	0.68	0.46	0.44	0.68	0.52	0.44	0.68	0.57	0.48	0.67	0.47	0.42	0.68	0.47	0.43	0.65	0.59	0.44

η_{RID}	SJ 5				SJ 10			SJ 25			SJ 50 SJ 100			SJ 150			SJ 200 SJ 250		SJ 300		SJ 600		SJ 800	
n_1 [rpm]	RATIO				RATIO			RATIO			RATIO			RATIO			RATIO		RATIO		RATIO		RATIO	
	RH	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RL	RV	RL	RV	RL	RV	RL
1 500	0.71	0.71	0.65	0.56	0.72	0.63	0.55	0.73	0.65	0.60	0.74	0.69	0.61	0.74	0.65	0.61	0.74	0.63	0.73	0.63	0.73	0.63	0.74	0.63
1 000	0.70	0.70	0.63	0.53	0.71	0.61	0.54	0.72	0.63	0.58	0.72	0.66	0.57	0.72	0.62	0.58	0.73	0.60	0.72	0.60	0.72	0.61	0.73	0.62
750	0.70	0.69	0.62	0.52	0.70	0.59	0.51	0.71	0.61	0.56	0.72	0.65	0.55	0.71	0.60	0.57	0.72	0.58	0.71	0.58	0.72	0.59	0.72	0.60
500	0.68	0.67	0.61	0.50	0.70	0.58	0.50	0.70	0.59	0.53	0.70	0.64	0.54	0.70	0.58	0.54	0.71	0.56	0.70	0.56	0.70	0.56	0.70	0.57
300	0.67	0.66	0.59	0.48	0.68	0.56	0.47	0.68	0.57	0.51	0.69	0.62	0.50	0.69	0.55	0.50	0.70	0.51	0.68	0.53	0.68	0.53	0.68	0.54
100	0.64	0.64	0.56	0.44	0.65	0.52	0.42	0.65	0.52	0.46	0.66	0.57	0.46	0.66	0.50	0.46	0.66	0.47	0.64	0.47	0.64	0.47	0.64	0.47
START.	0.59	0.60	0.52	0.39	0.60	0.47	0.37	0.60	0.46	0.39	0.61	0.50	0.42	0.59	0.42	0.38	0.60	0.38	0.56	0.37	0.55	0.35	0.54	0.34

η_{RID}	HS Series (all sizes, all ratios)
RUNNING	0.93
STARTING	0.90

4.12 Static braking torque

The braking torque is the necessary torque to keep the load on the screw jack in a static position. The braking torque shall be applied with a brake on the screw jack input shaft.

Braking torque calculation

The braking torque value is calculated as follows:

$$T_f = \frac{1.2 \cdot F \cdot P_h \cdot \eta'_{BS} \cdot \eta'_{RID}}{2\pi \cdot u}$$

where:

η'_{BS} - ball screw back-driving efficiency
η'_{RID} - worm gear back-driving efficiency
F [kN] - load applied on the screw jack
P_h [mm] - ball screw thread helix lead
u - worm gear ratio ($u > 1$)

The calculated T_F value must be compared with the minimum braking torque threshold value, which must always be assured. The real braking torque value is therefore the highest one of the two values.

$$T_{F\,eff} = max\,(T_F\,;\,T_{F\,min})$$

Following tables show the $T_{F\,min}$ and the back-driving efficiency values.

NOTE: where no value is stated, it means that the system is ideally self-locking. Actually, due to hardly predictable external factors, such as vibrations and shocks, it still can be possible to have a not self-locking system and therefore, even in this case, it is necessary to apply a braking torque to sustain the load in position, equal to the minimum $T_{F\,min}$.

d_0	16		20			25				32				40		
P_h	5	10	5	10	20	5	6	10	25	5	10	20	32	10	20	40
η'_{BS}	0.94	0.97	0.92	0.96	0.98	0.90	0.92	0.95	0.98	0.88	0.94	0.97	0.98	0.92	0.96	0.98

d_0	50				63			80				100		120		140
P_h	5	10	20	40	10	20	40	10	16	20	40	16	20	20	32	32
η'_{BS}	0.81	0.90	0.95	0.97	0.88	0.94	0.97	0.85	0.90	0.92	0.96	0.88	0.90	0.88	0.92	0.91

η'_{RID}	MA 5			MA 10			MA 25			MA 50 MA 80			MA 150			MA 200			MA 350		
	RATIO			RATIO			RATIO			RATIO			RATIO			RATIO			RATIO		
	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL
	0.68	0.26	-	0.69	-	-	0.68	0.21	-	0.68	0.38	-	0.66	-	-	0.66	0.02	-	0.60	0.42	-

η'_{RID}	SJ 5				SJ 10			SJ 25			SJ 50 SJ 100			SJ 150			SJ 200 SJ 250		SJ 300		SJ 600		SJ 800	
	RATIO				RATIO			RATIO			RATIO			RATIO			RATIO		RATIO		RATIO		RATIO	
	RH	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RN	RL	RV	RL	RV	RL	RV	RL	RV	RL
	0.66	0.68	0.42	-	0.68	0.26	-	0.68	0.21	-	0.68	0.38	-	0.66	-	-	0.66	-	0.57	-	0.53	-	0.51	-

η'_{RID}	HS Series (all sizes, all ratios)
	0.90

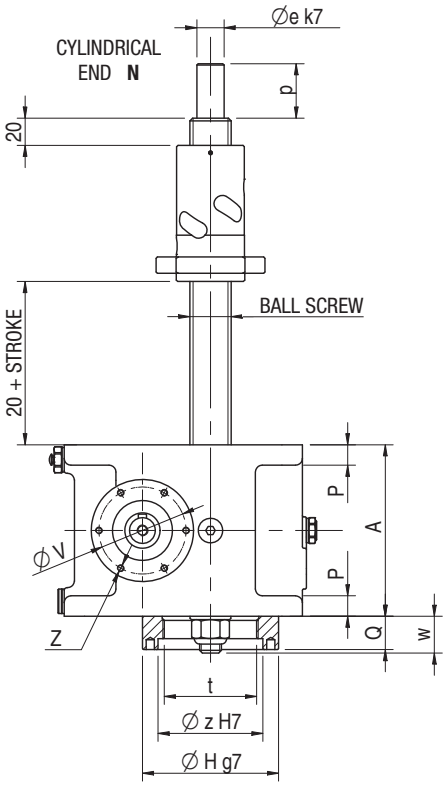
$T_{F\,min}$ [Nm]	MA 5	MA 10	MA 25	MA 50 MA 80	MA 150	MA 200	MA 350
	0.2	0.35	1.5	2.4	5.3	6.8	13.4

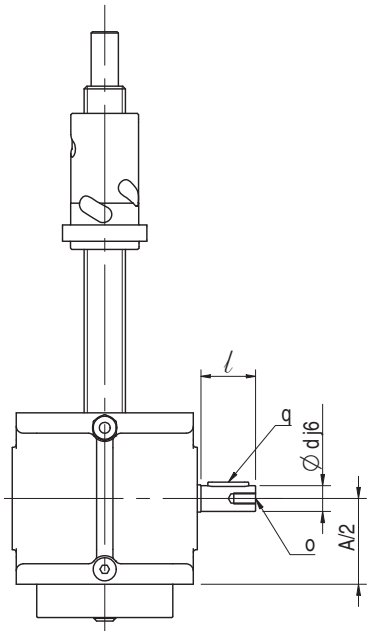
$T_{F\,min}$ [Nm]	SJ 5	SJ 10	SJ 25	SJ 50 SJ 100	SJ 150	SJ 200 SJ 250	SJ 300	SJ 600	SJ 800
	0.2	0.35	1.5	2.4	5.3	6.8	11.5	21.6	50.2

$T_{F\,min}$ [Nm]	HS 10	HS 25	HS 50	HS 100	HS 150	HS 200
	0.45	2	3.2	5.5	7.2	9.3

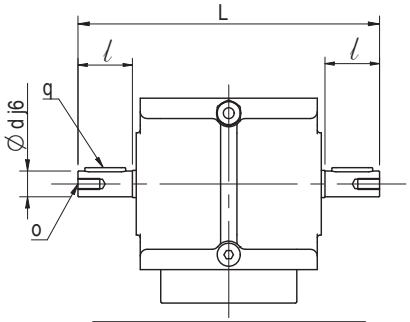
4.13 Overall dimensions

MA BS Series Mod.B

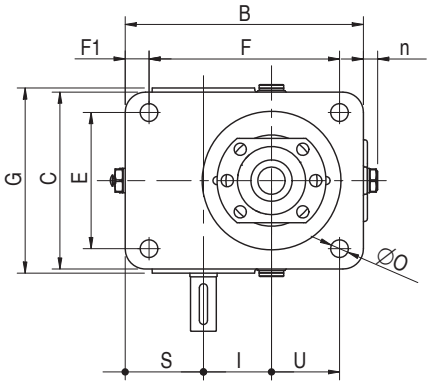




Vers.1: single input shaft

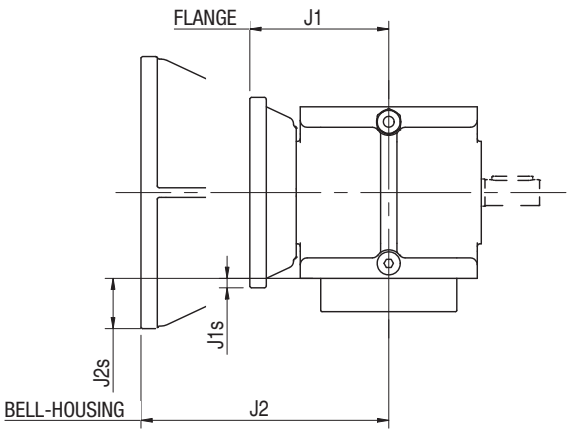


Vers.2: double input shaft



Vers.3: flange and hollow shaft IEC

Vers.4: flange and hollow shaft IEC + 2nd shaft



Vers.5: Vers.1 with bell-housing and coupling IEC

Vers.6: Vers.2 with bell-housing and coupling IEC

4.13 Overall dimensions

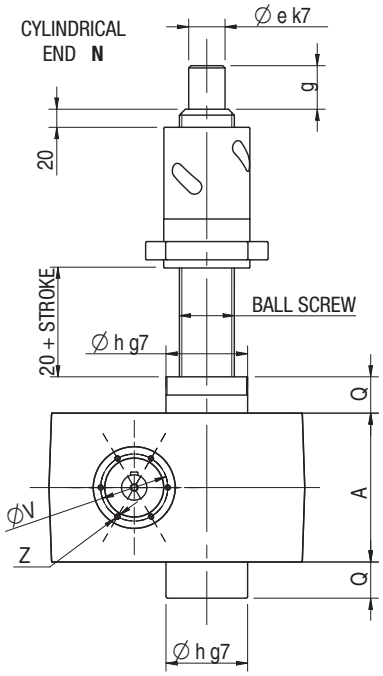
MA BS Series Mod.B

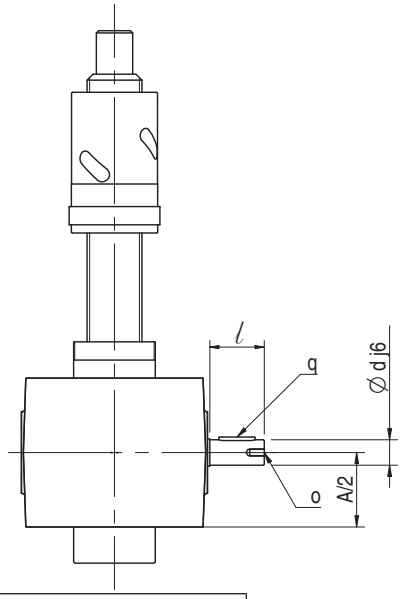
SIZE	MA 5 BS	MA 10 BS	MA 25 BS	MA 50 BS	MA 80 BS	MA 150 BS	MA 200 BS	MA 350 BS
BALL SCREW	BS 20 × P_h	BS 25 × P_h	BS 32 × P_h	BS 40 × P_h	BS 50 × P_h	BS 63 × P_h	BS 80 × P_h	BS 100 × P_h
A	80	100	126	160	160	200	230	280
B	124	140	175	235	235	276	330	415
C	80	105	130	160	160	200	230	300
E	62	80	100	120	120	150	175	230
F	95	110	140	190	190	220	270	330
F1	12.5	14	17.5	23	23	26	30	42
G	100	114	136	165	165	205	256	326
∅ H	65	80	100	120	120	160	190	240
I	30	40	50	63	63	80	100	125
L	149	179	221.5	269	269	330	378	490
∅ O	9	9	13	17	17	21	28	34
Q	15	16	24	26	26	30	35	40
S	46.5	46	57.5	80	80	91	113	121
U	31	38	50	70	70	75	87	126
∅ V	42	46	64	63	63	74	110	118
Z	M5, depth 10	M5, depth 12	M5, depth 10	M6, depth 14	M6, depth 14	M6, depth 14	M10, depth 20	M10, depth 25
∅ d	10	14	19	24	24	28	32	38
∅ e	12	15	20	30	40	40	50	70
l	22	30	40	50	50	60	60	80
n	—	—	10	10	10	12	10	10
o	M5, depth 10	M6, depth 14	M8, depth 16	M8, depth 16	M8, depth 16	M8, depth 16	M10, depth 24	M12, depth 32
p	19	24	40	40	45	50	60	65
q	3×3×15	5×5×20	6×6×30	8×7×40	8×7×40	8×7×40	10×8×40	10×8×60
t	M45×1.5	M55×1.5	M70×2	M90×2	M90×2	M110×2	M150×3	M180×3
w	15	17	25	36	38	41	42	45
∅ z	50	60	77	95	95	120	160	200
J1	63 B5/B14: 62	63 B5/B14: 69	63/71 B5: 102	80 B5: 100	80 B5: 100	80/90 B5: 120	90 B5: 142 100/112 B5: 142	—
J1s	63 B5: 30 63 B14: 5	6 3 B5: 20 63 B14: —	63 B5: 7 71 B5: 17	80 B5: 20	80 B5: 20	80/90 B5: —	90 B5: — 100/112 B5: 10	—
J2	71 B5: 122 71 B14: 131	71 B5: 129 71 B14: 138	80 B5: 182 80 B14: 176 90 B5: 182 90 B14: 182	90 B5: 200 90 B14: 200 100 B5: 220 100 B14: 220	90 B5: 200 90 B14: 200 100/112 B5: 220 100/112 B14: 220	100/112 B5 240 100/112 B14: 240	132 B5: 297	132 B5: 353 160 B5: 365
J2s	71 B5: 40 71 B14: 12.5	71 B5: 30 71 B14: 3	80 B5: 37 80 B14: — 90 B5: 37 90 B14: 7	90 B5: 20 90 B14: — 100 B5: 45 100 B14: —	90 B5: 20 90 B14: — 100/112 B5: 45 100/112 B14: —	100/112 B5 25 100/112 B14: —	132 B5: 35	132 B5: 10 160 B5: 35

NOTE: for ball nut dimensions, see ch. 4.8 “Ball nuts dimensions” on page 72.

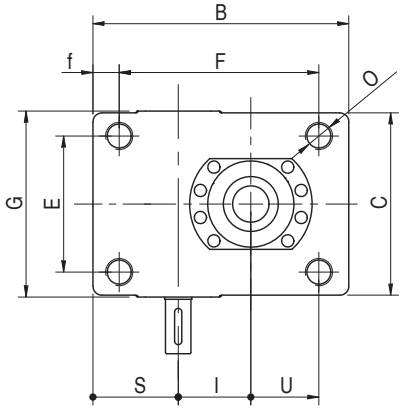
4.13 Overall dimensions

SJ BS Series Mod.B, size 5 - 10 - 25 - 50 - 100 - 150

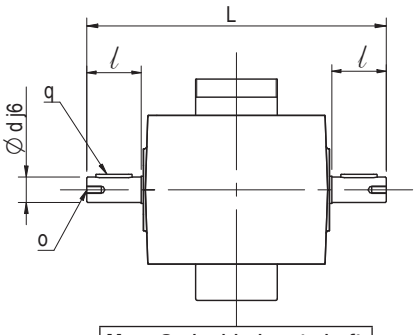




Vers.1: single input shaft



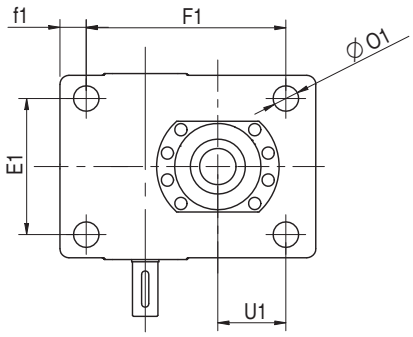
THREADED FIXING HOLES



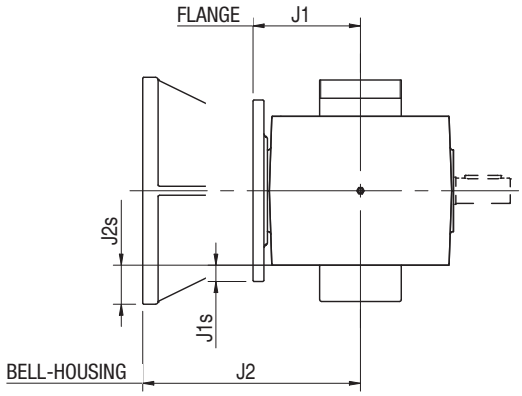
Vers.2: double input shaft

Vers.3: flange and hollow shaft IEC

Vers.4: flange and hollow shaft IEC + 2nd shaft



THROUGH FIXING HOLES



Vers.5: Vers.1 with bell-housing and coupling IEC

Vers.6: Vers.2 with bell-housing and coupling IEC

4.13 Overall dimensions

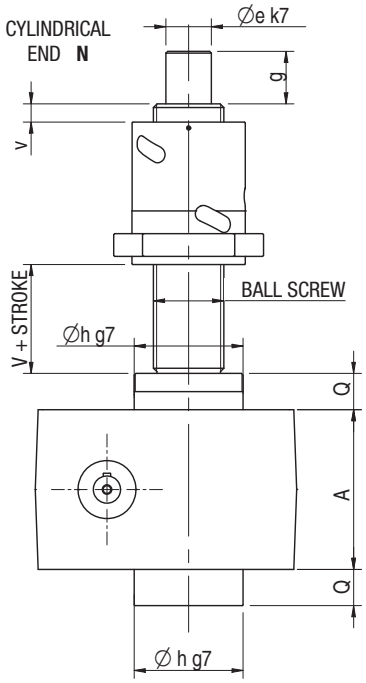
SJ BS Series Mod.B, size 5 - 10 - 25 - 50 - 100 - 150

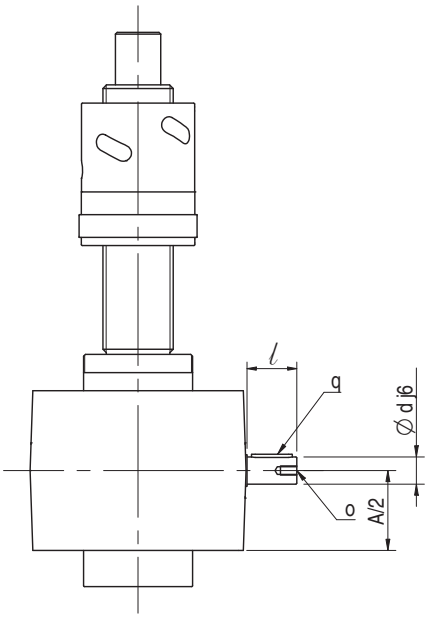
SIZE	SJ 5 BS	SJ 10 BS	SJ 25 BS	SJ 50 BS	SJ 100 BS	SJ 150 BS
BALL SCREW	BS 16-20 × P_h	BS 25 × P_h	BS 32 × P_h	BS 40 × P_h	BS 50 × P_h	BS 63 × P_h
A	62	76	82	118	160	164
B	100	110	160	200	220	282
C	86	96	130	160	170	201
E	52	63	81	115	134	150
E1	56	80	102	130	120	150
F	60	78	106	150	175	220
F1	80	85	131	165	180	220
G	90	100	136	165	165	205
I	25	30	50	63	63	80
L	135	165	221.5	269	269	330
O	M8, depth 14	M8, depth15	M10, depth 15	M12, depth 16	M20, depth 30	M30, depth 45
∅ O1	9	9	11	13	17	28
Q	12	18	23	32	40	40
S	37	40	50	59	74	94
U	21	29	42	63	60	75
U1	28	30	48	60	63	75
∅ V	46	46	64	63	63	74
Z	M6, depth13 (4 holes at 90°)	M5, depth10 (6 holes at 60°)	M5, depth10 (6 holes at 60°)	M6, depth14 (6 holes at 60°)	M6, depth14 (6 holes at 60°)	M6, depth14 (6 holes at 60°)
∅ d	9	14	19	24	24	28
∅ e	12	15	20	30	40	40
f	23	21	36	35	22	29
f1	10	15	17	17	20	29
g	19	24	38	38	48	48
∅ h	30	38.7	46	60	90	90
l	20	30	40	50	50	60
o	M4, depth 8	M6, depth14	M8, depth 16	M8, depth 16	M8, depth 16	M8, depth 16
q	3×3×15	5×5×20	6×6×30	8×7×40	8×7×40	8×7×40
v	20	20	20	20	20	20
∅ z	14	20	25	35	40	50
J1	56 B5/B14: 57.5	63 B5/B14: 62	63/71 B5: 102	80 B5: 100	80 B5: 100	80/90 B5: 120
J1s	56 B5: 29 56 B14: 9	63 B5: 32 63 B14: 7	63 B5: 29 71 B5: 39	80 B5: 41	80 B5: 20	80/90 B5: 18
J2	63 B5: 98	71 B5: 122 71 B14: 131	80 B5: 182 80 B14: 176 90 B5: 182 90 B14: 182	90 B5: 200 90 B14: 200 100 B5: 220 100 B14: 220	90 B5: 200 90 B14: 200 100/112 B5: 220 100/112 B14: 220	100/112 B5: 240 100/112 B14: 240
J2s	63 B5: 39	71 B5: 42 71 B14: 15	80 B5: 59 80 B14: 19 90 B5: 59 90 B14: 29	90 B5: 41 90 B14: 11 100 B5: 66 100 B14: 21	90 B5: 20 90 B14: — 100/112 B5: 45 100/112 B14: —	100/112 B5: 43 100/112 B14: —

NOTE: for ball nut dimensions, see ch. 4.8 “Ball nuts dimensions” on page 72.

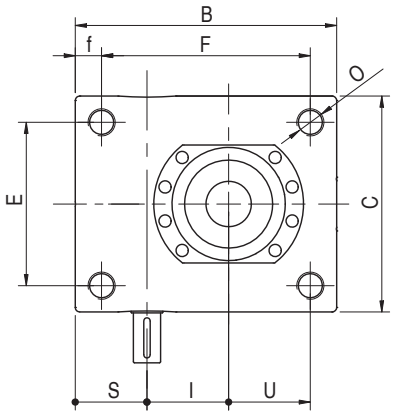
4.13 Overall dimensions

SJ BS Series Mod.B, size 200 - 250 - 300 - 600 - 800

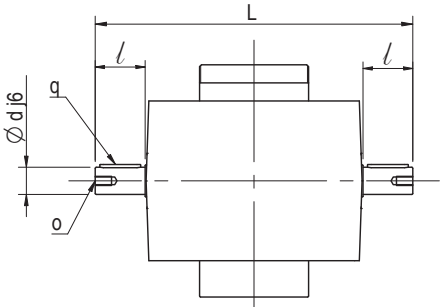




Vers.1: single input shaft



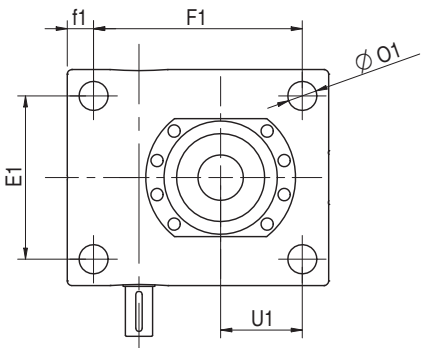
THREADED FIXING HOLES



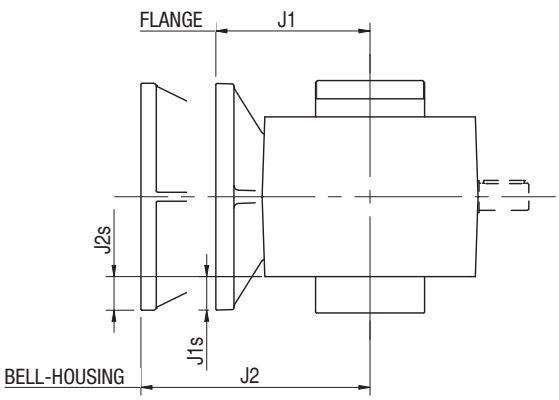
Vers.2: double input shaft

Vers.3: flange and hollow shaft IEC

Vers.4: flange and hollow shaft IEC + 2nd shaft



THROUGH FIXING HOLES



Vers.5: Vers.1 with bell-housing and coupling IEC

Vers.6: Vers.2 with bell-housing and coupling IEC

4.13 Overall dimensions

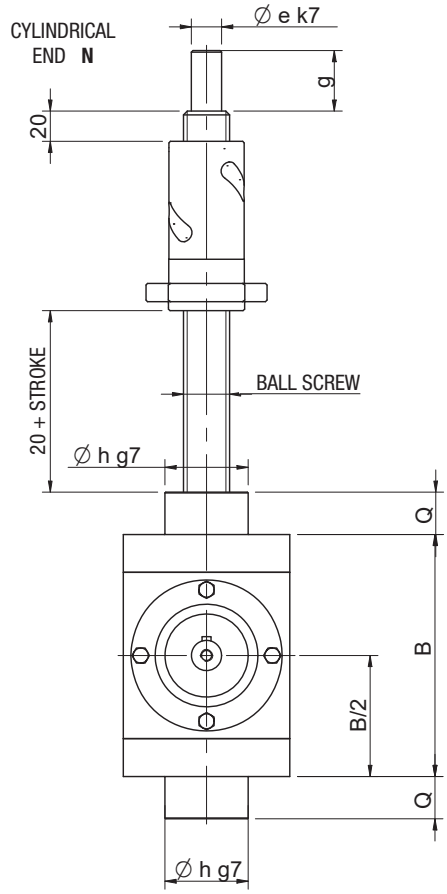
SJ BS Series Mod.B, size 200 - 250 - 300 - 600 - 800

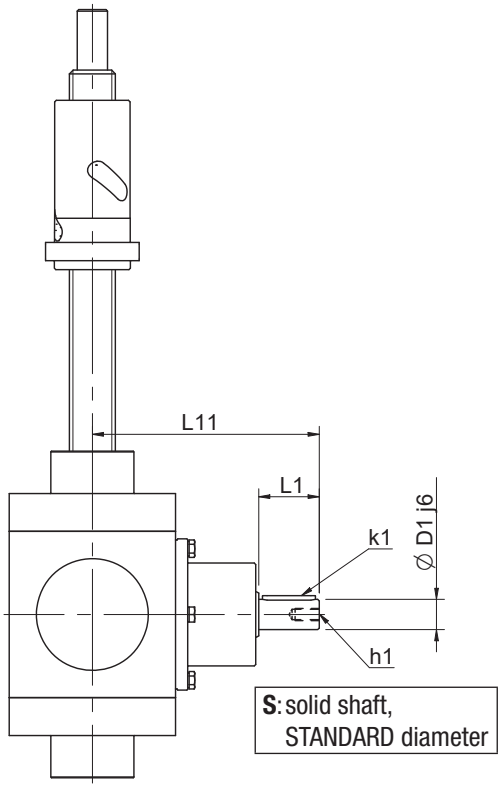
SIZE	SJ 200 BS	SJ 250 BS	SJ 300 BS	SJ 600 BS	SJ 800 BS
BALL SCREW	BS 80 × P_h	BS 100 × P_h	BS 100 × P_h	BS 120 × P_h	BS 140 × P_h
A	176	176	230	270	370
B	280	280	320	418	610
C	230	230	250	330	500
E	180	180	200	230	—
E1	180	180	200	230	360
F	230	230	270	355	—
F1	230	230	270	355	510
I	90	90	110	140	200
L	350	350	390	490	780
O	M30, depth 45	M30, depth 45	M30, depth 45	M30, depth 45	—
∅ O1	32	32	32	32	60
Q	40	40	50	50	60
S	75	75	85	117	170
U	90	90	100	135	—
U1	90	90	100	135	190
∅ d	30	30	40	55	70
∅ e	50	50	70	90	120
f	25	25	25	32	—
f1	25	25	25	32	50
g	58	58	68	85	120
∅ h	120	120	150	210	300
l	55	55	65	75	130
o	M10, depth 18	M10, depth 18	M10, depth 22	M12, depth 28	M14, depth 30
q	8×7×45	8×7×45	12×8×55	16×10×60	20×12×110
v	20	20	40	40	50
∅ z	60	60	80	80	140
J1	100/112 B5: 170	100/112 B5: 170	—	—	—
J1s	100/112 B5: 37	100/112 B5: 37	—	—	—
J2	132 B5: 292	132 B5: 292	—	—	—
J2s	132 B5: 62	132 B5: 62	—	—	—

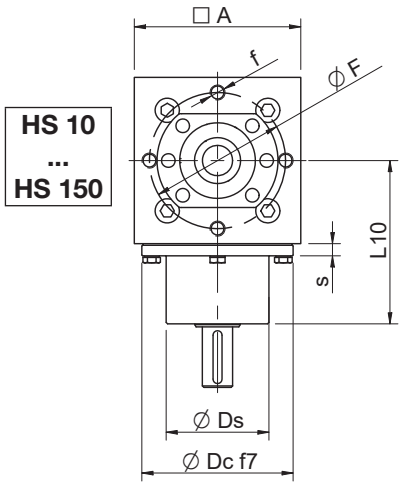
NOTE: for ball nut dimensions, see ch. 4.8 “Ball nuts dimensions” on page 72.

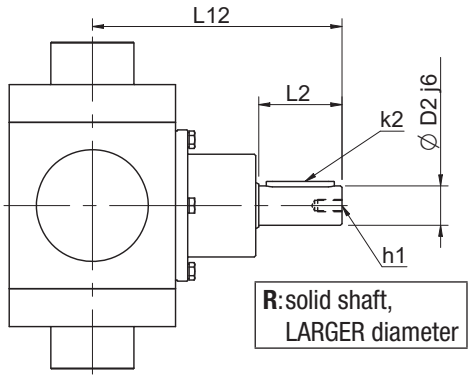
4.13 Overall dimensions

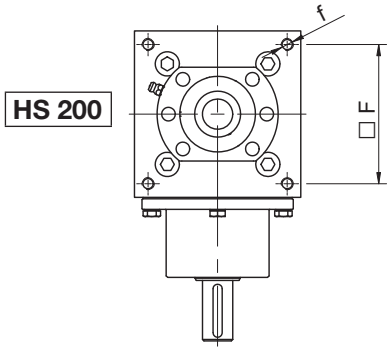
HS Series

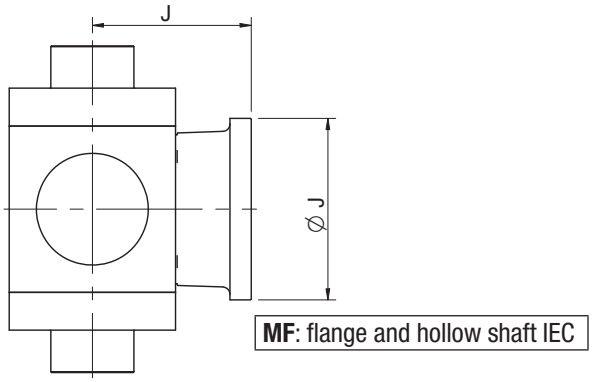












4.13 Overall dimensions

HS Series

SIZE	HS 10	HS 25	HS 50	HS 100	HS 150	HS 200
BALL SCREW	BS 25 × P_h	BS 32 × P_h	BS 40 × P_h	BS 50 × P_h	BS 63 × P_h	BS 80 × P_h
☐ A	86×86	110×110	134×134	166×166	200×200	250×250
B	122	160	190	230	292	332
∅ D1	16	20	24	32	42	55
∅ D2	24	26	32	45	55	70
∅ Dc	84	100	122	156	185	230
∅ Ds	59	68	80	107	120	152
∅ F	72	90	108	132	160	-
☐ F	-	-	-	-	-	190×190
L1	30	40	50	65	85	100
L2	50	55	65	90	110	140
L10	82	108	130	150	180	216
L11	114	150	182	217	267	318
L12	134	165	197	242	292	358
Q	25	28	32	42	38	55
∅ e	M6, depth 18	M8, depth 25	M12, depth 28	M16, depth 32	M18, depth 46	M24, depth 41
f						
g	24	40	40	45	50	60
∅ h	M6, depth 12	M8, depth 20	M8, depth 20	M10, depth 25	M10, depth 25	M12, depth 25
h1						
k1	5×5×25	6×6×35	8×7×45	10×8×60	12×8×80	16×10×90
k2	8×7×40	8×7×45	10×8×55	14×9×80	16×10×100	20×12×120
J	71 B5: 90 80 B5: 100 80 B14: 100	80 B5: 105 80 B14: 105 90 B5: 115 90 B14: 115	90 B5: 125 100-112 B5 135: 100-112 B14: 135	90 B5: 160 100-112 B5: 160 100-112 B14: 160	100-112 B5: 220 132 B5: 220 132 B14: 220	132 B5: 250 160 B5: 250
∅ J	71 B5: 160 80 B5: 200 80 B14: 120	80 B5: 200 80 B14: 120 90 B5: 200 90 B14: 140	90 B5: 200 100-112 B5 250: 100-112 B14: 160	90 B5: 200 100-112 B5: 250 100-112 B14: 160	100-112 B5: 250 132 B5: 300 132 B14: 200	132 B5: 300 160 B5: 350

NOTE: for ball nut dimensions, see ch. 4.8 “Ball nuts dimensions” on page 72.

4.14 Electric motor attachment

IEC motor attachment

IEC electric motor		MA BS Series							
		MA 5 BS	MA 10 BS	MA 25 BS	MA 50 BS	MA 80 BS	MA 150 BS	MA 200 BS	MA 350 BS
63	B5	F	F	F					
	B14	F	F						
71	B5	B	B	F	F	F			
	B14	B	B	F					
80	B5			B	F	F	F		
	B14			B					
90	B5			B	B	B	F	F	
	B14			B	B	B			
100 - 112	B5				B	B	B	F	
	B14				B	B	B		
132	B5							B	B
160	B5								B

IEC electric motor		SJ BS Series							
		SJ 5 BS	SJ 10 BS	SJ 25 BS	SJ 50 BS	SJ 100 BS	SJ 150 BS	SJ 200 BS	SJ 250 BS
56	B5	F							
	B14	F							
63	B5	B	F	F					
	B14		F						
71	B5		B	F	F	F			
	B14		B	F					
80	B5			B	F	F	F		
	B14			B					
90	B5			B	B	B	F		
	B14			B	B	B			
100 - 112	B5				B	B	B	F	F
	B14				B	B	B	B	B
132	B5							B	B

IEC electric motor		HS Series					
		HS 10	HS 25	HS 50	HS 100	HS 150	HS 200
71	B5	F					
80	B5	F	F				
	B14	F	F				
90	B5		F	F	F		
	B14		F	F			
100 - 112	B5			F	F	F	
	B14			F	F		
132	B5					F	F
	B14					F	
160	B5						F

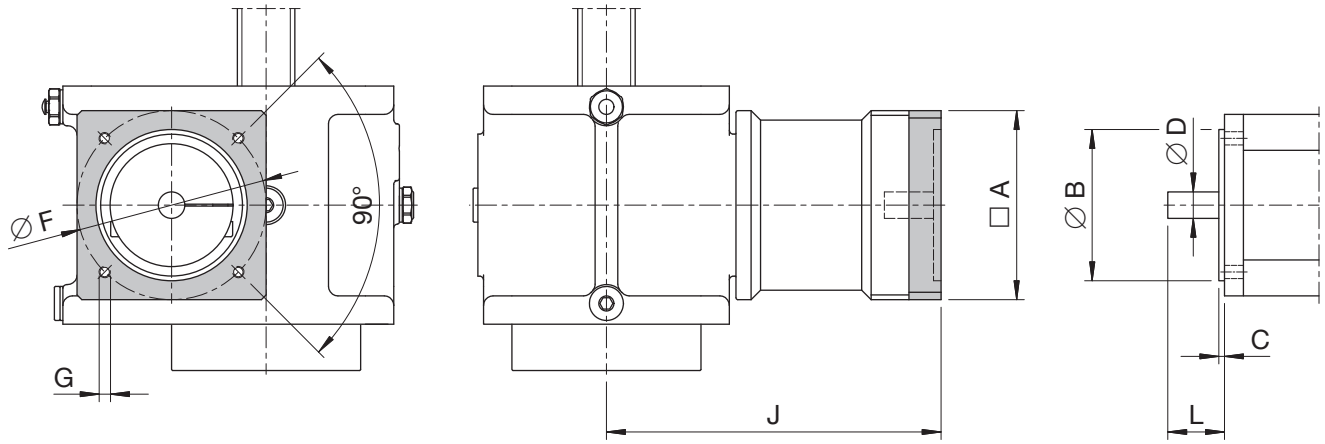
F: flange + hollow shaft B: bell-housing + coupling

Code: **Vers._(IEC motor size flange)**
example: **Vers.3(IEC 71 B14)** or **Vers.6(IEC 132 B5)**

4.14 Electric motor attachment

MA BS Series Mod.B - servomotor attachment

ATTENTION! Servomotor attachment is not available for SJ BS Series Mod.B and for HS Series.



SIZE	FLANGE ON SCREW JACK							MOTOR SHAFT
	CODE	□ A	∅ B	C	∅ F	G	J	∅ D×L
MA 5 BS	F1	65	40	2.5	63	M5	104	∅9×20
							129	∅11×23, ∅14×30
	F2	65	50	3	70	M5	106	∅8×25
							129	∅11×30, ∅14×30, ∅14×31
MA 10 BS	F1	75	60	3	75	M5	148	∅11×23, ∅14×30
	F2	80	70	3	90	M6	148	∅11×30, ∅14×30, ∅16×40, ∅19×35, ∅19×40
	F3	82	50	3	95	M6	148	∅14×30
MA 25 BS	F1	100	80	3	100	M6	177	∅14×30, ∅14×37, ∅16×35, ∅16×40, ∅19×35, ∅19×40
	F2	105	95	3	115	M8	177	∅19×40, ∅19×45, ∅22×45, ∅24×45
							187	∅19×50, ∅19×55, ∅24×50
MA 50 BS MA 80 BS	F1	116	95	3	130	M8	219	∅24×50
	F2	126	110	3.5	130	M8	219	∅19×40, ∅24×50
	F3	130	110	3.5	145	M8	219	∅16×40, ∅19×40, ∅19×58, ∅22×55, ∅22×58, ∅24×58, ∅28×55
							226	∅24×65, ∅28×63
MA 150 BS	F1	140	110	3.5	165	M10	244	∅24×50
	F2	155	130	3.5	165	M10	244	∅24×50, ∅28×60, ∅32×58
							264	∅32×80
MA 200 BS	F1	165	155	4	190	M10	284	∅32×60
	F2	180	114.3	3.5	200	M12	284	∅35×65, ∅35×70
							296	∅35×79, ∅35×80, ∅42×79
							327	∅42×113
	F3	205	180	5	215	M12	284	∅28×60, ∅32×58
							296	∅38×80, ∅42×82
MA 350 BS	F1	205	180	5	215	M12	330	∅28×60, ∅32×58
							340	∅38×80, ∅42×82
	F2	220	200	5	235	M12	376	∅42×110, ∅55×110
	F3	250	230	5	265	M16	413	∅65×130
	F4	264	250	5	300	M16	393	∅48×110, ∅55×110

Code: **Vers._(screw jack flange code - motor shaft dimensions _**)**

** - in case of shaft **with key** DIN 6885 Part 1, add code **K**

example: **Vers.5(F2 24-50)** or **Vers.6(F2 24-50 K)**

NOTE: In case of servomotor with dimensions not specified in the table, please contact SERVOMECH technical support to check feasibility of motor attachment.

4.15 Accessories

Bellows

In applications with particular environment conditions, bellows protect the screw from contaminants.

The usually supplied bellows are circular, sewn (double seam), in NYLON with a PVC outside and inside coating. For special application requirements, different executions or materials can be supplied on request.

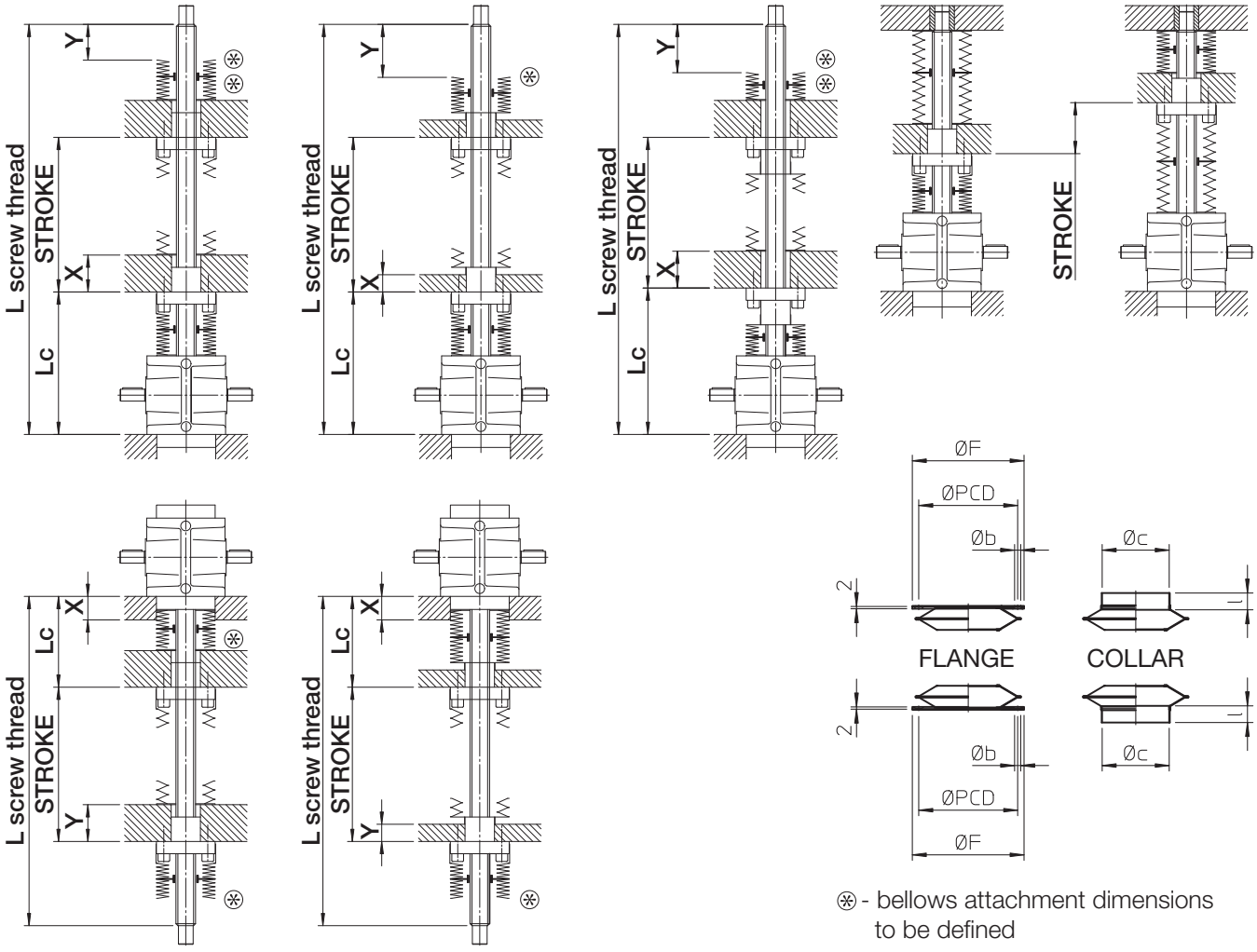
The bellows cause changes to the retracted and extended lengths and screw jack overall dimensions stated in the catalogue. On request, orders will be acknowledged with a screw jack drawing giving exact dimensions.

Usually, bellows are fitted on both sides: between the screw jack housing and the ball nut and between the nut and the ball screw end. Anyway, some applications require only one of the two bellows.

The attachments dimensions of the bellow between the screw jack housing and the nut are determined by the screw jack parts dimensions where the bellow is fixed, while the attachments dimensions of the bellow between ball nut and screw end depend on the application, because the bellow is directly in contact with the application's structure.

The protective bellow is available for all screw jack series (MA BS, SJ BS, HS).

Ordering code: **B**

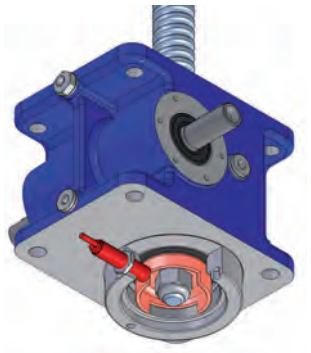


⊛ - bellows attachment dimensions to be defined

4.15 Accessories

Worm wheel rotation detector

Available for screw jacks MA BS and SJ BS Series only (not for HS Series).



Some applications require the possibility to verify if the worm wheel rotates while the worm shaft is moving in order to get information about the good condition and functioning of the worm wheel toothing.

A cylindrical element, machined in order to have a “crown” of empty and full spaces, is fixed to the worm wheel creating a phonic wheel that, while rotating, activates a corresponding proximity switches. As output of such proximity switch, activated and deactivated by the alternation of empty and full spaces, a “train” of impulses is generated which confirms the rotation of the worm wheel. On the contrary, the constant output signal of the proximity switch means the stop of the worm wheel.

For more information, contact SERVOMECH technical support.

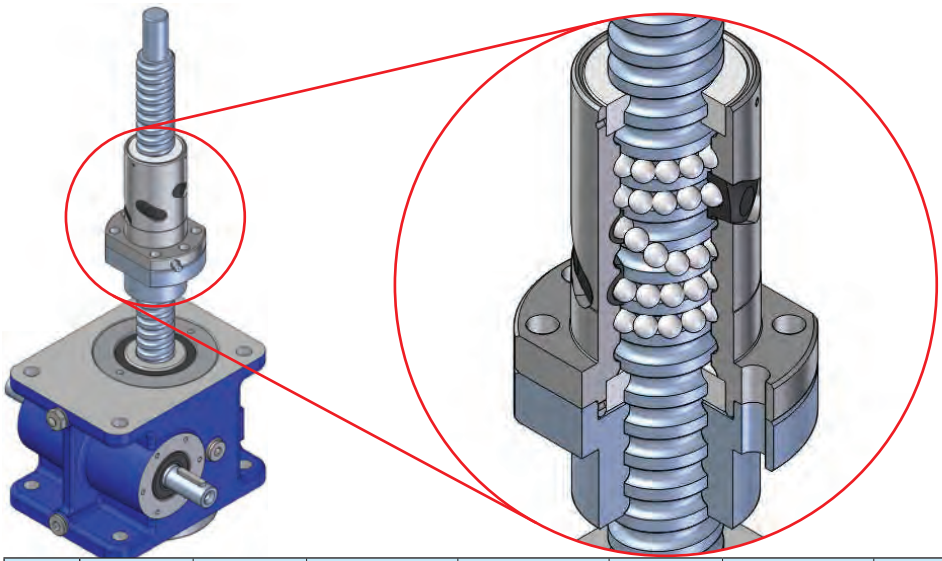
Safety nut

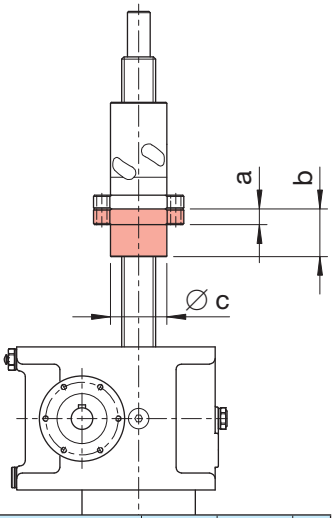
The safety nut is a back-up feature to prevent the load dropping in case of working nut balls failure, which can be caused by overload or by overcoming a fatigue limit.

The safety nut is an extension to the main nut. It does not have balls inside, but a helix that traces the shape of the ball truck on the screw. As long as the main nut is working properly, the “thread” of the safety nut does not touch the ball truck; in case the balls of the main nut should fail, the “thread” of the safety nut will touch the ball truck and sustain the load, with a consequent slithering in the contact area. The safety nut is made in steel, therefore the slithering between the two parts would damage the ball truck on the screw. So, in case the safety nut is activated, it is necessary to replace both screw and main nut.

The safety nut works in **both** load direction.

The safety nut is available for all screw jack series (MA BS, SJ BS, HS).



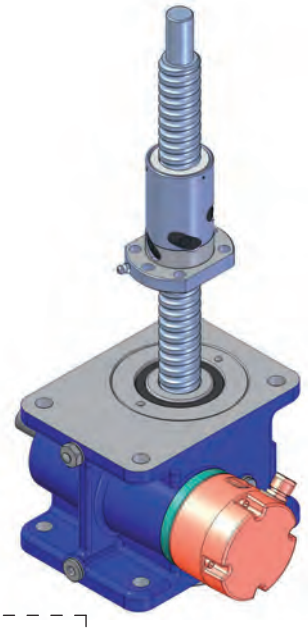


Ball screw	16			20			25				32				40			50				63			80				100		120		140
Lead	5	10	16	5	10	20	5	6	10	25	5	10	20	32	10	20	40	5	10	20	40	10	20	40	10	16	20	40	16	20	20	32	32
a	12	12	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18	20	20	20	20	20	25	25	24	25	25	25	34	39	30	50	50
b	25	25	25	25	25	25	35	35	35	35	32	42	42	42	50	50	50	55	65	65	65	55	70	70	60	60	60	70	85	95	110	140	140
∅c	28	32	32	36	36	36	40	40	40	40	50	50	50	50	63	63	63	75	75	75	75	90	95	95	105	125	125	125	150	150	170	200	220

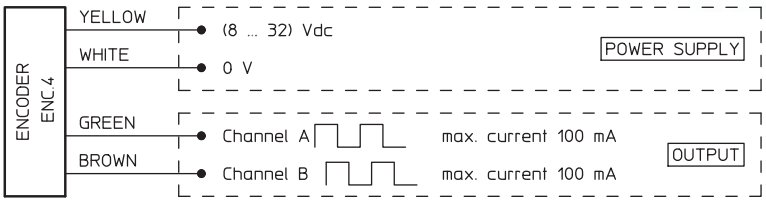
Ordering code: **SBC**

4.15 Accessories

ROTARY ENCODER Code ENC.4



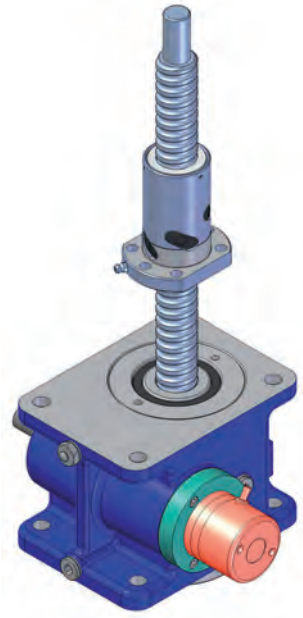
Hall-effect encoder, incremental, bi-directional
Resolution: 4 pulses per revolution
Output: PUSH-PULL
2 channels (A and B, phase difference 90°)
Input voltage: (8 ... 32) Vdc
Max. commutable current (I_{out}): 100 mA
Max output voltage drop:
with load connected to 0 and I_{out} = 100 mA: 4.6 V
with load connected to + V and I_{out} = 100 mA: 2 V
Protection:
against short circuit
against input polarity inversion
against any incorrect output connection
Cable length: 1.3 m
Protection: IP 55



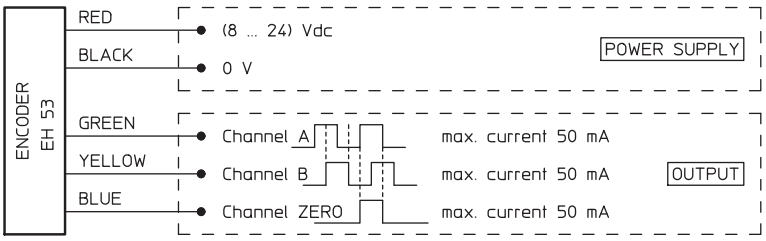
The encoder ENC.4 is available for all screw jack series (MA BS, SJ BS, HS).

Ordering code: **ENC.4**

ROTARY ENCODER Code EH53



Optical encoder, incremental, bi-directional
Resolution: 100 or 500 pulses per revolution
Output: PUSH-PULL
2 channels (A and B, phase difference 90°)
channel ZERO
Input voltage: (8 ... 24) Vcc
No-load current: 100 mA
Max. commutable current: 50 mA
Cable length: 0.5 m
Protection: IP 54



The encoder ENC.4 is available for all screw jack series (MA BS, SJ BS, HS).

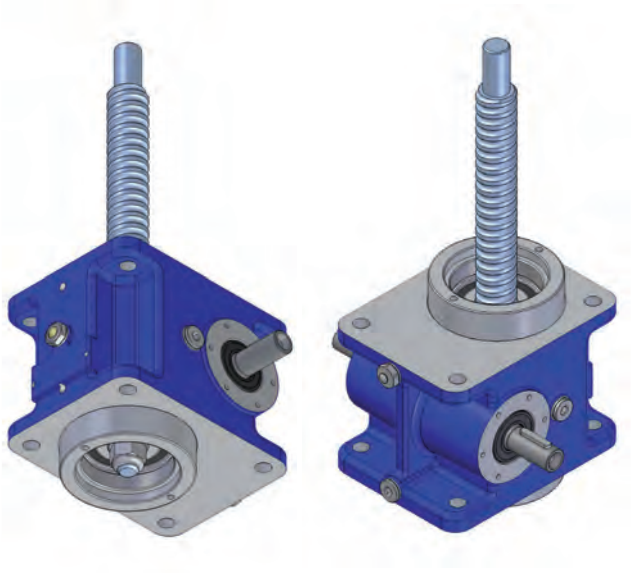
Ordering code: **EH 53**

4.15 Accessories - MA BS Series

Raised cover

The housing of the screw jacks MA BS Mod.B is enclosed inside two threaded covers, one on the top and one on bottom. Screw jacks Mod.B have always raised cover (CA) mounted on the screw jack housing on the opposite side of the acme screw, to protect the rotating screw threaded end. The threaded cover on the screw side is always supplied as low cover (CB) in standard execution, raised cover execution available on request. The raised cover CA with toleranced outer diameter acts as a centring diameter of the screw jack inside the machine structure.

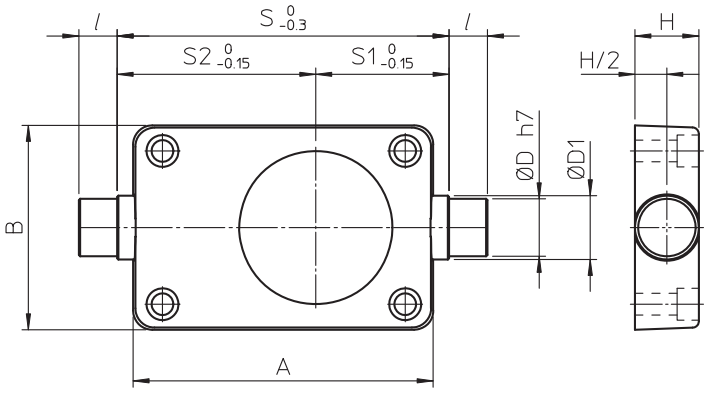
Ordering code: **CA - CA**

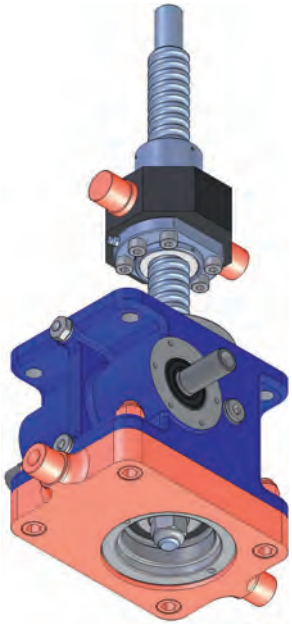


Trunnion mount

The trunnion mount is bolted to either the top or the bottom of the screw jack housing and allows the screw jack pivoting around the axis defined by the trunnion mount's lateral pins.

NOTE: the part of the machine where the nut is fixed must have two cylindrical pins (or holes) with axes parallel to the trunnion mount pivots axis.





	MA 5 BS	MA 10 BS	MA 25 BS	MA 50 BS	MA 80 BS	MA 150 BS	MA 200 BS	MA 350 BS
A	124	140	175	235	235	276	330	415
B	80	105	130	160	160	200	230	300
∅D	15	20	25	45	45	50	70	80
$∅D_1$	20	25	30	50	50	60	80	90
H	20	25	30	50	50	60	80	90
l	15	20	20	30	30	40	45	60
S	130	145	200	260	260	305	360	440
S_1	50.5	56.5	80	104.5	104.5	119.5	132	181.5
S_2	79.5	88.5	120	155.5	155.5	185.5	228	258.5
mass [kg]	0.8	1.6	3.2	9.8	9.8	15.8	29	52

Ordering code: **SC (screw side)** screw jacks with SC fixed on ball screw side

Ordering code: **SC (opposite screw side)** screw jacks with SC fixed on side opposite to ball screw

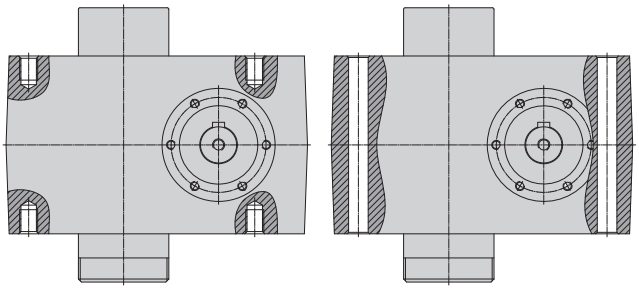
NOTE: Trunnion mount for ball nut is available on request. For information, contact SERVOMECH technical support..

4.15 Accessories - SJ BS Series

Screw jack housing fixing holes

On the gear housing of screw jack SJ BS Series there are fixing holes, which can be threaded tapped holes (on both housing fixing planes) or through holes.

The threaded holes position on the fixing plane can differ from the through holes position.



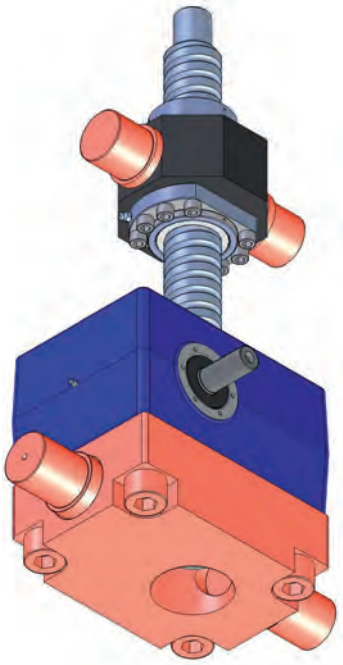
Ordering code: **FF** (threaded holes)

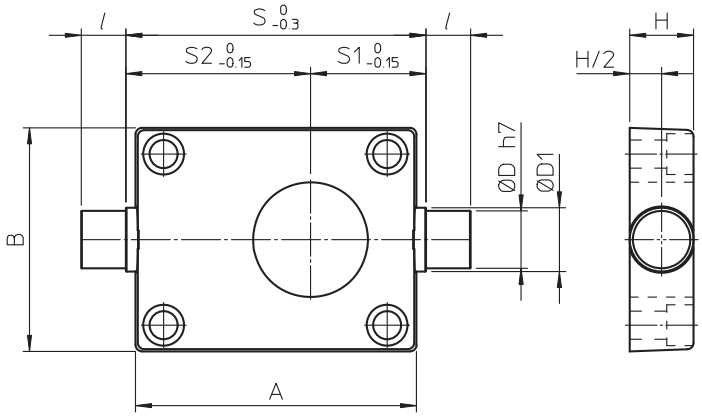
Ordering code: **FP** (through holes)

Trunnion mount

The trunnion mount is bolted to either the top or the bottom of the screw jack housing and allows the screw jack pivoting around the axis defined by the trunnion mount's lateral pins.

NOTE: the part of the machine where the nut is fixed must have two cylindrical pins (or holes) with axes parallel to the trunnion mount pivots axis.





	SJ 5 BS	SJ 10 BS	SJ 25 BS	SJ 50 BS	SJ 100 BS	SJ 150 BS	SJ 200 BS	SJ 250 BS	SJ 300 BS
A	100	110	160	200	220	276	280	280	312
B	86	96	130	160	170	200	230	230	242
ØD	15	20	25	35	45	60	70	70	70
$ØD_1$	20	25	30	40	50	70	90	90	85
H	20	25	30	40	50	80	100	100	100
l	15	20	20	30	35	65	75	75	75
S	105	115	185	215	235	305	300	300	350
S_1	40.5	42.5	72.5	85.5	90.5	119.5	125	125	140
S_2	64.5	72.5	112.5	129.5	144.5	185.5	175	175	210
mass [kg]	1.1	1.8	3.4	7.3	9	30	40	40	40

Ordering code: **SC (screw side)** screw jacks with SC fixed on ball screw side

Ordering code: **SC (opposite screw side)** screw jacks with SC fixed on side opposite to ball screw

NOTE: Trunnion mount for ball nut is available on request. For more information, contact SERVOMECH technical support.

4.16 Ordering code MA BS Series Mod.B

MA	50	BS 40 × 10	Mod.B	RL	Vers. 3 (80 B5)	U-RH	X
1	2	3	4	5	6	7	8

C300	IT 5	SFN-D.40.10.5R (Pos.A) + SBC	N B2 B1 CB / CA
9	10	11	12

...
13

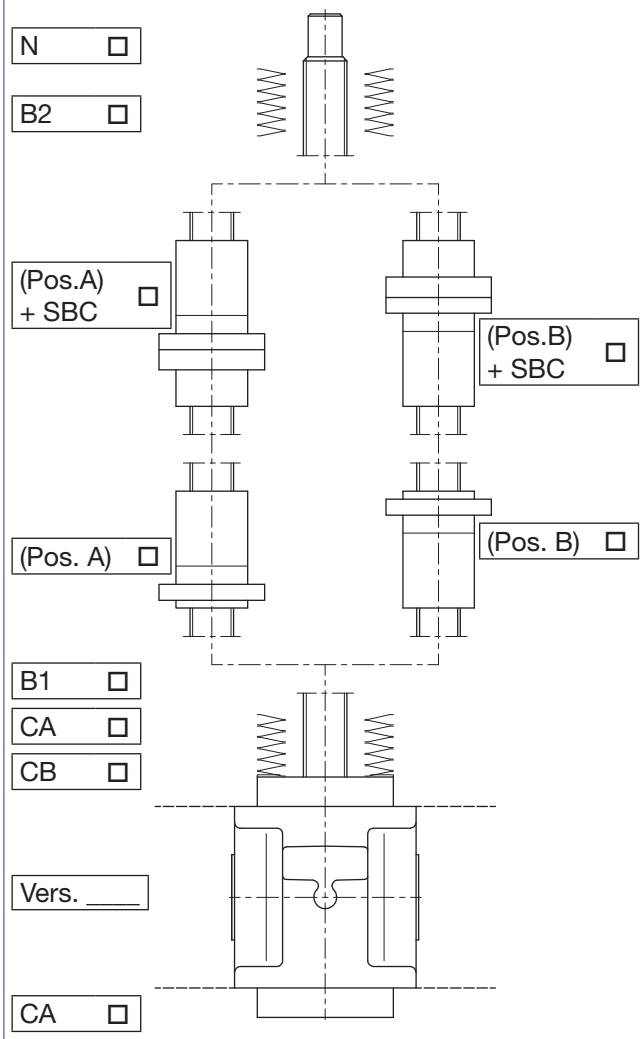
...
14

AC 3-phase brake motor 0.75 kW 4-pole 230/400 V 50 Hz IP 55 Ins. F
15

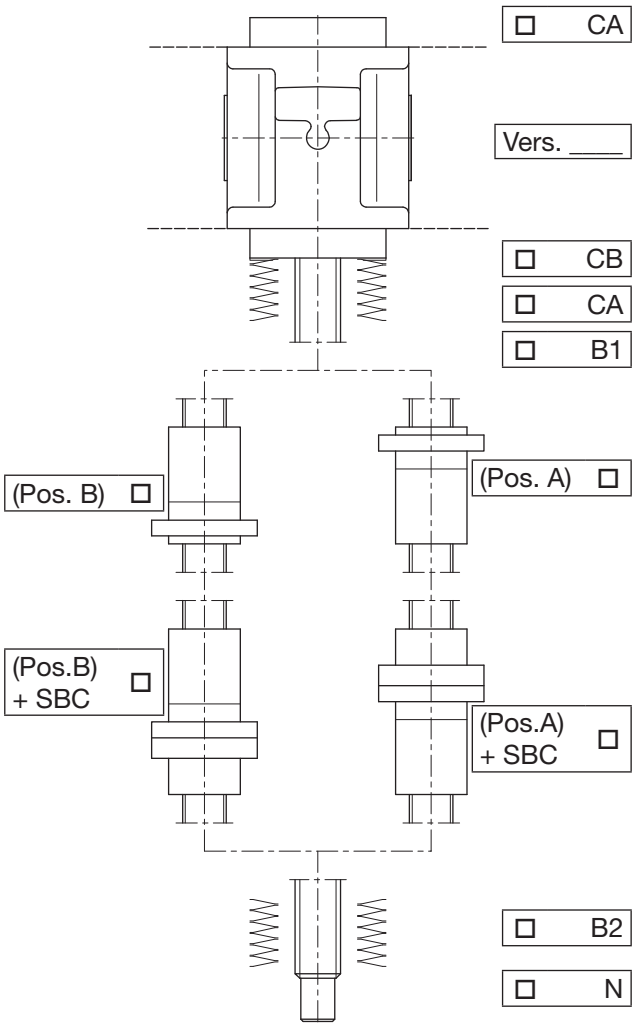
1	MA (screw jack MA BS Series)		
2	Screw jack size		
	5 ... 350		page 68 - 69
3	Ball screw		
	BS diameter × lead		page 70 - 71
4	Mod.B (Model: travelling nut)		
5	Worm gear ratio		page 68 - 69
6	Input version		
	Vers.1, Vers.2, Vers.3, Vers.4, Vers.5, Vers.6		page 8
7	Screw jack mounting and input shaft position		
	U-RH, U-LH, D-RH, D-LH, H-RH, H-LH		page 9
8	Fixing plane		
	X, Y		page 9
9	Screw jack stroke length (example: C300 = 300 mm stroke)		
10	Ball screw accuracy grade		
	IT 3 or IT 5: whirled ball screw		page 70
	IT 7: rolled ball screw		page 71
11	Ball nut		
		Nut code	page 72 - 75
	Pos.A, Pos.B	Orientation of nut mounted on screw	page 111
	SBC	Safety nut	page 106
12	Accessories		
	N	Screw end	page 94 - 95
	B_1, B_2	Bellows	page 105
	CB, CA	Low cover, raised cover	page 108
	SC	Trunnion mount	page 108
		Worm wheel rotation detector	page 106
13	Other accessories		
	example: encoder (with all relevant data)		page 107
14	Other specifications		
	example: lubricant for low temperature		
15	Motor data		
16	Product configuration sheet		page 111
17	Application layout		

Product configuration sheet

UPWARD mounting ☐



DOWNWARD mounting ☐



UPWARD mounting ☐

DOWNWARD mounting ☐

4.16 Ordering code SJ BS Series Mod.B

SJ	50	BS 40 × 10	Mod.B	RL	Vers. 3 (80 B5)	U-RH	X	FF
1	2	3	4	5	6	7	8	9

C300	IT 5	SFN-D.40.10.5R (Pos.A) + SBC	N B2 B1
10	11	12	13

...
14

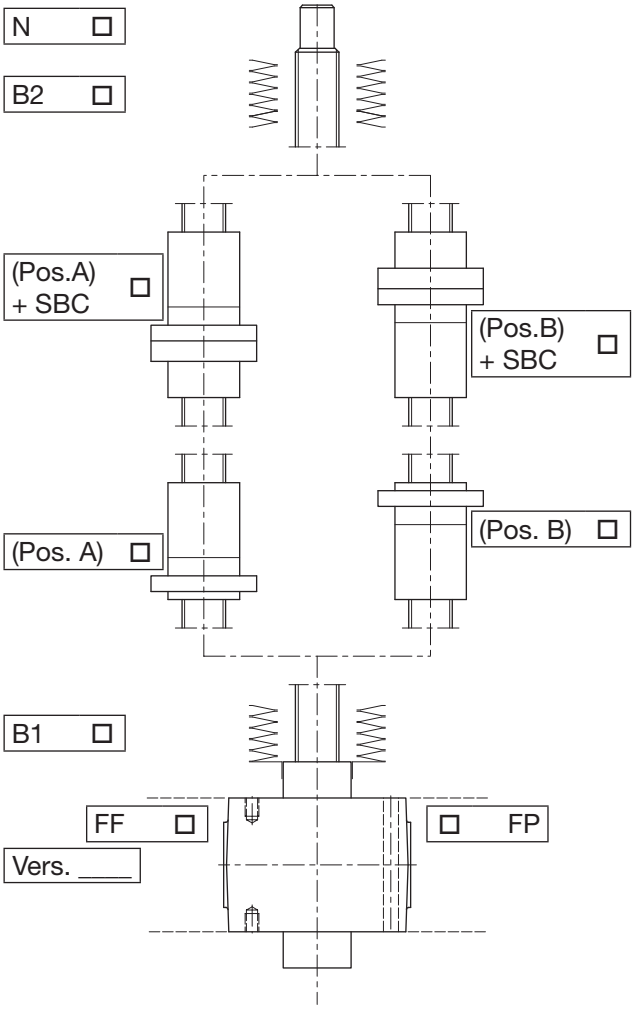
...
15

AC 3-phase brake motor 0.75 kW 4-pole 230/400 V 50 Hz IP 55 Ins. F
16

1	SJ (screw jack SJ BS Series)		
2	Screw jack size		
	5 ... 300		page 68 - 69
3	Ball screw		
	BS diameter × lead		page 70 - 71
4	Mod.B (Model: travelling nut)		
5	Worm gear ratio		page 68 - 69
6	Input version		
	Vers.1, Vers.2, Vers.3, Vers.4, Vers.5, Vers.6		page 8
7	Screw jack mounting and input shaft position		
	U-RH, U-LH, D-RH, D-LH, H-RH, H-LH		page 9
8	Fixing plane		
	X, Y		page 9
9	Gear box fixing holes		
	FF, FP		page 109
10	Screw jack stroke length (example: C300 = 300 mm stroke)		
11	Ball screw accuracy grade		
	IT 3 or 5: whirled ball screw		page 70
	IT 7: rolled ball screw		page 71
12	Ball nut		
		Nut code	page 72 - 75
	Pos.A, Pos.B	Orientation of nut mounted on screw	page 113
	SBC	Safety nut	page 106
13	Accessories		
	N	Screw end	page 96 - 99
	B_1, B_2	Bellows	page 105
	SC	Trunnion mount	page 109
		Worm wheel rotation detector	page 106
14	Other accessories		
	example: encoder (with all relevant data)		page 107
15	Other specifications		
	example: lubricant for low temperature		
16	Motor data		
17	Product configuration sheet		page 113
18	Application layout		

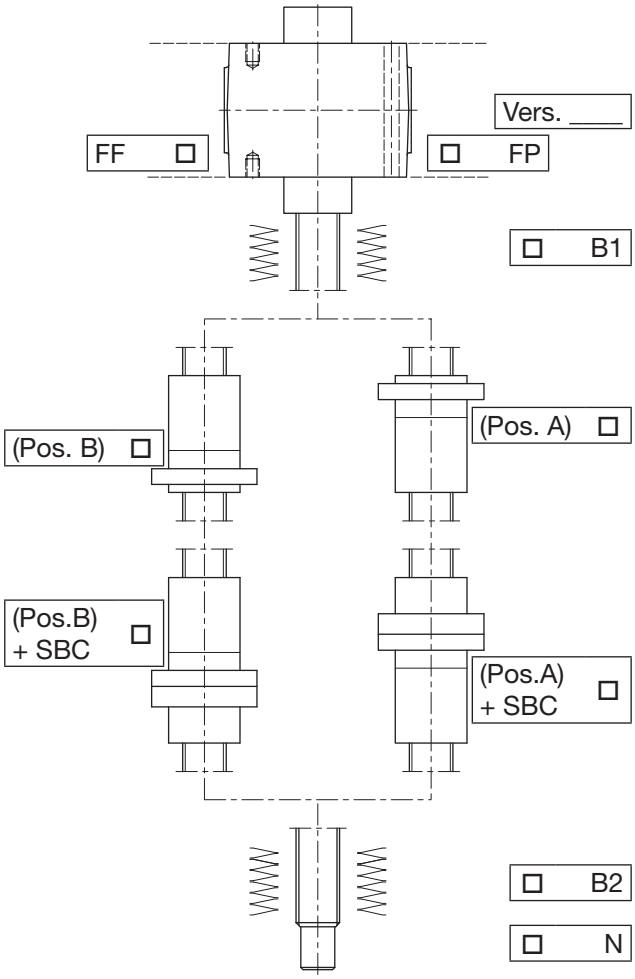
Product configuration sheet

UPWARD mounting ☐



UPWARD mounting ☐

DOWNWARD mounting ☐



DOWNWARD mounting ☐

4

4.16 Ordering code HS Series

HS	50	R2	BS 40 × 10	S	scheme 10	S 180	U	X
1	2	3	4	5	6	7	8	9

C300	IT 5	SFN-D.40.10.5R (Pos.A) + SBC	N B2 B1
10	11	12	13

...
14

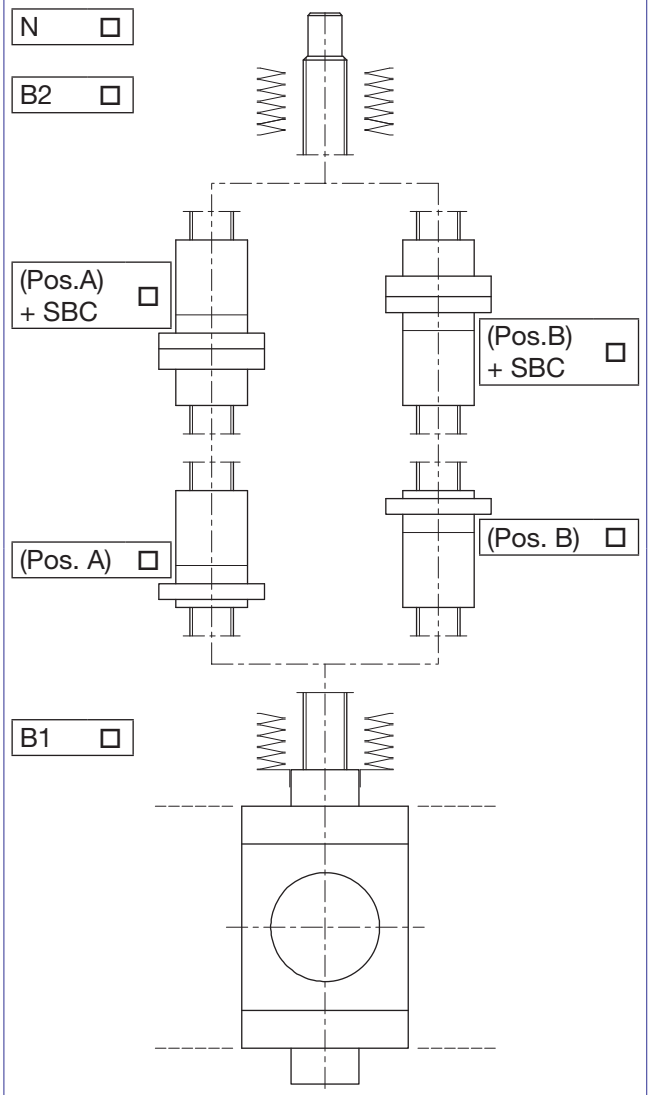
...
15

AC 3-phase brake motor 0.75 kW 4-pole 230/400 V 50 Hz IP 55 Ins. F
16

1	HS (screw jack HS Series)		
2	Screw jack size		
	10 ... 200		page 68 - 69
3	Bevel gear ratio		
	R1, R1.5, R2, R3, R4		page 68 - 69
4	Ball screw		
	BS diameter × lead		page 70 - 71
5	Input		
	S, R, MF, MA		page 10
6	Kinematics scheme		
	scheme 10, scheme 20		page 10
7	Additional output shaft (version and position)		
	S, R - 90°, 180°, 270°		page 11
8	Mounting position		
	U, D, H		page 11
9	Fixing plane		
	X, Y		page 11
10	Screw jack stroke length (example: C300 = 300 mm stroke)		
11	Ball screw accuracy grade		
	IT 3 or 5: whirled ball screw		page 70
	IT 7: rolled ball screw		page 71
12	Ball nut		
		Nut code	page 72 - 75
	Pos.A, Pos.B	Orientation of nut mounted on screw	page 115
	SBC	Safety nut	page 106
13	Accessories		
	N	Screw end	page 100 - 101
	B_1, B_2	Bellows	page 105
14	Other accessories		
	example: encoder (with all relevant data)		page 107
15	Other specifications		
16	Motor data		
17	Product configuration sheet		page 115
18	Application layout		

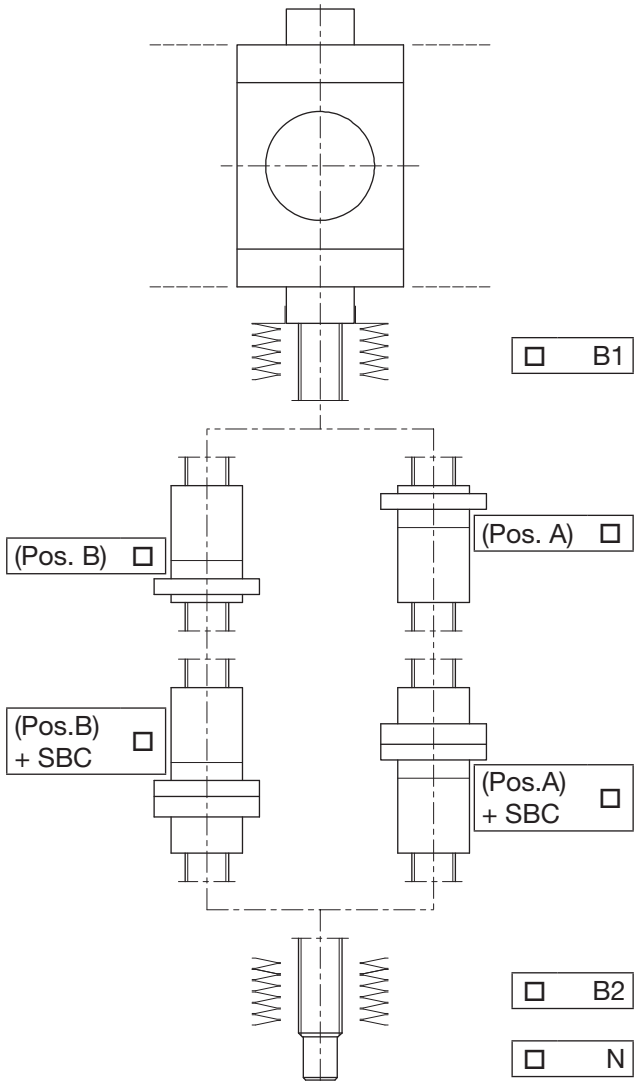
Product configuration sheet

UPWARD mounting ☐



UPWARD mounting ☐

DOWNWARD mounting ☐



DOWNWARD mounting ☐

4

5.1 Installation – Maintenance – Lubrication

Transport and handling

Screw jacks with mounted ball screw and all accessories can be often difficult to handle because of their overall dimensions. Therefore, it is recommended to handle the products with care during transport and handling to avoid damages on mechanical parts and/or fittings and also to prevent any risk for the personnel in charge of such operations. Screw jack supporting points should be previously identified and used during transport or to raise it by handling. In case of doubts, please contact SERVOMECH technical support to prevent any possible damage!

Storage

During storage, screw jacks shall be protected against atmospheric agents thus to prevent dust or other contaminants to settle on ball screw and other moving parts.

In case of long storage periods, for example more than 6 months, it is necessary to move the input shafts to avoid damaging of the ring seals. Furthermore, keep all not painted parts properly lubricated to prevent oxidation.

Installation

The screw jack must be installed to work with push or pull axial load only, avoiding lateral and radial load. The correct perpendicularity between ball screw axis and screw jack fixing side shall be checked carefully.

The installation of many screw jacks for synchronized lifting movement requires particular attention on two different factors:

- alignment of load support points: screw ends in case of travelling ball screw; bronze nut in case of travelling nut;
- use of connecting shafts and couplings with high torsional stiffness, to assure a perfect synchronism of all lifting points.

Commissioning and use

Before screw jack commissioning and activation, the following checks must be carried out:

- input shaft turning direction and related ball screw or nut linear motion direction;
- stroke end limit switches position cannot exceed the given limits;
- proper connection of the mechanical transmission and electric motor (rotating direction and motor supply voltage).

Lubrication and maintenance

SERVOMECH screw jacks are supplied with lubricant type and quantity as indicated in the lubricants table. For the proper lubrication of all screw jack components, please always specify in your order the screw jack mounting position.

Scheduled maintenance shall be carried out on screw jacks depending on the relevant use and environment conditions.

Ball nuts must be periodically greased with lubricant stated in the table or an equivalent one. For this operation, it is recommended to use the specific re-lubrication systems, consisting of grease nipples placed on the cover in case of Mod.A (travelling screw) screw jack, or directly on the nut in case of Mod.B (travelling nut) screw jack.

Worm gears are lifelong lubricated. Additional lubrication can be done only in case of verified lubricant leakage. In such a case, use the lubricant type indicated in the table or an equivalent one.

For further information about installation and maintenance, please refer to **Use and Maintenance Manual** of the specific product available for download at www.servomech.com.

5.1 Installation – Maintenance – Lubrication

Lubricants for **screw jacks Model A (travelling screw)**:

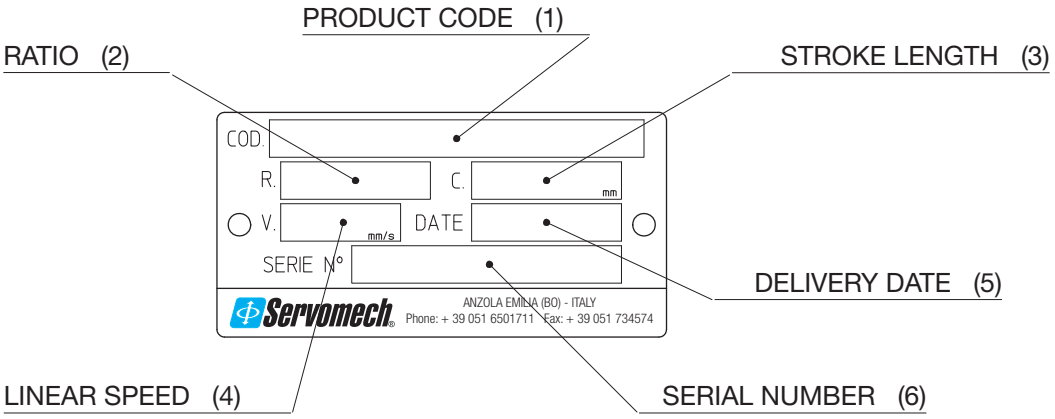
SCREW JACK	GEARBOX	NUT
MA 5 BS	grease: ENI Grease SLL 00	grease: LUBCON Thermoplex ALN 1001
MA 10 BS		
MA 25 BS	oil: ENI Blasia S 320	
MA 50 BS		
MA 100 BS		
MA 150 BS		
MA 200 BS		
MA 350 BS		

Lubricants for **screw jacks Model B (travelling nut)**:

SCREW JACK	GEARBOX	NUT
MA 5 BS	grease ENI Grease SLL 00	grease: LUBCON Thermoplex ALN 1001
MA 10 BS		
MA 25 BS	oil: ENI Blasia S 320	
MA 50 BS		
MA 80 BS		
MA 150 BS		
MA 200 BS		
MA 350 BS		
SJ 5 BS	grease: ENI Grease SM2	
SJ 10 BS		
SJ 25 BS		
SJ 50 BS	grease: ENI Grease SLL 00	
SJ 100 BS		
SJ 150 BS		
SJ 200 BS		
SJ 250 BS		
SJ 300 BS		
SJ 600 BS		
SJ 800 BS		
HS 10	oil: ENI Blasia S 320	
HS 25		
HS 50		
HS 100		
HS 150		
HS 200		

5.2 Product nameplate

Each SERVOMECH screw jack is uniquely identified and supplied complete with a nameplate showing the following information.



1) **Product code**: is an alphanumeric code stating the series, size, ratio, version and stroke limit device of the screw jack.

2) **Ratio**: is the ratio of the worm gear.

3) **Stroke length**: is the stroke length in millimetres achievable by the actuator.

4) **Linear speed**: is the linear speed in mm/sec for screw jacks supplied with an electric motor; if the motor is not supplied, this field is blank.

5) **Delivery date**: is the assembly date, expressed in week/year (ex.: 37/23 = week 37 / year 2023) which usually is also the delivery date; this date is considered as a reference for the duration of the guarantee.

6) **Serial number**: is the number referred to the unit and assures the exact identification of the product, even after long time; it must be given as reference when ordering spare parts for the unit.

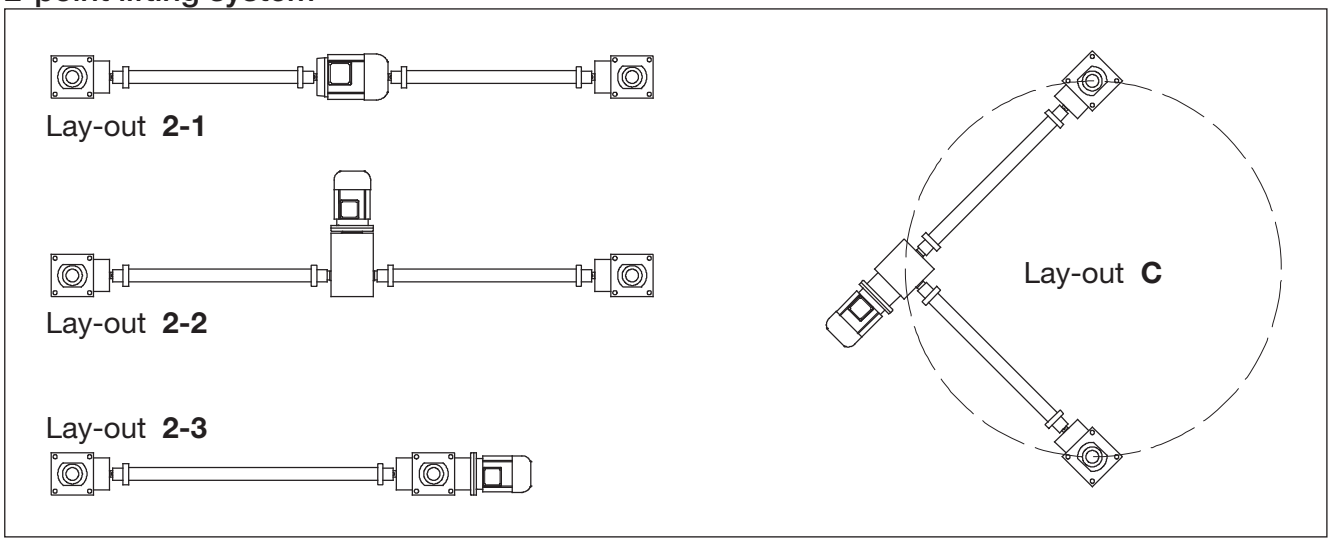
Installation, operation and maintenance manual available at:
www.servomech.com/download

5.3 Lifting systems

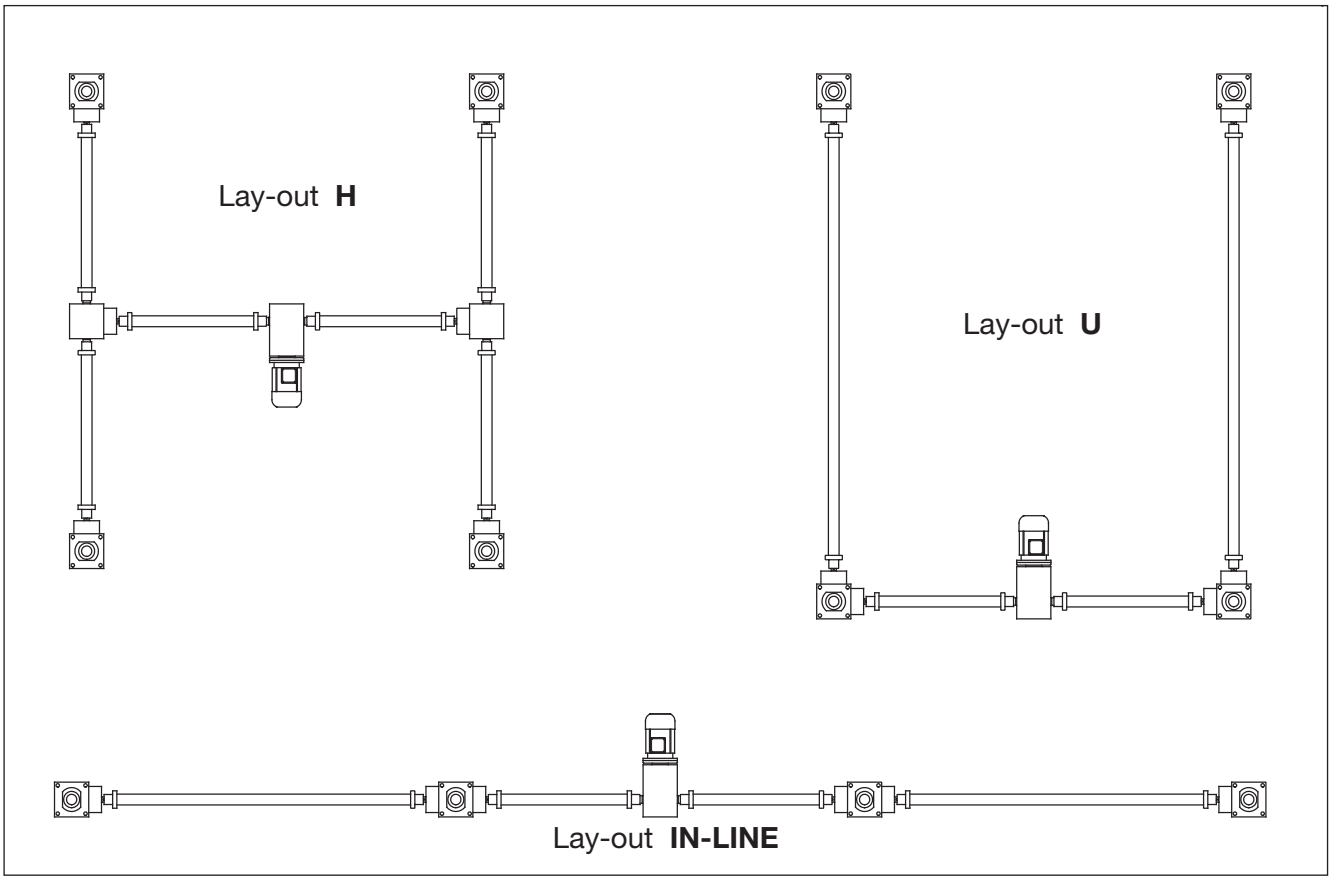
SERVOMECH can support customers during selection and to supply complete drive solution for screw jack systems. Some application examples are given below.

Screw jacks HS Series

2-point lifting system



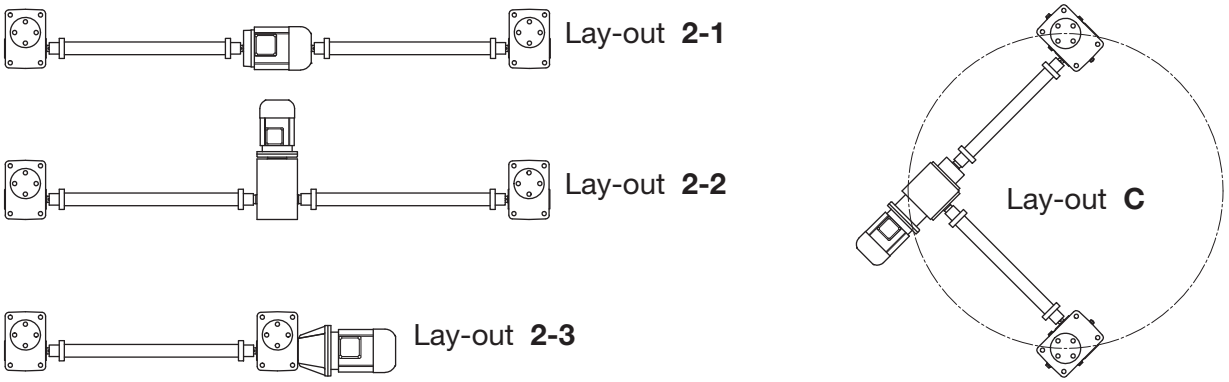
4-point lifting system



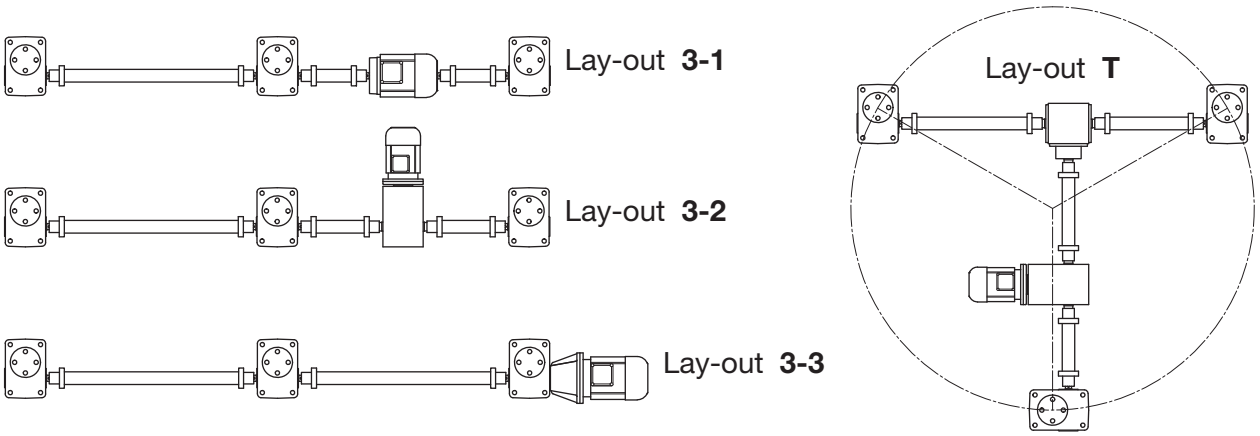
5.3 Lifting systems

Screw jacks MA BS Series and SJ BS Series

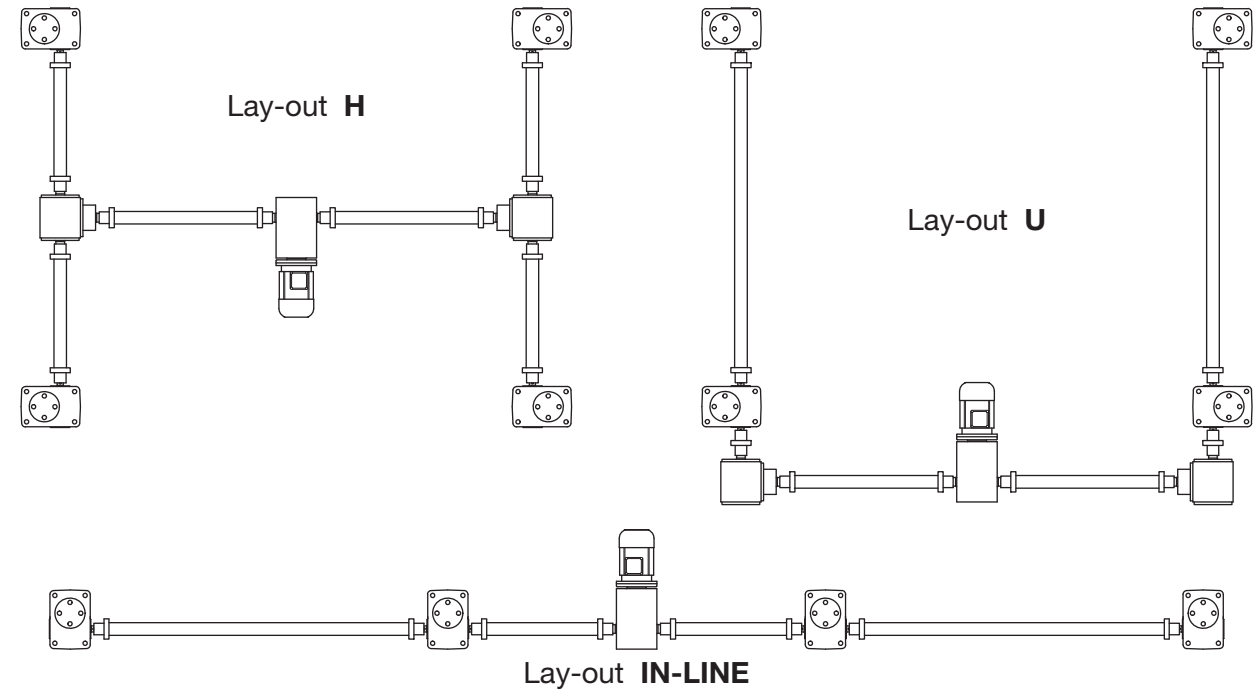
2 points lifting system



3 points lifting system



4 points lifting system



Servomech	APPLICATION WORKSHEET Screw jacks with **travelling screw (Mod.A)**	Page 1 of 2 Date: _____ / _____ / _____

Company: _____

Address: _____

Contact person: _____ Position: _____

Telephone: _____ Fax: _____ E-mail: _____

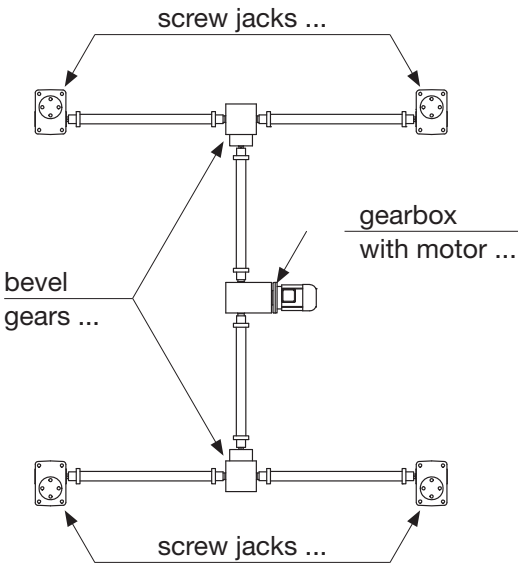
APPLICATION: _____

_____

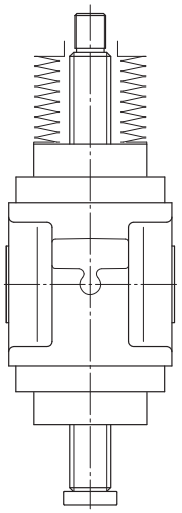
_____

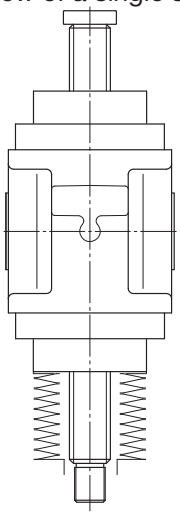
SKETCH - APPLICATION LAYOUT – plane view

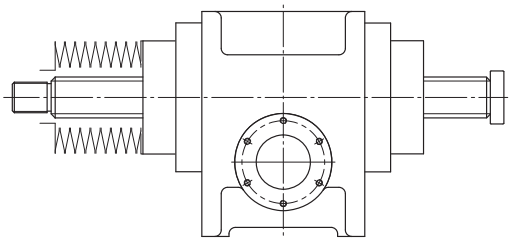
Example



Side view of a single screw jack







☐ UPWARD MOUNTING ☐ DOWNWARD MOUNTING ☐ HORIZONTAL MOUNTING

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Servomech	APPLICATION WORKSHEET Screw jacks with **travelling screw (Mod.A)**	Page 2 of 2 Date: _____ / _____ / _____

NUMBER OF SCREW JACKS PER APPLICATION: _____

STROKE REQUIRED: _____mm ACME SCREW LENGTH: _____mm

TOTAL STATIC LOAD FOR APPLICATION: PULL: _____ kN PUSH: _____ kN

MAX. **STATIC** LOAD FOR **SINGLE** SCREW **JACK**: PULL: _____ kN PUSH: _____ kN at STROKE _____ mm

SCREW JACK MOUNTING:

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

SCREW JACK ☐ SUBJECTED TO VIBRATIONS ☐ NOT SUBJECTED TO VIBRATIONS

TOTAL DYNAMIC LOAD FOR APPLICATION: PULL: _____ kN PUSH: _____ kN

MAX. **DYNAMIC** LOAD FOR **SINGLE** SCREW **JACK**: PULL: _____ kN PUSH: _____ kN at STROKE _____ mm

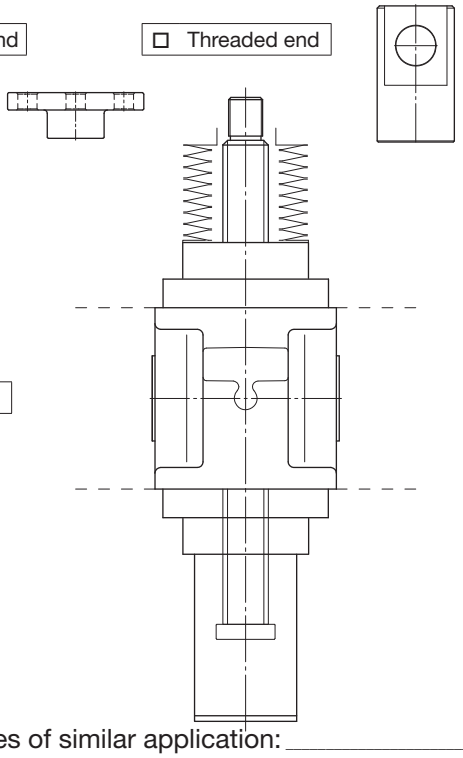
LINEAR SPEED REQUIRED: _____ mm/s _____ mm/min _____ m/min SINGLE STROKE PERFORMING TIME: __ s

DUTY CYCLE: _____ cycles / hour _____ working hours / day Notes:_____

LIFETIME REQUIRED: _____ cycles _____ clock hours _____ calendar days Notes: _____

ENVIRONMENT: TEMPERATURE _____ °C ☐ DUST HUMIDITY ___ % POLLUTER _____

☐ Flange end ☐ Threaded end ☐ Rod end



☐ Bellows

☐ Guides

☐ Safety nut

☐ Protective tube

☐ Stop nut

☐ Anti-turn device

☐ Stroke end switches

Suggestions based on previous experiences of similar application: _____

_____

_____

Notes:_____

Total number of screw jacks required: _____

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Servomech	APPLICATION WORKSHEET Screw jacks with **travelling nut (Mod.B)**	Page 1 of 2 Date: _____ / _____ / _____

Company: _____

Address: _____

Contact person: _____ Position: _____

Telephone: _____ Fax: _____ E-mail: _____

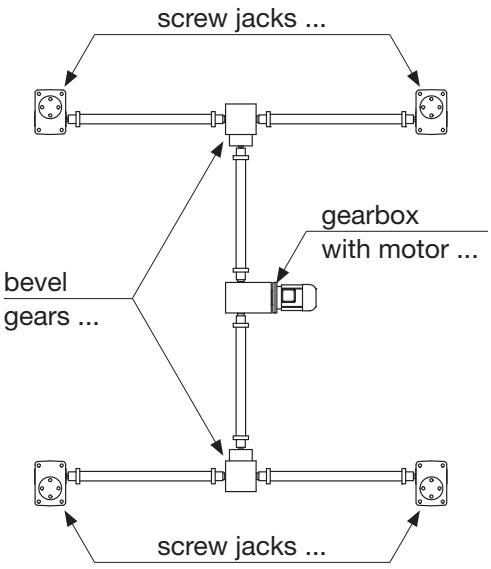
APPLICATION: _____

_____

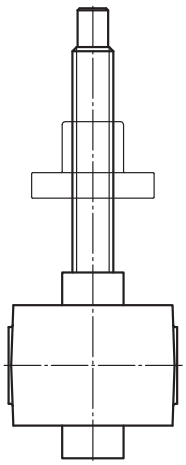
_____

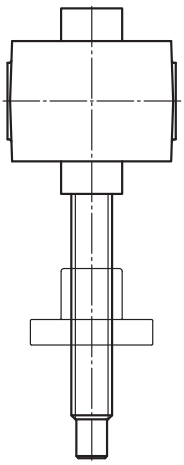
SKETCH - APPLICATION LAYOUT – plane view

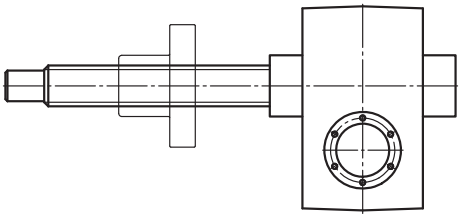
Example



Side view of a single screw jack







☐ UPWARD MOUNTING ☐ DOWNWARD MOUNTING ☐ HORIZONTAL MOUNTING

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5

NUMBER OF SCREW JACKS PER APPLICATION: _____

STROKE REQUIRED: _____mm ACME SCREW LENGTH: _____mm

TOTAL STATIC LOAD FOR APPLICATION: PULL: _____ kN PUSH: _____ kN

MAX. **STATIC** LOAD FOR **SINGLE** SCREW **JACK**: PULL: _____ kN PUSH: _____ kN at STROKE _____ mm

SCREW JACK MOUNTING:

- ☐ Euler I (screw jack housing firmly fixed to the base – free travelling nut)
- ☐ Euler II (screw jack housing and travelling nut fixed to pivoting supports)
- ☐ Euler III (screw jack housing firmly fixed to the base – guided travelling nut)

SCREW JACK ☐ SUBJECTED TO VIBRATIONS ☐ NOT SUBJECTED TO VIBRATIONS

TOTAL DYNAMIC LOAD FOR APPLICATION: PULL: _____ kN PUSH: _____ kN

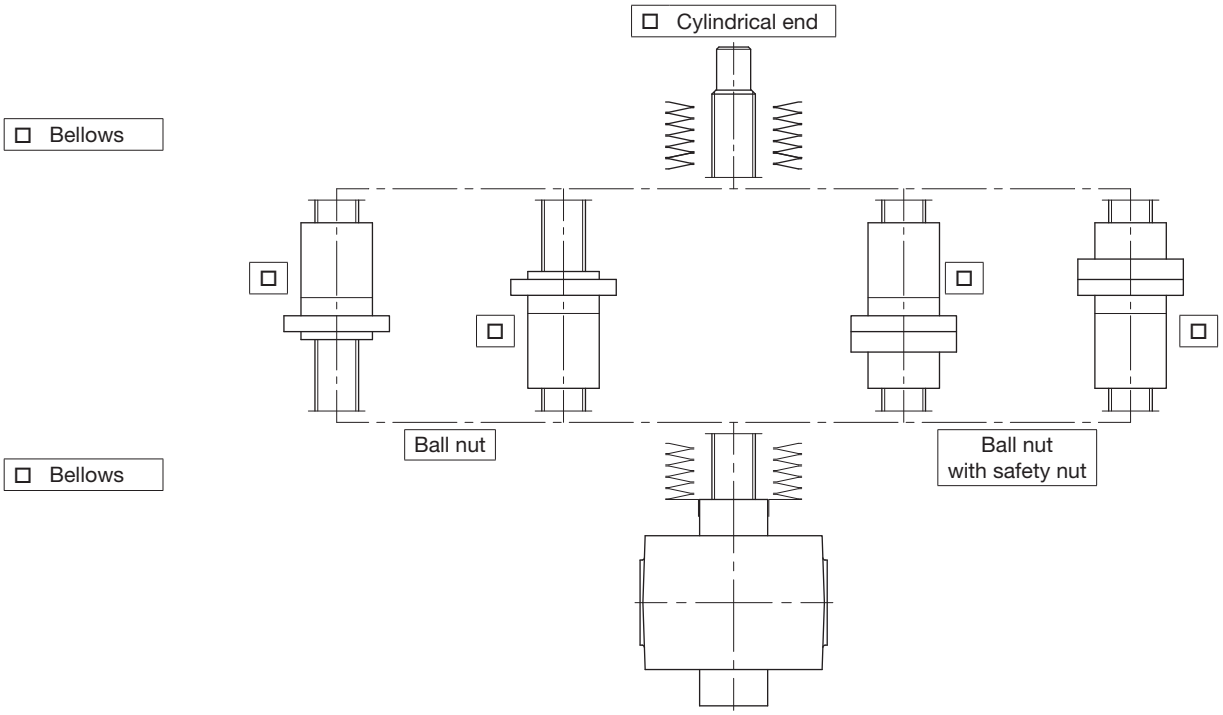
MAX. **DYNAMIC** LOAD FOR **SINGLE** SCREW **JACK**: PULL: _____ kN PUSH: _____ kN at STROKE _____ mm

LINEAR SPEED REQUIRED: _____ mm/s _____ mm/min _____ m/min SINGLE STROKE PERFORMING TIME: __ s

DUTY CYCLE: _____ cycles / hour _____ working hours / day Notes:_____

LIFETIME REQUIRED: _____ cycles _____ clock hours _____ calendar days Notes: _____

ENVIRONMENT: TEMPERATURE _____ °C ☐ DUST HUMIDITY ___ % POLLUTER _____



Suggestions based on previous experiences of similar application: _____

_____

Notes:_____

Total number of screw jacks required: _____

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