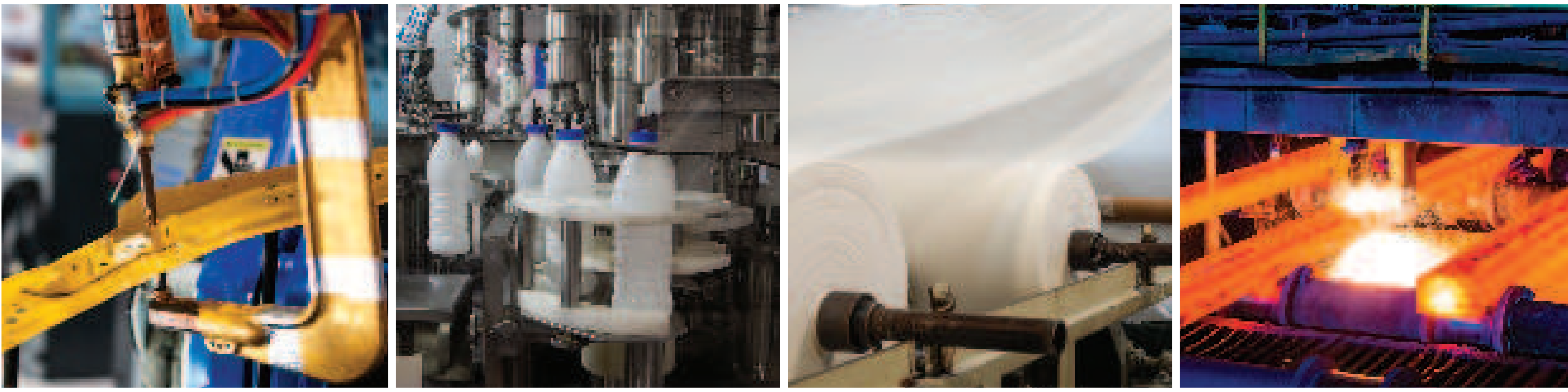
High performance actuator catalogue



Contents

Introduction

ENERGY SAVINGS UP TO

90%

Core technologies

Actuation technology

Our extensive experience and knowledge of actuation systems allows us to satisfy the most demanding requirements using linear actuators, telescopic pillars and control units.

Linear actuators

We offer a wide range of low- to medium-duty actuator designs and configurations for simple industrial or specific health care applications. Our versatile range provides everything from low- to high-load capacities and medium operating speeds to quiet and aesthetically designed systems. (→ **fig. 1**)

High-performance actuators

Our range of high-duty actuators meets the needs of demanding industrial applications with high loads and speeds in continuous operation. These actuators provide the best controllability and reliability for programmable motion cycles. (→ **fig. 2**)

Telescopic pillars

We offer a wide range of options for several applications. In addition, our telescopic pillars are quiet, robust, powerful, resistant to high offset loads and feature attractive designs. (→ **fig. 3**)

Control units

Ideal for applications focused on system control, SKF control units provide connections for foot and hand or desk switches. (→ **fig. 4**)

Fig. 1

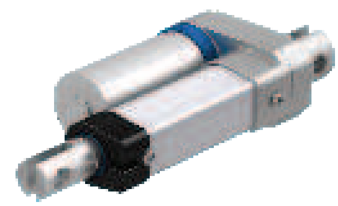


Fig. 2

Fig. 3

Fig. 4

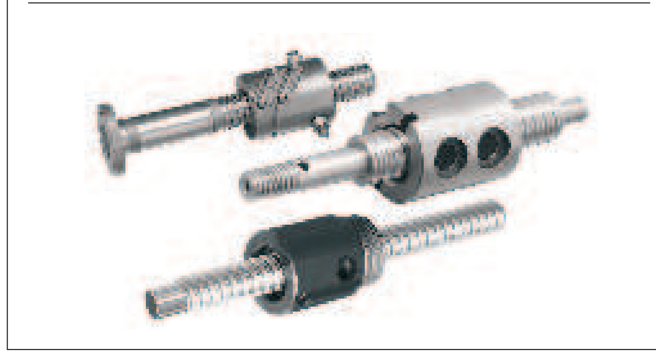
Ball and roller screw technology

For applications that require driving by transforming rotary action into linear motion, we provide a comprehensive range of solutions including rolled ball screws, roller screws and ground ball screws.

Miniature ball screws

SKF miniature ball screws are very compact and provide silent operations. (→ **fig. 5**)

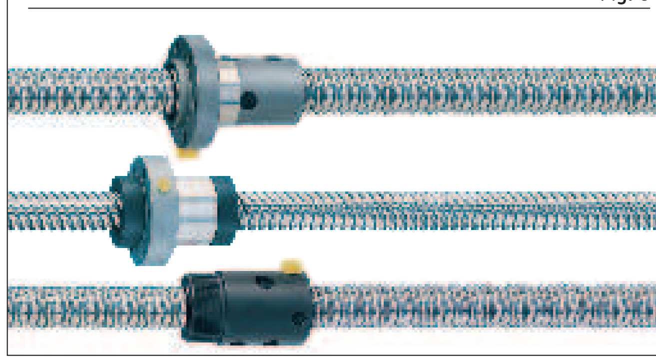
Fig. 5



Rolled ball screws

We offer several, highly precise recirculating systems to cover most application requirements which can reduce or eliminate backlash. (→ **fig. 6**)

Fig. 6



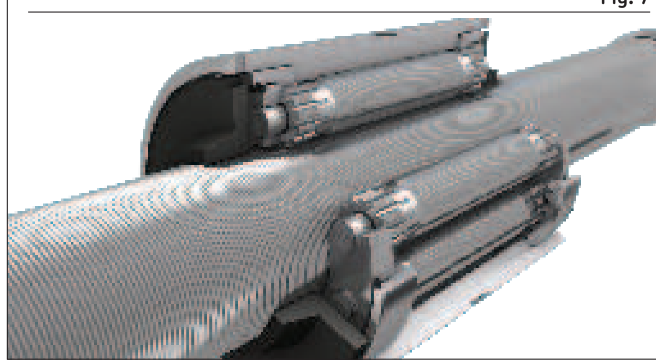
Ground ball screws

SKF ground ball screws offer increased rigidity and precision.

Roller screws

SKF roller screws go far beyond the limits of ball screws providing the ultimate precision, rigidity, high speed and acceleration. In addition, backlash can be reduced or eliminated. Long leads are available for very fast movements. (→ **fig. 7**)

Fig. 7



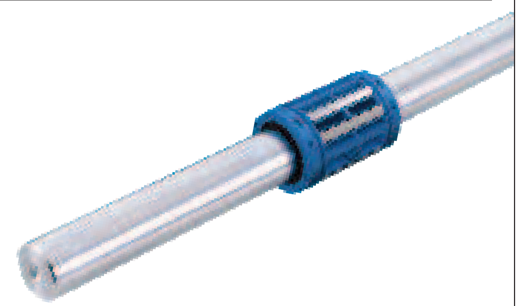
Linear guide technology

To provide optimal solutions for all your guiding needs, our product range features shaft guidings, profile rail guides and precision rail guides.

Linear ball bearings

Cost-effective, simple and self-aligning, SKF shaft guidings feature unlimited stroke, adjustable preload and excellent sealing performance. They are also available in corrosion-resistant versions and pre-mounted on an aluminium housing as a unit. (→ **fig. 8**)

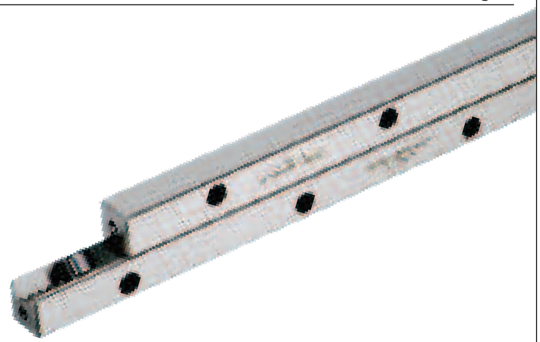
Fig. 8



Precision rail guides

With a range of modular options, SKF precision rail guides feature different rolling elements and cages. These guides feature high precision, high load carrying capacity and stiffness, and also come with an anti-creeping system. They are also available as a ready-to-mount kit. (→ **fig. 9**)

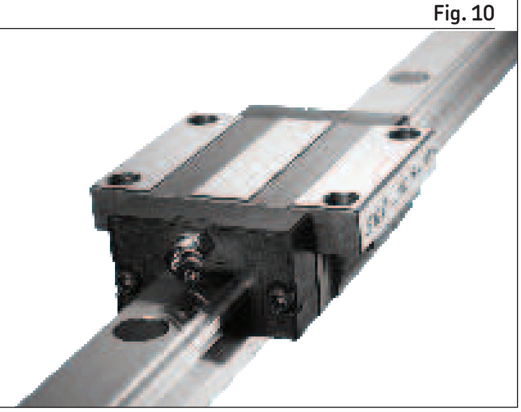
Fig. 9



Profile rail guides

Featuring unlimited stroke through joint rails and excellent rigidity, capable of withstanding moment loads in all directions, SKF profile rail guides are ready to mount and provide easy maintenance along with high reliability. They are available in ball or roller versions as well as standard and miniature sizes. (→ **fig. 10**)

Fig. 10

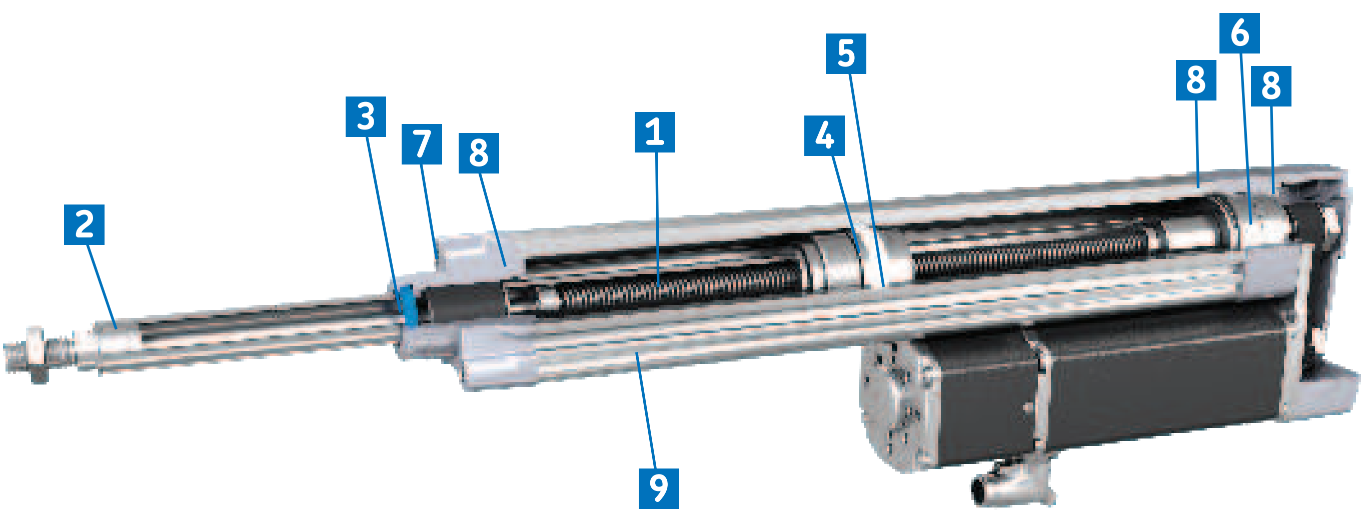


Product overview

Linear actuators

Electromechanical linear actuators enable precise, controlled, and repeatable push/pull movements in linear drive applications. Linear actuators serve as efficient, virtually maintenance-free, and environmentally friendly alternatives to hydraulic or pneumatic types.

Actuators with a modular design and open architecture offer opportunities to choose and integrate components to achieve customized solutions within existing envelopes. Application potential expands with the introduction of technologies for specific purposes, such as hall sensors, limit switches, potentiometers, friction clutches, or back-up nuts.



1 Screw with nut to transform rotative movement into linear movement
2 Push tube which moves the load
3 Shaft seal to protect against contaminants ingress
4 Magnet ring for proximity sensors to detect position
5 Anti-rotation device
6 Bearing to hold the load
7 Opening to let the actuator breath (not visible)
8 Flat seal between housings
9 Protection tube

Screws

Ball and roller screws are key components to build electric cylinders. They transfer rotary movements of the motor into linear movements. Their efficiency and their load and speed capabilities have a very big influence on the performance of electric cylinders.

Thanks to decades of experience with manufacturing ball and roller screws and continuous product and process development, SKF builds electric cylinders with precision screw solutions that fulfill the most demanding applications in terms of efficiency, precision, durability and value. All screws are made of high-strength materials with specific heat-treatment.

Lead screw

These screws transmit torque into linear motion through direct sliding friction. A typical assembly consists of a steel screw and plastic nut. Some of the electric cylinders are equipped with lead screws with a relatively high friction coefficient that makes them well suited for self-locking application. Lead screw actuators accommodate high static force, withstand excessive vibration, operate quietly, and represent cost-effective solutions.

Precision rolled ball screws

SKF ball screw assemblies provide high performance solutions suitable for a wide range of applications where high loads, precision driving, durability and value are prerequisites.

High technology machinery associated with precise control of the cold forming and metallurgical processes enable the production of screws that offer virtually the same accuracy and performance of ground ball screws, but at a lower cost. Standard lead precision is G9, according to ISO 286-2:1988. SKF production meets G7 lead precision for screw shaft nominal diameter starting from 20 mm. On request, SKF can deliver ball screws with G5 lead precision, according to ISO 3408-3:2006, defined for positioning screws, and matching the lead precision of G5 ground ball screws.

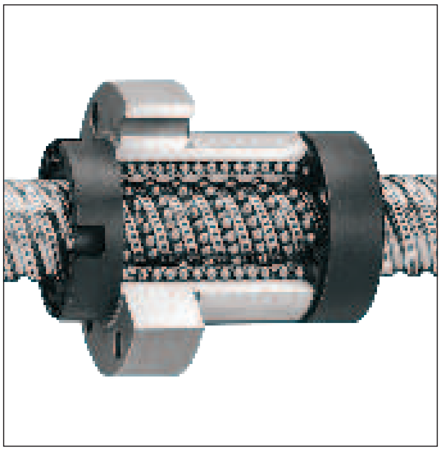
Roller screws

Roller screws offer a performance level far beyond the capabilities of ball screws. Planetary roller screws are well suited for heavy loads, high duty, high rotational speed, high linear speed, high acceleration and rigidity, and for operation in harsh environments.

For very high precision applications, recirculating roller screws with a very fine lead of thread allow high positioning accuracy, repeatability and exceptional rigidity.

For applications where compactness and low weight are essential, SKF also offers fully integrated cylinders, built with inverted roller screws.

Lead screw



Precision rolled ball screws

Roller screws

Product range comparison

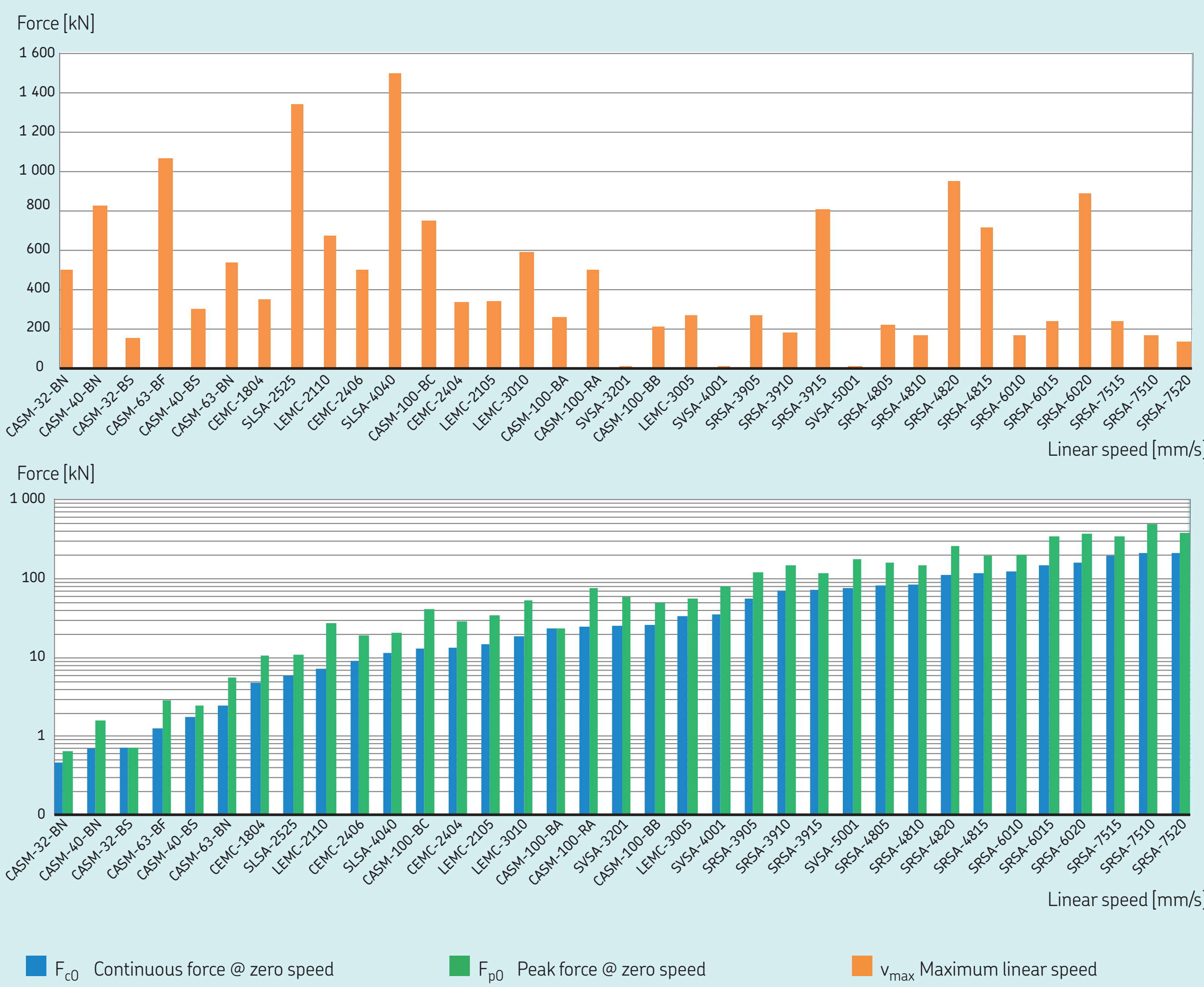
Force and speed capabilities

The graph below (→ diagram 1) provides a quick overview about the continuous force, peak load capabilities and the speed of the high performance actuators with servo motors. Use this graph to quickly evaluate which actuator could fit best in your application.

The continuous force describes the force the actuator can push or pull continuously without overheating. The peak load is the maximum force an actuator can push or pull for a short time (peak) at low speed, without being mechanically destroyed or by overheating.

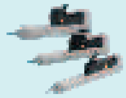
The v_{max} is the maximum linear speed the actuator can reach without destroying the mechanical system. If the motor of the actuator could turn faster, it needs to be limited.

Diagram 1



NOTE: Continuous force and peak force are shown in logarithm scale, maximum linear speed is shown in decimal scale

CASM-32/40/63



Electric cylinders with lead or ball screws for loads up to 5,4 kN or speeds up to 1 067 mm/s. These cylinders are equipped with brushless DC motors with integrated electronics or with servo motors for higher performance demands, in inline or parallel configuration.

CASM-100

Electric cylinders with ball and roller screws for an extended range of forces, up to 82 kN and speeds up to 890 mm/s. Several screw sizes, gearboxes and motors can be combined to provide a wide selection of performance levels.

LEMC

Electric cylinders with high performance roller screws for forces up to 80 kN or speeds up to 1 000 mm/s. LEMC cylinders are equipped with smart AC motors with bevel or parallel gearboxes or with servo motors in inline or parallel configuration for very high performance.

SRSA, SVSA, SLSA

For high loads up to 500 kN, SKF offers the SRSA range with high performance roller screws and servomotors. For improved positioning accuracy, the SVSA is equipped with a roller screw with 1 mm lead which can handle forces up to 175 kN. The high speed version SLSA has a large pitch screw and reaches speeds up to 1,5 m/s. All are available with inline or parallel motor.

CEMC

Compact electric cylinders CEMC for highest performance among the cylinders listed here? Need to define what group you are considering, but low weight. The fully integrated actuators are equipped with hollow shaft motor and inverted roller screws and are built for loads up to 28 kN. The perfect choice for weight sensitive robot arm applications.

Linear units

Linear unit	Maximum dynamic axial force F_{max}	Maximum linear speed v_{max}	Dynamic load capacity C	Screw type	Screw diameter	Ref page
	kN	mm/s	kN	–	mm	–
CASM-32/40/63	5,4	1 067	21	Lead screw/ Ball screw	9–20 10–20	58
CASM-100	82	890	106	Ball screw/ Roller screw	32–40 30	124
LEMC	80	1 000	106,3	Roller screw	21–30	154
SRSA	500	1 111	572	Roller screw	39–75	206
SVSA	175	10,4	174,2	Roller screw	32–50	214
SLSA	50	1 500	51,7	Ball screw	25–40	216

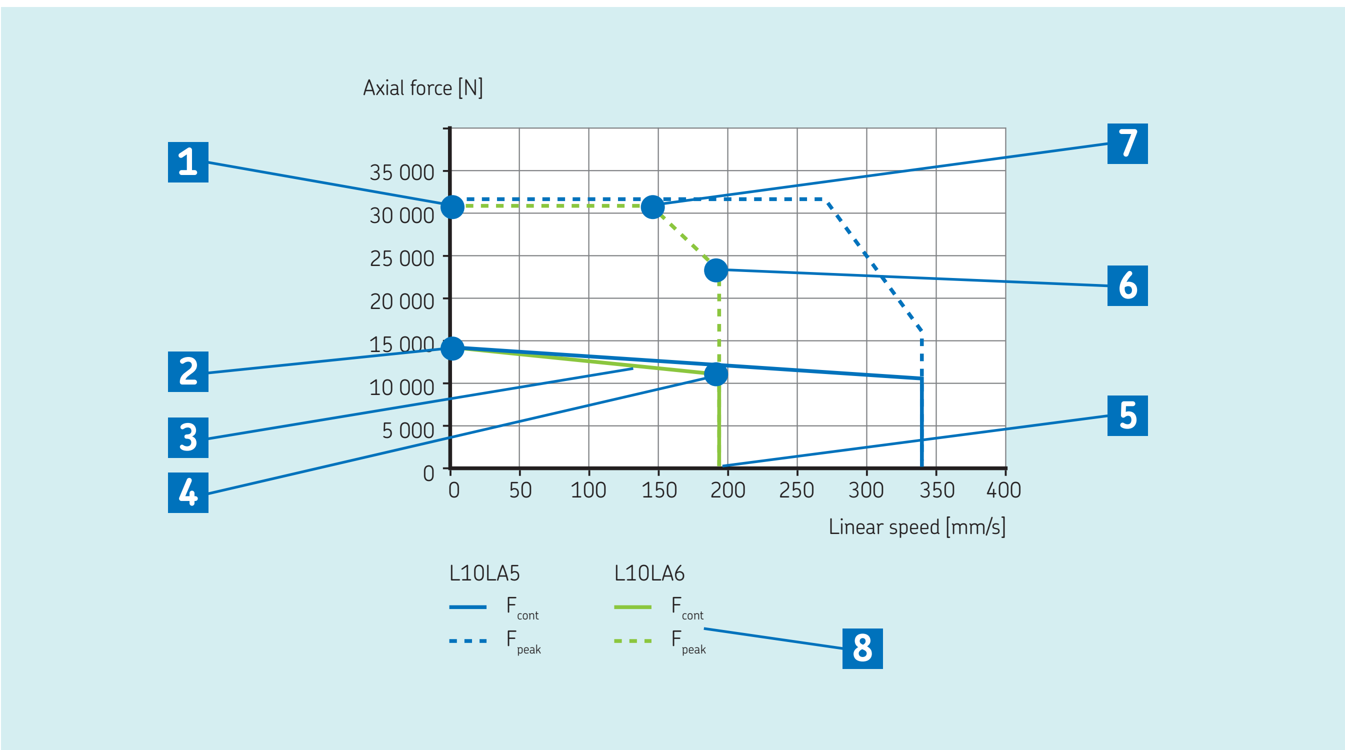
Actuators

Actuator family	Continuous force @ zero speed F_{c0}	Peak force @ zero speed F_{p0}	Maximum linear speed V_{max}	Maximum stroke S_{max}	Motor type	Ref page
	kN		mm/s	mm	–	–
CASM-32/40/63	2,4	5,4	1 060	800	BLDC motor/ Servo motor	66
CASM-100	25,6	75,5	750	2 000	AC mtor/ Servo motor	128
LEMC	50,7	69	680	800	AC motor/ Servo motor	160
CEMC	13,2	28	500	170	Servo motor on inverted roller screw	194
SRSA	208,1	490	950	1 500	Servo motor	220
SVSA	74,6	174	10	900	Servo motor	272
SLSA	11,3	20,3	1 500	1 200	Servo motor	284

How to read a performance diagram

In the product range chapter, a technical description is available for each actuator family. This includes performance overview, a detailed product description and motors and adapters information. In addition to that, each actuator type and size has dedicated tables with the main technical data. In particular the performance of each complete actuator is described through diagrams.

Below is a general description of how to read the axial force/ linear speed diagram.



1 Peak force at zero speed. This is typically the highest peak force of a servo motor (F_{p0})

2 Continuous force at zero speed. This is typically the highest continuous force of a servo motor (F_{c0})

3 The continuous force of a servo actuator is typically decreasing when speed is increasing

4 Continuous force of the servo actuator at maximum speed (F_c)

5 Maximum speed of the servo actuator

6 Peak force of the servo actuator at maximum speed (F_p)

7 Maximum speed of the servo actuator at maximum peak force

8 A different colour means the same linear unit but a different motor/ gearbox combination

A

Product benefits of electric cylinders over pneumatic and hydraulic cylinders

Linear movements in modern applications place high demand on travel profiles. Pneumatic and hydraulic cylinders quickly reach their system performance limits while SKF electric cylinders offer improved performance and simpler setup in applications that were traditionally served by pneumatic and hydraulic cylinders.

Performance

Controllability and positioning precision

The compressibility of air provides limitations on the level of control that can be achieved with pneumatic actuators. It's also difficult to provide the slow, controlled speeds that are needed in certain applications. With hydraulics, the situation improves, but to control in multiple positions, still requires a complex servo-hydraulic configuration that increases the cost and setup time of the overall system.

Electromechanical actuators have a direct mechanical link between the motor and the screw that provides complete controllability of the system, with high levels of repeatability, down to the micron level as well as higher stiffness. Moreover, it's very easy to precisely change the speed along the motion cycle. Finally, for electromechanical systems, there is no warm up time, increasing the productivity of the machine (→ **table 1**).

Table 1

	Pneumatic	Hydraulic	Electromechanical
Positioning precision	Low	Medium	**High**
Controlled speed	Difficult	Possible, but complex	**Easy**
Warm up time	Needed	Needed	**Not needed**

Weight

Pneumatic cylinders by themselves are lightweight devices, but if we consider other components like hoses, valves, air filter and so on, the overall system weight increases. The same concept applies to hydraulics.

Electromechanical actuators have a higher weight if just compared to an equivalent fluid power cylinder, but are significantly lighter once the overall system is considered (→ **table 2**).

Table 2

	Pneumatic	Hydraulic	Electromechanical
Cylinder weight	**Low**	**Low**	High
Overall system weight	High	High	**Low**

Power density

Pneumatic cylinder force capacity is heavily limited by the maximum pressure (usually up to 10 bars) that can be achieved and by the related energy losses due to air compression. This means that to generate high forces, big cylinder diameters and pressure levels are needed. And forces are usually limited to 30 kN for a size 200 cylinder.

Electromechanical cylinders can provide much higher forces compared to a pneumatic cylinder with the same section size, with a power density up to 8 times higher. Hydraulic cylinders can have an even higher power density but they need more installation space in the machine due to tubes and hoses. Electromechanical cylinders just use power cables for operation, requiring a smaller space (→ **table 3**).

Table 3

	Pneumatic	Hydraulic	Electromechanical
Force	Up to 30 kN	**> 500 kN**	Up to 500 kN
Cylinder dimension vs force	1	**< 1/8**	Up to 1/8
Installation space	Big	Big	**Small**

High speed performance

With pneumatic cylinders, it is easy to reach very high speeds in operation. With hydraulics, a large flow is needed to meet the same goal, but there must be enough pressurized oil in the system to reach the required flow level.

For hydraulics an accumulator can do the job by holding the pressurized volume, deploying additional capacity when needed.

In any event, this means a more complex and costly hydraulic system setup that can lead to very high power consumption.

With electromechanical cylinders, it is easy to match the application needs by selecting the best combination of screw lead and motor rotational speed, which optimizes the power consumption without any added system complexity (→ **table 4**).

Table 4

	Pneumatic	Hydraulic	Electromechanical
High speed	**Very Easy**	Difficult	Easy
Power consumption	High	High	**Low**

Reliability and lifetime

Electromechanical actuators have more components than a generic pneumatic or hydraulic cylinder. Thus, such a fluid power system has many more critical parts (compressor, filter/regulator, valves, seals, hoses….etc.). If these components have issues, it will affect the entire system, leading to machine downtime. This fluid power system is also very contamination sensitive and requires efficient filters that need to be serviced over time.

With electromechanical systems, the most common points of failure are the screw or the bearings. These components have L_{10} life ratings, which can be calculated based on the life equations typically found in the SKF catalogs. This greatly helps in selecting the correct product sizing, and facilitating predictive maintenance operations. Moreover, electromechanical actuators are less sensitive to contaminants as they do not have a complete circuit constantly under pressure (with several parts subject to wear) (→ **table 5**).

Table 5

	Pneumatic	Hydraulic	Electromechanical
System complexity	High	High	**Low**
Predictive maintenance	Possible	Possible	**Easy**
Contamination sensitivity	High	High	**Low**

Safety/Environment

Safety

Hydraulic cylinders usually work with very high pressures (up to 350 bars) and represent a potential hazard for personnel working around the system, due to pinhole leaks and improper couplings. Moreover, if mineral oil is used, there is a potential fire hazard. For pneumatics, the situation improves but the stored energy can still be a danger during maintenance checks or unexpected system shutdowns.

It is possible to minimize such risks with these systems by using relief and bleed valves, non-combustible fluid, automatic fire alarm systems and dedicated safety procedures for inspection and maintenance. However, doing so dramatically raises the overall cost and complexity of the system.

Electromechanical actuators do not have fluid under pressure and therefore are safer during operation. By eliminating the motor power, the overall system is de-energized and can more easily be safely managed. By using self-locking actuators or an external fail safe brake, it's also possible to further increase the safety level of the equipment during service (→ **table 6**).

Table 6

	Pneumatic	Hydraulic	Electromechanical
Potential hazard	Medium	High	**Low**
Safety in operation	Complex	Complex	**Very easy**

Energy savings

Pressure losses and air compressibility make pneumatics less efficient than other linear motion methods. Hydraulics have better efficiency but still experience several losses in the conversion between pressure generation and linear movement. In both cases, a compressor must run continuously, creating pressure even if there is no movement.

Electromechanical systems use energy on demand so they consume close to zero energy while not in use. Their higher efficiency in converting electricity into mechanical power allows them to achieve tangible energy savings in operation (→ **table 7**).

Table 7

	Pneumatic	Hydraulic	Electromechanical
Consumption while not in use	Medium	High	**Close to zero**

Noise

Pressure pulsation, created by the operation of pumps in a fluid power system, is one of the primary causes of noise issues for this technology. But other components like valves and compressors are also contributing to noise generation.

Electromechanical systems are generating noise primarily from the screw movement. Therefore, noise is generated only when the actuator is in use. Moreover, the overall level is usually negligible when compared to a fluid powered system (→ **table 8**).

Table 8

	Pneumatic	Hydraulic	Electromechanical
Cylinder noise level	Medium	Low	**Low**
System noise level	Very high	Very high	**Nil**

Environmental

Air can be contaminated by oil or other impurities, and needs to be filtered to avoid environmental pollution. Also, leakages and disposal of hydraulic oil represent a significant environmental issue and potential source of pollution.

The energy losses on the whole system, especially hydraulic, can cause ambient overheating that then has to be evacuated, causing extra energy waste for the cooling system.

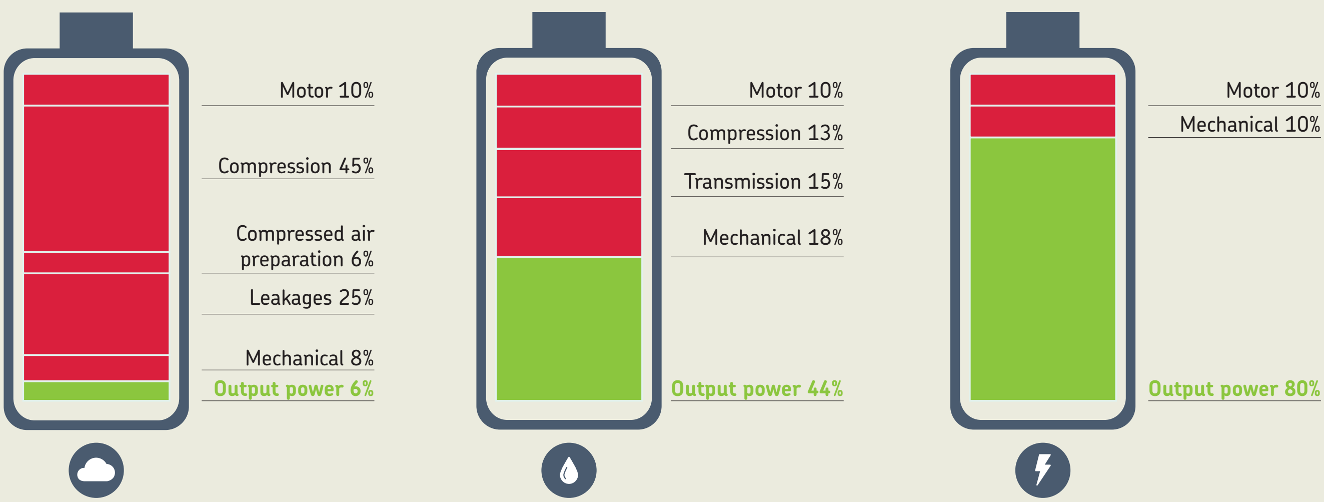
Electromechanical systems use grease as lubricant that is fully contained inside the actuator body. The quantity used is small and doesn't represent a significant source of pollution.

Electromechanical actuators also generate heat but at a negligible level compared to hydraulic, thus being much more efficient (→ **table 9**).

Table 9

	Pneumatic	Hydraulic	Electromechanical
Environmental pollution risk	Medium	High	None
Heat generation	Medium	High	Low

Efficiency: Energy losses comparison



Simplicity

Installation

Pneumatic systems require many components, including hoses, pumps, valves, regulators, lubricators, and air filters. Hydraulic systems, as well, require a complex setup including a fluid reservoir, pumps, motors, release valves, heat exchangers, along with noise-reduction equipment. This means the commissioning time is long since several parts of the system must be fine-tuned.

Electromechanical systems only require a motor, electric cables and, depending on the motor type, a driver.

This allows a much smaller system footprint and a simple mechanical layout, reducing significantly the installation and commissioning time of the equipment (→ **table 9**).

Table 9

	Pneumatic	Hydraulic	Electromechanical
Footprint	Large	Large	**Very small**
System commissioning time	Very long	Very long	**Short**

Maintenance

Fluid powered systems require constant maintenance to achieve overall system efficiency, avoiding leaks and failures. The filtering system, valves, pipes and fittings should be monitored and serviced to improve cylinder performance over time. Moreover, manual inspection operations are required to check the system status and spot possible issues.

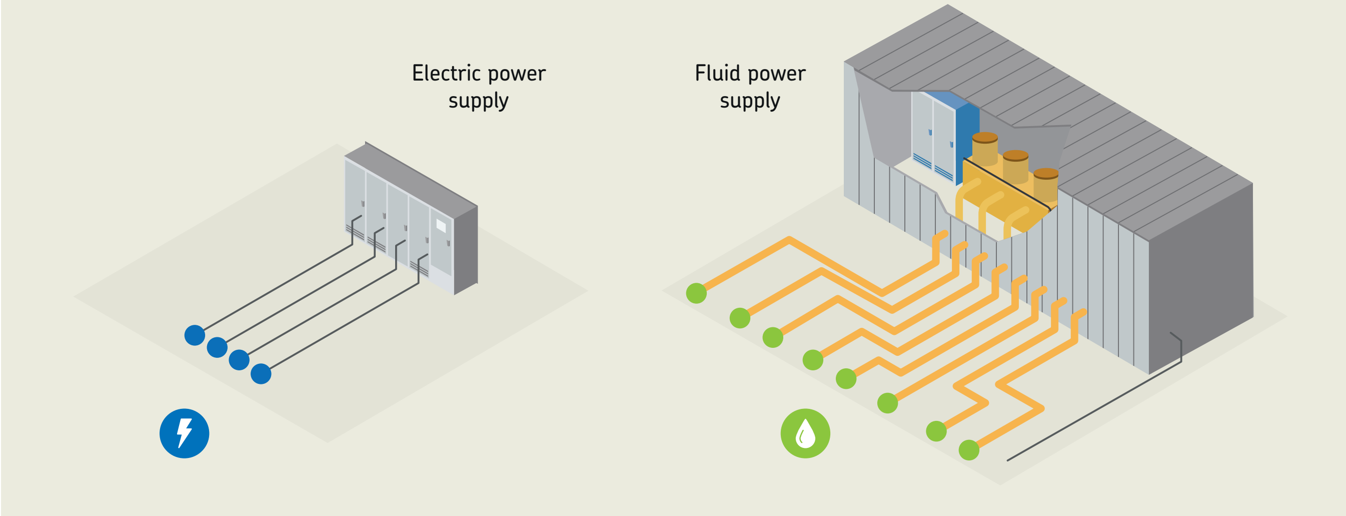
Electromechanical actuators can be operated virtually without maintenance for their whole lifetime or, depending on the working cycle and application, may just require a relubrication operation at defined intervals.

It's also possible to perform predictive maintenance strategies thanks to the integrated sensors (like current, displacement, force, acceleration) that allow real-time remote monitoring and that can be and that also can forecast product lifetime in operation (→ **table 10**).

Table 10

	Pneumatic	Hydraulic	Electromechanical
Maintenance	Constant	Constant	**Not required / seldom**
Cost of maintenance	High	High	**Very low**
Remote monitoring	Possible	Possible	**Easy**

Installation



Quicker replacement

Replacing components in a fluid power system requires depressurization, oil disposal (in the case of hydraulics), part substitution and recalibration to get back into operation. This requires a defined amount of time with specialized service personnel.

Electromechanical actuators can be quickly replaced by disconnecting the cables and substituting the current actuator with a new one. No further action is required to restart operation (→ **table 11**).

Table 11

	Pneumatic	Hydraulic	Electromechanical
Time of replacement	Long	Long	**Very short**
Specialized service personnel	Required	Required	**Not necessary**
Maintenance downtime	Longer	Longer	**Very short**

Design

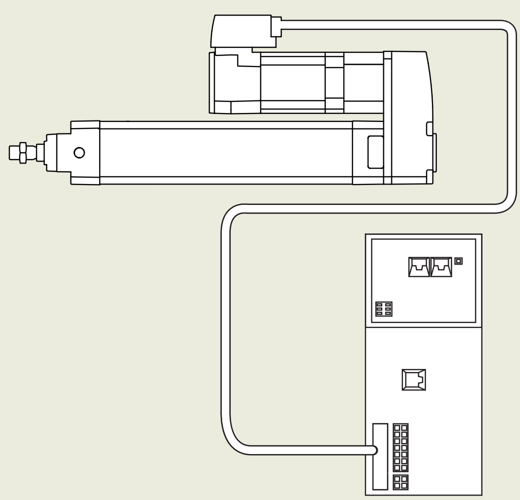
When designing a fluid powered system, it's important to correctly place the numerous components and to accurately define the right route for the pipes and hoses, creating contraints in the machine layout. Depending on the number of cylinders, the distance between them and the overall machine layout, the design phase can take some time as the designer also has to consider a simple installation and maintenance process.

With electromechanical systems, the design process is lean thanks to the use of few components and electric cables only, thus allowing a more flexible routing and installation (→ **table 12**).

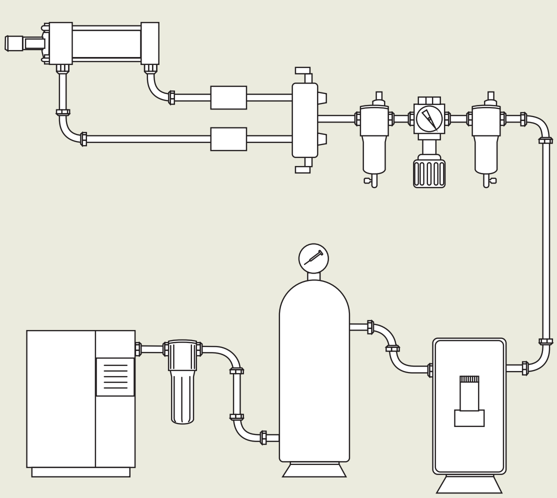
Table 12

	Pneumatic	Hydraulic	Electromechanical
Design time	Long	Long	**Short**
Project constraints	Significant	Significant	**Less**

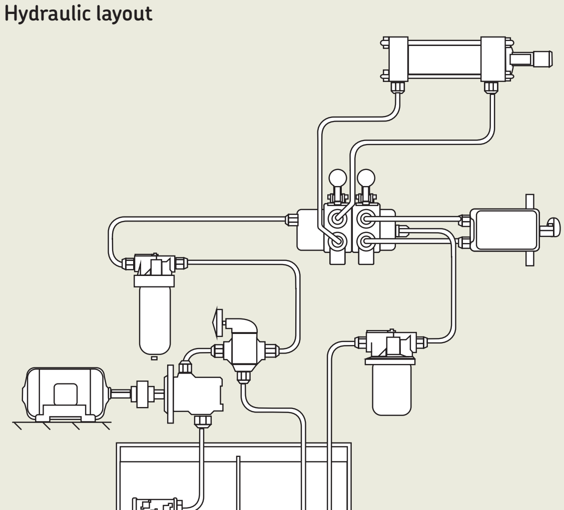
Electromechanical layout



Pneumatic layout



Hydraulic layout



Total cost of ownership

The evolution in continuous industrial processes is becoming more demanding in terms of motion control performance. The current pneumatics and hydraulics solutions are not competitive in terms of TCO (Total Cost of Ownership) that considers all direct and indirect costs associated with an asset over its entire life cycle.

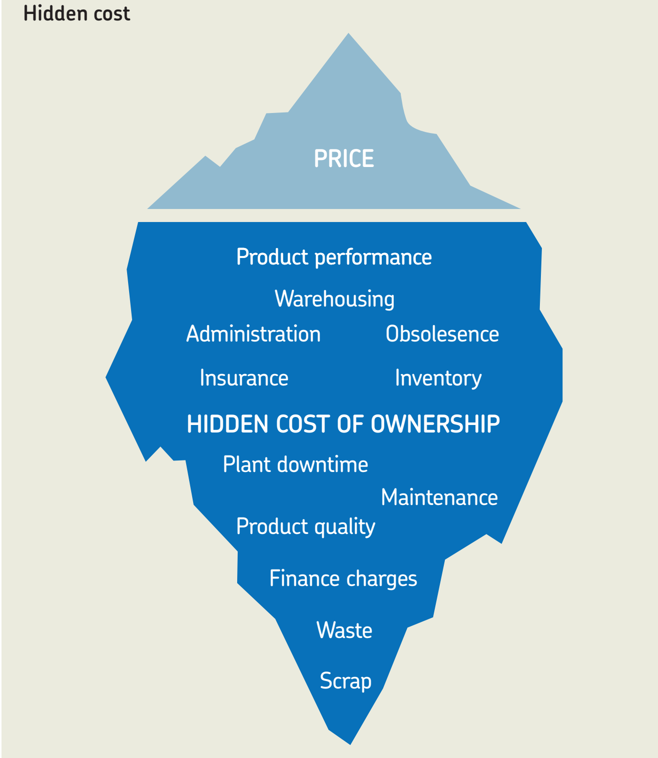
Beside the more obvious performance advantages, there are several others hidden behind the technology or with usual production and factory processes.

For example, a higher system efficiency - both in operation or in standby mode - lead to direct savings proportional to the number of cylinders, in monthly and yearly energy expenses.

Concerning costs related to machine downtime and maintenance operation, a system with less components, less sensitivity to re-lubrication needs, easier to be serviced and with a quicker replacement time can provide tangible savings in different accounting areas of the factory. Moreover, less components mean less of a need for spare parts and so a lower capital investment in parts.

Another hidden cost concerns safety and hazard prevention devices and procedures. A system with an embedded higher safety level can help to reduce the cost of running a safe manufacturing operation. Moreover, removing the oil from some areas of the plant helps to reduce costs related to oil cleaning and disposal.

Hidden cost



Cost saving calculator

SKF has developed a tool to support customers in evaluating the cost of running their machinery comparing the use of pneumatic, hydraulic or electromechanical technologies. By inserting some basic information into the tool, the user can get an estimation of the cost savings achievable by switching to mechatronic solutions.

→ Visit skf.com/actuator-select in the cost saving calculator section to get started

Customization capabilities

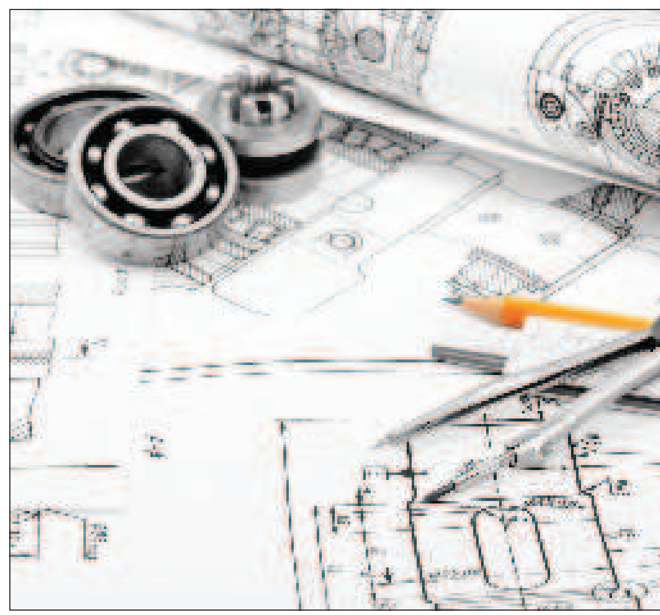
SKF electric cylinder customization

On the standard electric cylinder product range, SKF offers an extensive customization program that is able to meet virtually any application need. There are 3 levels of customization that depend on specific requirements and the complexity of implementation.

Basic customization

These basic design options can be implemented quickly and easily:

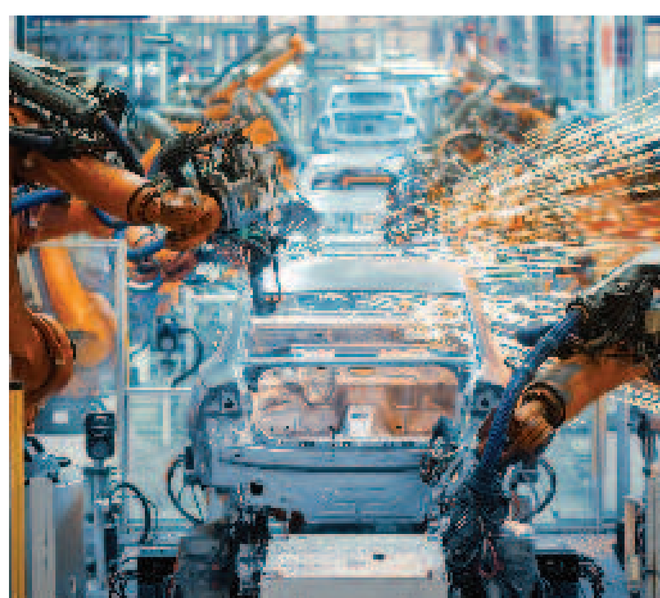
- Stroke
- Mounting holes
- Colors
- Attachments
- Motor
- Cables / connectors



Advanced customization

These design options are more complex and require a dedicated project by SKF personnel working with the customer:

- Materials
- Housing
- Guiding system
- Gearbox (e.g., with hand crank)
- Screw (e.g., lead, treatments)
- Screw Nut (e.g., additional backup nut)
- Painting and surface treatments



Complete customization

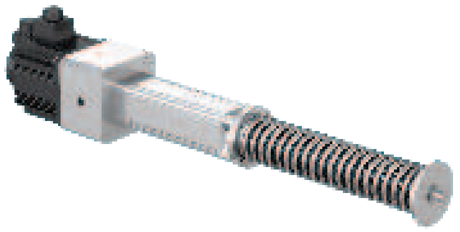
In case the standard actuator offering cannot fully satisfy the technical requirements, SKF can offer completely customized solutions that are tailor made for each customer.

Examples of basic and advanced customizations

Electric cylinder CASM with spring around the push tube

An electric cylinder CASM (→ **fig. 2**) has to move a high constant load. To relieve the cylinder's motor and screw from this high load, SKF added a spring around the push tube. Most of the constant load is carried by this spring. The motor and the screw are mainly used to accelerate and decelerate the load while moving. This customization increases the cylinder's service life significantly and enables the use of a smaller motor system.

Fig. 2



Electric cylinder CASM made of stainless steel

The electric cylinder CASMS (→ **fig. 3**) are often used in food and beverage applications. For direct contact with food, SKF made a customized version of the CASM in stainless steel, according to the EHEDG Doc 8 guidelines. This cylinder has a rounded, smooth surface with no area for food or bacteria accumulation. The seals are made of H-Ecopur/FDA. The stainless steel cylinder is resistant to food industry chemicals and solvents and is high pressure washable.

Fig. 3

Electric cylinder CASM for harsh environments and low temperatures

Electric cylinders CASM are built and tested for IP54S applications (→ **fig. 4**). To operate CASM in wet and dusty environments, they are prepared to connect a pneumatic hose. With the hoses open end in a dry place, the CASM can breathe dry air during operation. This eliminates the under pressure while extending the push tube and prevents the entry of dust and humidity into the cylinder. In applications with low temperatures (→ **fig. 5**), the standard grease of electric cylinders starts to thicken and the lubrication effect is reduced. With a special low temperature grease, this thickening can be eliminated and the cylinders can run smoothly even in very cold environments.

Fig. 4

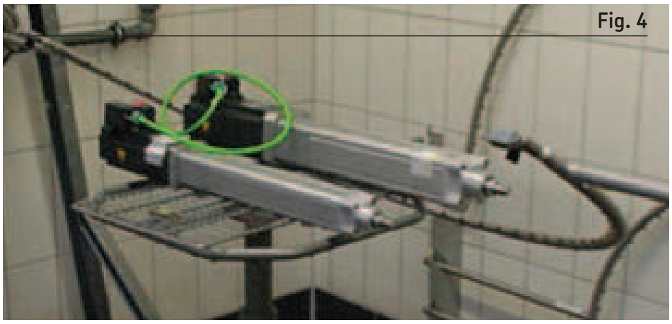
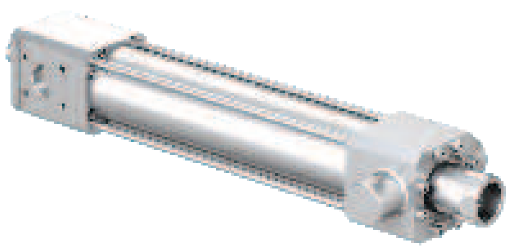


Fig. 5

Electric cylinder LEMC with customized attachment

The electric cylinders LEMC (→ **fig. 6**) are modular in design, which enables quick modifications. In this special case, the LEMC is equipped with a customized trunnion flange to perfectly fit into the customer's application.

Fig. 6



Examples of complete customizations

Electric cylinder with very long stroke length (3 100 mm)

An application on water gates (→ **fig. 7**) in a hydro power station in Sweden required the replacement a hydraulic cylinder to get rid of the oli leakage risk and improve the uptime in the field.

The solution (→ **fig. 8**) developed has achieved the long stroke (3 100 mm) and high load requirements, ensuring a reliable operation in a harsh environment.

Electric cylinder for parallel running

The application (→ **fig. 9**) required high accuracy, high stiffness, special environmental demands and a load capacity up to 160 kN.

The design ended up in a parallel system with customized gear boxes, robust sealing solution, roller screws, servo motor and redundant brake system.

Electric cylinder for height adjustment on working platform

The requirements were to find an electromechanical solution that had a stroke of 300 mm, max load capacity of 70 kN and a maximum weight of 50 kg. The design solution (→ **fig. 10**) was an actuator with a roller screw, planetary gear and an ultra-compact servo motor. This solution provided a dynamic load capacity of 72 kN, a total weight of 42 kg and a design adapted for harsh environment.

Electric cylinder adjusting airflow into combustion chamber for a gas turbine

The function “Inlet Guide Vane” (IGV) for a gas turbine was previously operated by a hydraulic cylinder. But higher demands on controllability and safety required an electromechanical servo solution, specifically designed for that equipment.

The solution (→ **fig. 11**) also included, besides the electric cylinder, a customized Factory Acceptance Test (FAT) and specific documentation package delivered with each product.

Fig. 7

Fig. 8

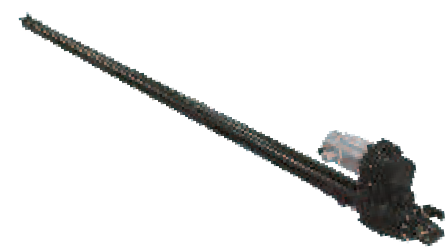


Fig. 9

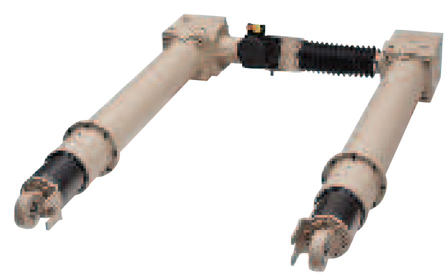
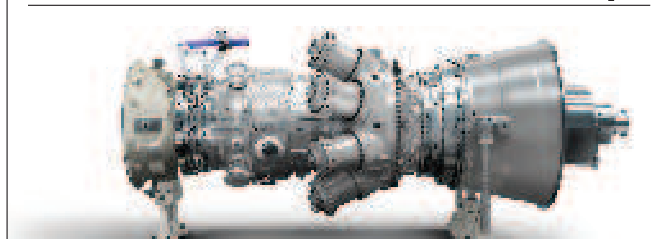


Fig. 10

Fig. 11



Electric cylinder LEMC with recirculating roller screw

The modular LEMC actuators might be customized with different types of screws to satisfy specific performance requirements (→ **fig. 12**). On a test rig application for material resistance and deformation analysis, it was required to achieve high stiffness and high movement resolution in terms of small linear displacement per motor turn. By using SKF preloaded recirculating roller screw PVU 32x1 coupled with a planetary gearbox, it was possible to obtain high pressing forces, high positioning precision and controllability to easily handle micrometric displacements in the application.

Fig. 12

Compact and lightweight electric cylinder for automotive assembly lines

The application requirements were a dimensionally compact and lightweight actuator with long lifetime and high speed and acceleration. The SKF customized cylinder (→ **fig. 13**) is based on a roller screw BRC 15x8 with an aluminium body and a brushless motor, resulting in a very compact solution weighing less than 4 kg only.

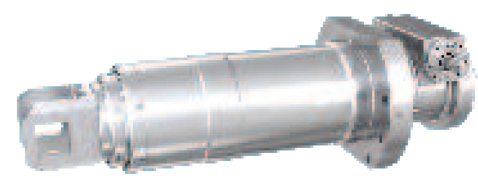
Fig. 13

Telescopic electric cylinder

For the steel industry segment, to fit into space availability and required output power, SKF has designed telescopic ball screw actuators used to adjust mould and bloom size on continuous casting (→ **fig. 14**). Two ball screws coupled with worm gears are used to realize the movement while a stainless steel body and special sealing material are protecting the actuator from the harsh working environment (high temperatures, steel particles...).

The telescopic design enables a longer stroke for the same retracted length, so that a wider product range can be manufactured using the existing casting line. By improving the mould displacement controllability, telescopic actuators also make it possible to increase the slab quality.

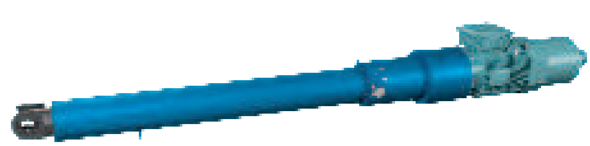
Fig. 14



Extreme power SRSA electric cylinder

For a heavy steel application, SKF has realized a customized SRSA cylinder with cutting edge performance to replace hydraulics (→ **fig. 15**), boosted actuator dynamic capacity (+25%) thanks to a special bearing arrangement and ultra power roller screw size 75 with increased load capacity, long stroke (1 700 mm) and integrated torque limiter between motor and actuator. Moreover, an integrated Profibus absolute multi-turn encoder is mounted on a roller screw to identify actuator position even if the torque limiter has been activated. The actuator is capable of moving up to 110 kN with its 30 kW asynchronous motor and has an overall weight of 1,3 tons and a length of 6 meters in a fully extended position.

Fig. 15



Customization request form

Please fill in this application information sheet and return it to your local sales representative OR by email to actuators@skf.com

Company: .... Name of representative: ....
Tel.: .... Email: ....

Dimensions

* Stroke length:	.... mm			
* Retracted length:	.... mm			
* Rear attachment:	☐ Front plate	☐ Back plate	☐ Front trunnions	
	☐ Rear trunnions	☐ Other		
Mounting:	☐ Vertical	☐ Horizontal	☐ Diagonal	

Performance

* Load profile:
Describe all factors, including i.e. mass moved, push/pull force required.

* Max linear speed:	.... mm/s	at load: .... kN		
* Static load capacity:	Pull: .... kN	Push: .... kN	at max. stoke: .... mm	
* Lateral (side) force:	☐ No	☐ Yes	if Yes: .... kN	
Self-locking:	☐ None	☐ In & Out	☐ In	☐ Out
Number of work cycles:	........cycles/hour	........hours/day	.... days/year	.........years
Duty factor	..........%		at load: .... kN	

Motor type

* Motor voltage:	☐ DC	☐ AC	☐ no motor
Control mode (Command):	☐ Analog	☐ Digital	☐ Field bus
Manual emergency operation:	☐ No	☐ Yes	

Miscellaneous

* Feedback:	☐ None	☐Limit swiches	☐ Potentiometer	☐ Encoder
IP Protection:	IP			
* Ambient temperature:	Lowest	Highest		
* Atmospheric / chemical influence:	☐ Indoor	☐Outdoor	☐Actuator is protected from rain	
Humidity:	..........%			
Vibrations:	☐ No	☐ Yes	If yes Amplitude: .... mm	
			Frequency: .... Hz	
Max. noise:	.... dBa (distance 1 m)			
Back-up nut:	☐ No	☐ Yes		
Friction clutch:	☐ No	☐ Yes		

Quantity needed: Prototype .... pcs Pre-series .... pcs Series .... pcs
Other customer requirements that cannot be defined above:

....

....

* mandatory fields

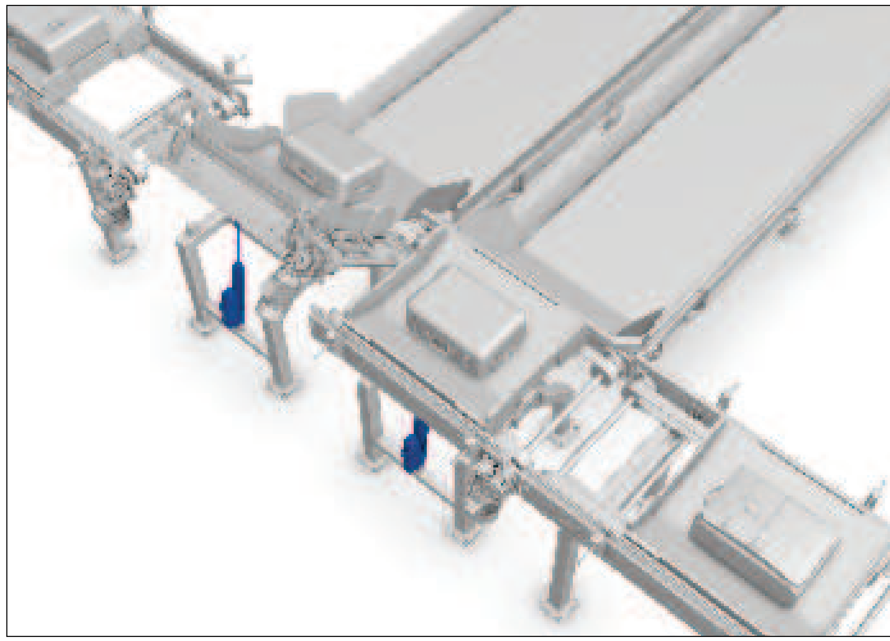

STOP
START

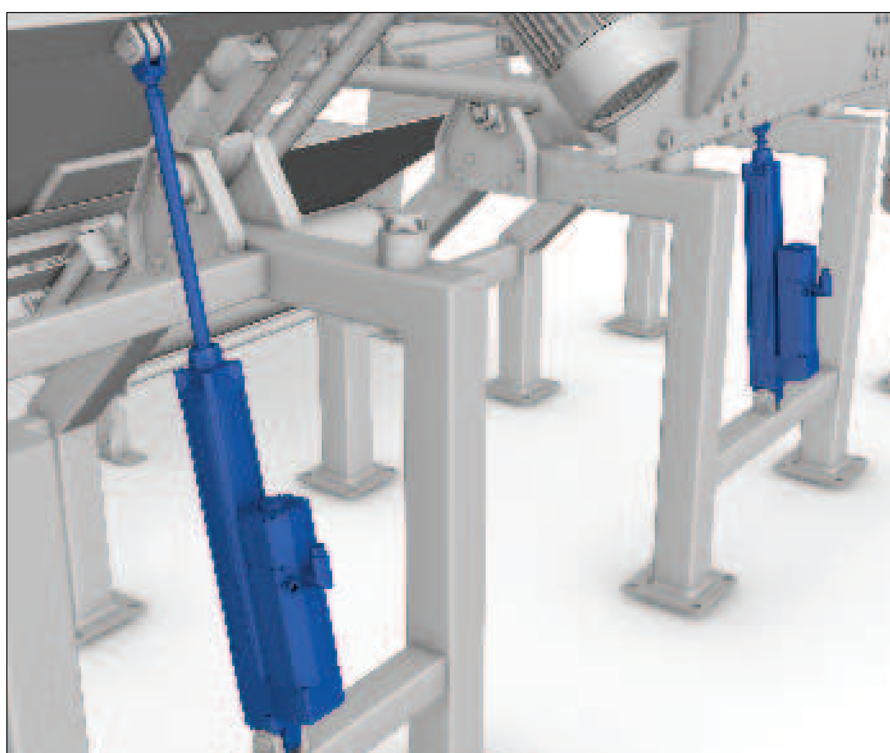
Application examples

Material handling – conveyor systems

The high controllability, constant force and accurate positioning capabilities of electric cylinders make them an ideal choice for diverting and sorting applications on conveyor lines.

Conveyor lines are often distributed over a larger area. Bus communication of the electric cylinders simplify the wiring and is also perfectly suited to visualize and control the full system over a larger distance.

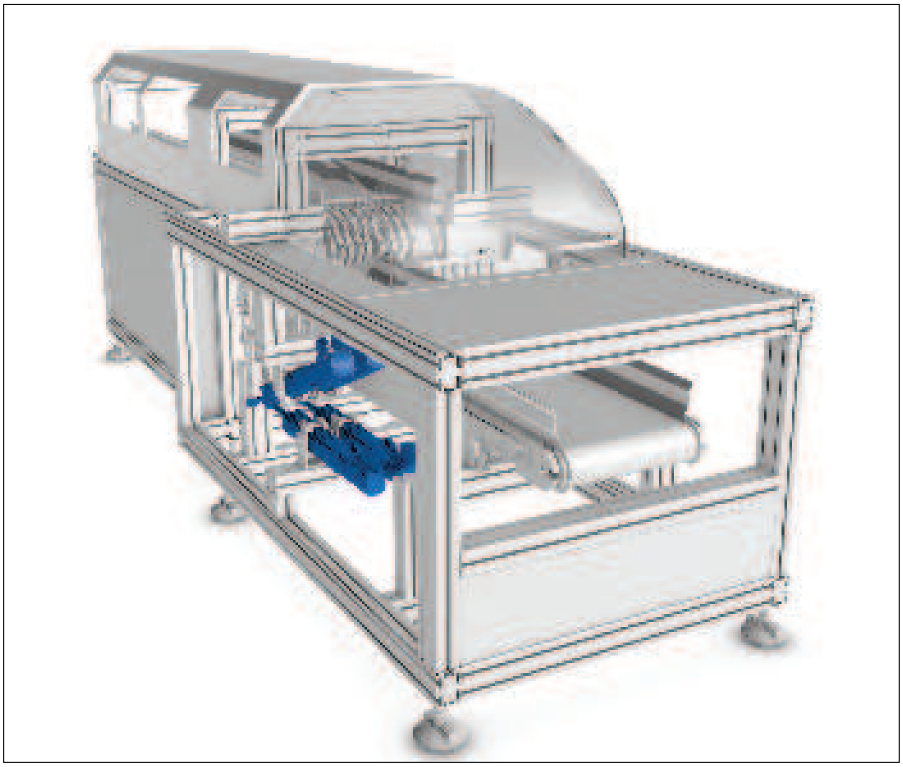


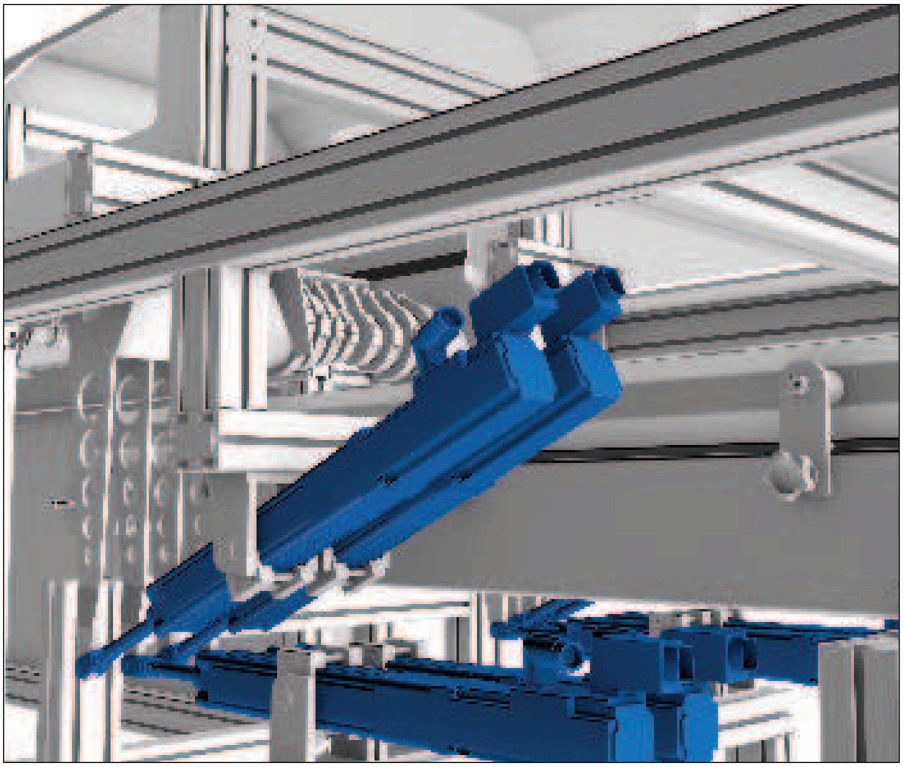


Food and beverage – slicing of meat

The high controllability and accurate positioning of electric cylinders enables fast knife adjustments and extreme precision in meat slicing machines.

Fully automated cutting machines individually measure the meat and cut it . Quick adjustments of the knives enable users to increase the speed of the conveyor and therefore the productivity of the cutting line with improved continuity.

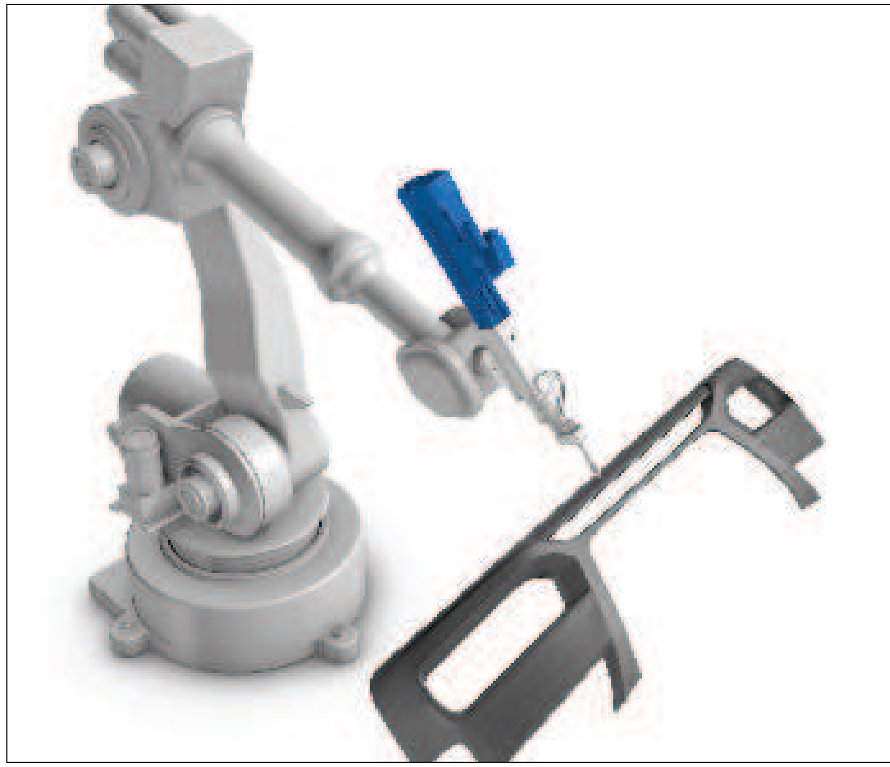




Material joining equipment – gluing machines

Gluing robots with electric cylinders deliver a constant amount of glue which can be adjusted relative to the speed of the robot arm and the viscosity of the glue.

Gluing robots are used in many industries from sinks and windows to machine and automobile parts. Gluing robots help to reduce the cycle time and improve the quality of the products. You can help to ensure consistent quality, optimize operation time and reduce production cost by using electric cylinders in dosage applications.

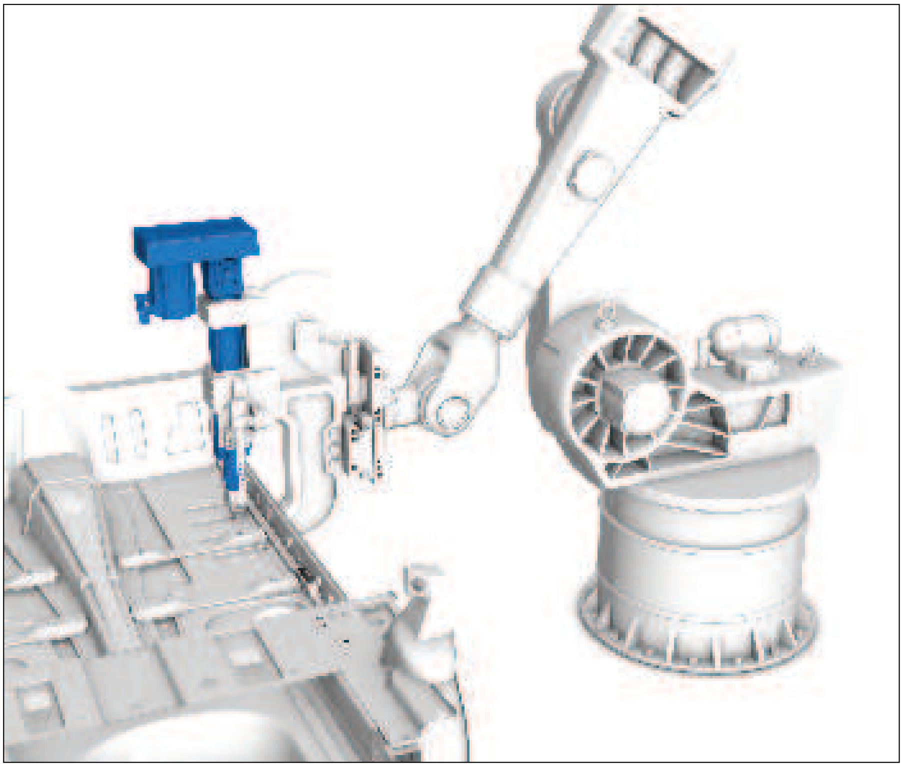


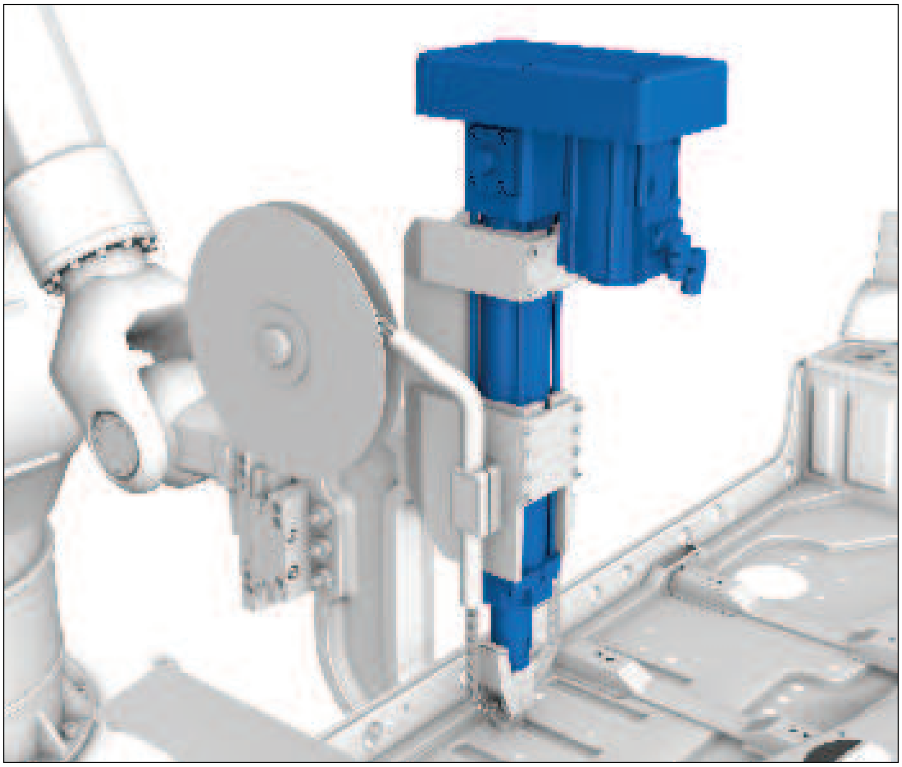
Material joining equipment – riveting

Electric cylinders deliver continuous high quality rivets, enabling the use of fewer rivets with no compromise in strength, thereby boosting production line output.

The integrated roller screw technology increases the riveting speed and therefore productivity. The compact lightweight actuator is ideally suited for robot operated technology.

In addition, electric cylinders are highly dynamic and very efficient which saves a lot of energy and operating cost.



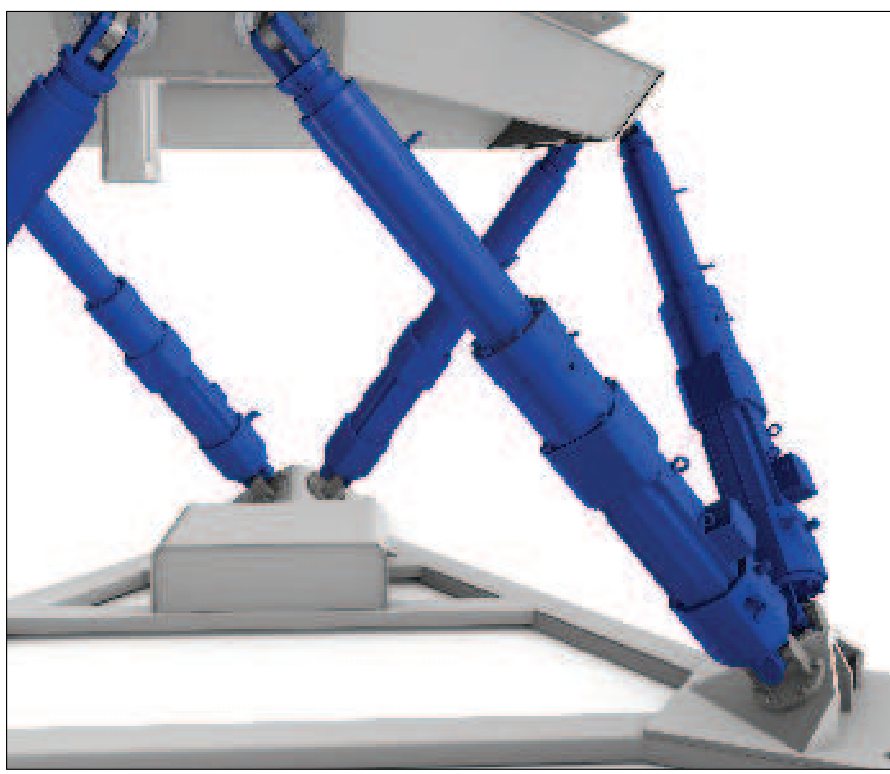


A

Testing equipment – bench or simulator

Testing benches require a high level of flexibility to perform different tests, a high level of repeatability to eliminate noise in measurements, and a long service life to survive the equipment being tested. Electric cylinders meet all of these requirements while delivering cost saving energy efficiency.

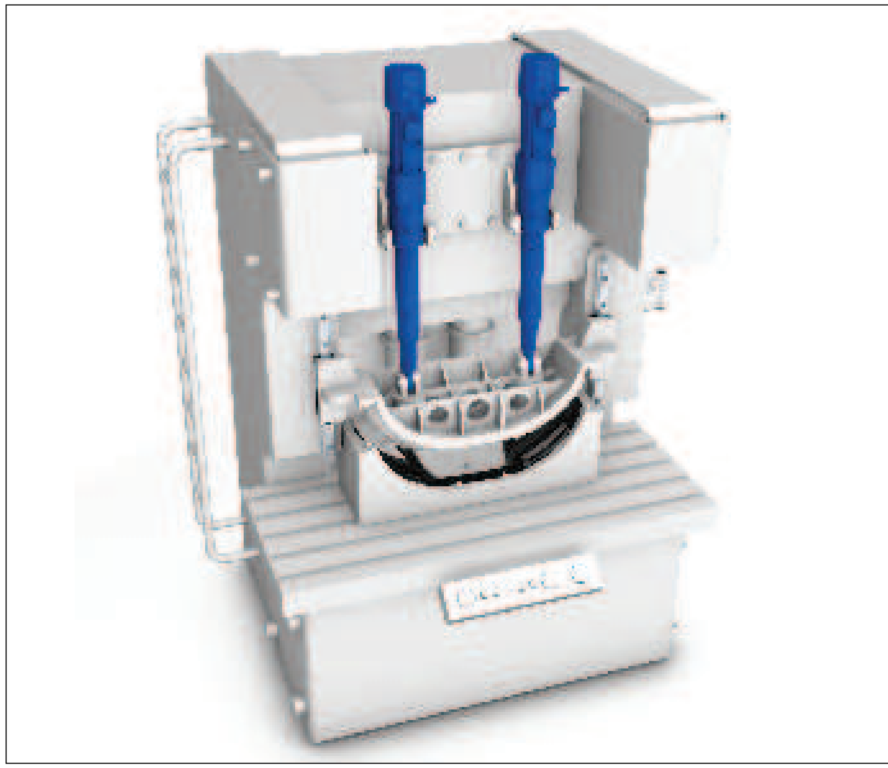
Depending on the selected type of electric cylinders, testing benches or hexapods can be highly dynamic or ultra-stiff with very high precision. In any case, they offer excellent feedback and real time control.

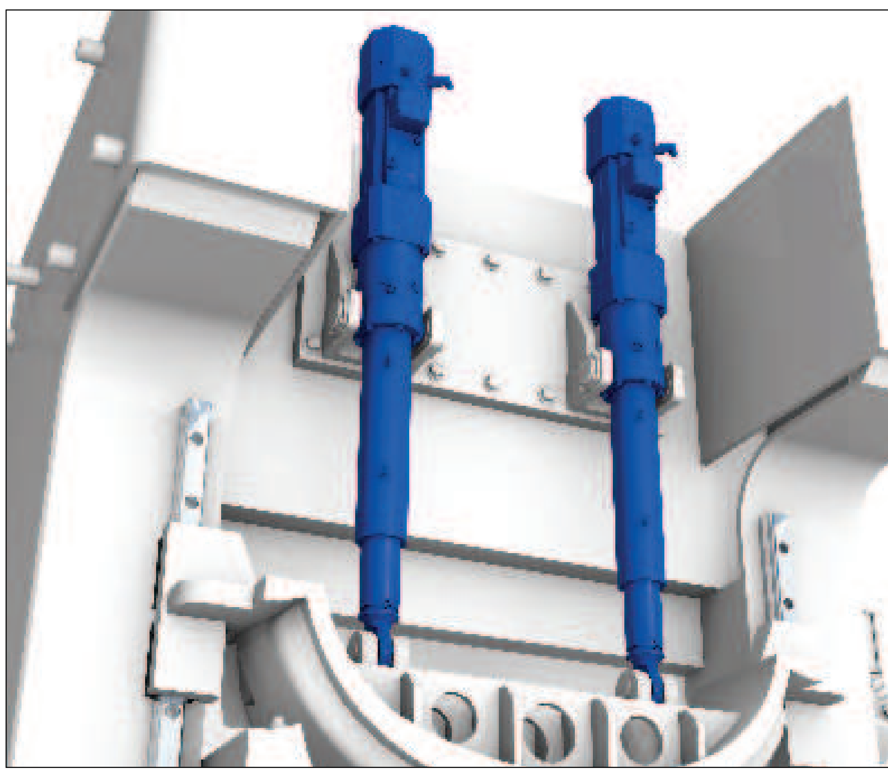


Electric press systems

Thanks to the high controllability of their speed and force, electric cylinders can increase the quality and productivity of pressing and fitting equipment.

Electric press systems are programmable for different workpieces. They are running fully electric and cleanly and are highly energy efficient. The permanent position feedback enables for in-process verification and monitoring, which results in continuous quality on a high level.



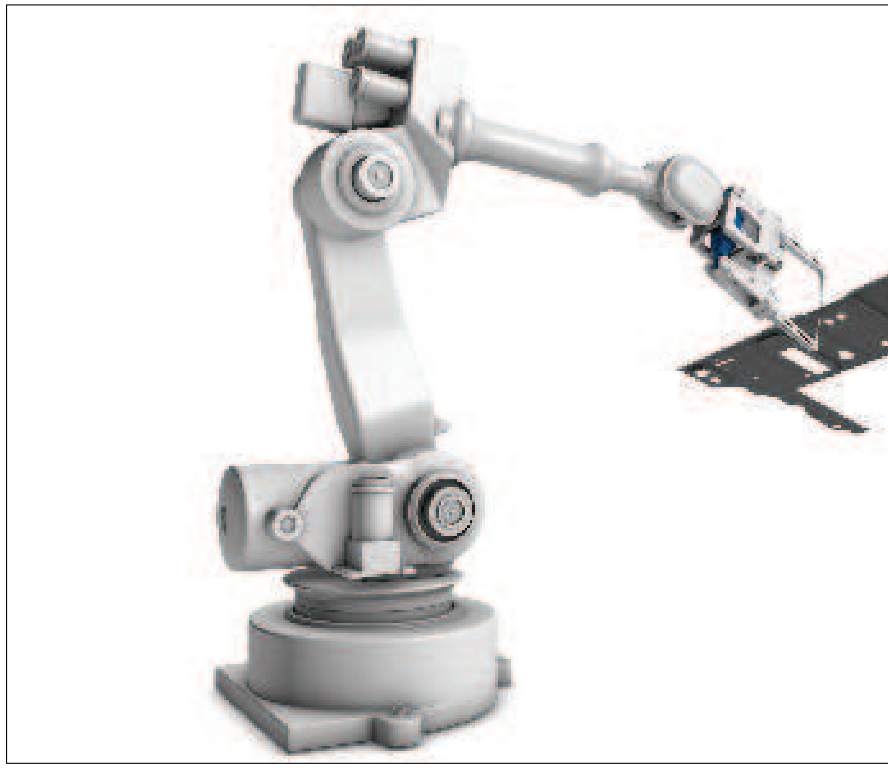


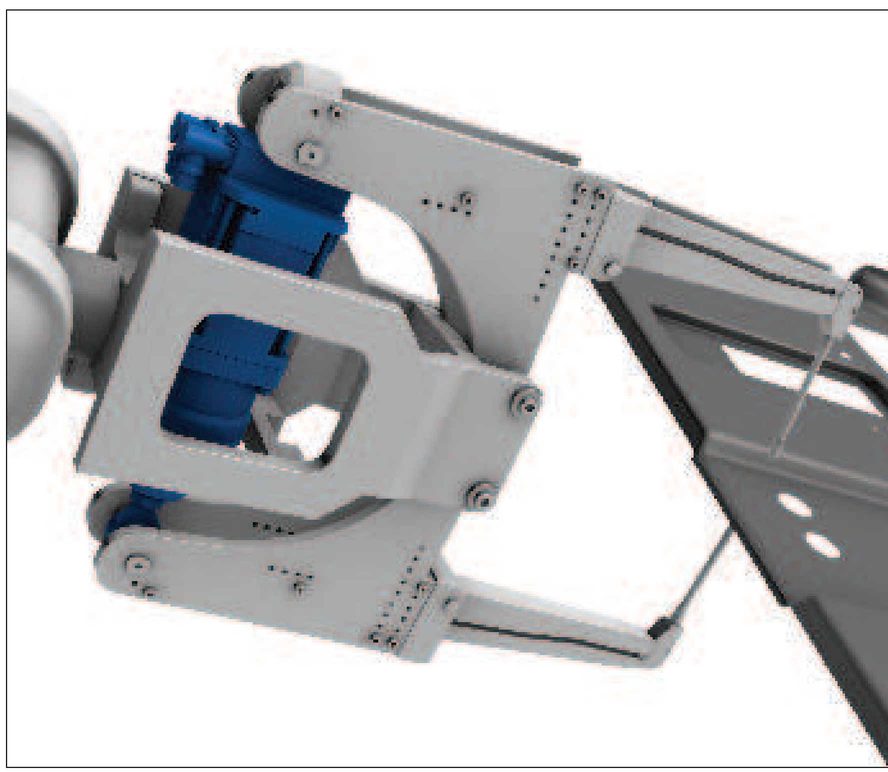
Material joining equipment – spot welding

Spot welding guns with electric cylinders enable high quality welding spots with constant force while the wear of the electrodes is equalized.

Low weight is a key feature of the compact, fully integrated electric cylinder which allows fast movement of the robot arm.

Reduced production downtime and less wasted material are some of the many advantages of a spot welding gun equipped with electric cylinders.



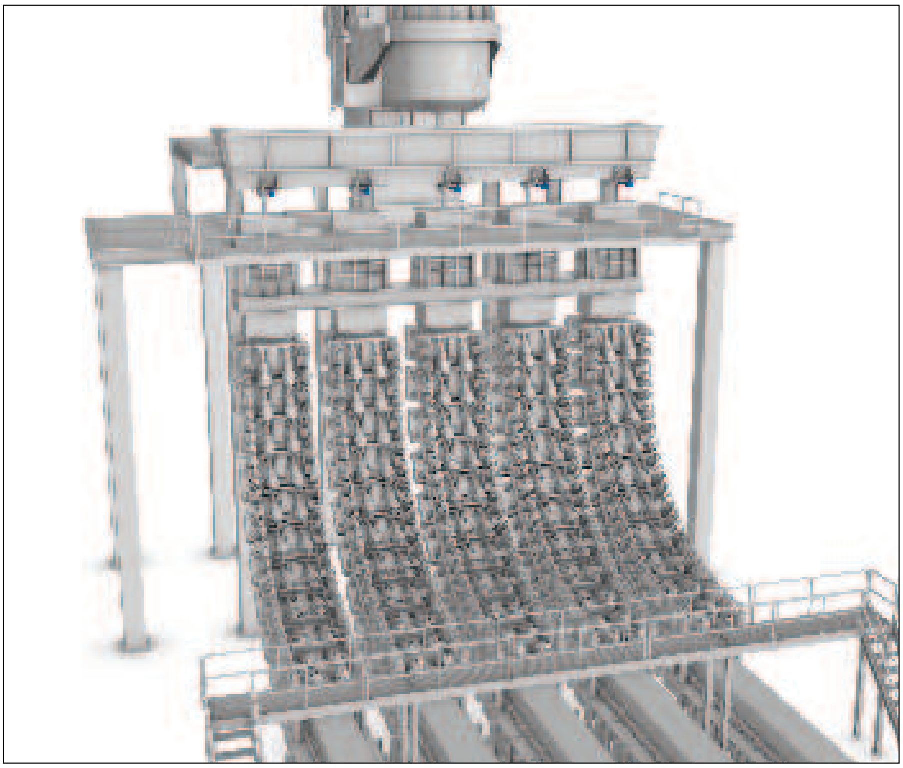


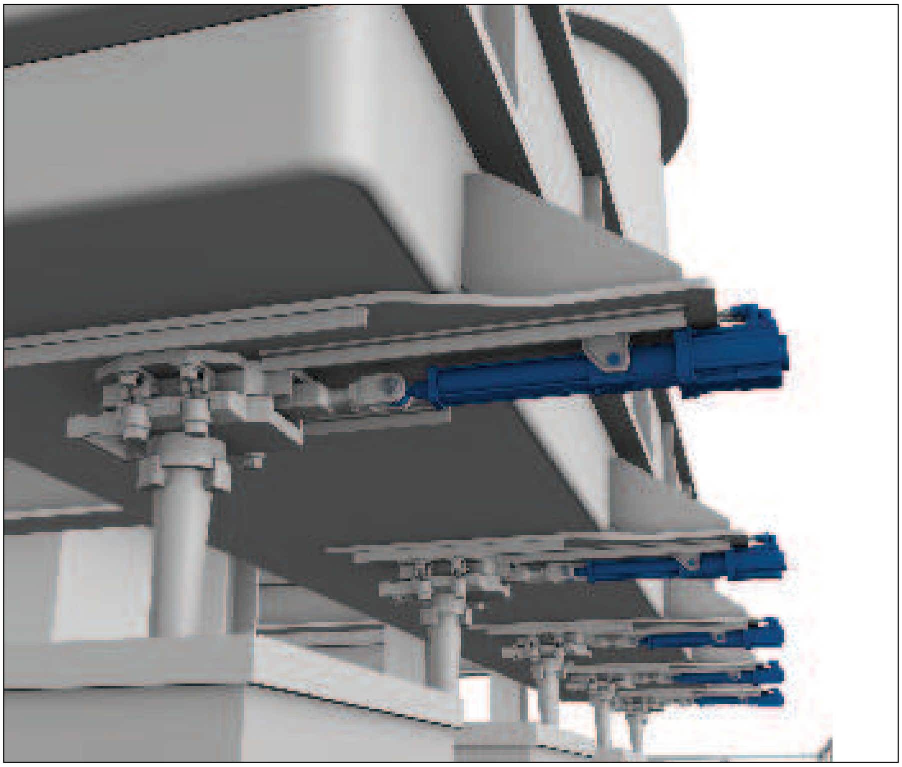
Heavy industry – continuous casting of metals

Accurate positioning and high force capabilities make electric cylinders the perfect choice to regulate the flow of melted metals in continuous casting equipment.

Electric cylinders are robust and withstand the harsh environment in heavy industry applications.

Reliable products are very important as downtime in metal casting applications can be extremely costly. Electric cylinders offer permanent feedback and can also indicate if maintenance is needed.





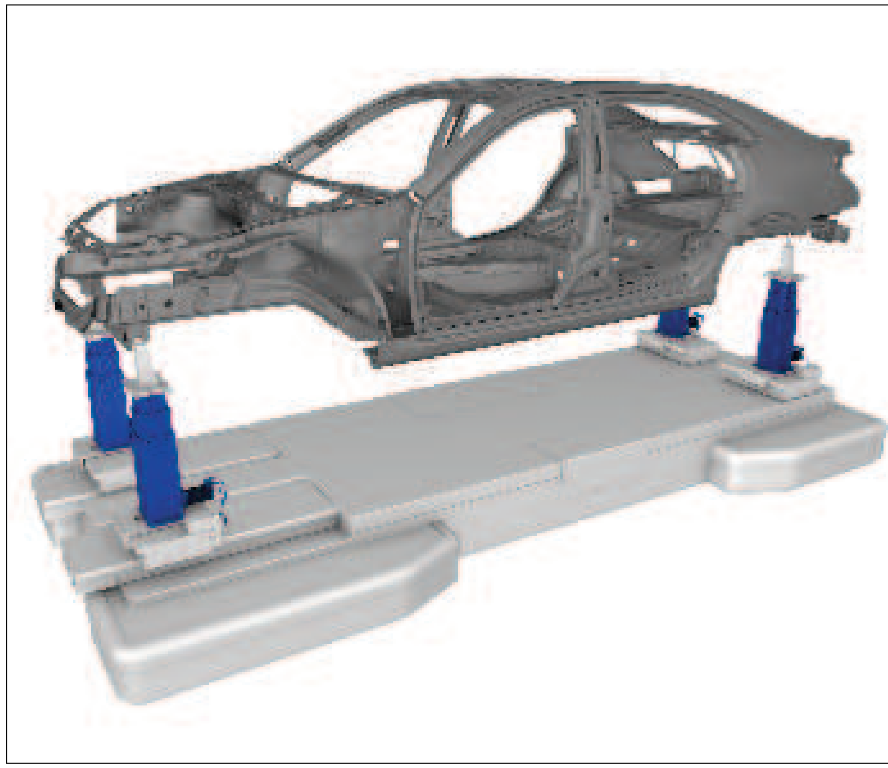
Factory automation – automotive

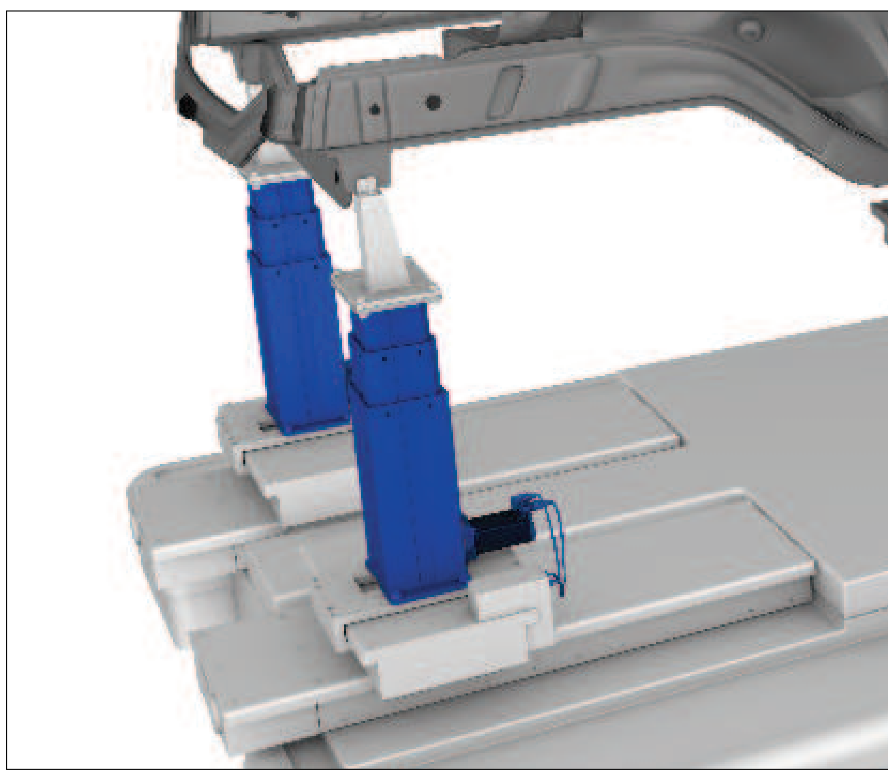
The high controllability and robust construction make a CPSM pillar the ideal solution for realizing a smart chassis levelling function in automotive car transfer units.

The need of handling different types of car chassis on the same line requires a flexible system setup that allows a quick resetting with precise positioning.

The optional integrated dampening system protects the pillar from mechanical shocks during the loading and unloading phases, ensuring high reliability and longer lifetime in operation.

The usage of customer-defined servo motors allows for easier integration into the control network, reducing the commissioning time of the transfer unit.

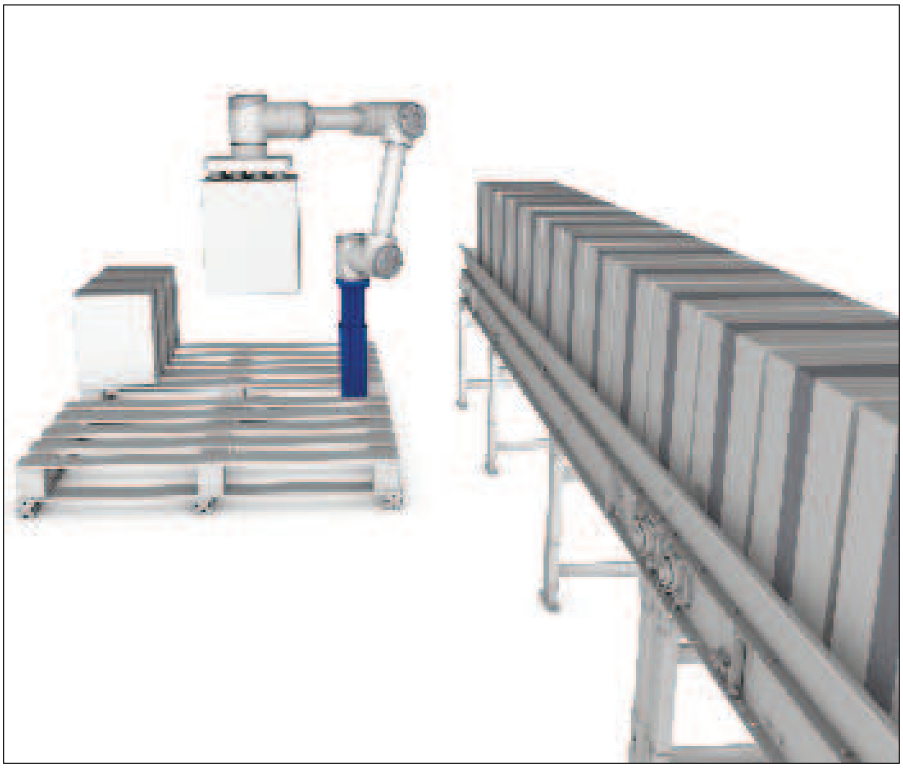


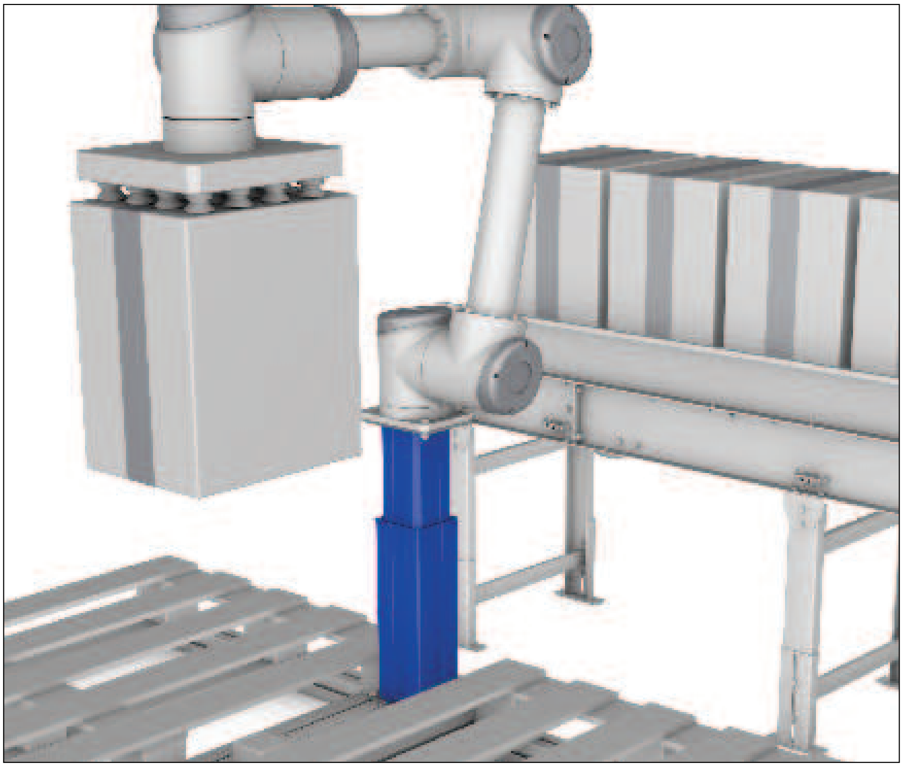


Packaging – pick and place

Fully automated pick and play solutions are becoming a new standard with packaging stations. The main challenge for packaging system manufacturers is to complete multi-axis systems in a simple and cost effective way, while still delivering the required performance.

CPSM servo pillars represent an effective solution to complete vertical axis regulation, thanks to its ability to move heavy excentric loads with a high duty cycle operation.

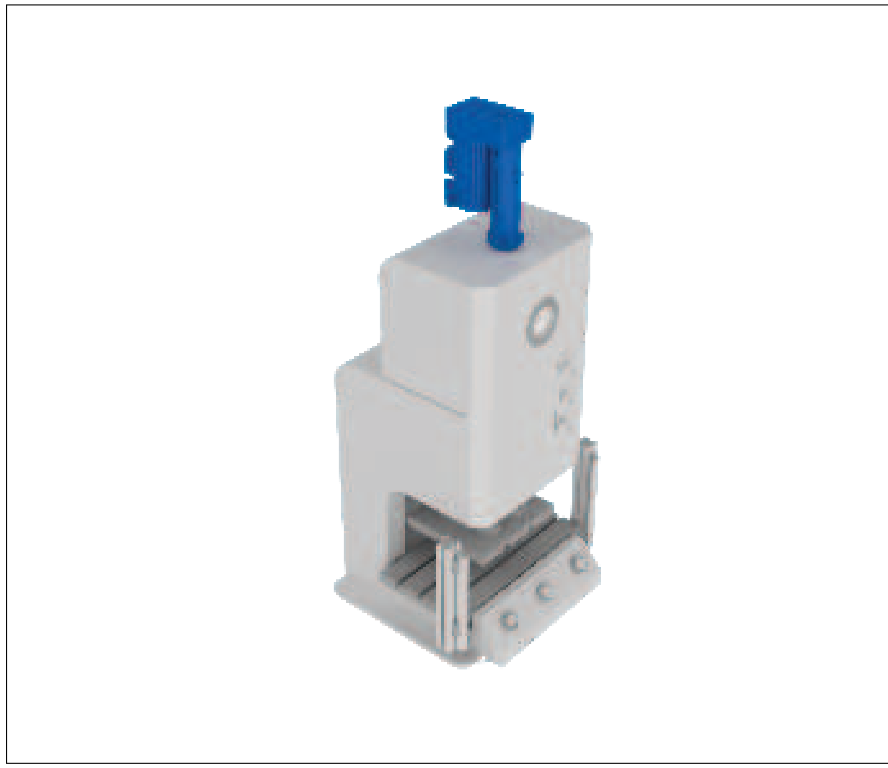


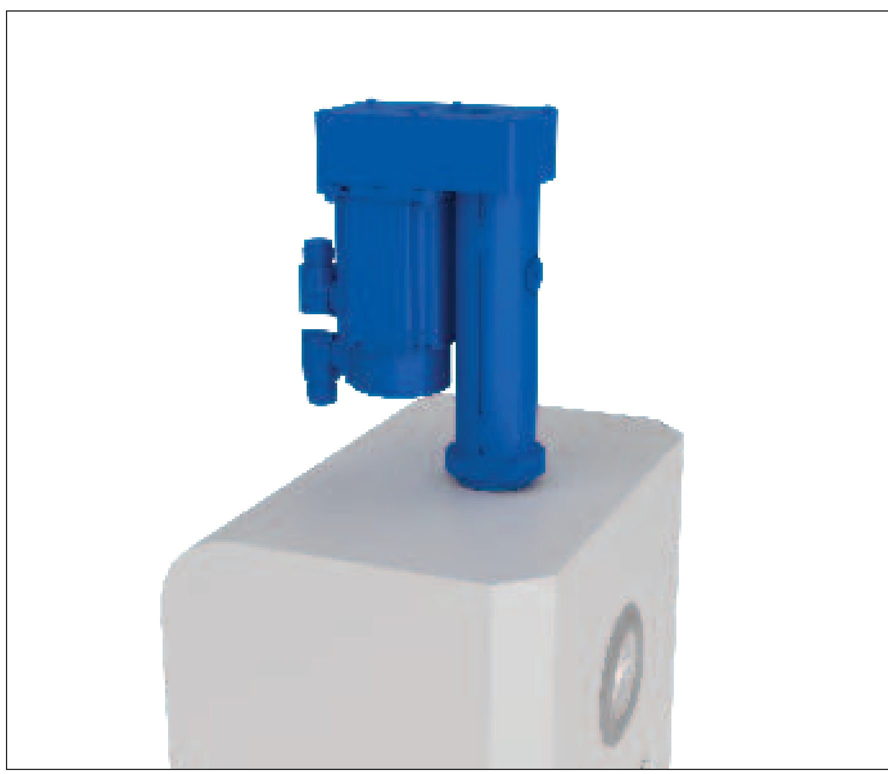


Factory automation - Small presses

Small vertical presses require a high level of flexibility and precise control of the force applied and position of the press head. SEMC actuators can surpass the limit of pneumatic and small hydraulic cylinders typically used in this application by delivering higher performances from the integrated roller screw technology and servomotor controllability.

If you have small dimensions, this solution allows easy retrofit during machine refurbishment, keeping the same mechanical installation layout.





A

System set-up

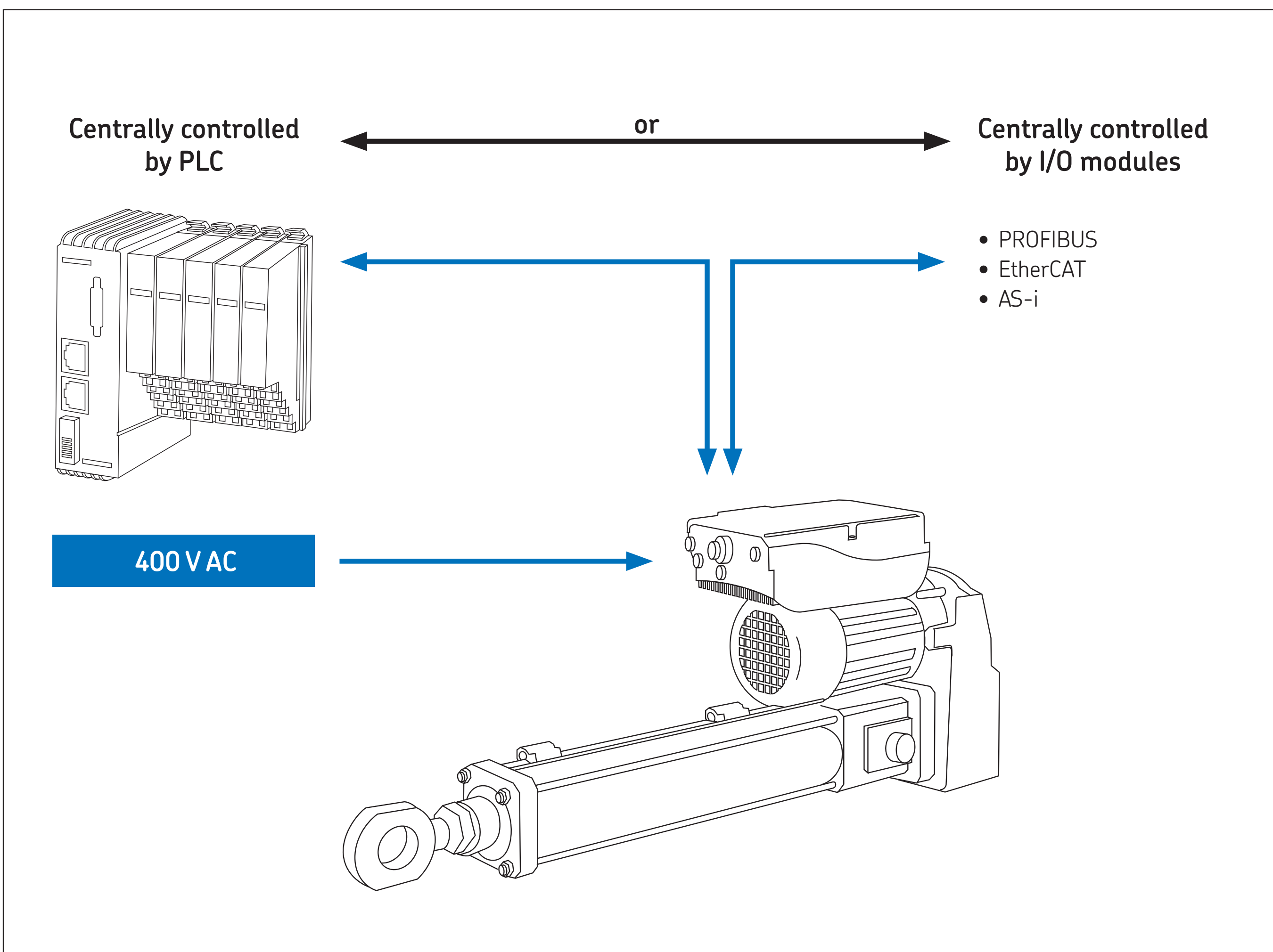
Modular concepts enable the linear units to be motorized with motors of your choice. Each motor type has its own special characteristic and allows simple integration in a large number of applications. Speed up your time to market by using the motor type and motor brand you are familiar with. If you prefer to buy complete actuators, SKF offers a range of AC motors, brushless DC motors and servo motors which will perfectly suit the performance of the linear units.

AC Motor setup

- 400 V AC mains connection to power the actuator
- Central controller to control the movements and position of the actuator
- Bus communication to decentrally control the actuator and easily integrate it into automated systems

Full flexibility

Apart from direct connection of the digital inputs and outputs to a PLC, the control signals can be connected to virtually any fieldbus. (Profibus, Ethernet, EtherCAT, AS-i, CanOpen, ...) througth I/O modules.

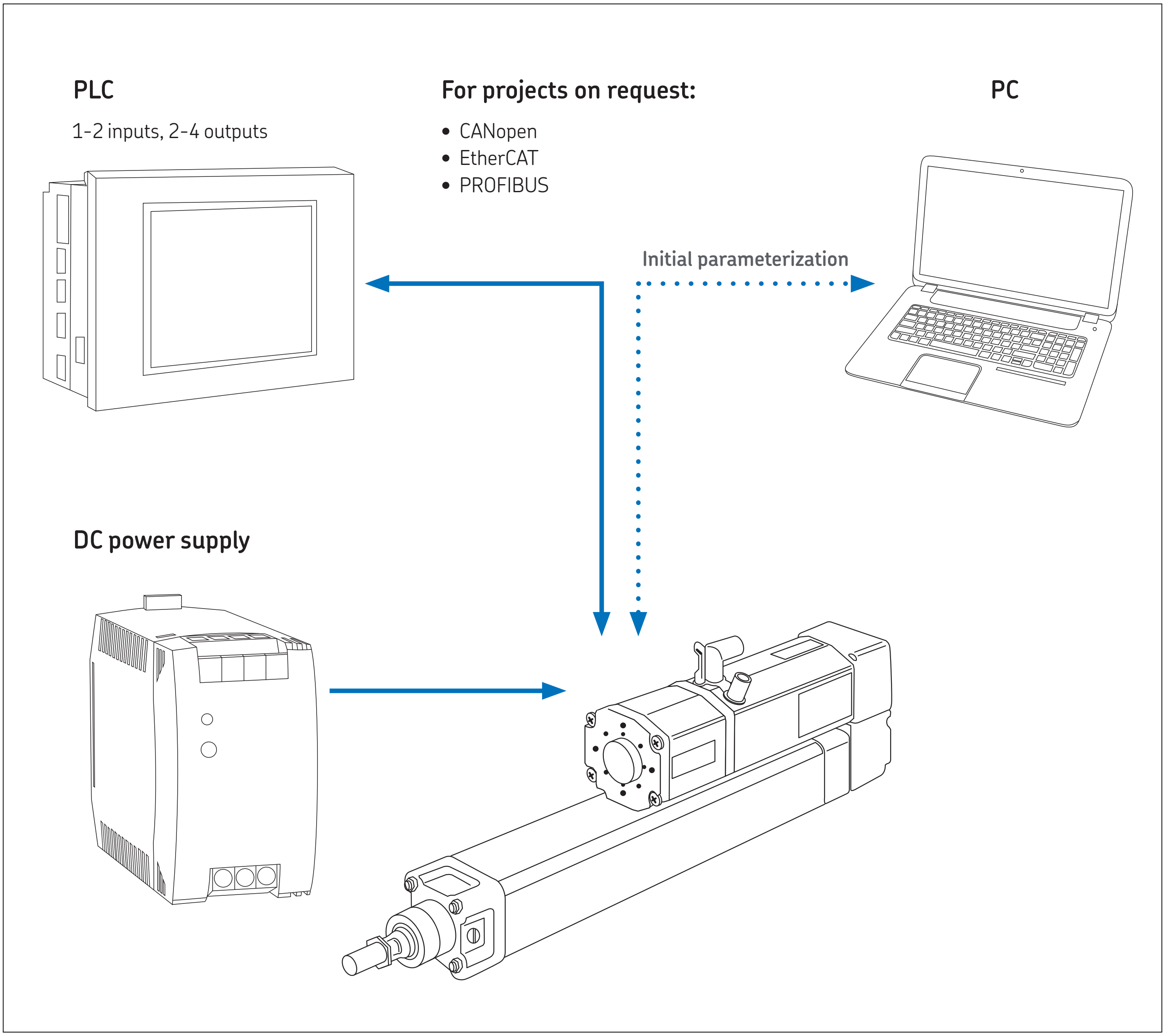


Brushless DC motor setup

- DC power supply to provide power to the actuator
- PLC to recall the pre-parameterized motion profiles which are stored in the integrated motion controller
- PC to initially parameterize the motion controller

Simplicity at its best

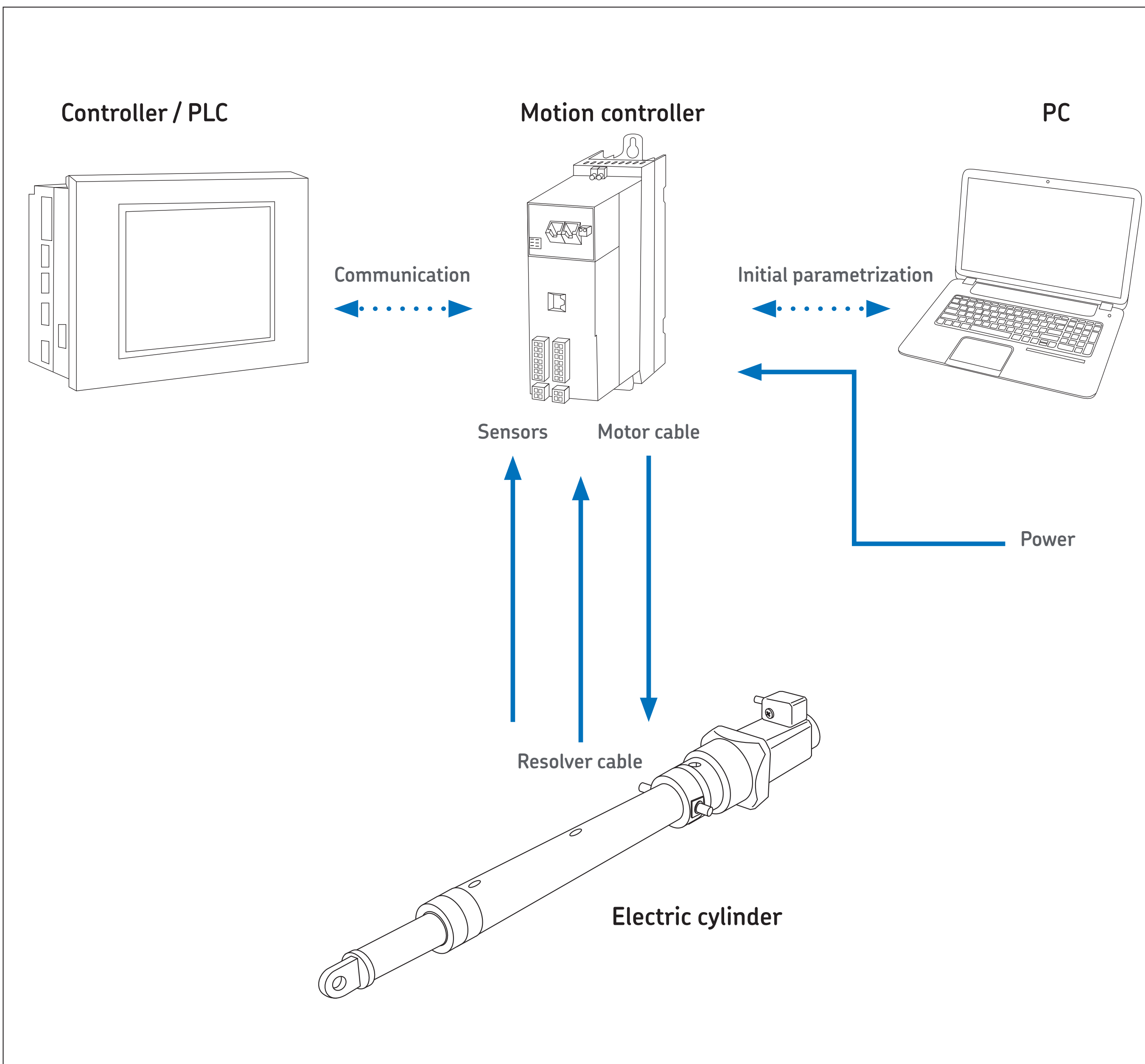
Brushless DC motors with integrated drive and brake are the cost efficient all-in-one solution for automated systems. After the initial parameterization, the system runs independently or can be controlled by a PLC.



Servo motor setup

- Motion controller to control actuator motion tasks
- PC to define initial settings of motion controller.
- Communication between PLC and motion controller through digital inputs/outputs or fieldbus (CANopen, Profibus, Profinet, Ethernet, EtherCAT, Powerlink MN/CN, Powerlink CN, DeviceNet).

Servo motor systems offer a high power density and highest controllability. Use the full performance of the mechanical system by a compact and powerful servo motor and move to any position with the highest accuracy.



SKF engineering tools

Apps and web-based solutions

To simplify the product selection process, SKF has created a set of free Web tools and Apps that allow quick and easy navigation into the wide linear motion offering.

Actuator Select

Users can choose the desired product family among Pillars, Linear Actuators, Rotary Actuators and Controls. Then, by entering few simple parameters, they will be guided in the product selection.

Key features include:

- Four complete product lines
- Dynamic filtering of the results
- Result ranking by application
- Product comparison (up to 3 at time)
- Indication of compatible control unit for selected Pillar or Actuator
- Cost saving calculator
- Direct link to product drawing, technical datasheet and catalogues

Additionally, there is a specific section dedicated to the selection of linear servo axis components (e.g., motor, linear unit and accessories) based on application data. Users enter application requirements and operating conditions, which the calculator then translates into performance specifications. For a linear servo axis, the calculator will present combinations of motor, linear unit and controller that fulfill the requirements. For in-depth technical information on the High Performance Actuator Calculator, please visit the dedicated section on **page 45**.

The Actuator Select tool is available for both phones and tablets. A web-based version of the tool is available at www.skf.com/actuator-select, while the app can be downloaded at the Apple App Store or Google Play.



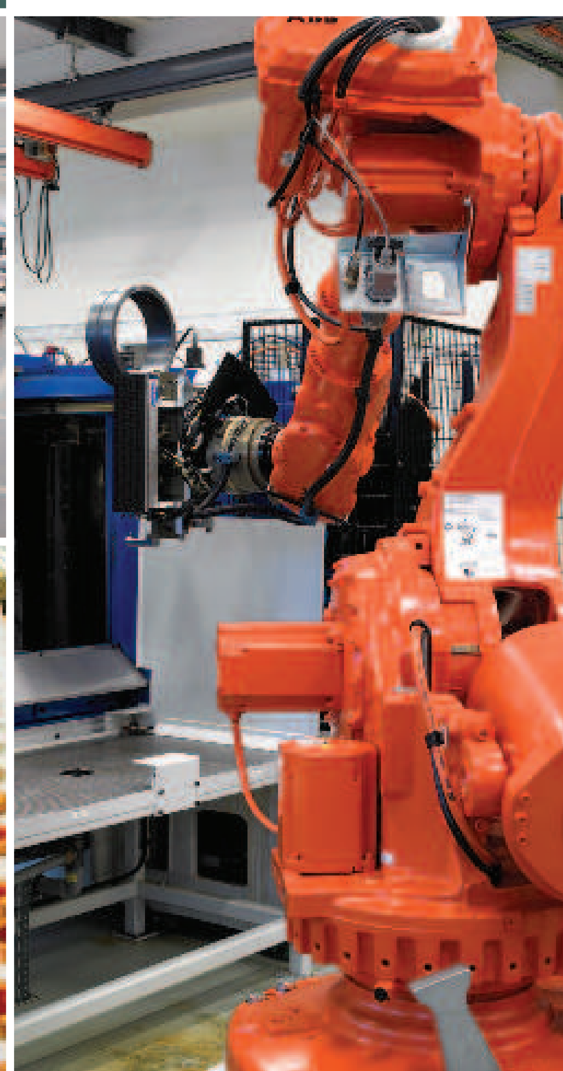
Calculation

MORE THAN

200

ACTUATOR VARIANCES
TO SELECT FROM





Actuator select performance calculator

The SKF High Performance Actuator Calculator section is a free online actuator and accessory selection tool. This calculation tool will give recommendations to select components of a linear servo axis (motor, linear unit and accessories) based on the application data. Based on the requirements and operating conditions of the user, the program will transform them into performance requirements. For a linear servo axis, it will present combinations of motor, linear unit and controller that fulfill the requirements.

The user can insert the main information about the working cycle, describing each step as absolute movement, weight and inertia of the mass to be moved. Based on that, the program will provide simple graphs that show the required position, speed and acceleration over time (→ **fig. 1**).

Consequently, the program suggests a list of possible solutions that fulfill the user needs in terms of perfomance and lifetime. For each solution, the graphs are updated to show the requirements vs. the real performance of the selection (→ **fig. 2**).

Fig. 1

Fig. 2

The user can then select the desired accessories, like front and rear attachments and limit switches. For each of them, it is possible to see the product picture and a brief description (→ **fig. 3**).

Finally, the program provides a recap of the selected solution and a printable list of the selected items for ordering (→ **fig. 4**).

It is available for both phones and tablets. A web-based version is available at www.skf.com/actuator-select

Please find the app at the Apple AppStore or Google Play.

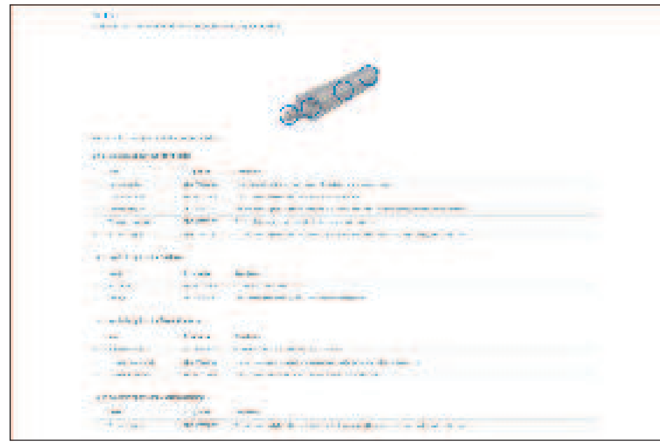


Fig. 3

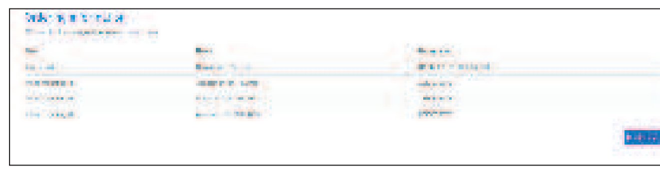
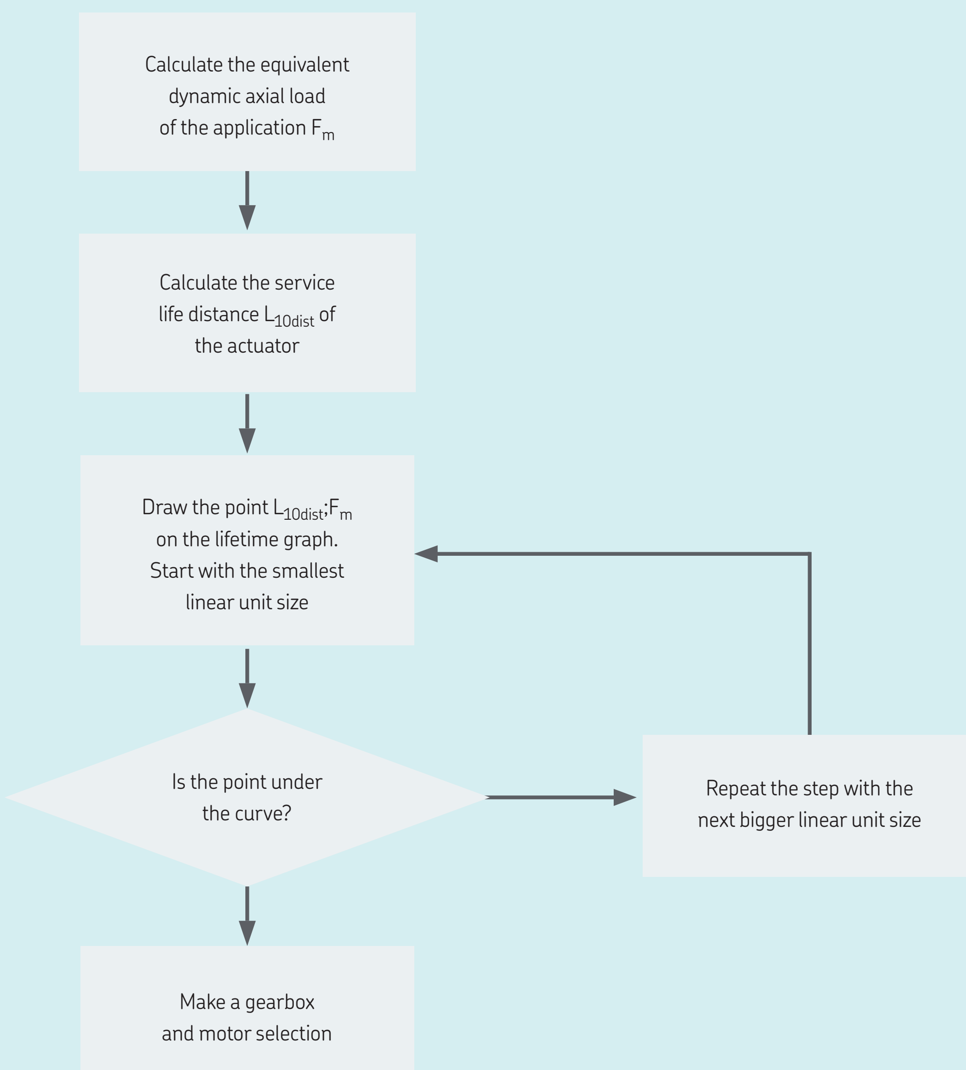


Fig. 4

Simplified calculation process

By following the described flow (→ **diagram 1**), the user can select the right linear unit and motor that fulfill the application needs. Each of these steps is described in the following pages, with the related calculation formulas to be used and a real example. The main factors to be considered from the application are the equivalent dynamic axial load, acting on the actuator, the travel distance to be achieved and the desired speed during the working cycles. From these values, user can then define the right actuator size and the required motor performances, in terms of torque and rotating speed. Finally, it's then possible to define the desired type of motor adapters, to match the possible dimensional constrains or to get a reduction ratio between the motor and the linear unit. If further assistance is needed, please contact SKF to get complete technical support.

Diagram 1

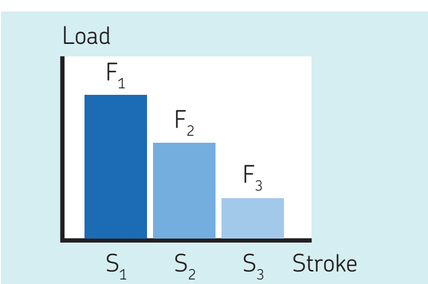


General calculation formulae

How to calculate the equivalent dynamic axial load F_m of the application.

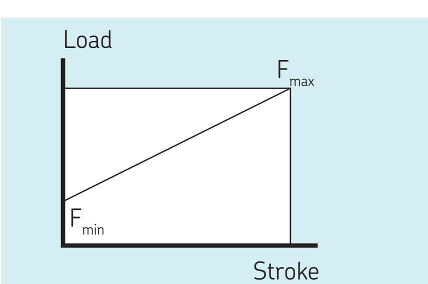
In most of the applications, the magnitude of the load fluctuates over the travelling distance. The service life of the linear unit depends on the load acting on it. To simplify the calculation we calculate the equivalent dynamic axial load over a full motion cycle F_m which has the same influence on the linear unit's service life as the actual fluctuating load.

$$F_m = \sqrt[3]{\frac{F_1^3\, s_1 + F_2^3\, s_2 + F_3^3\, s_3 + \dots}{s_1 + s_2 + s_3}}$$



or

$$F_m = \frac{F_{min} + 2F_{max}}{3}$$



where:

F_m: Equivalent dynamic axial load in N
$F_1, F_2 \dots F_n$: Load exerted over a segment of travelled distance sn
$S_1, S_2 \dots S_n$: Travelling distance over which the load F_n is exerted

Example to calculate the equivalent dynamic axial load

F_1 = 700 N, s_1 = 200 mm
F_2 = 500 N, s_2 = 0 mm
F_3 = 300 N, s_3 = 200 mm

$$F_m = \sqrt[3]{\frac{700^3 \times 200 + 500^3 \times 0 + 300^3 \times 200}{200 + 0 + 200}} = \mathbf{570}\ \text{N}$$

or

$$F_m = \frac{300 + 1\,400}{3} = \mathbf{566}\ \text{N}$$

How to calculate the lifetime distance L_{10dist}

The service life distance L_{10dist} is defined as the life in km that 90% of a sufficiently large group of apparently identical actuators can be expected to attain or exceed.

$$L_{10dist} = \frac{S_{cycle}\, t_L \times 3{,}6}{t_{cycle}}$$

$$L_{10dist} = s_{cycle}\, n_{cycles}$$

where:

L_{10dist}: Lifetime distance in km
S_{cycle}: Distance travelled per motion cycle in m (both directions)
t_{cycle}: Time per motion cycle in s (from one motion cycle to the next)
t_L: Required lifetime in hours
n_{cycles}: Number of cycles (in 1 000)

Example to select a linear unit

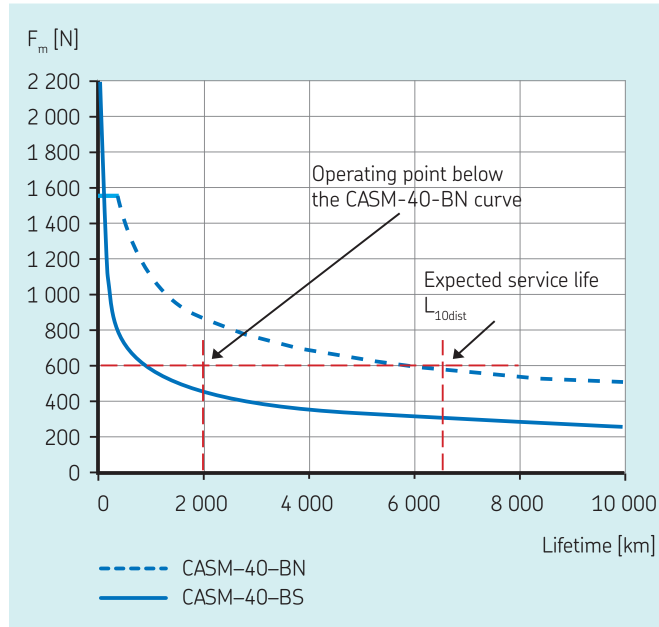
Total distance travelled per motion cycle: s_{cycle} = 0,4 m
Total time per motion cycle: t_{cycle} = 20 s
Required lifetime: t_L = 5 years x 230 days/year x 24 hours/day = 27 600 hours
n_{cycles} = 3 cycles/minute x 60 minutes x 24 hours x 230 days x 5 years / 1000 = 4 968 k_{cycles}

$$L_{10dist} = \frac{0{,}4 \times 27\,600 \times 3{,}6}{20} = 1\,987 \text{ km}$$

$$L_{10dist} = 0{,}4 \times 4\,968 = 1\,987 \text{ km}$$

Select the linear unit

Equivalent dynamic axial load F_m = 570 N
Lifetime distance L_{10dist} = 1 987 km



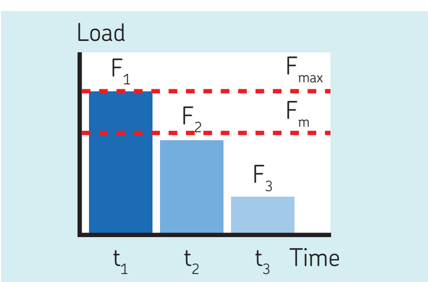
The operating point is below the CASM-40- BN curve. It is the smallest linear unit which fulfills the requirements. The expected service life is almost 6 500 km.

Motor selection

How to calculate the thermal load of the motor F_{th}

To calculate the mean motor torque, we first need to calculate the thermal load F_{th} over the motor running time. Please note that the use of a motor brake during pause time will reduce the needed power of the motor.

$$F_{th} = \sqrt[2]{\frac{F_1^2 t_1 + F_2^2 t_2 + F_3^2 t_3}{t_1 + t_2 + t_3}}$$



F_{th}: Equivalent thermal load of the application
$F_1, F_2 \ldots F_n$: Load exerted over a time (percentage of full motion cycle time t_{cycle})
$t_1, t_2 \ldots t_n$: Time over which the load F_n is exerted

Example

$F_1 = 700$ N, $t_1 = 2$ s
$F_2 = 500$ N, $t_2 = 15$ s (No travelling distance, but to hold a load of 500 N in position)
$F_3 = 300$ N, $t_3 = 3$ s

If no brake is engaged

$$F_{th} = \sqrt[2]{\frac{700^2 \times 2 + 500^2 \times 15 + 300^2 \times 3}{2 + 15 + 3}} = 500 \text{ N}$$

If a brake is engaged during the period t_2 to hold the load ($F_2 = 0$ for the motor)

$$F_{th} = \sqrt[2]{\frac{700^2 \times 2 + (0^2 \times 15) + 300^2 \times 3}{2 + 15 + 3}} = 250 \text{ N}$$

How to select an SKF – verified motor

When using an SKF-verified motor, make sure that the continuous force of the actuator mentioned in the system capabilities is equal to or higher than the calculated thermal load F_{th} of your application.

Example

The continuous force F_c of the CASM-40-BN inline configuration with Siemens 1FK7022 servo motor is 301 N. This is only enough if the brake is activated during the pause time t_2.(F_{th} = 250 N) (→ **table 1**).

If the system should run without using a brake, the bigger motor 1FK7034 is needed with a continuous force of 572 N (F_{th} = 500 N) (→ **table 2**).

Table 1

CASM-40 inline configuration with Siemens 1FK7022

	Unit	Peak force F_p	Cont. force F_c
CASM-40-LS	N	600	710
CASM-40-BS	N	2 375	758
CASM-40-BN	N	1 447	302

Table 2

CASM-40 inline configuration with Siemens 1FK7034

	Unit	Peak force F_p	Cont. force F_c
CASM-40-BS	N	2 375	1 485
CASM-40-BN	N	1 550	574

How to select a motor not verified by SKF

If using a motor of your choice, the force capabilities of the linear units have to be converted into motor torque specifications for the motor. The minimum required continuous torque and the maximum torque of the motor need to be calculated. This could either be done by considering screw leads and friction or by a simplified calculation using information about the linear unit's maximum input torque to get the maximum force.

Calculation of the required continuous torque of the motor

$$M_{Ac} = \frac{M_{max}\,F_{th}}{F_{max}}$$

where
M_{Ac}: Required continuous torque of the motor in Nm
M_{max}: Maximum input torque of the linear unit in Nm
F_{th}: Equivalent thermal load of the application in N
F_{max}: Maximum dynamic axial force of the linear unit in N

Example (if using the brake)

$$M_{Ac} = \frac{4 \times 250}{1\,550} = \mathbf{0{,}65}\ \text{Nm}$$

Calculation of the maximum required torque of the motor

$$M_{Amax} = \frac{T_{U\,max}\,F_{Amax}}{F_{U\,max}}$$

where
M_{Amax}: Required maximum torque of the motor in Nm
$T_{U\,max}$: Maximum input torque of the linear unit in Nm
F_{Amax}: Maximum dynamic axial load of the application in N
$F_{U\,max}$: Maximum dynamic axial force of the linear unit in N

$$M_{Amax} = \frac{4 \times 700}{1\,550} = \mathbf{1{,}81}\ \text{Nm}$$

In our example, the continuous torque of the motor should be higher than 0,65 Nm (if using the brake) while the maximum torque must exceed 1,81 Nm to move the load of 700 N.

This calculation is valid for inline adapters and parallel adapters with a belt, where the gear ratio equals 1 and the efficiency is close to 100%.

The rotational speed is directly linked to the linear speed. Divide the linear speed by the screw lead to obtain the rotational speed. The relation of torque and force is a constant factor: To get the torque, take the force * M_{max} / F_{max}

Please Note

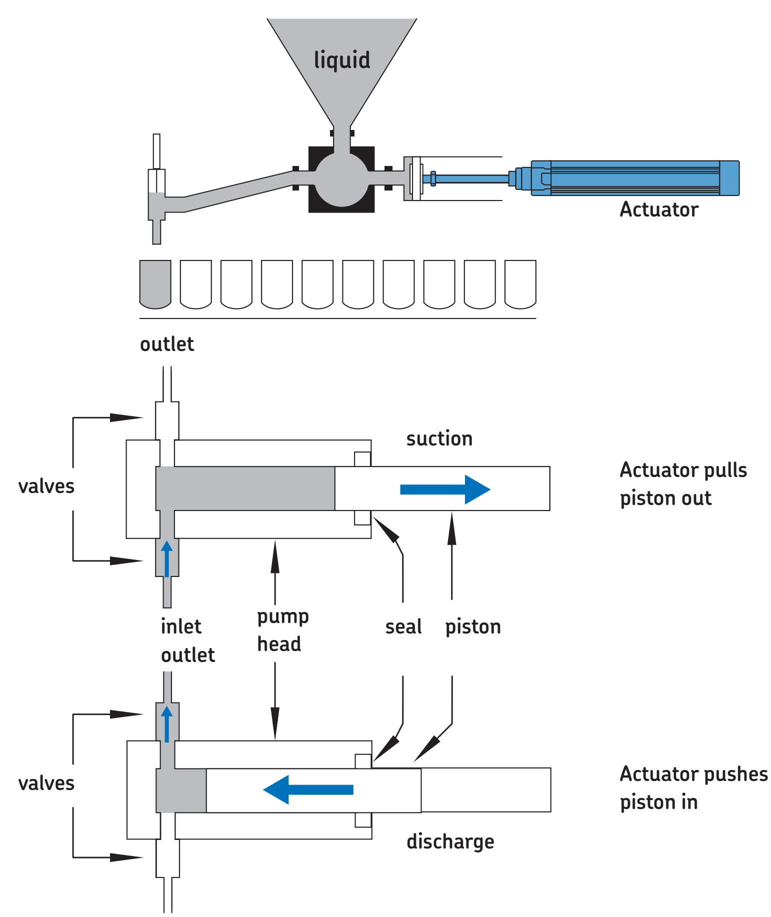
The dynamic torque of the motor may vary with the speed. Please make sure that your motor is able to reach the needed speed, acceleration and max. torque for your application.

Calculation examples

Dosage of liquids with CASM electric cylinders

Technical requirements

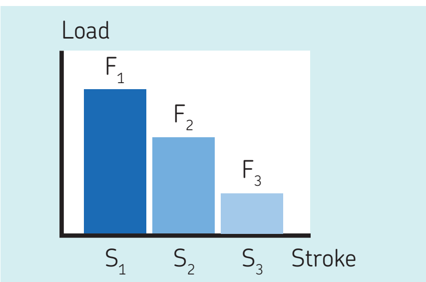
- Stroke: s = 100 mm
- Mounting position: horizontal
- Push force: F_1 = 250 N
- Pull force: F_2 = 50 N
- Cycles: 90 cycles per minute
- Working time: 16 hours per day
- Lifetime: 2 years (520 days)



Selection of the linear unit

Calculate the equivalent dynamic axial load F_m of the application

$$F_m = \sqrt[3]{\frac{F_1^3 s_1 + F_2^3 s_2 + F_3^3 s_3 + \ldots}{s_1 + s_2 + s_3 + \ldots}}$$



where
F_m = Equivalent dynamic axial load in N
$F_1, F_2 \ldots F_n$ = Load exerted over a segment of travelled distance s_n
$s_1, s_2 \ldots s_n$ = Travelling distance over which the load F_n is exerted

$$F_m = \sqrt[3]{\frac{250^3 \times 100 + 50^3 \times 100}{100 + 100}} = 199 \text{ N}$$

Calculate the service life distance L_{10dist}

$L_{10dist} = s_{cycles} \times n_{cycles}$

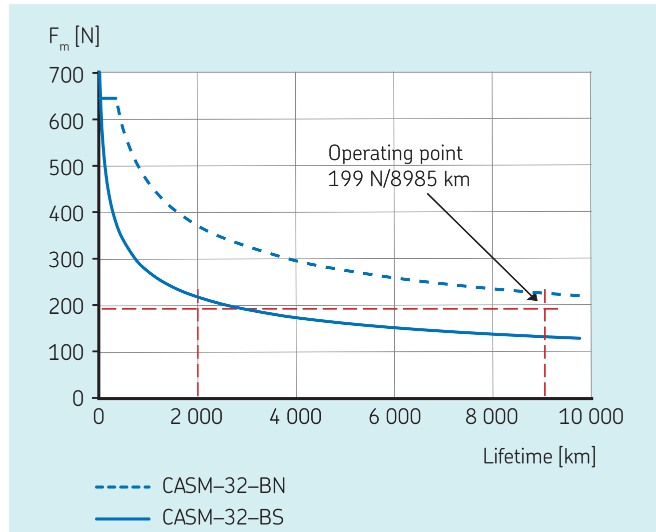
where:
L_{10dist} = Lifetime distance in km
S_{cycle} = Distance travelled per motion cycle in m (both directions)
n_{cycles} = Number of cycles (in 1 000 cycles)

Distance travelled per motion cycle: s_{cycle} = extend 100 mm + retract 100 mm = 0,2 m
Number of cycles n_{cycles} = 90 cycles x 60 minutes x 16 hours x 520 days = 44 928 k_{cycles}

$L_{10dist} = 0{,}2 \times 44\,928 = 8\,985{,}6$ km

Select the linear unit

Equivalent dynamic axial load F_m = 199 N
Lifetime distance L_{10dist} = 8 985,6 km



The operating point is below the dashed line. The CASM-32-BN is the smallest linear unit for this application which fulfills the requirements.

Selected linear unit: CASM-32-BN with 100 mm stroke. The expected service life is >10 000 km

Speed check

To move 200 mm within 0,667 seconds (90 cycles per minute), we need a speed of at least 200 mm/0,667 s = 300 mm/s

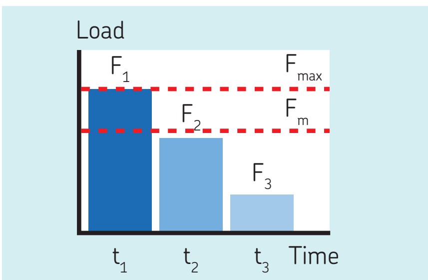
The CASM-32-BN can do 500 mm/s.

Linear unit CASM–32–BN

Selection of the motor

Calculation of the thermal load of the motor F_{th}

$$F_{th} = \sqrt[2]{\frac{F_1^2\, t_1 + F_2^2\, t_2 + F_3^2\, t_3 + \ldots}{t_1 + t_2 + t_3 + \ldots}}$$



where:

F_{th}: Equivalent thermal load of the application

F_1, F_2… F_n: Load exerted over a time (percentage of full motion cycle time t_{cycle})

t_1, t_2… t_n: Time over which the load F_n is exerted

$$F_{th} = \sqrt[2]{\frac{250^2 \times 0{,}333 + 50^2 \times 0{,}333}{0{,}333 + 0{,}333}} = 180\ \text{N}$$

What if we would move with maximum speed and engage the brake during the pause time? The maximum speed is 500 mm/s. We could do the 100 mm stroke within 0,2 seconds (acceleration and deceleration disregarded).

$$F_{th} = \sqrt[2]{\frac{250^2 \times 0{,}2 + 50^2 \times 0{,}2 + 0{,}333}{0{,}2 + 0{,}2 + 0{,}267}} = 140\ \text{N}$$

In some cases, a smaller (cheaper) motor can be used if we are using a brake.

Using an SKF verified motor

Make sure that the continuous force of the actuator is higher than the calculated thermal force F_{th} of the application.

The continuous force F_c of the CASM-32-BN with a Siemens 1FK7015 motor is 169 N. This would only work if we are moving with maximum speed and engage the brake during the pause time (→ **table 3**, **fig. 1** and **2**).

If we don't want to use a brake, the bigger motor 1FK7022 is needed which allows a continuous force F_c of 385 N.

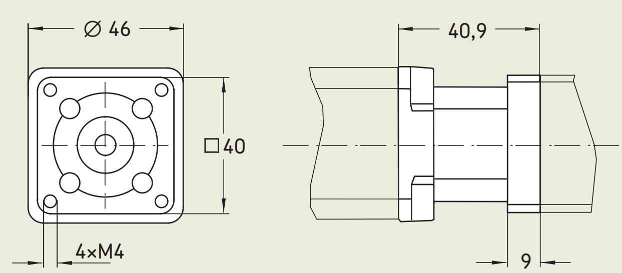
Table 3

CASM-32 inline configuration with Siemens 1FK7015

	Unit	Peak force F_p	Cont. force F_c
CASM-32-LS	N	300	47
CASM-32-BS	N	700	503
CASM-32-BN	N	528	169

Fig. 1

Inline adapter kit for CASM-32 and Siemens 1FK7015 motor



All dimensions in mm

Fig. 2

When doing 90 cycles per minute with the slowest possible speed of 300 mm/s, the bigger motor 1FK7022 is needed which allows a continuous force F_c of 385 N (→ **table 4, fig. 3** and **4**).

B

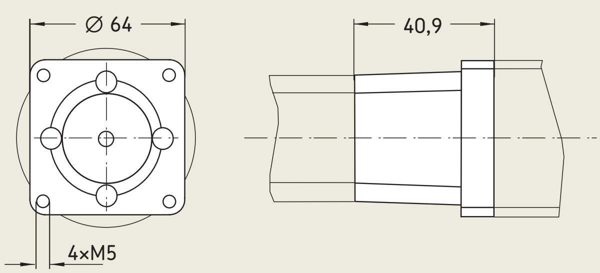
Table 4

CASM-32 inline configuration with Siemens 1FK7022

	Unit	Peak force F_p	Cont. force F_c
CASM-32-BS	N	700	700
CASM-32-BN	N	528	385

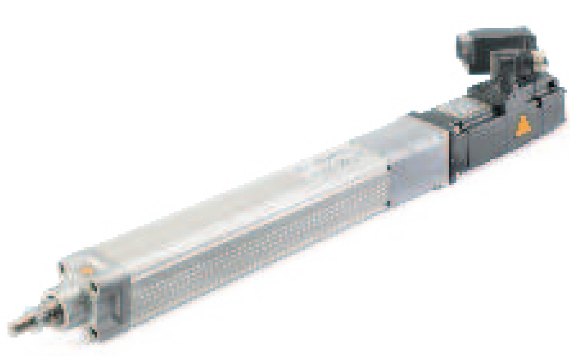
Fig. 3

Inline adapter kit for CASM-32 and Siemens 1FK7022 motor



All dimensions in mm

Fig. 4



Fluid power replacement advices

To realize all the advantages of electromechanical actuators, the approach to system redesign must be different from the commonly adopted one. As pneumatic, hydraulic and electromechanical cylinders have unique features, there needs to be a change in thinking when it's time to replace one with the other.

In fact, it's important to understand the different mechanical and electrical specifications along with the required budget, as there are always multiple ways to replace one application. This requires more time to analyze and study but it's the only way to make an effective product selection that can save a lot of money at the end.

There are some common mistakes that designers can make when replacing a fluid powered cylinder with a electromechanical one that may lead to oversized systems. To avoid them, it's important to consider the following:

1. Define the real force requirement

In many applications, the real work load and related required push and pull forces are not known, as it's quite easy with fluid power to oversize the system by using higher pressures or bigger cylinder diameters. This can lead to an oversize of the actuator screw and motor that significantly increases the cost. Instead, by measuring the real force in the application, it's possible to select an optimized solution that delivers the required performance at the right price.

2. Evaluate the duty cycle in operation

While duty cycle can have a minor impact on fluid powered systems, in actuators it can determine the type of motor technology required and therefore the related system complexity and cost. If the application is done from time to time (e.g. 1 minute operating – 4 minutes standing still), it's possible to use brushed motors that can deliver the required power much cheaper than equivalent brushless motors with drivers.

3. Analyze the mechanical layout

Hydraulics can deliver more power in a smaller package than electromechanical actuators. In case of leveraged connections (e.g. scissor mechanism), it's quite common to have an unfavorable situation where the high forces are exerted over a very short stroke. By slightly revising the mechanical layout, it may be possible to have more favorable leverages that spread the load over a longer stroke, requiring less peak output power and then a smaller actuator.

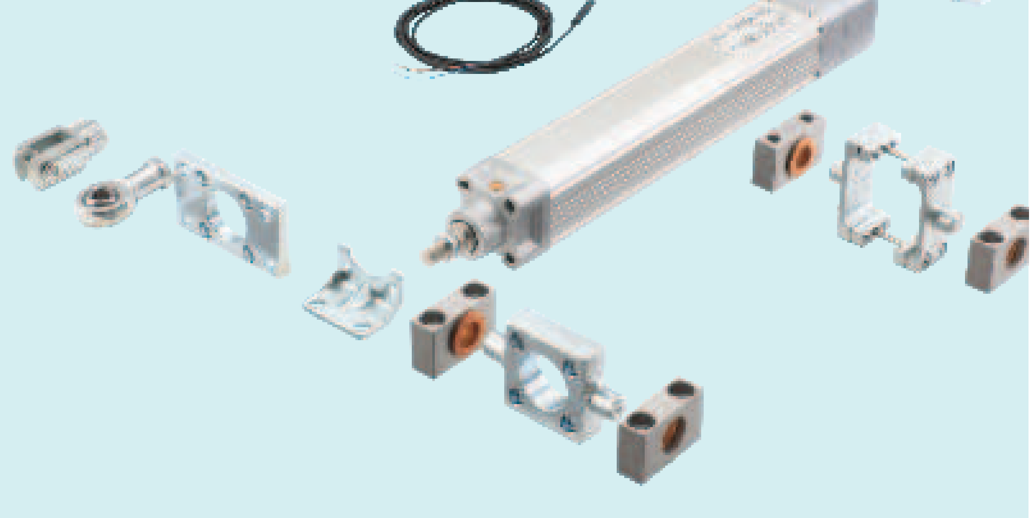
4. Define the required motion accuracy

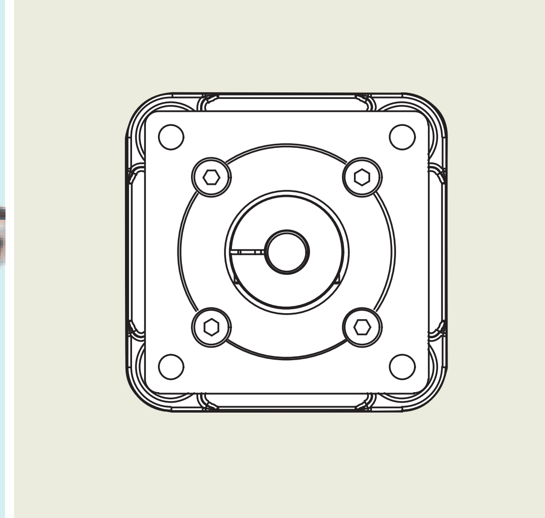
Depending on the application, it may be needed to perform a simple motion from one position to another and back or to have fine control of the speed and acceleration in multiple positions. With electromechanical actuators, the simple DC and asynchronous AC motors can perform basic movements in an ON/OFF control mode while with a servo motor, it's possible to achieve complete control in operation with the use of a motion controller. Moreover, depending on the positioning accuracy required, it's possible to select a simple trapezoidal screw with axial play or a recirculating pre-loaded roller screw for the ultimate positioning precision and repeatability, down to microns. The cost and control complexity rises linearly allowing a direct selection tailored to real application needs.

With more than 40 years of experience in making electromechanical actuators, SKF has extensive expertise in sizing electromechanical solutions for different types of industries and applications. A dedicated team of Application Engineers are available to support customers in defining the right solution, and advising on the best choice based on theoretical calculation and field expertise.

SKF offers the widest range of actuators on the market that can also be customized to fit any application requirements.

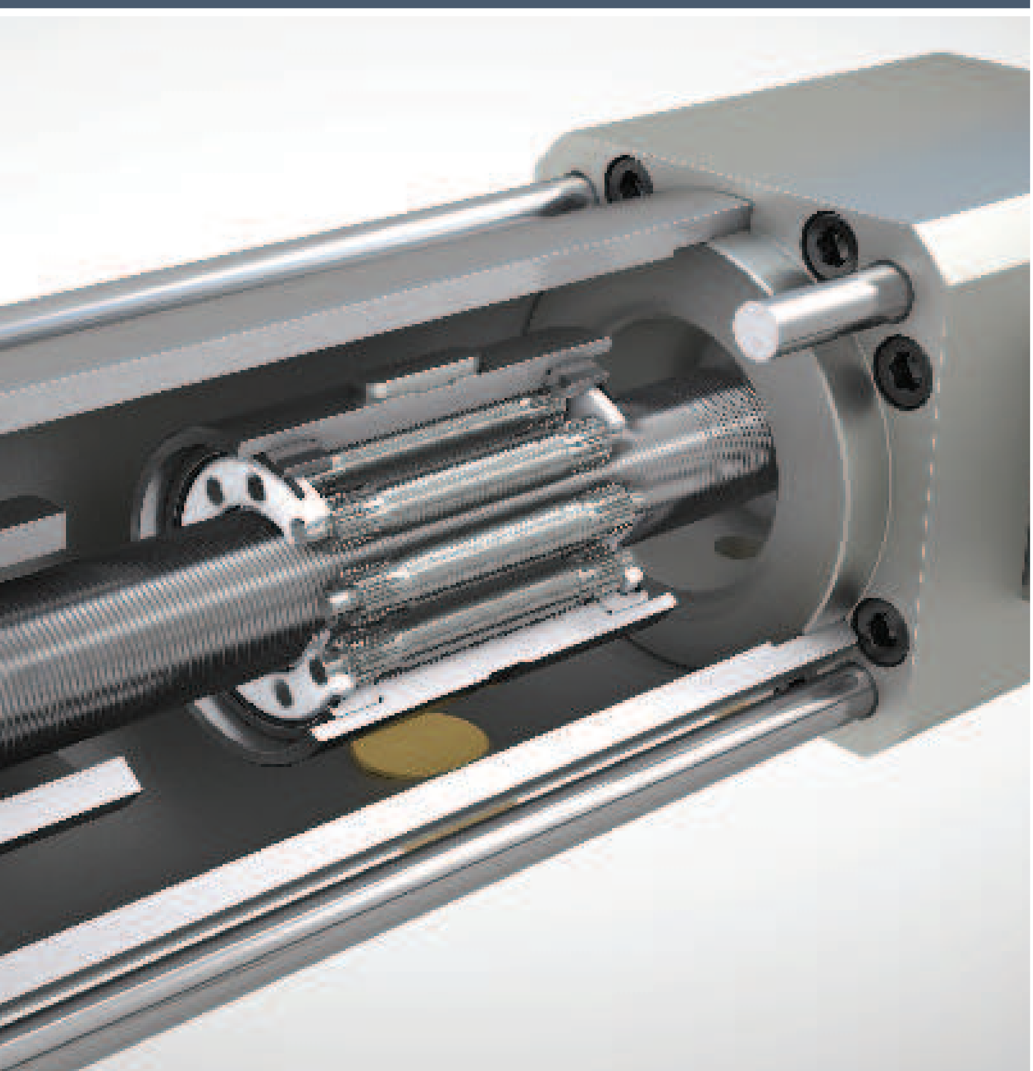
→ Visit skf.com/actuator-select to easily select and size your actuator and to get in contact with our experts.

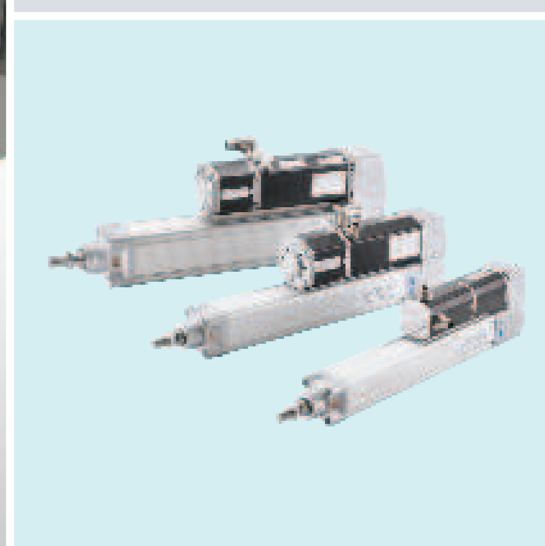




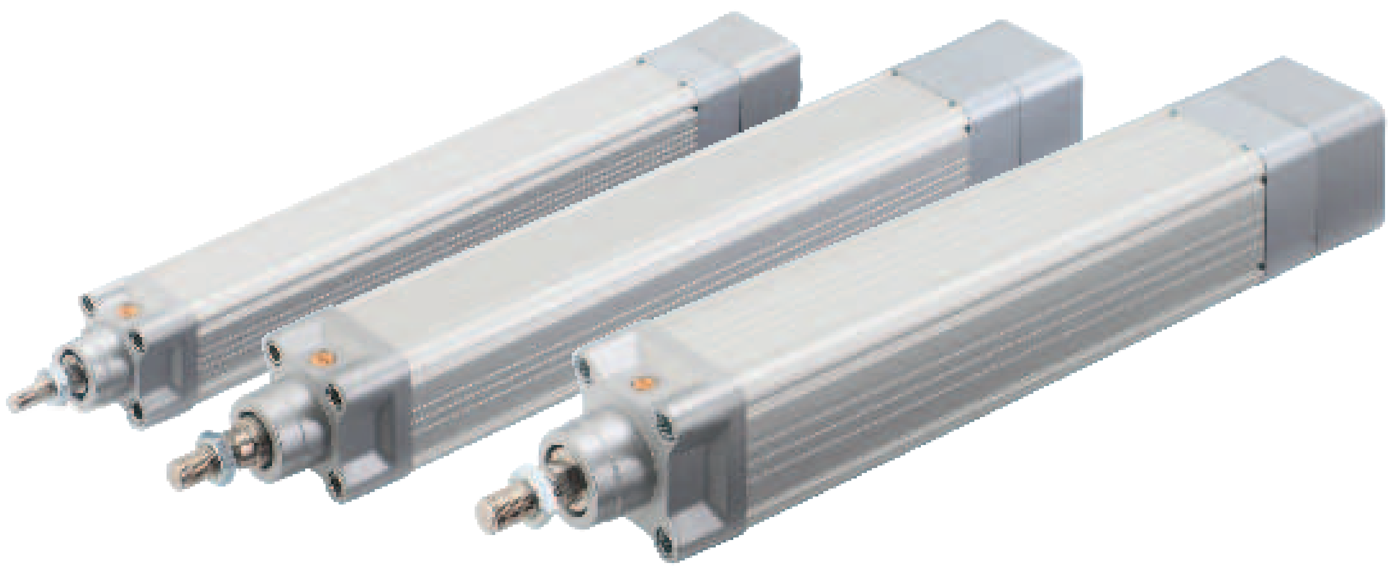
Product range

UP TO 500 kN AXIAL FORCE





Electric cylinders CASM-32/40/63



C

Features

- Modular cylinder system in three different sizes
- Three different screws for each cylinder size
- Inline and parallel (belt) gearboxes
- Customized motor adapter plate
- Meets ISO-15552 standards
- High level of precision and repeatability
- Wide range of accessory parts

Benefits

- Optimal for a wide range of power and life-time requirements
- Wide range of speed and force
- Mechanically fits most applications
- Fits most of brushless DC and servo motors
- Easy to replace pneumatic cylinders
- Accurate positioning (depending upon feed-back system of the motor)
- Flexibility in mounting cylinders

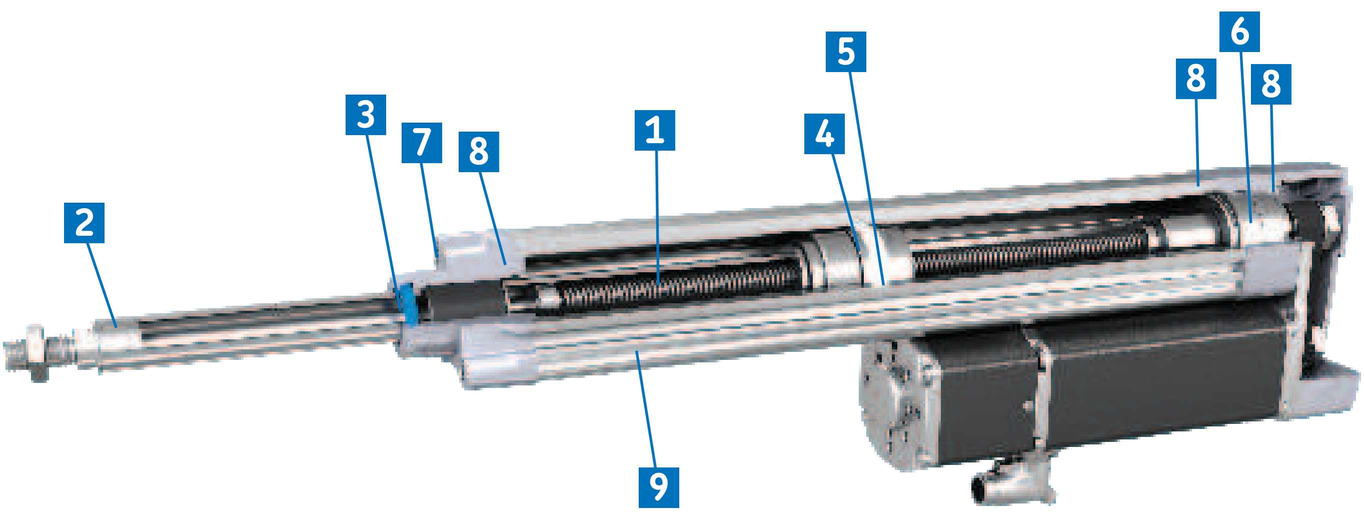
Product description

CASM electric cylinders are ideally suited to perform fast and powerful linear movements. Unlike pneumatic or hydraulic cylinders, CASM electric cylinders are flexible and thus can be positioned precisely. In addition, due to a reduced number of components, the whole system is more cost effective, resulting in lower energy and maintenance costs.

The CASM modular concept enables easy connection to your preferred motor and control system. This can reduce design and programming costs considerably.

Thanks to high grade materials, a sealing system with IP54S level protection and high quality manufacturing, CASM electric cylinders can also be used long term even under adverse conditions.

The low backlash design provides positioning precision of up to ± 0,01 mm. Together with various screws for different speeds and forces, CASM electric cylinders are the optimum solution for a variety of applications.



1 High quality ball and lead screws with low axial play and low friction, lubricated for the whole product life
2 Stainless steel push tube
3 Shaft seal to protect against contaminants ingress
4 Magnet ring for proximity sensors
5 Anti-rotation device with overload protection
6 High-quality SKF bearings
7 Sinter filter for high airflow
8 Flat seal between housings
9 Anodised aluminium profile with proximity sensor slots

C

Performance overview of linear units

Linear unit	F_{max}	F_{0max}	V_{max}
	kN		mm/s
CASM-32-LS	0,3	0,7	60
CASM-32-BS	0,7	0,7	150
CASM-32-BN	0,63	0,7	500
CASM-40-LS	0,6	1,5	70
CASM-40-BS	2,375	2,375	300
CASM-40-BN	1,55	2,375	826
CASM-63-LS	1	3,7	70
CASM-63-BN	5,4	5,4	533
CASM-63-BF	2,8	5,4	1 067

Performance overview of actuators

Linear unit	Motor	Adapter	F_{c0}	F_{p0}	V_{max}
–	–	–	kN		mm/s
CASM-32-LS	BG45	inline/parallel	0,300	0,300	60
CASM-32-LS	1FK7015	inline/parallel	0,300	0,300	60
CASM-32-BS	BG45	inline/parallel	0,393/0,389	0,700	150
CASM-32-BS	1FK7015	inline/parallel	0,549/0,544	0,700	150
CASM-32-BS	1FK7022	inline	0,700	0,700	150
CASM-32-BN	BG45	inline/parallel	0,132/0,131	0,497/0,492	500
CASM-32-BN	1FK7015	inline/parallel	0,185/0,183	0,528/0,523	500
CASM-32-BN	1FK7022	inline	0,449	0,630	500
CASM-40-LS	BG65S	inline/parallel	0,6/0,596	0,600	70
CASM-40-LS	1FK7022	inline/parallel	0,600	0,600	70
CASM-40-BS	BG65S	inline/parallel	0,673/0,666	1,805/1,787	298
CASM-40-BS	BG75	inline/parallel	1,239/1,227	2,375	300
CASM-40-BS	1FK7022	inline/parallel	0,908/0,899	2,375	300
CASM-40-BS	1FK7034	inline/parallel	1,709/1,692	2,375	300
CASM-40-BN	BG65S	inline/parallel	0,268/0,265	0,719/0,712	756
CASM-40-BN	BG75	inline/parallel	0,494/0,489	1,55/1,276	783
CASM-40-BN	1FK7022	inline/parallel	0,362/0,358	1,447/1,276	826
CASM-40-BN	1FK7034	inline/parallel	0,681/0,674	1,55/1,276	826
CASM-63-LS	BG75	inline/parallel	0,711/0,704	1,000	70
CASM-63-LS	1FK7034	inline/parallel	0,98/0,97	1,000	70
CASM-63-BN	BG75	inline/parallel	0,62/0,613	2,19/2,168	533
CASM-63-BN	1FK7034	inline/parallel	0,855/0,846	3,471/2,937	533
CASM-63-BN	1FK7044	inline	2,403	5,400	533
CASM-63-BF	BG75	inline/parallel	0,313/0,31	1,108/1,097	1 067
CASM-63-BF	1FK7034	inline/parallel	0,432/0,428	1,756/1,486	1 067
CASM-63-BF	1FK7044	inline	1,216	2,800	1 067

Motors and gearboxes

Servo motors

The Siemens motors provided by SKF come with a multipole resolver, a shaft-end with no keyway and a holding brake.

In addition, they are equipped with a Drive-CLiQ interface. A rotating plug adapter simplifies the connection and cable routing in all installation positions.

For more information, please visit the following sites:

Motors:
www.siemens.com/motors
Frequency converters:
www.siemens.com/sinamics
Automations systems:
www.siemens.com/simotion
Controls:
www.siemens.com/simatic
Engineering software:
www.siemens.com/sizer
Support worldwide:
www.siemens.de/service

Motor technical data

Motor type Designation	Unit	1FK7015-5AK71-1SH3	1FK7022-5AK71-1UH3	1FK7034-2AK71-1UH0	1FK7044-4CH71-1UH0
Rated power (100 K)	kW	0,1	0,43	0,63	1,41
Rated speed	min^{-1}	6 000	6 000	6 000	4 500
Rated current	A	0,85	1,4	1,3	4,9
Rated torque (100 K)	Nm	0,16	0,6	1	3
Static torque (100 K)	Nm	0,35	0,85	1,6	4
Peak torque	Nm	1	3,4	6,5	12
Inertia with brake	10^{-4} kgm^2	0,102	0,35	0,98	1,41
Shaft diameter	mm	20	28	36	48
Weight with brake	kg	1,2	2	4	8,3

Ordering key

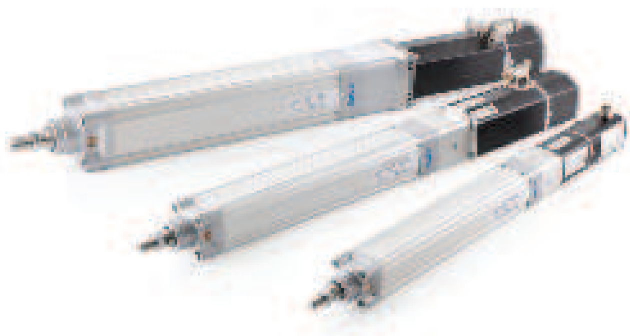
Motor	CASM-32		CASM-40		CASM-63	
	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter
1FK7015-5AK-71-1SH3	ZBE-375530	ZBE-375540	–	–	–	–
1FK7022-5AK71-1UH3	ZBE-375537	–	ZBE-375538	ZBE-375546	–	–
1FK7034-2AK71-1UH0	–	–	ZBE-375545	ZBE-375603	ZBE-375544	ZBE-375543
1FK7044-4CH71-1UH0	–	–	–	–	ZBE-375535	–

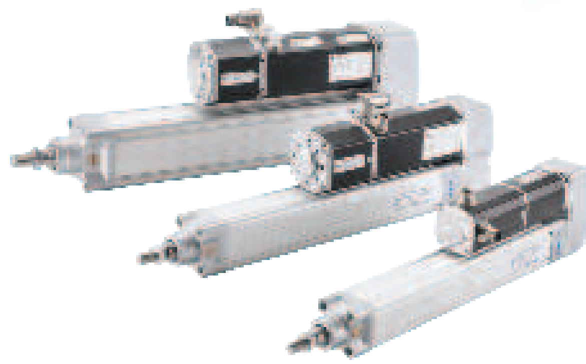
Brushless DC motors

Brushless DC motors are perfectly suited to replace pneumatic cylinders in many applications. The motors provided by SKF are equipped with internal controllers and are very simple to set up. Connected to the power supply, the motors can be programmed by a computer with up to 14 motion profiles. The profiles can be activated by 2-4 binary inputs (PLC outputs or switches).

The internal encoders enable for high positioning accuracy while the internal brake secures the system in case of a power loss.

For more information, please visit the following site:
www.skf.com/casm
www.dunkermotoren.de





C

Motor technical data

Motor type Designation	Unit	BG45x30PI	BG65Sx50PI	BG75x75PI
Nominal voltage	V	24	40	40
Rated power	W	90	236	450
Rated speed	min^{-1}	3 360	3 570	3 700
Rated current	A	4,9	7	12,7
Rated torque	Ncm	25	169	116
Peak torque	Ncm	94,2	169	410
Inertia	gcm^2	44	129	652
Shaft diameter	mm	6	8	14
Weight with brake	kg	0,74	2,17	3,3

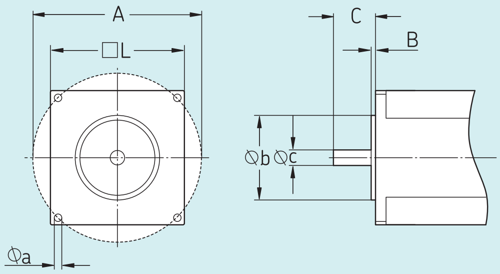
Ordering key

Motor	CASM-32		CASM-40		CASM-63	
	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter
BG45x30PI	ZBE-375570	ZBE-375573	–	–	–	–
BG65Sx50 PI	–	–	ZBE-375571	ZBE-375574	–	–
BG75x75 PI	–	–	ZBE-375579	ZBE-375578	ZBE-375572	ZBE-375575

Third party motors

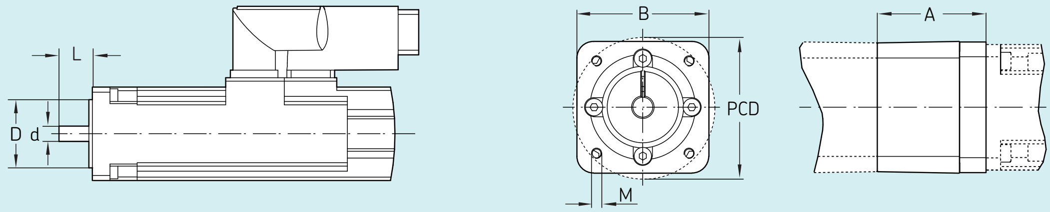
In order to attach your preferred motor to the linear unit, SKF offers tailor made solutions within the specifications below.

For motor specifications which are not covered by the specifications below, please contact SKF.



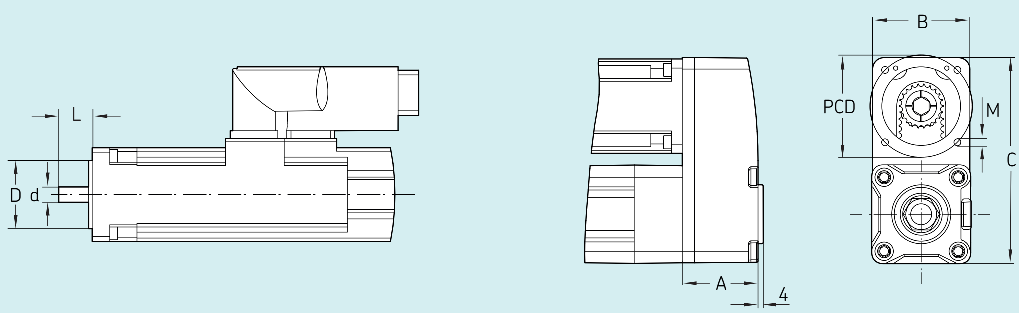
	CASM-32		CASM-40			CASM-63	
	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter	Parallel adapter	Inline adapter	Parallel adapter
Order #	M/0129709	M/0130493	M/0129710	M/0130494	M/0130647	M/0129711	M/0130495
	mm	mm *(in)*	mm	mm *(in)*	mm		
□ L	20...any value	20...47,5	40...any value	30...62	30...110	60...any value	30...86
∅b	18...75	15...32	31...75	20...44	20...65	47...95	20...65
B	1...7	1...10	1...5	1...3	1...4	1...5	1...4
∅A	36...106	19...49	36...106	24...68	24...89	52...103	24...89
∅c	6...14	6, 8, *(1/4)*	8...14	8, 9, *(1/4)*, *(3/8)*	8, 11, 12, 14	11...19	8, 11, 12, 14
C	13...33	15...40	13...33	16...41	15...32	15...48	15...32

Inline interface



Interface	d	D	L	PCD	M	A	B	Torque max	Inertia	Weight
	mm				–	mm		Nm	10^{-4} kgm^2	kg
CASM-32										
ZBE-375530	8	30	20	46	M4	40,9	46	2	0,006	0,25
ZBE-375537	9	40	20	64	M5	49,4	55	2	0,006	0,3
ZBE-375570	6	22	20	32	3,4	39,7	45,5	2	0,006	0,25
M/0129709	6...14	18...75	13...33	36...106	N/A	N/A	>20	2	N/A	N/A
CASM-40										
ZBE-375538	9	40	20	63	M5	49,4	55	12	0,006	0,3
ZBE-375545	14	60	30	75	M6	52,4	72	12	0,006	0,3
ZBE-375571	8	32	25	45	5,5	53,5	54	12	0,006	0,3
ZBE-375579	14	32	30	45	5,3	52,4	75	12	0,006	0,3
M/0129710	8...14	31...75	13...33	36...106	N/A	N/A	>40	12	N/A	N/A
CASM-63										
ZBE-375544	14	60	30	75	M6	62,4	75	25	0,200	0,35
ZBE-375535	19	80	40	100	M6	70,9	100	25	0,200	0,35
ZBE-375579	14	32	30	60	6,4	67,1	75	25	0,200	0,35
M/0129711	11...19	47...95	15...48	52...103	N/A	N/A	>60	25	N/A	N/A

Parallel interface



Interface	d	D	L	PCD	M	A	B	C	Torque max	Inertia	Weight
	mm (in)				–	mm			Nm	10^{-4} kgm^2	kg
CASM-32											
ZBE-375540	8	30	20	46	M4	40,1	45,1	93,3	1	0,0016	0,35
ZBE-375573	6	22	20	32	3,4	39,5	45,1	93,3	1	0,0016	0,35
M/0130493	6, 8 (1/4")	15...32	15...40	19...49	N/A	N/A	20...47,5	93,3	1	N/A	N/A
CASM-40											
ZBE-375546	9	40	20	63	M5	47,1	56,6	115,3	3	0,0089	0,4
ZBE-375603	14	60	30	75	M6	58,1	74,1	157,3	3	0,0548	0,45
ZBE-375574	8	32	25	40	5,5	46,5	56,6	115,3	3	0,0089	0,4
ZBE-375578	14	32	30	45	5,3	58	74,1	156,6	3	0,0548	0,45
M/0130494	8, 9 (1/4", 3/8")	20...44	16...41	24...68	N/A	N/A	30...62	115,3	3	N/A	N/A
M/0130647	8, 11, 12, 14	20...65	15...32	24...89	N/A	N/A	30...110	157,3	3	N/A	N/A
CASM-63											
ZBE-375543	14	60	30	75	M6	58,1	74,1	157,3	5,5	0,0548	0,45
ZBE-375575	14	32	30	60	6,4	39,5	45,1	157,3	5,5	0,0548	0,45
M/0130495	8, 11, 12, 14	20...65	15...32	24...89	N/A	N/A	30...86	157,3	5,5	N/A	N/A

Manuals

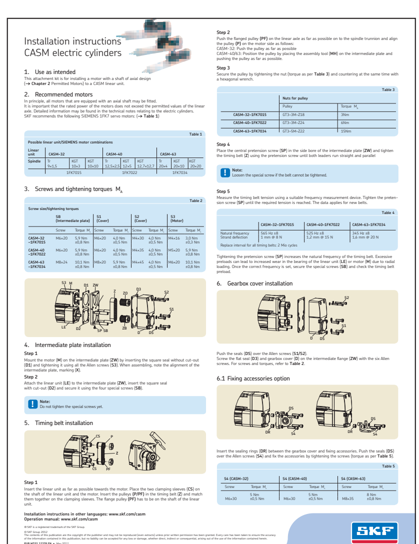
Supporting documents are available for downloading on skf.com/casm in each product page under technical data section:

- operating manual PUB 12396/1
- mounting instruction PUB 12378 /11008 / 14796 / 14832

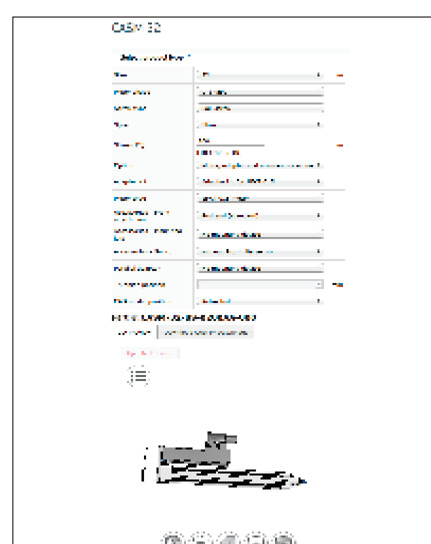
3D models

Product configurators for 3D models download are available on skf.com/casm, after selecting the desired actuator size

Operating manual PUB 12396/1



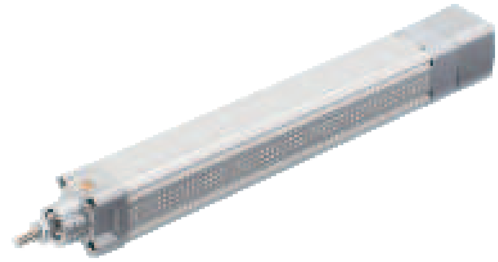
Mounting instruction PUB 12378 /11008 / 14796 / 14832



3D Models

CASM-32

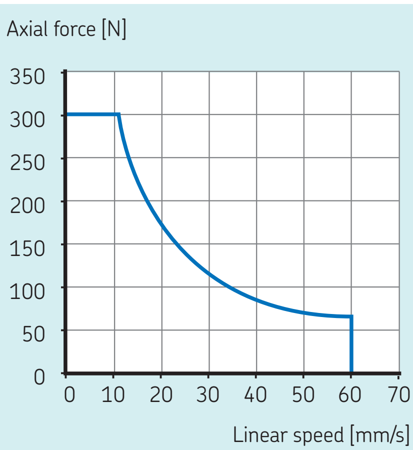
Linear unit



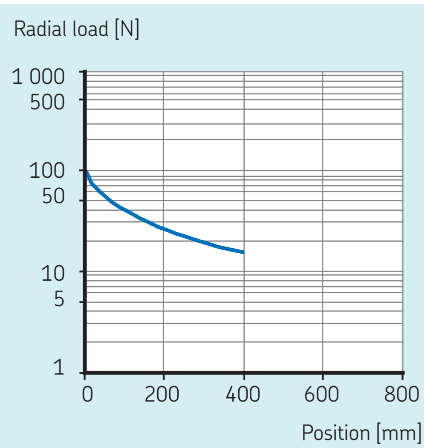
Technical data

Designation	Symbol	Unit	CASM-32-LS	CASM-32-BS	CASM-32-BN
Performance Data					
Max. dynamic axial force	F_{max}	kN	0,3	0,7	0,63
Max. static axial force	F_{0max}	kN	0,7	0,7	0,7
Dynamic load capacity	C	kN	N/A	2,8	2,5
Maximum torque to reach F_{max}	M_{max}	Nm	0,24	0,45	1,19
Max. linear speed	v_{max}	mm/s	60	150	500
Max. rotational speed	n_{max}	1/min	2 400	3 000	3 000
Max. acceleration	a_{max}	m/s^2	1	6	6
Duty cycle	D_{unit}	%	60	100	100
Mechanical Data					
Screw type	–	–	Lead screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	9	10	10
Screw lead	p_{screw}	mm	1,5	3	10
Lead accuracy	–	–	N/A	G7	G7
Stroke	s	mm	50...400	50...400	50...400
Internal overstroke each side	s_0	mm	1	1	1
Backlash	$s_{backlash}$	mm	N/A	0,06	0,06
Efficiency	η_{lu}	%	0,3	0,75	0,84
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	0,0413	0,0420	0,0420
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0036	0,0047	0,0047
Weight @ 0 mm stroke	m_{lu}	kg	0,74	0,74	0,74
Δ weight per 100 mm stroke	Δm	kg	0,34	0,34	0,34
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50
Max. humidity	φ	%	95	95	95
Degree of protection	IP	-	54S	54S	54S
Standards	-	-	ISO 15552	ISO 15552	ISO 15552

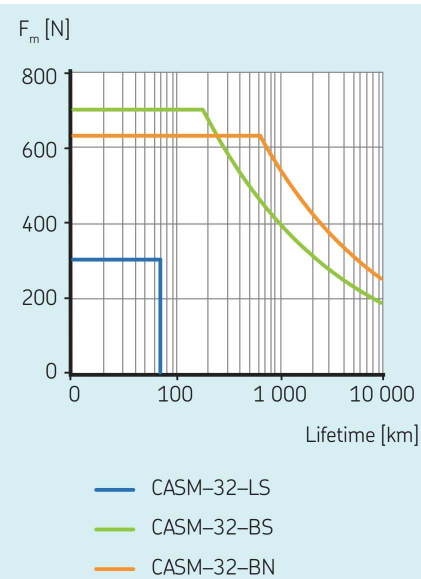
Performance diagrams



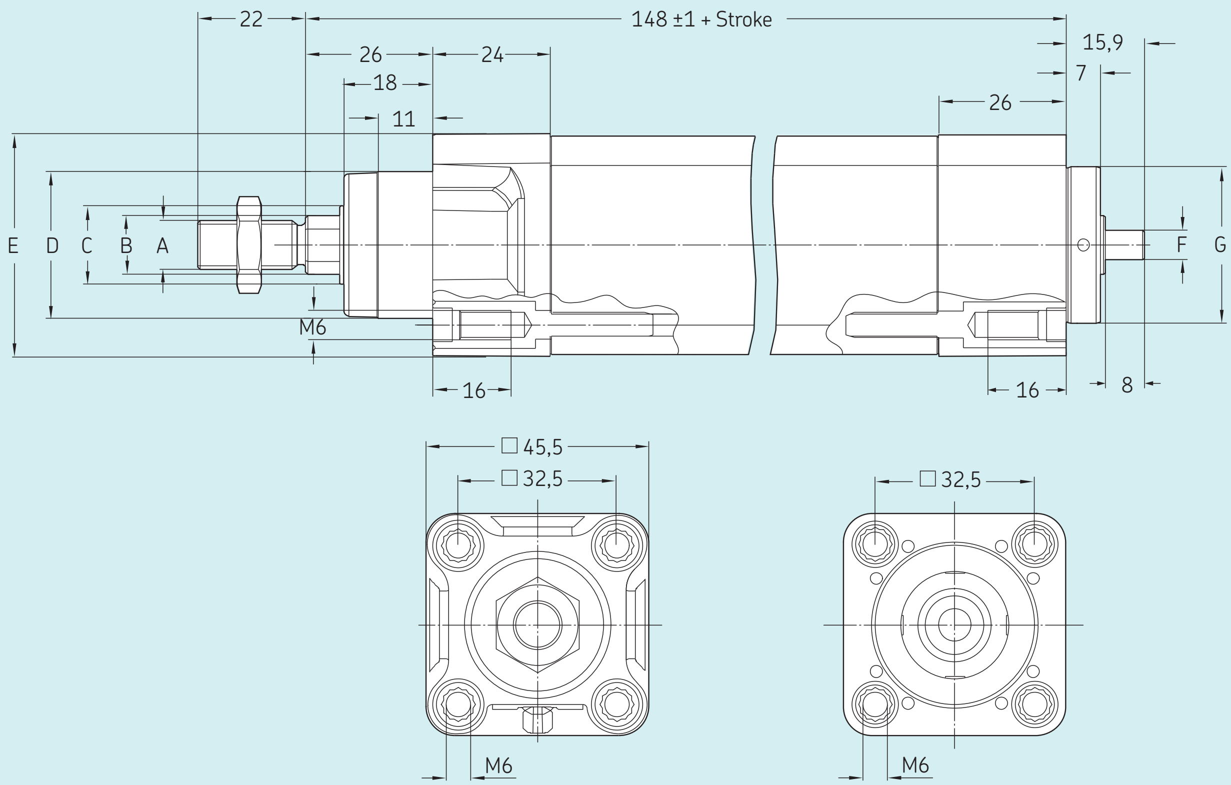
Valid only for CASM–32–LS.
No limitation for ball screw types
(max. load at max. speed).



The radial load acts perpendicular to
the moving direction.



Dimensional drawing



	A	B	C	D	E	F	G
		mm					
CASM-32	M10 × 1,25	∅ 12	∅ 16	∅ 30d11	□ 44,5	∅ 6h6	∅ 32f7

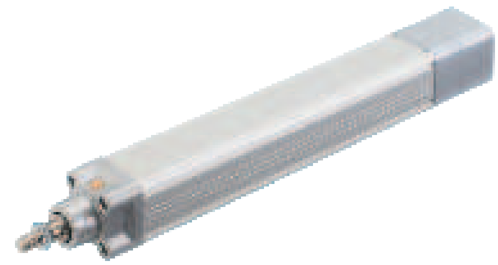
Ordering key

See page 74

C

CASM-40

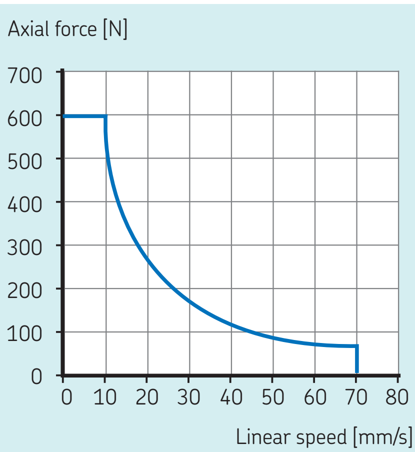
Linear unit



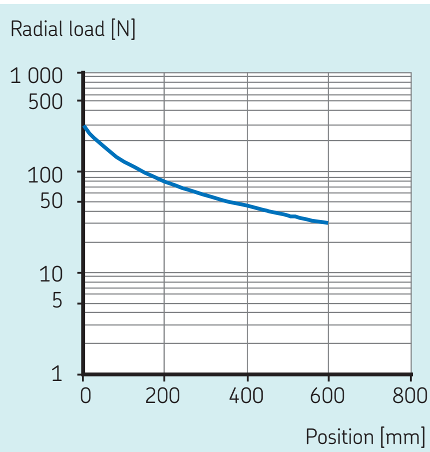
Technical data

Designation	Symbol	Unit	CASM–40–LS	CASM–40–BS	CASM–40–BN
Performance Data					
Max. dynamic axial force	F_{max}	kN	0,6	2,375	1,55
Max. static axial force	F_{0max}	kN	1,5	2,375	2,375
Dynamic load capacity	C	kN	N/A	4,8	6
Maximum torque to reach F_{max}	M_{max}	Nm	0,63	2,22	3,64
Max. linear speed	v_{max}	mm/s	70	300	826
Max. rotational speed	n_{max}	1/min	1 680	3 600	3 900
Max. acceleration	a_{max}	m/s^2	1	6	6
Duty cycle	D_{unit}	%	60	100	100
Mechanical Data					
Screw type	–	–	Lead screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	12,5	12	12,7
Screw lead	p_{screw}	mm	2,5	5	12,7
Lead accuracy	–	–	N/A	G7	G7
Stroke	s	mm	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	1	1	1
Backlash	$s_{backlash}$	mm	N/A	0,07	0,07
Efficiency	η_{lu}	%	0,38	0,85	0,86
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	0,1262	0,1246	0,1279
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0123	0,0103	0,0144
Weight @ 0 mm stroke	m_{lu}	kg	1,25	1,26	1,29
Δ weight per 100 mm stroke	Δm	kg	0,46	0,46	0,46
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50
Max. humidity	φ	%	95	95	95
Degree of protection	IP	–	54S	54S	54S
Standards	–	–	ISO 15552	ISO 15552	ISO 15552

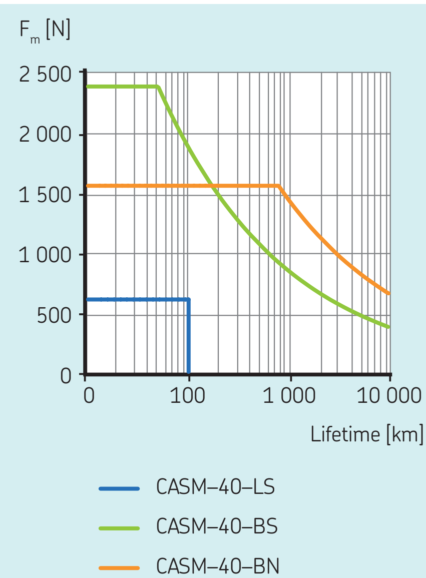
Performance diagrams



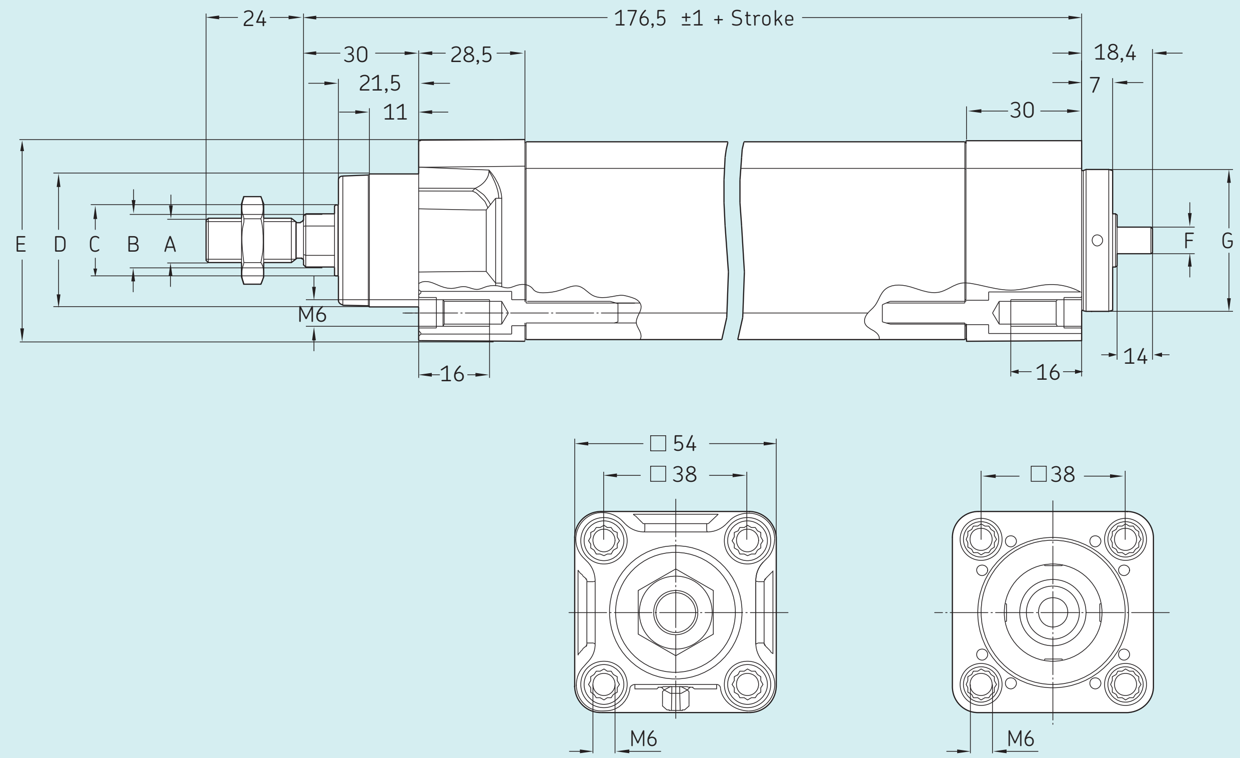
Valid only for CASM–40–LS.
No limitation for ball screw types
(max. load at max. speed).



The radial load acts perpendicular to the moving direction.



Dimensional drawing



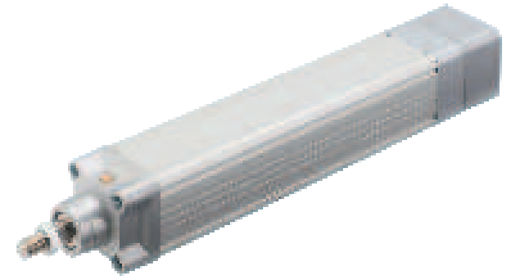
	A	B	C	D	E	F	G
		mm					
CASM-40	M12 × 1,25	∅ 16	∅ 20	∅ 35d11	□ 53	∅ 8h6	∅ 40f7

Ordering key

See page 74

CASM-63

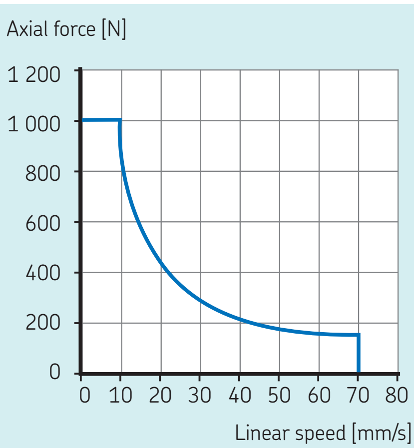
Linear unit



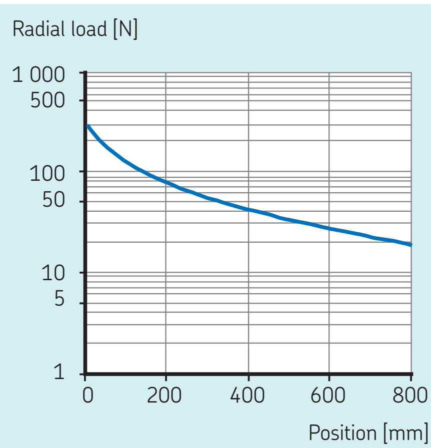
Technical data

Designation	Symbol	Unit	CASM-63-LS	CASM-63-BN	CASM-63-BF
Performance Data					
Max. dynamic axial force	F_{max}	kN	1	5,4	2,8
Max. static axial force	F_{0max}	kN	3,7	5,4	5,4
Dynamic load capacity	C	kN	N/A	21	10
Maximum torque to reach F_{max}	M_{max}	Nm	1,63	10,11	10,36
Max. linear speed	v_{max}	mm/s	70	533	1 067
Max. rotational speed	n_{max}	1/min	1 050	3 200	3 200
Max. acceleration	a_{max}	m/s^2	1	6	6
Duty cycle	D_{unit}	%	60	100	100
Mechanical Data					
Screw type	–	–	Lead screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	20	20	20
Screw lead	p_{screw}	mm	4	10	20
Lead accuracy	–	–	N/A	G7	G7
Stroke	s	mm	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	1	1	1
Backlash	$s_{backlash}$	mm	N/A	0,07	0,07
Efficiency	η_{lu}	%	0,39	0,85	0,86
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	0,7600	0,7600	0,7636
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0809	0,0809	0,0855
Weight @ 0 mm stroke	m_{lu}	kg	2,80	2,90	2,90
Δ weight per 100 mm stroke	Δm	kg	0,81	0,81	0,81
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50
Max. humidity	φ	%	95	95	95
Degree of protection	IP	-	54S	54S	54S
Standards	-	-	ISO 15552	ISO 15552	ISO 15552

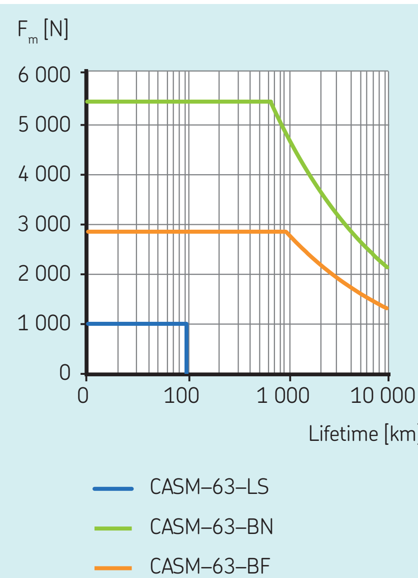
Performance diagrams



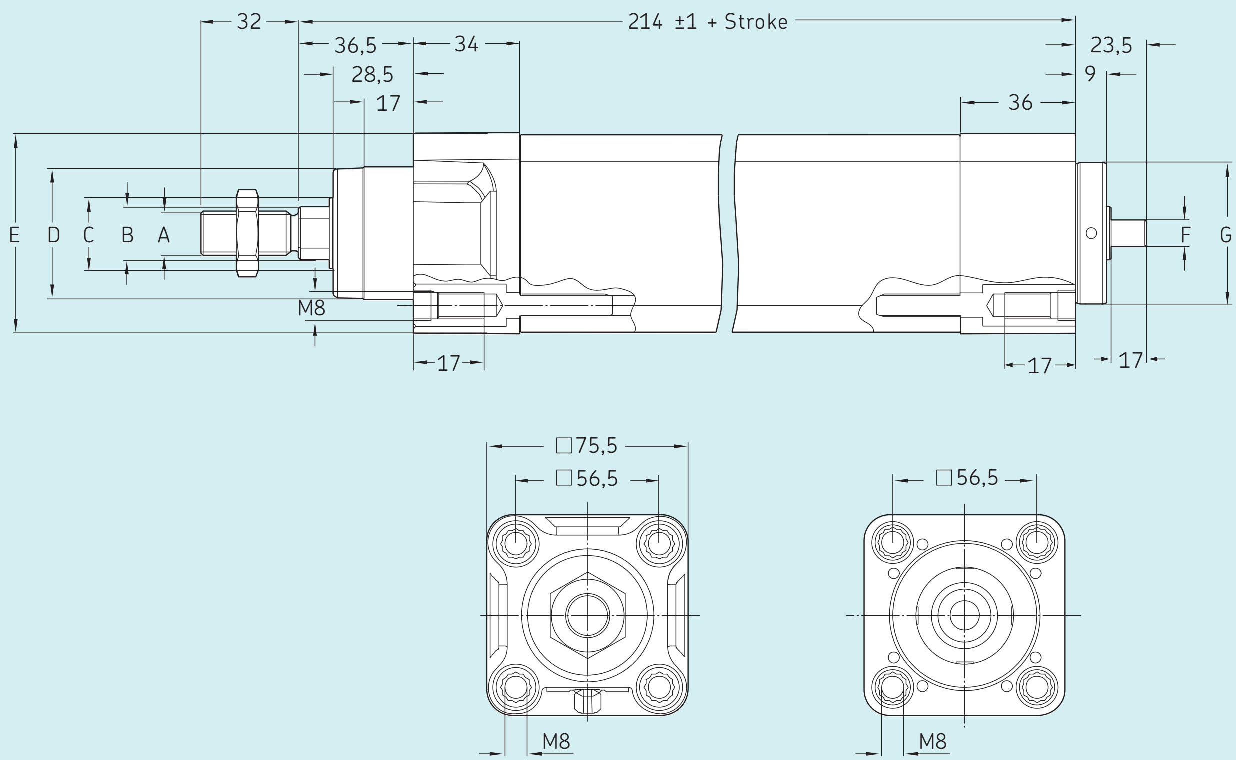
Valid only for CASM–63–LS.
No limitation for ball screw types
(max. load at max. speed).



The radial load acts perpendicular to
the moving direction.



Dimensional drawing



	A	B	C	D	E	F	G
		mm					
CASM-63	M16 × 1,5	∅ 20	∅ 28	∅ 45d11	□ 74	∅ 12h6	∅ 60f7

Ordering key

See page 74

Ordering key

Linear units

C A S M - 3 2 - B S - 0 3 0 0 A M - 0 0 0

Screw:
LS Lead screw 9×1,5 mm
BS Ball screw 10×3 mm
BN Ball screw 10×10 mm

Stroke:
50 mm
100 mm
150 mm
200 mm
300 mm
400 mm

Option[1]
A Motor, adapter and accessories separately delivered
M Motor, adapter and foot mountings[2] pre-mounted

C A S M - 4 0 - L S - 0 1 0 0 A A - 0 0 0

Screw:
LS Lead screw 12,5×2,5 mm
BS Ball screw 12×5 mm
BN Ball screw 12,7×12,7 mm

Stroke:
100 mm
200 mm
300 mm
400 mm
500 mm
600 mm

Option[1]
A Motor, adapter and accessories separately delivered
M Motor, adapter and foot mountings[2] pre-mounted

C A S M - 6 3 - B F - 0 7 0 0 A A - 0 0 0

Screw:
LS Lead screw 20×4 mm
BN Ball screw 20×10 mm
BF Ball screw 20×20 mm

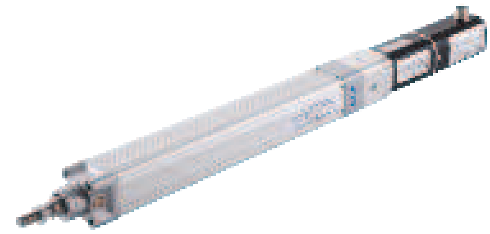
Stroke:
100 mm
200 mm
300 mm
400 mm
500 mm
600 mm
700 mm
800 mm

Option[1]
A Motor, adapter and accessories separately delivered
M Motor, adapter and foot mountings[2] pre-mounted

[1] Motor, adapter kit and accessories need to be ordered separately
[2] Foot mountings pre-mounted on inline version only

C

CASM-32-LS



Electric cylinder
servo motor, inline configuration

Technical data

Designation	Symbol	Unit	BLDC motor BG45	Servo motor 1FK7015
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,300	0,300
Continuous force @ max. speed	F_c	kN	0,047	0,047
Peak force @ zero speed	F_{p0}	kN	0,300	0,300
Peak force @ max. speed	F_p	kN	0,300	0,300
Dynamic load capacity	C	kN	N/A	N/A
Holding force (motorbrake option)	F_{Hold}	kN	0,700	0,700
Max. linear speed	v_{max}	mm/s	60	60
Max. acceleration	a_{max}	m/s^2	1	1
Duty cycle	D	%	60	60
Mechanical Data				
Screw type	–	–	Lead screw	Lead screw
Screw diameter	d_{screw}	mm	9	9
Screw lead	p_{screw}	mm	1,5	1,5
Lead accuracy	–	–	N/A	N/A
Stroke	s	mm	50...400	50...400
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	N/A	N/A
Gear reduction	i	–	1	1
Efficiency	η	%	23	20
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,0913	0,1303
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0036	0,0036
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0190
Weight @ 0 mm stroke	m	kg	1,61	2,09
Δ weight per 100 mm stroke	Δm	kg	0,34	0,34
Weight of optional brake	m_{brake}	kg	0,12	0,10
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	24	N/A
Nominal current	I	A	4,9	1,0
Peak current	I_{peak}	A	15,0	1,6
Nominal power	P	kW	0,091	0,100
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

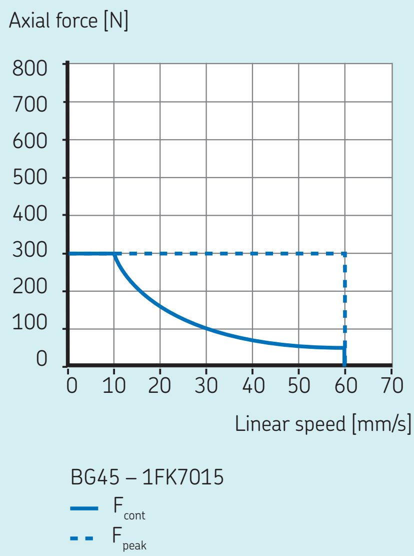
Ordering information

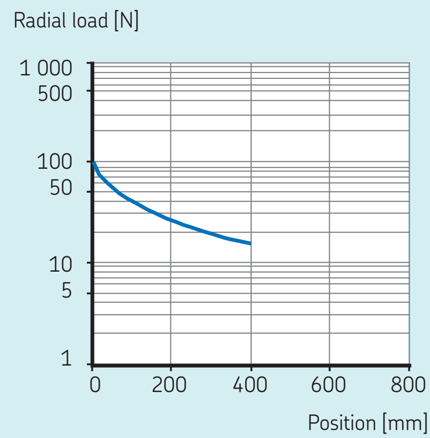
	BLDC motor BG45	Servo motor 1FK7015
Linear unit	see page 64	see page 64
Motor	BG45X30PI	1FZ7015-5AK71-1SH3
Adapter	ZBE-375570	ZBE-375530

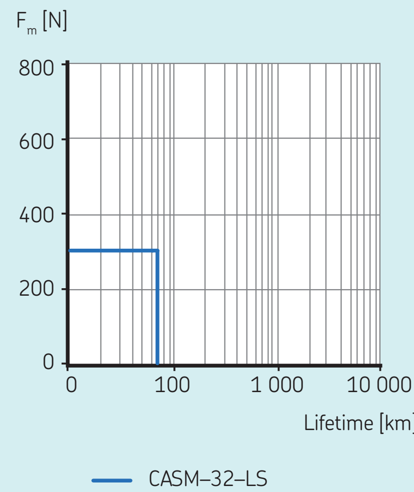
For more information regarding motors and motor adapters, please visit page 52

C

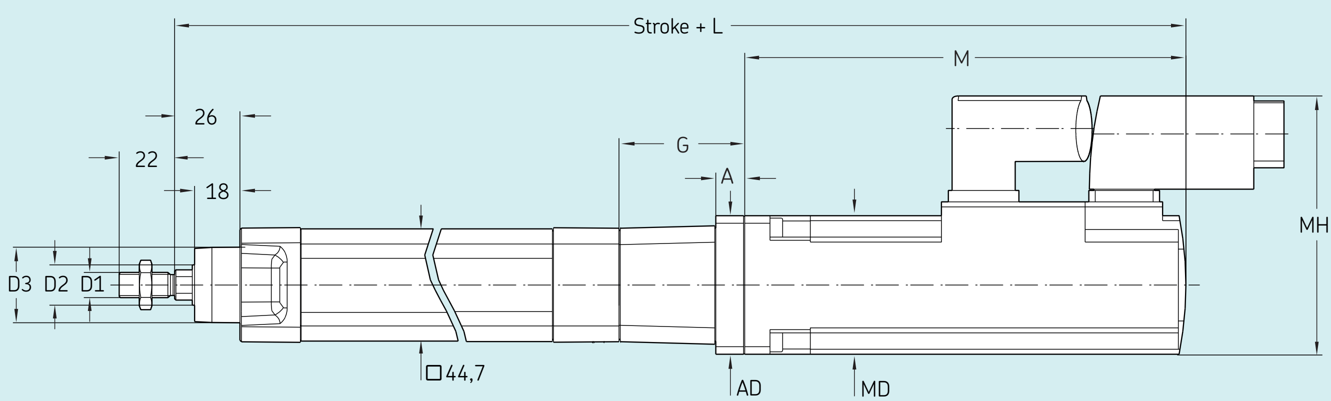
Performance diagrams







Dimensional drawing



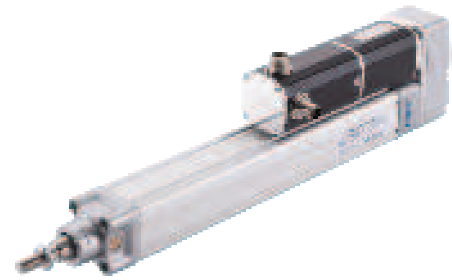
Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG45	M10 × 1,25	∅ 16	∅ 30	347,7	39,7	6,7	4,5	160	44	60,8
1FK7015	M10 × 1,25	∅ 16	∅ 30	353,9	40,9	9	40	165	40	86

Ordering key

See page 112

CASM-32-LS

Electric cylinder
servo motor, parallel configuration



Technical data

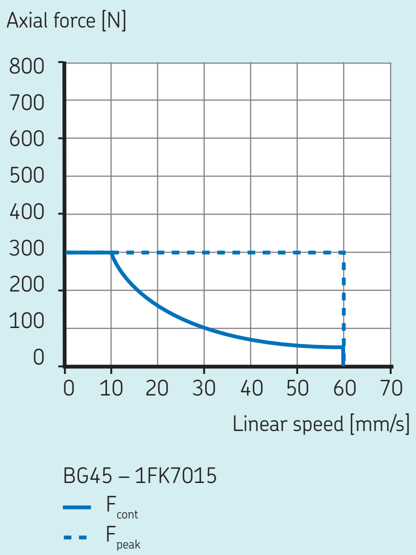
Designation	Symbol	Unit	BLDC motor BG45	Servo motor 1FK7015
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,300	0,300
Continuous force @ max. speed	F_c	kN	0,047	0,047
Peak force @ zero speed	F_{p0}	kN	0,300	0,300
Peak force @ max. speed	F_p	kN	0,300	0,300
Dynamic load capacity	C	kN	N/A	N/A
Holding force (motorbrake option)	F_{Hold}	kN	0,700	0,700
Max. linear speed	v_{max}	mm/s	60	60
Max. acceleration	a_{max}	m/s^2	1	1
Duty cycle	D	%	60	60
Mechanical Data				
Screw type	–	–	Lead screw	Lead screw
Screw diameter	d_{screw}	mm	9	9
Screw lead	p_{screw}	mm	1,5	1,5
Lead accuracy	–	–	N/A	N/A
Stroke	s	mm	50...400	50...400
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	N/A	N/A
Gear reduction	i	–	1	1
Efficiency	η	%	23	20
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,0869	0,1259
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0036	0,0036
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0190
Weight @ 0 mm stroke	m	kg	1,71	2,19
Δ weight per 100 mm stroke	Δm	kg	0,34	0,34
Weight of optional brake	m_{brake}	kg	0,12	0,10
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	24	n/a
Nominal current	I	A	4,9	1,0
Peak current	I_{peak}	A	15,0	1,6
Nominal power	P	kW	0,091	0,100
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

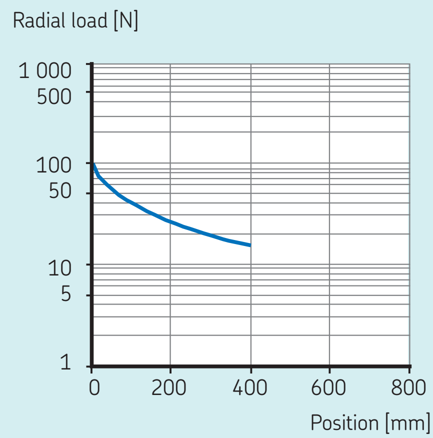
Ordering information

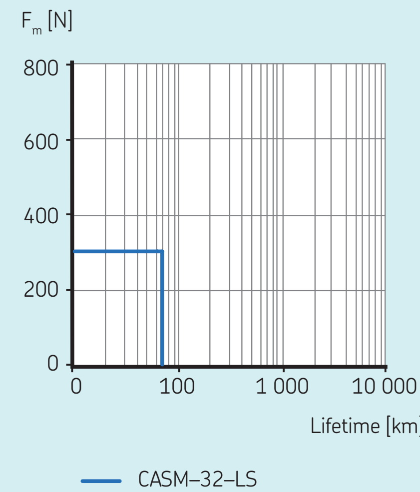
	BG45	**1FK7015**
Linear unit	see page 64	see page 64
Motor	BG45X30PI	1FZ7015-5AK71-1SH3
Adapter	ZBE-375573	ZBE-375540

For more information regarding motors and motor adapters, please visit page 52

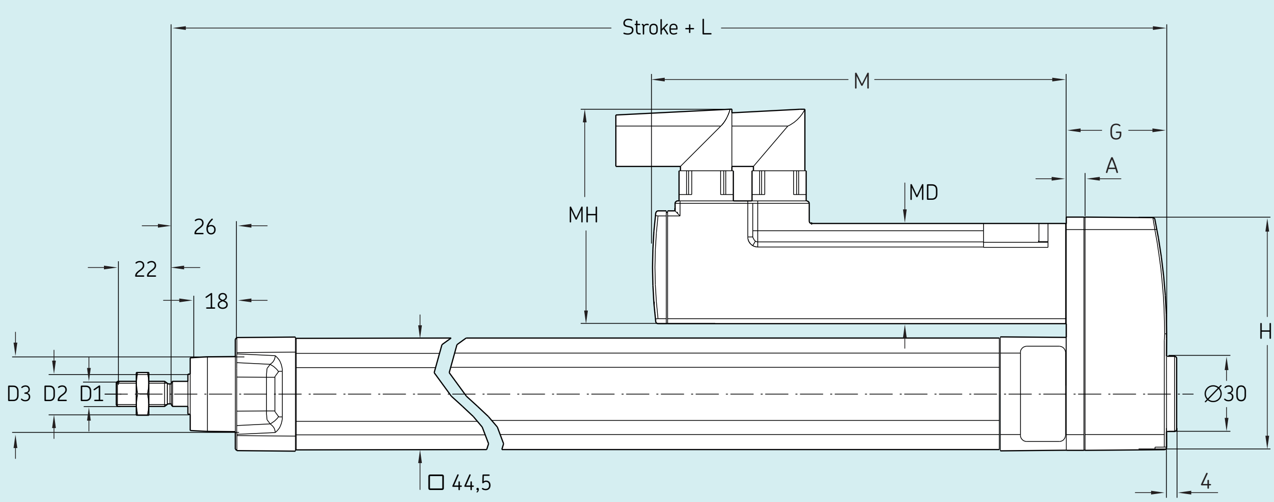
Performance diagrams







Dimensional drawing



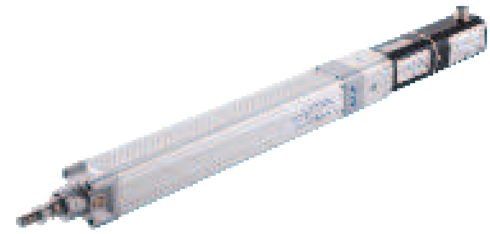
Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG45	M10 × 1,25	∅ 16	∅ 30	187,5	39.5	7	93,3	160	44	60,8
1FK7015	M10 × 1,25	∅ 16	∅ 30	188,1	40.1	7	93,3	165	40	86

Ordering key

See page 112

CASM-32-BS

Electric cylinder servo motor, inline configuration



Technical data

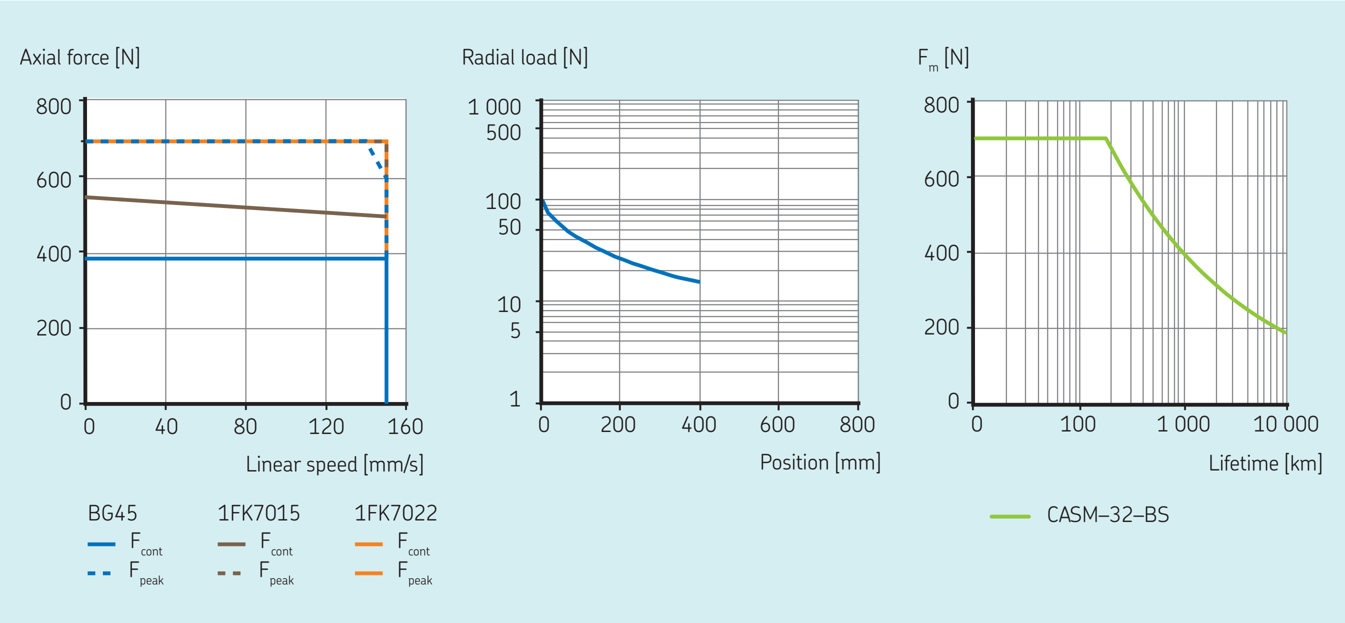
Designation	Symbol	Unit	BLDC motor BG45	Servo motor 1FK7015	Servo motor 1FK7022
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	0,393	0,550	0,700
Continuous force @ max. speed	F_c	kN	0,393	0,503	0,700
Peak force @ zero speed	F_{p0}	kN	0,700	0,700	0,700
Peak force @ max. speed	F_p	kN	0,603	0,700	0,700
Dynamic load capacity	C	kN	2,8	2,8	2,8
Holding force (motorbrake option)	F_{Hold}	kN	0,558	0,700	0,279
Max. linear speed	v_{max}	mm/s	150	150	150
Max. acceleration	a_{max}	m/s^2	6	6	6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	10	10	10
Screw lead	p_{screw}	mm	3	3	3
Lead accuracy	–	–	G7	G7	G7
Stroke	s	mm	50...400	50...400	50...400
Internal overstroke each side	s_0	mm	1	1	1
Backlash	$s_{backlash}$	mm	0,06	0,06	0,06
Gear reduction	i	–	1	1	1
Efficiency	η	%	58	51	65
Inertia @ 0 mm stroke	J	10^{-4} kgm²	0,0920	0,1310	0,3280
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm²	0,0047	0,0047	0,0047
Inertia of optional brake	J_{brake}	10^{-4} kgm²	0,0000	0,0190	0,0700
Weight @ 0 mm stroke	m	kg	1,61	2,09	2,84
Δ weight per 100 mm stroke	Δm	kg	0,34	0,34	0,34
Weight of optional brake	m_{brake}	kg	0,12	0,10	0,20
Electrical Data					
Motor type	–	–	Brushless DC	Servo	Servo
Nominal voltage	U	V DC	24	N/A	N/A
Nominal current	I	A	4,9	1,0	1,4
Peak current	I_{peak}	A	15,0	1,6	1,8
Nominal power	P	kW	0,091	0,100	0,400
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50
Degree of protection	IP	–	54S	54S	54S
Standards	–	–	ISO 15552	ISO 15552	ISO 15552

Ordering information

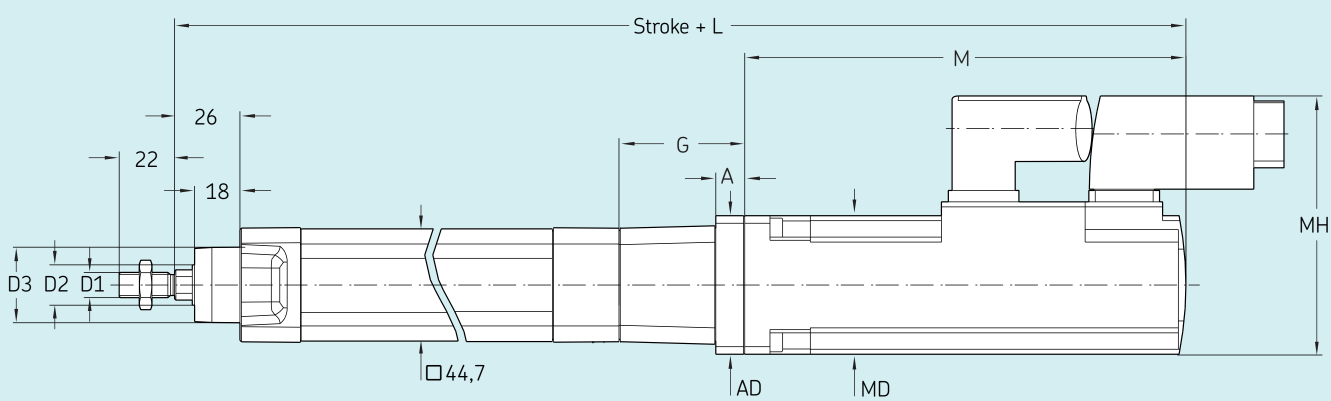
	BG45	1FK7015	1FK7022
Linear unit	see page 64	see page 64	see page 64
Motor	BG45X30PI	1FZ7015-5AK71-1SH3	1FK7022-5AK71-1UH3
Adapter	ZBE-375570	ZBE-375530	ZBE-375537

For more information regarding motors and motor adapters, please visit page 52

Performance diagrams



Dimensional drawing



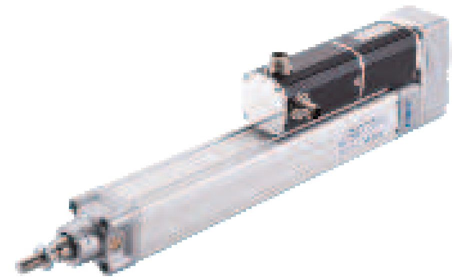
Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG45	M10 × 1,25	∅ 16	∅ 30	347,7	39,7	6,7	45,5	160	44	60,8
1FK7015	M10 × 1,25	∅ 16	∅ 30	353,9	40,9	9	40	165	40	86
1FK7022	M10 × 1,25	∅ 16	∅ 30	372,4	49,4	11	55	175	55	103

Ordering key

See page 112

CASM-32-BS

Electric cylinder
servo motor, parallel configuration



Technical data

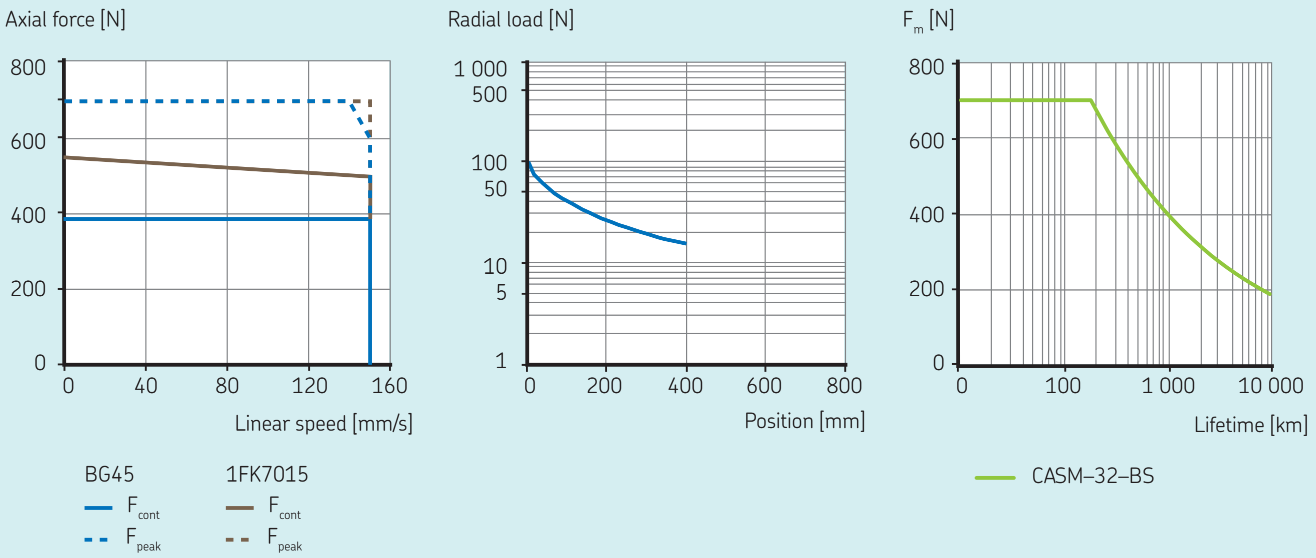
Designation	Symbol	Unit	BLDC motor BG45	Servo motor 1FK7015
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,389	0,544
Continuous force @ max. speed	F_c	kN	0,389	0,498
Peak force @ zero speed	F_{p0}	kN	0,700	0,700
Peak force @ max. speed	F_p	kN	0,597	0,700
Dynamic load capacity	C	kN	2,8	2,8
Holding force (motorbrake option)	F_{Hold}	kN	0,558	0,700
Max. linear speed	v_{max}	mm/s	150	150
Max. acceleration	a_{max}	m/s^2	6	6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	-	-	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	10	10
Screw lead	p_{screw}	mm	3	3
Lead accuracy	–	–	G7	G7
Stroke	s	mm	50...400	50...400
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	0,06	0,06
Gear reduction	i	–	1	1
Efficiency	η	%	57	50
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,0875	0,1265
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0047	0,0047
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0190
Weight @ 0 mm stroke	m	kg	1,71	2,19
Δ weight per 100 mm stroke	Δm	kg	0,34	0,34
Weight of optional brake	m_{brake}	kg	0,12	0,10
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	24	N/A
Nominal current	I	A	4,9	1,0
Peak current	I_{peak}	A	15,0	1,6
Nominal power	P	kW	0,091	0,100
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	-	54S	54S
Standards	-	-	ISO 15552	ISO 15552

Ordering information

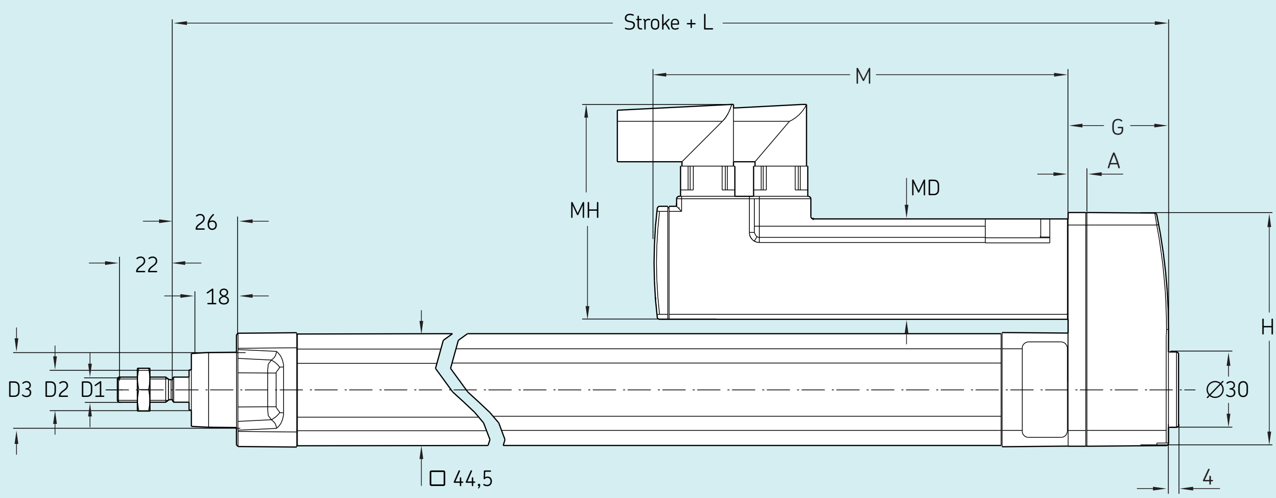
	BG45	1FK7015
Linear unit	see page 64	see page 64
Motor	BG45X30PI	1FZ7015-5AK71-1SH3
Adapter	ZBE-375573	ZBE-375540

For more information regarding motors and motor adapters, please visit page 52

Performance diagrams



Dimensional drawing



Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG45	M10 × 1,25	∅ 16	∅ 30	187,5	39,5	7	93,3	160	44	60,8
1FK7015	M10 × 1,25	∅ 16	∅ 30	188,1	40,1	7	93,3	165	40	86

Ordering key

See page 112

CASM-32-BN

Electric cylinder servo motor, inline configuration

Technical data

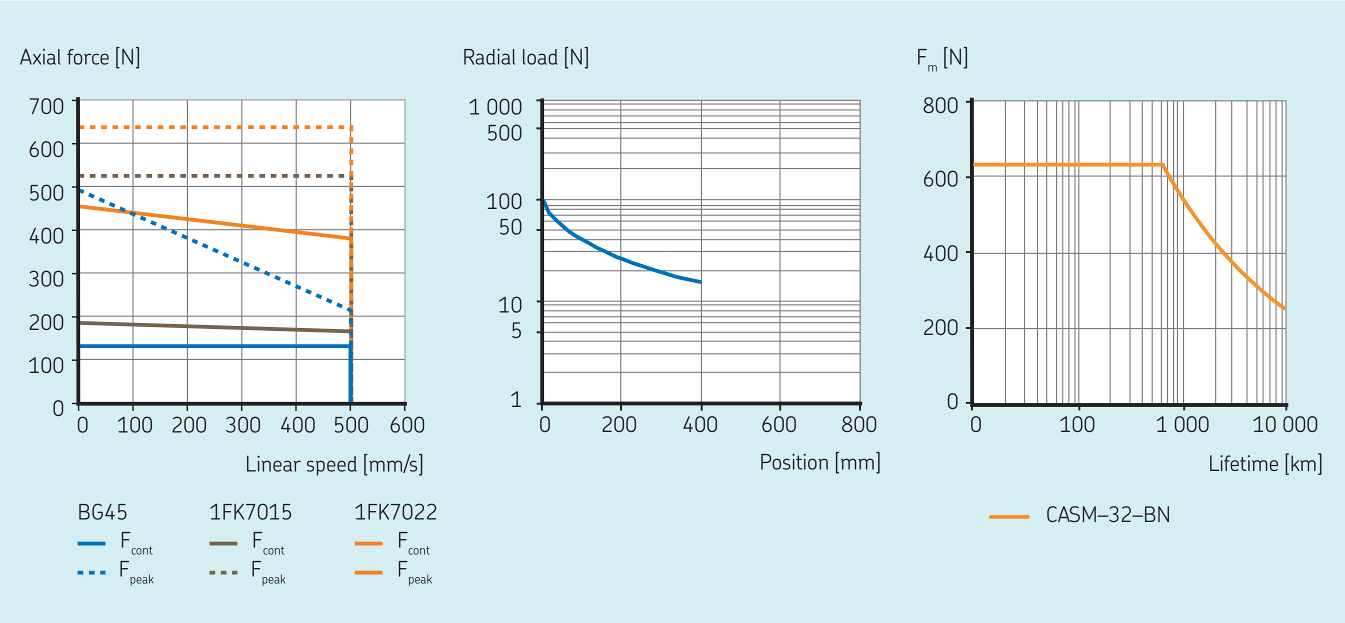
Designation	Symbol	Unit	BLDC motor BG45	Servo motor 1FK7015	Servo motor 1FK7022
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	0,132	0,185	0,449
Continuous force @ max. speed	F_c	kN	0,132	0,169	0,385
Peak force @ zero speed	F_{p0}	kN	0,497	0,528	0,630
Peak force @ max. speed	F_p	kN	0,203	0,528	0,630
Dynamic load capacity	C	kN	2,5	2,5	2,5
Holding force (motorbrake option)	F_{Hold}	kN	0,131	0,151	0,357
Max. linear speed	v_{max}	mm/s	500	500	500
Max. acceleration	a_{max}	m/s^2	6	6	6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	-	–	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	10	10	10
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G7	G7	G7
Stroke	s	mm	50...400	50...400	50...400
Internal overstroke each side	s_0	mm	1	1	1
Backlash	$s_{backlash}$	mm	0,06	0,06	0,06
Gear reduction	i	–	1	1	1
Efficiency	η	%	65	57	72
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,0920	0,1310	0,3280
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0047	0,0047	0,0047
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0190	0,0700
Weight @ 0 mm stroke	m	kg	1,61	2,09	2,84
Δ weight per 100 mm stroke	Δm	kg	0,34	0,34	0,34
Weight of optional brake	m_{brake}	kg	0,12	0,10	0,20
Electrical Data					
Motor type	–	–	Brushless DC	Servo	Servo
Nominal voltage	U	V DC	24	N/A	N/A
Nominal current	I	A	4,9	1,0	1,4
Peak current	I_{peak}	A	15,0	1,6	1,8
Nominal power	P	kW	0,091	0,100	0,400
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50
Degree of protection	IP	–	54S	54S	54S
Standards	–	–	ISO 15552	ISO 15552	ISO 15552

Ordering information

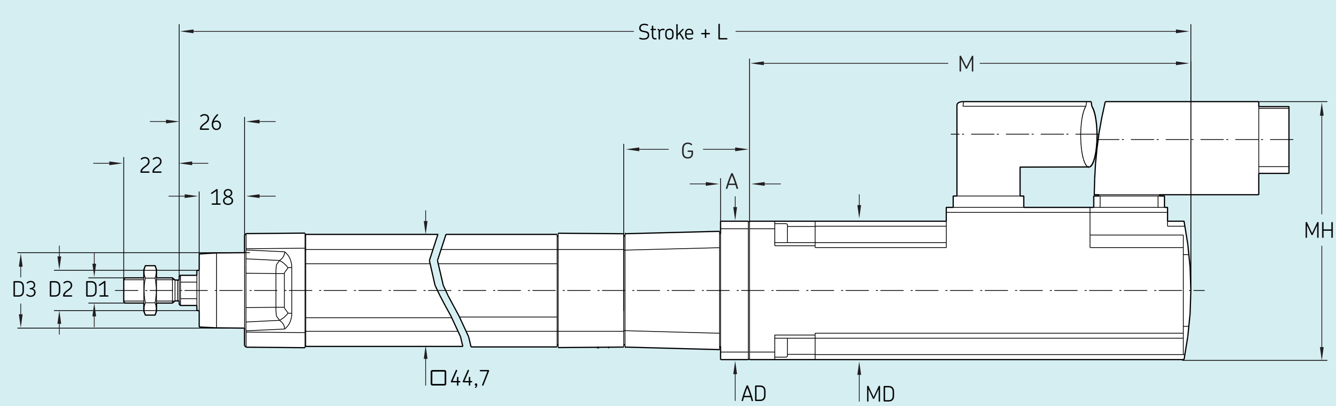
	BG45	1FK7015	1FK7022
Linear unit	see page 64	see page 64	see page 64
Motor	BG45X30PI	1FK7015-5AK71-1SH3	1FK7022-5AK71-1UH3
Adapter	ZBE-375570	ZBE-375530	ZBE-375537

For more information regarding motors and motor adapters, please visit page 52

Performance diagrams



Dimensional drawing



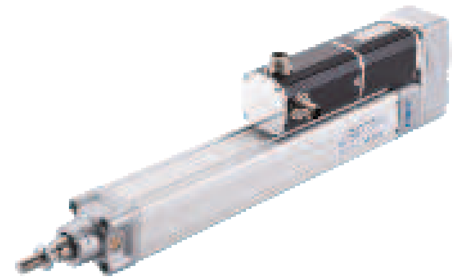
Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG45	M10 × 1,25	∅ 16	∅ 30	347,7	39,7	6,7	45,5	160	44	60,8
1FK7015	M10 × 1,25	∅ 16	∅ 30	353,9	40,9	9	40	165	40	86
1FK7022	M10 × 1,25	∅ 16	∅ 30	372,4	49,4	11	55	175	55	103

Ordering key

See page 112

CASM-32-BN

Electric cylinder
servo motor, parallel configuration



Technical data

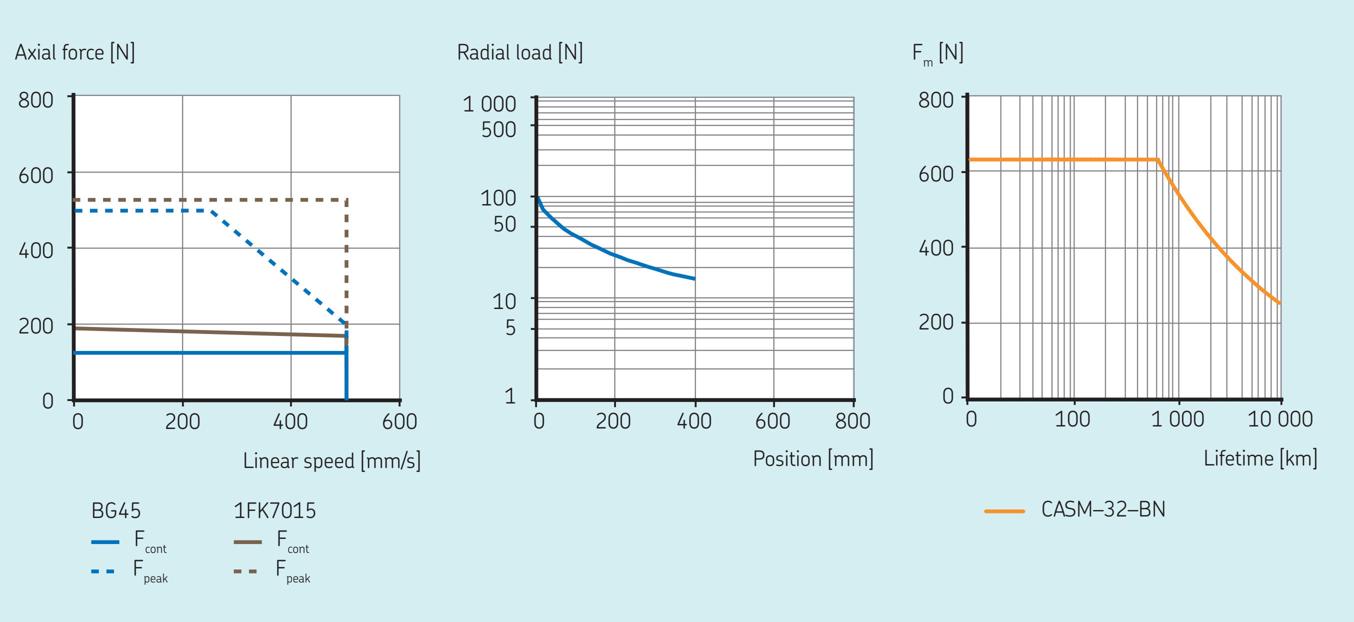
Designation	Symbol	Unit	BLDC motor BG45	Servo motor 1FK7015
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,131	0,183
Continuous force @ max. speed	F_c	kN	0,131	0,167
Peak force @ zero speed	F_{p0}	kN	0,492	0,523
Peak force @ max. speed	F_p	kN	0,201	0,523
Dynamic load capacity	C	kN	2,5	2,5
Holding force (motorbrake option)	F_{Hold}	kN	0,131	0,151
Max. linear speed	v_{max}	mm/s	500	500
Max. acceleration	a_{max}	m/s^2	6	6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	10	10
Screw lead	p_{screw}	mm	10	10
Lead accuracy	–	–	G7	G7
Stroke	s	mm	50...400	50...400
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	0,06	0,06
Gear reduction	i	–	1	1
Efficiency	η	%	64	57
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,0875	0,1265
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0047	0,0047
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0190
Weight @ 0 mm stroke	m	kg	1,71	2,19
Δ weight per 100 mm stroke	Δm	kg	0,34	0,34
Weight of optional brake	m_{brake}	kg	0,12	0,10
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	24	N/A
Nominal current	I	A	4,9	1,0
Peak current	I_{peak}	A	15,0	1,6
Nominal power	P	kW	0,091	0,100
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

Ordering information

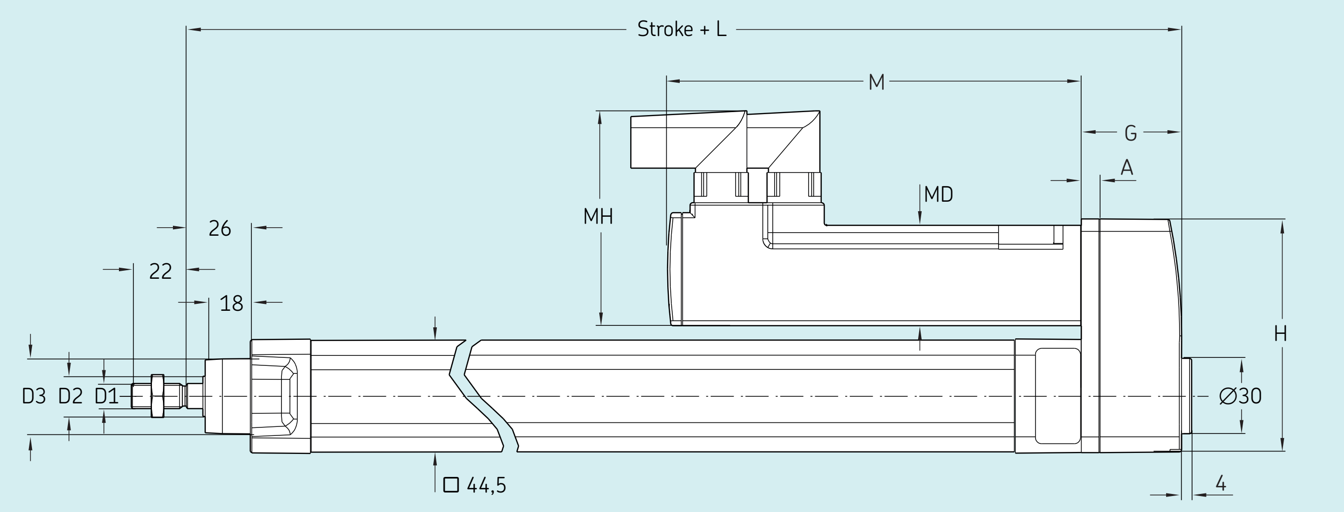
	BG45	**1FK7015**
Linear unit	see page 64	see page 64
Motor	BG45X30PI	1FK7015-5AK71-1SH3
Adapter	ZBE-375573	ZBE-375540

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing



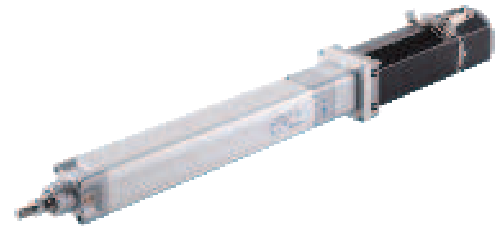
Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG45	M10 × 1,25	∅ 16	∅ 30	187,5	39,5	7	93,3	160	44	60,8
1FK7015	M10 × 1,25	∅ 16	∅ 30	188,1	40,1	7	93,3	165	40	86

Ordering key

See page 112

CASM-40-LS

Electric cylinder
servo motor, inline configuration



Technical data

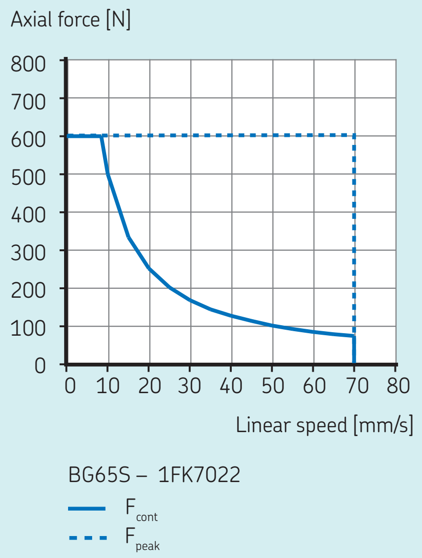
Designation	Symbol	Unit	BLDC motor BG65S	Servo motor 1FK7022
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,600	0,600
Continuous force @ max. speed	F_c	kN	0,071	0,071
Peak force @ zero speed	F_{p0}	kN	0,600	0,600
Peak force @ max. speed	F_p	kN	0,600	0,600
Dynamic load capacity	C	kN	N/A	N/A
Holding force (motorbrake option)	F_{Hold}	kN	–	–
Max. linear speed	v_{max}	mm/s	70	70
Max. acceleration	a_{max}	m/s^2	1	1
Duty cycle	D	%	60	60
Mechanical Data				
Screw type	–	–	Lead screw	Lead screw
Screw diameter	d_{screw}	mm	12,5	12,5
Screw lead	p_{screw}	mm	2,5	2,5
Lead accuracy	–	–	N/A	N/A
Stroke	s	mm	100...600	100...600
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	N/A	N/A
Gear reduction	i	–	1	1
Efficiency	η	%	32	33
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,2612	0,4122
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0123	0,0123
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0700
Weight @ 0 mm stroke	m	kg	3,22	3,35
Δ weight per 100 mm stroke	Δm	kg	0,46	0,46
Weight of optional brake	m_{brake}	kg	0,50	0,20
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	40	N/A
Nominal current	I	A	7,0	1,4
Peak current	I_{peak}	A	20,0	1,8
Nominal power	P	kW	0,236	0,400
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

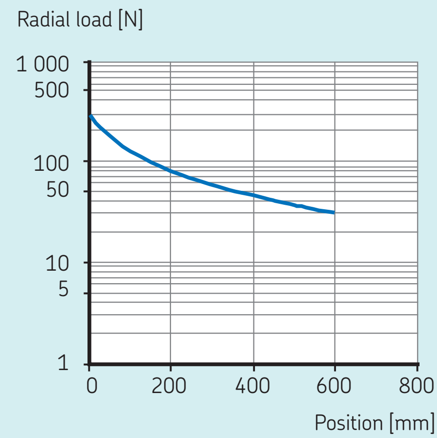
Ordering information

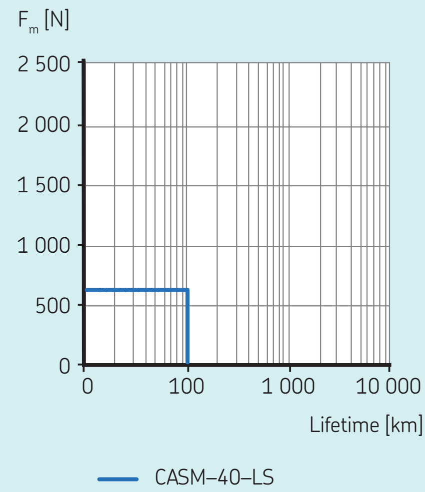
	BG65	1FK7022
Linear unit	see page 64	see page 64
Motor	BG65SX50PI	1FK7022-5AK71-1UH3
Adapter	ZBE-375571	ZBE-375538

For more information regarding motors and motor adapters, please visit page 62

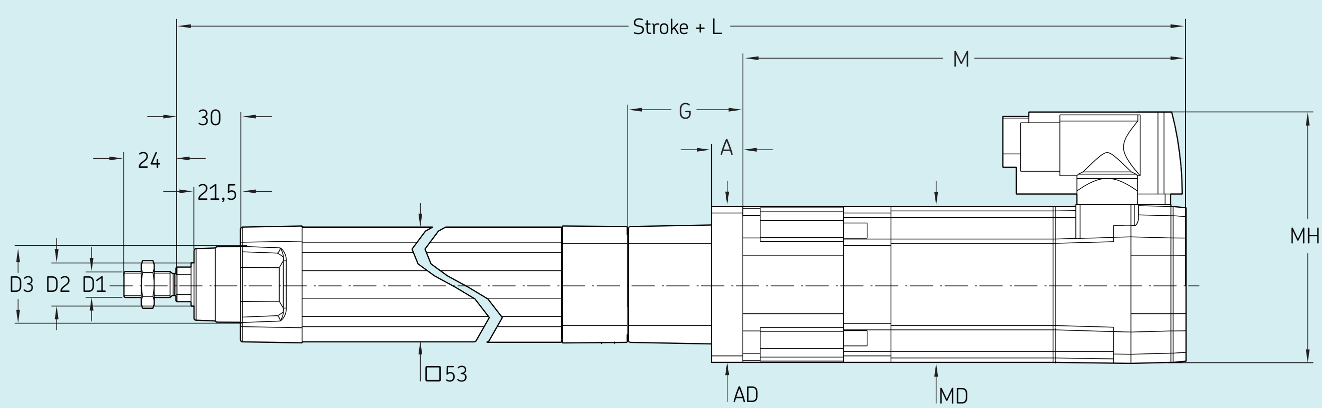
Performance diagrams







Dimensional drawing

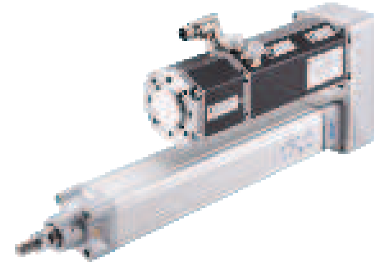


Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG65S	M12 × 1,25	∅ 20	∅ 35	431	53,5	35	54	201	65	96,5
1FK7022	M12 × 1,25	∅ 20	∅ 35	400,9	49,4	11	64	175	55	103

Ordering key

See page 112

CASM-40-LS



Electric cylinder
servo motor, parallel configuration

Technical data

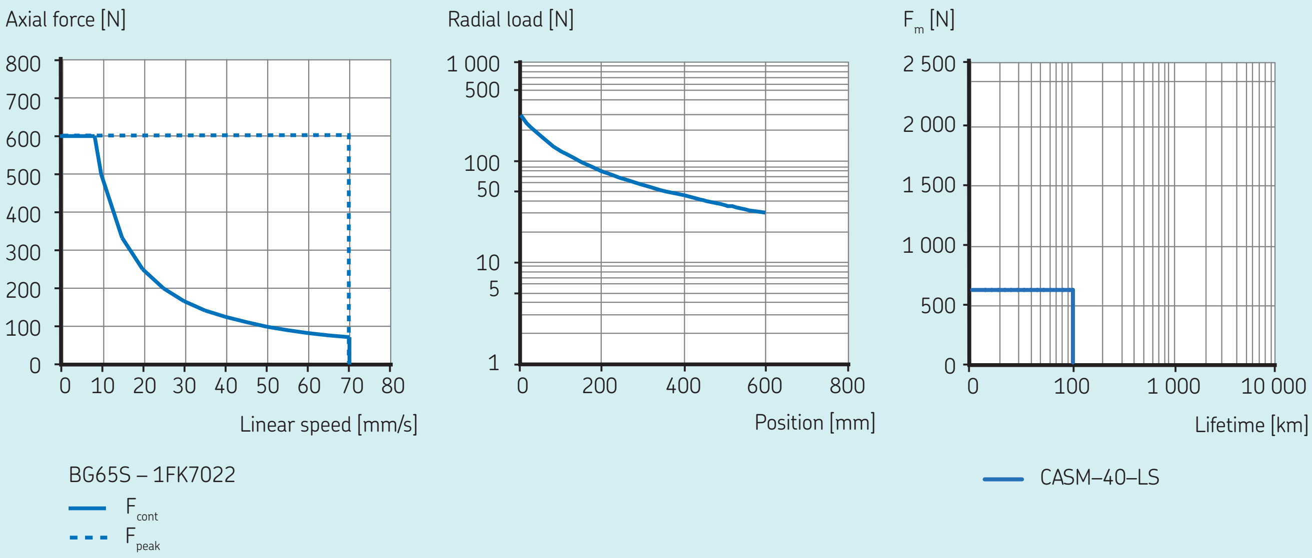
Designation	Symbol	Unit	BLDC motor BG65S	Servo motor 1FK7022
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,596	0,600
Continuous force @ max. speed	F_c	kN	0,071	0,071
Peak force @ zero speed	F_{p0}	kN	0,600	0,600
Peak force @ max. speed	F_p	kN	0,600	0,600
Dynamic load capacity	C	kN	N/A	N/A
Holding force (motorbrake option)	F_{Hold}	kN	–	–
Max. linear speed	v_{max}	mm/s	70	70
Max. acceleration	a_{max}	m/s^2	1	1
Duty cycle	D	%	60	60
Mechanical Data				
Screw type	–	–	Lead screw	Lead screw
Screw diameter	d_{screw}	mm	12,5	12,5
Screw lead	p_{screw}	mm	2,5	2,5
Lead accuracy	–	–	N/A	N/A
Stroke	s	mm	100...600	100...600
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	N/A	N/A
Gear reduction	i	–	1	1
Efficiency	η	%	32	32
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,2641	0,4151
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0123	0,0123
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0700
Weight @ 0 mm stroke	m	kg	3,32	3,45
Δ weight per 100 mm stroke	Δm	kg	0,46	0,46
Weight of optional brake	m_{brake}	kg	0,50	0,20
Electrical Data				
Motor type			Brushless DC	Servo
Nominal voltage	U	V DC	40	N/A
Nominal current	I	A	7,0	1,4
Peak current	I_{peak}	A	20,0	1,8
Nominal power	P	kW	0,236	0,400
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

Ordering information

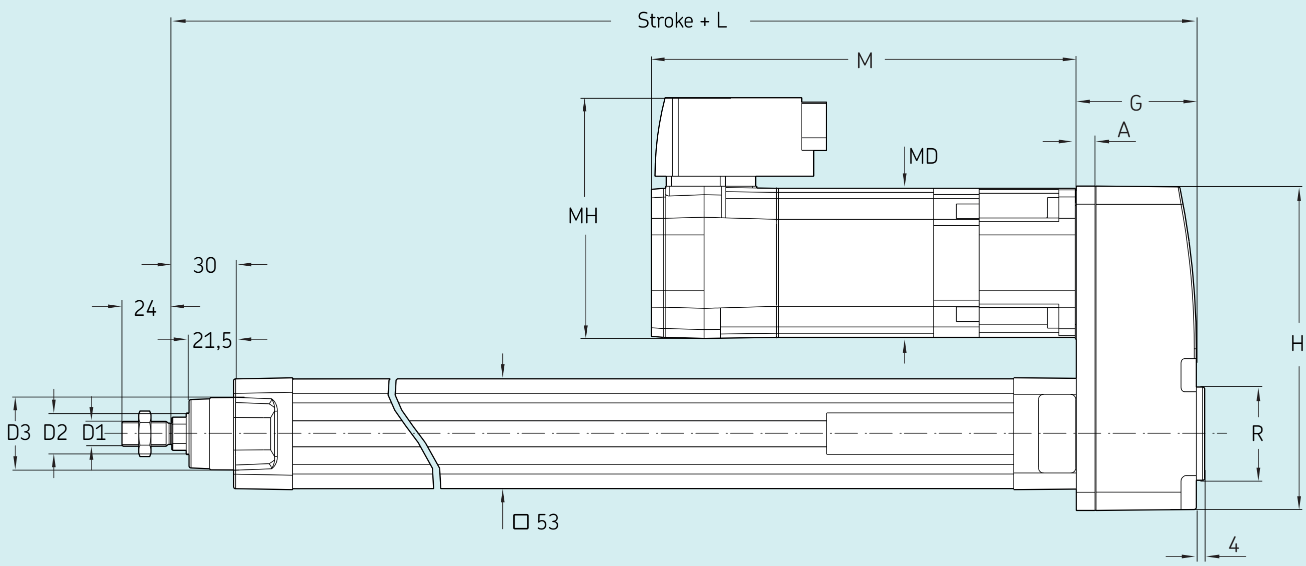
	BG655	**1FK7022**
Linear unit	see page 64	see page 64
Motor	BG65SX50PI	1FK7022-5AK71-1UH3
Adapter	ZBE-375574	ZBE-375546

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing



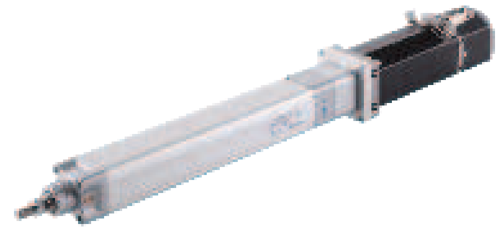
Motor	D1	D2	D3	L	G	A	H	M	MD	MH	R
		mm									
BG65S	M12 × 1,25	∅ 20	∅ 35	223	46.5	7	115,3	201	65	96,5	∅35
1FK7022	M12 × 1,25	∅ 20	∅ 35	223,6	47,1	7	115,3	175	55	103	∅35

Ordering key

See page 112

CASM-40-BS

Electric cylinder
servo motor, inline configuration



Technical data

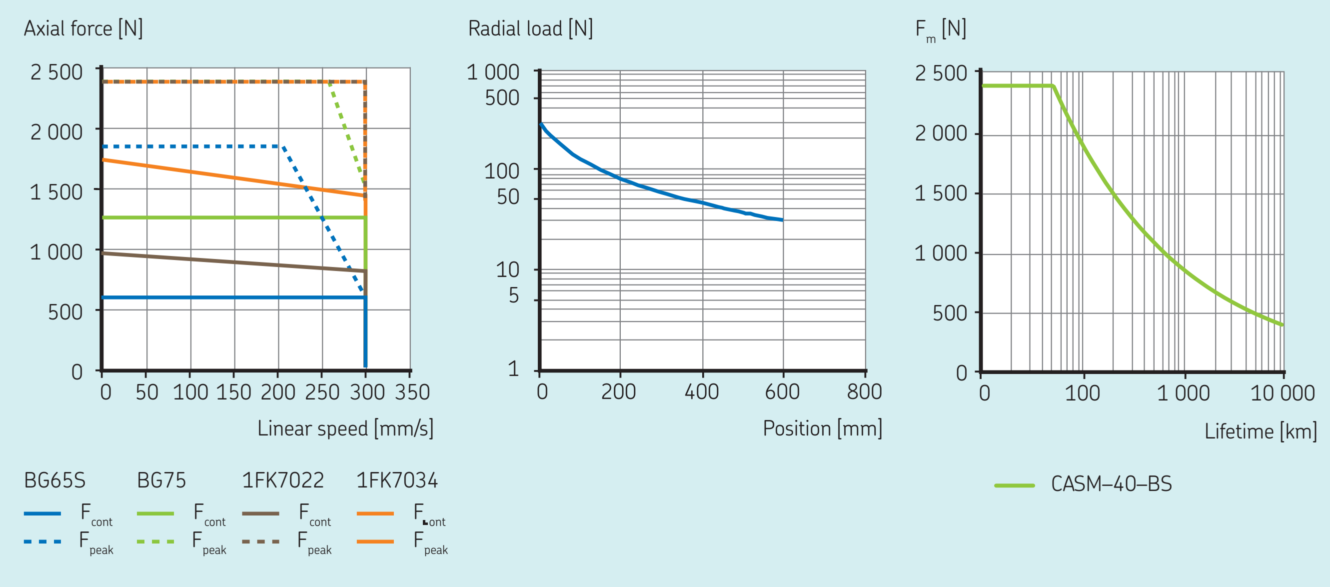
Designation	Symbol	Unit	BLDC motor BG65S	BLDC motor BG75	Servo motor 1FK7022	Servo motor 1FK7034
Performance Data						
Continuous force @ zero speed	F_{c0}	kN	0,673	1,239	0,908	1,709
Continuous force @ max. speed	F_c	kN	0,673	1,239	0,758	1,485
Peak force @ zero speed	F_{p0}	kN	1,805	2,375	2,375	2,375
Peak force @ max. speed	F_p	kN	0,673	1,453	2,375	2,375
Dynamic load capacity	C	kN	4,8	4,8	4,8	4,8
Holding force (motorbrake option)	F_{Hold}	kN	1,478	1,478	1,478	2,375
Max. linear speed	v_{max}	mm/s	298	300	300	300
Max. acceleration	a_{max}	m/s^2	6	6	6	6
Duty cycle	D	%	100	100	100	100
Mechanical Data						
Screw type	–	–	Ball screw	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	12	12	12	12
Screw lead	p_{screw}	mm	5	5	5	5
Lead accuracy	–	–	G7	G7	G7	G7
Stroke	s	mm	100...600	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	1	1	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07	0,07	0,07
Gear reduction	i	–	1	1	1	1
Efficiency	η	%	72	77	73	75
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,2596	0,7826	0,4106	1,0306
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0103	0,0103	0,0103	0,0103
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0000	0,0700	0,1000
Weight @ 0 mm stroke	m	kg	3,23	4,36	3,36	5,06
Δ weight per 100 mm stroke	Δm	kg	0,46	0,46	0,46	0,46
Weight of optional brake	m_{brake}	kg	0,50	0,50	0,20	0,40
Electrical Data						
Motor type			Brushless DC	Brushless DC	Servo	Servo
Nominal voltage	U	V DC	40	40	N/A	N/A
Nominal current	I	A	7,0	12,7	1,4	1,3
Peak current	I_{peak}	A	20,0	50,0	1,8	1,9
Nominal power	P	kW	0,236	0,450	0,400	0,600
Environment and Standards						
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50	0...+50
Degree of protection	IP	–	54S	54S	54S	54S
Standards	–	–	ISO 15554	ISO 15555	ISO 15556	ISO 15557

Ordering information

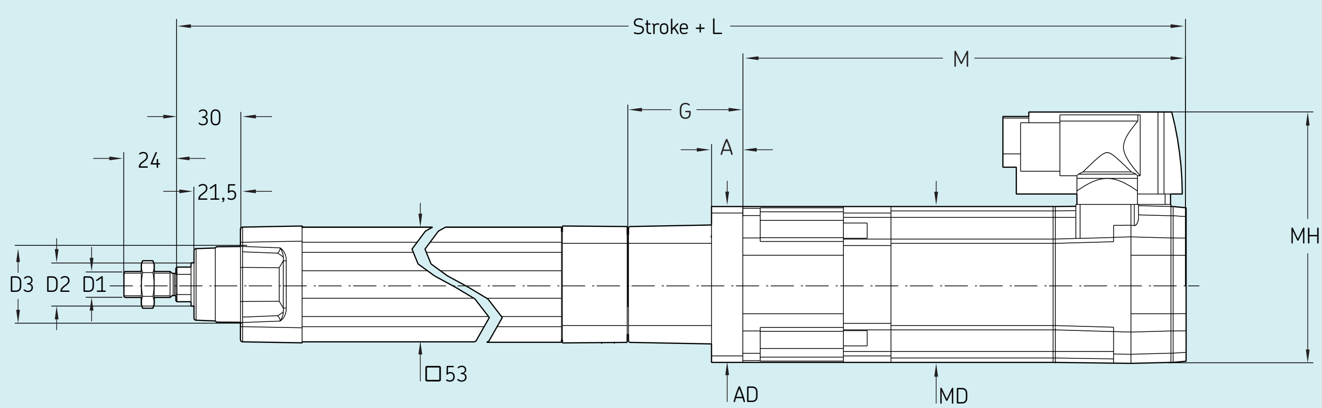
	BG65S	BG75	1FK7022	1FK7034
Linear unit	see page 64	see page 64	see page 64	see page 64
Motor	BG65SX50PI	BG75X75PI	1FK7022-5AK71-1UH3	1FK7034-2AK71-1UH0
Adapter	ZBE-375571	ZBE-375579	ZBE-375538	ZBE-375545

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing

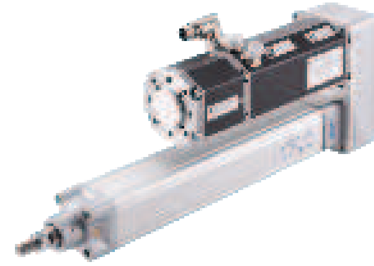


Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG65S	M12 × 1,25	∅ 20	∅ 35	431	53,5	35	54	201	65	96,5
BG75	M12 × 1,25	∅ 20	∅ 35	462,9	52,4	14	75	234	75	100
1FK7022	M12 × 1,25	∅ 20	∅ 35	400,9	49,4	11	64	175	55	103
1FK7034	M12 × 1,25	∅ 20	∅ 35	428,9	52,4	14	72	200	72	117

Ordering key

See page 112

CASM-40-BS



Electric cylinder servo motor, parallel configuration

Technical data

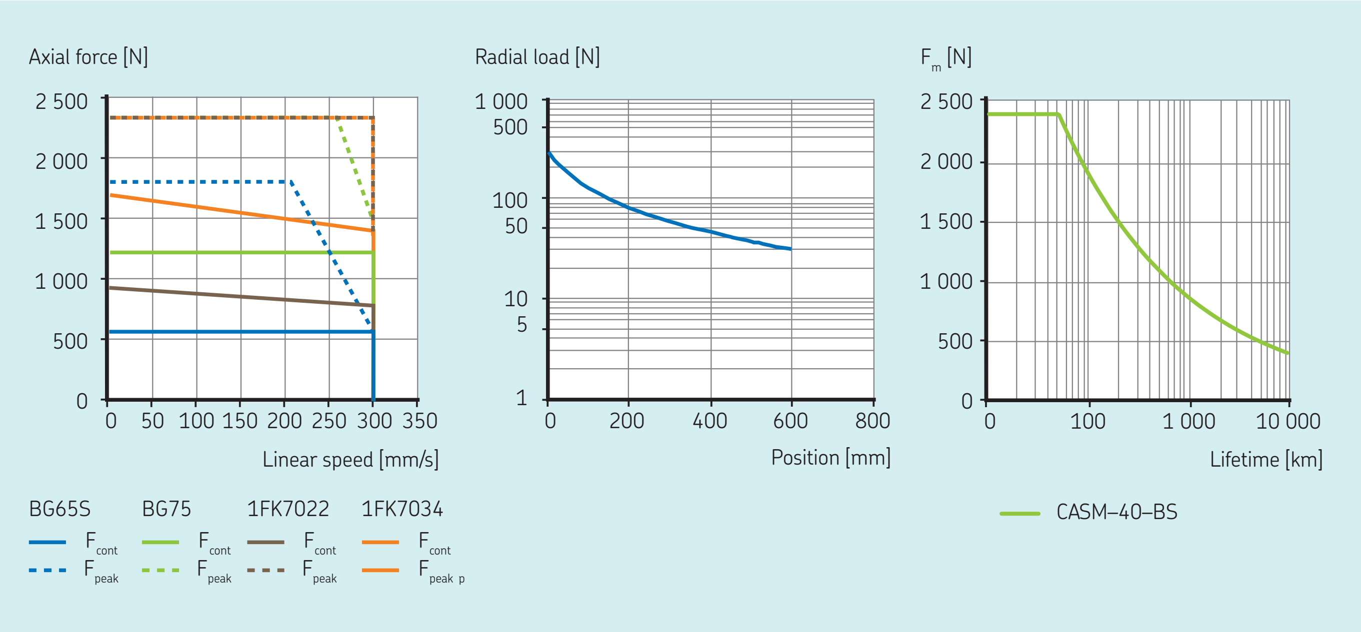
Designation	Symbol	Unit	BLDC motor BG65S	BLDC motor BG75	Servo motor 1FK7022	Servo motor 1FK7034
Performance Data						
Continuous force @ zero speed	F_{c0}	kN	0,666	1,227	0,899	1,692
Continuous force @ max. speed	F_c	kN	0,666	1,227	0,751	1,470
Peak force @ zero speed	F_{p0}	kN	1,787	2,375	2,375	2,375
Peak force @ max. speed	F_p	kN	0,666	1,438	2,375	2,375
Dynamic load capacity	C	kN	4,8	4,8	4,8	4,8
Holding force (motorbrake option)	F_{Hold}	kN	1,478	1,478	1,478	2,375
Max. linear speed	v_{max}	mm/s	298	300	300	300
Max. acceleration	a_{max}	m/s^2	6	6	6	6
Duty cycle	D	%	100	100	100	100
Mechanical Data						
Screw type	–	–	Ball screw	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	12	12	12	12
Screw lead	p_{screw}	mm	5	5	5	5
Lead accuracy	–	–	G7	G7	G7	G7
Stroke	s	mm	100...600	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	1	1	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07	0,07	0,07
Gear reduction	i	–	1	1	1	1
Efficiency	η	%	72	76	72	74
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,2624	0,8314	0,4134	1,0794
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0103	0,0103	0,0103	0,0103
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0000	0,0700	0,1000
Weight @ 0 mm stroke	m	kg	3,33	4,51	3,46	5,21
Δ weight per 100 mm stroke	Δm	kg	0,46	0,46	0,46	0,46
Weight of optional brake	m_{brake}	kg	0,50	0,50	0,20	0,40
Electrical Data						
Motor type			Brushless DC	Brushless DC	Servo	Servo
Nominal voltage	U	V DC	40	40	N/A	N/A
Nominal current	I	A	7,0	12,7	1,4	1,3
Peak current	I_{peak}	A	20,0	50,0	1,8	1,9
Nominal power	P	kW	0,236	0,450	0,400	0,600
Environment and Standards						
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50	0...+50
Degree of protection	IP	–	54S	54S	54S	54S
Standards	–	–	ISO 15558	ISO 15559	ISO 15560	ISO 15561

Ordering information

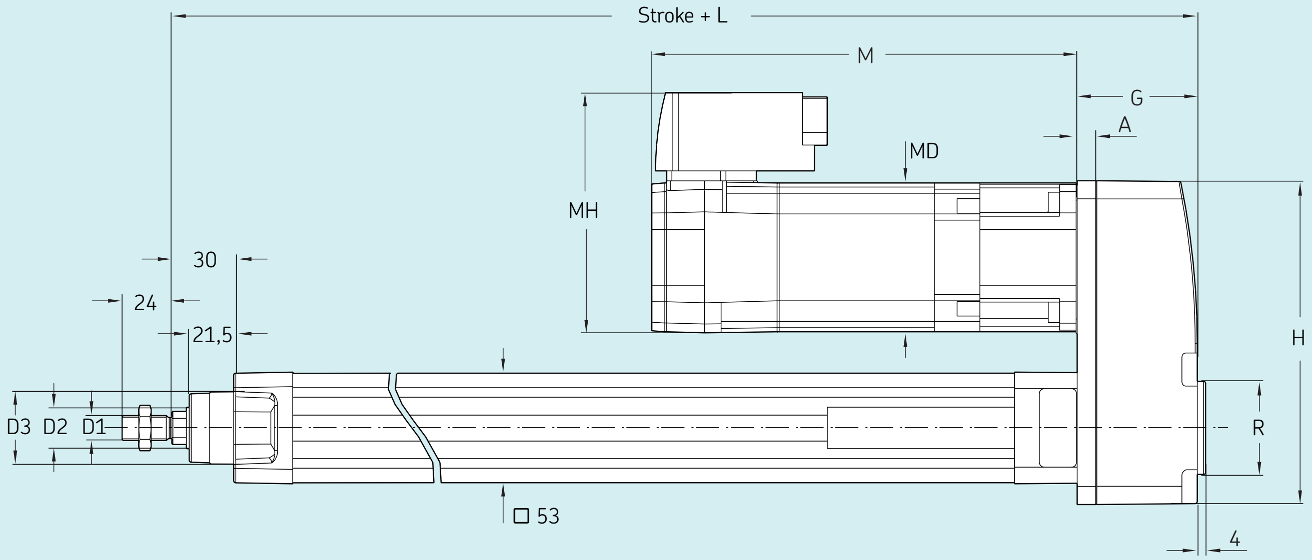
	BG65S	BG75	1FK7022	1FK7034
Linear unit	see page 64	see page 64	see page 64	see page 64
Motor	BG65SX50PI	BG75X75PI	1FK7022-5AK71-1UH3	1FK7034-2AK71-1UH0
Adapter	ZBE-375574	ZBE-375578	ZBE-375546	ZBE-375603

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing



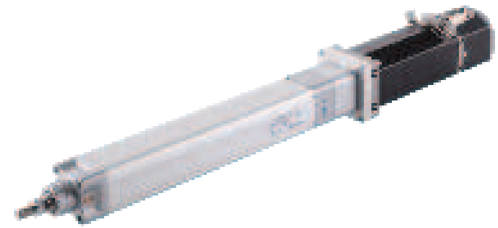
Motor	D1	D2	D3	L	G	A	H	M	MD	MH	R
		mm									
BG65S	M12 × 1,25	∅ 20	∅ 35	223	46,5	7	115,3	201	65	96,5	∅35
BG75	M12 × 1,25	∅ 20	∅ 35	234,5	58	7	156,6	234	75	100	∅45
1FK7022	M12 × 1,25	∅ 20	∅ 35	223,6	47,1	7	115,3	175	55	103	∅35
1FK7034	M12 × 1,25	∅ 20	∅ 35	234,6	58,1	9	157,3	200	72	117	∅45

Ordering key

See page 112

CASM-40-BN

Electric cylinder
servo motor, inline configuration



Technical data

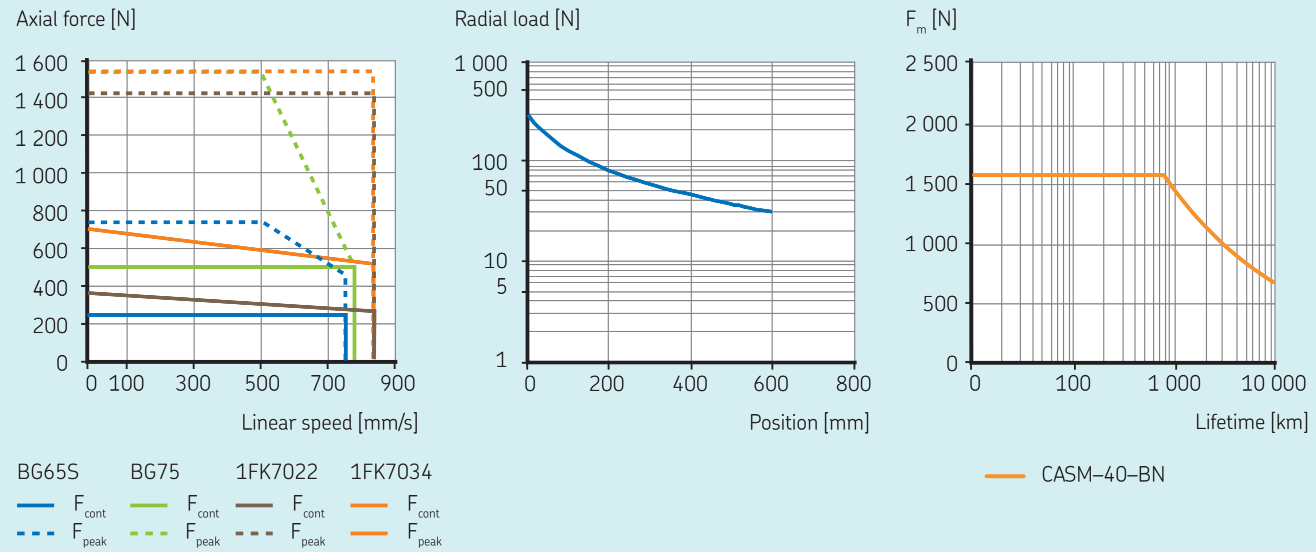
Designation	Symbol	Unit	BLDC motor BG65S	BLDC motor BG75	Servo motor 1FK7022	Servo motor 1FK7034
Performance Data						
Continuous force @ zero speed	F_{c0}	kN	0,268	0,494	0,362	0,681
Continuous force @ max. speed	F_c	kN	0,268	0,494	0,302	0,574
Peak force @ zero speed	F_{p0}	kN	0,719	1,550	1,447	1,550
Peak force @ max. speed	F_p	kN	0,268	0,494	1,447	1,550
Dynamic load capacity	C	kN	6	6	6	6
Holding force (motorbrake option)	F_{Hold}	kN	0,575	0,575	0,575	1,093
Max. linear speed	v_{max}	mm/s	756	783	826	826
Max. acceleration	a_{max}	m/s^2	6	6	6	6
Duty cycle	D	%	100	100	100	100
Mechanical Data						
Screw type	–	–	Ball screw	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	12,7	12,7	12,7	12,7
Screw lead	p_{screw}	mm	12,7	12,7	12,7	12,7
Lead accuracy	–	–	G7	G7	G7	G7
Stroke	s	mm	100...600	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	1	1	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07	0,07	0,07
Gear reduction	i	–	1	1	1	1
Efficiency	η	%	73	77	74	76
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,2629	0,7859	0,4139	1,0339
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0144	0,0144	0,0144	0,0144
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0000	0,0700	0,1000
Weight @ 0 mm stroke	m	kg	3,26	4,39	3,39	5,09
Δ weight per 100 mm stroke	Δm	kg	0,46	0,46	0,46	0,46
Weight of optional brake	m_{brake}	kg	0,50	0,50	0,20	0,40
Electrical Data						
Motor type			Brushless DC	Brushless DC	Servo	Servo
Nominal voltage	U	V DC	40	40	N/A	N/A
Nominal current	I	A	7,0	12,7	1,4	1,3
Peak current	I_{peak}	A	20,0	50,0	1,8	1,9
Nominal power	P	kW	0,236	0,450	0,400	0,600
Environment and Standards						
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50	0...+50
Degree of protection	IP	–	54S	54S	54S	54S
Standards	–	–	ISO 15552	ISO 15552	ISO 15552	ISO 15552

Ordering information

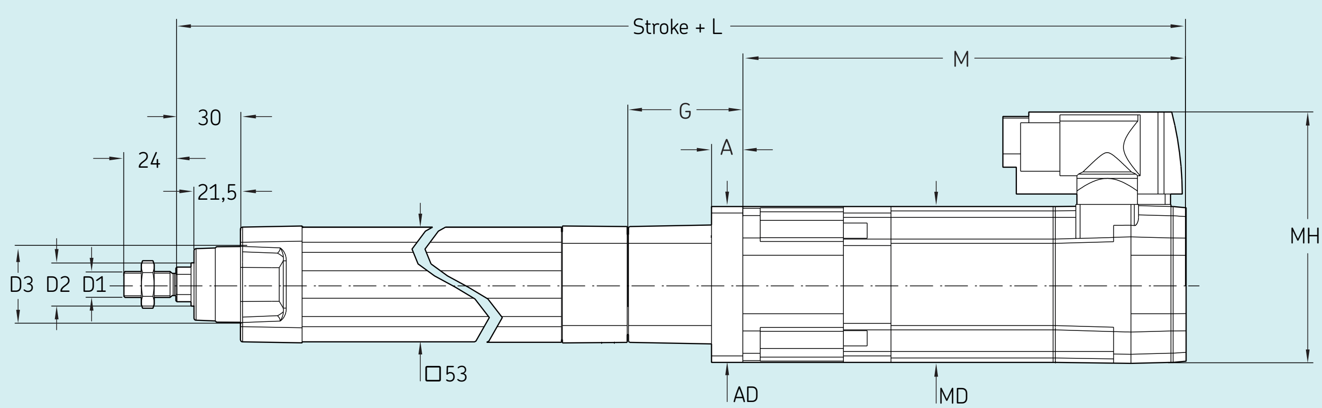
	BG65S	BG75	1FK7022	1FK7034
Linear unit	see page 64	see page 64	see page 64	see page 64
Motor	BG65SX50PI	BG75X75PI	1FK7022-5AK71-1UH3	1FK7034-2AK71-1UH0
Adapter	ZBE-375571	ZBE-375579	ZBE-375538	ZBE-375545

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing

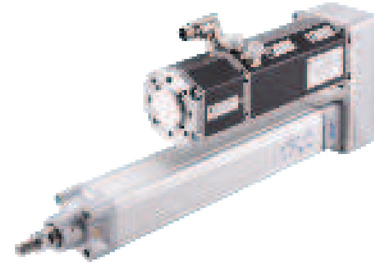


Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG65S	M12 × 1,25	∅ 20	∅ 35	431	53,5	35	54	201	65	96,5
BG75	M12 × 1,25	∅ 20	∅ 35	462,9	52,4	14	75	234	75	100
1FK7022	M12 × 1,25	∅ 20	∅ 35	400,9	49,4	11	64	175	55	103
1FK7034	M12 × 1,25	∅ 20	∅ 35	428,9	52,4	14	72	200	72	117

Ordering key

See page 112

CASM-40-BN



Electric cylinder
servo motor, parallel configuration

Technical data

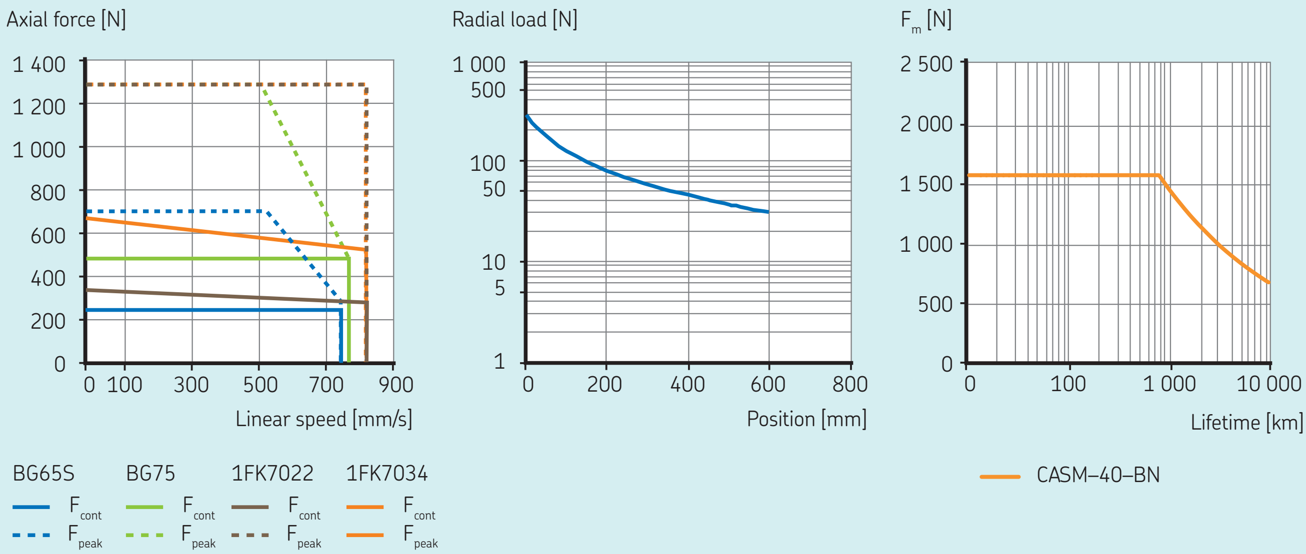
Designation	Symbol	Unit	BLDC motor BG65S	BLDC motor BG75	Servo motor 1FK7022	Servo motor 1FK7034
Performance Data						
Continuous force @ zero speed	F_{c0}	kN	0,265	0,489	0,358	0,674
Continuous force @ max. speed	F_c	kN	0,265	0,489	0,299	0,569
Peak force @ zero speed	F_{p0}	kN	0,712	1,276	1,276	1,276
Peak force @ max. speed	F_p	kN	0,265	0,489	1,276	1,276
Dynamic load capacity	C	kN	6	6	6	6
Holding force (motorbrake option)	F_{Hold}	kN	0,575	0,575	0,575	1,093
Max. linear speed	v_{max}	mm/s	756	783	826	826
Max. acceleration	a_{max}	m/s^2	6	6	6	6
Duty cycle	D	%	100	100	100	100
Mechanical Data						
Screw type	–	–	Ball screw	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	12,7	12,7	12,7	12,7
Screw lead	p_{screw}	mm	12,7	12,7	12,7	12,7
Lead accuracy	–	–	G7	G7	G7	G7
Stroke	s	mm	100...600	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	1	1	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07	0,07	0,07
Gear reduction	i	–	1	1	1	1
Efficiency	η	%	72	77	73	75
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	0,2657	0,8347	0,4167	1,0827
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0144	0,0144	0,0144	0,0144
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,0000	0,0700	0,1000
Weight @ 0 mm stroke	m	kg	3,36	4,54	3,49	5,24
Δ weight per 100 mm stroke	Δm	kg	0,46	0,46	0,46	0,46
Weight of optional brake	m_{brake}	kg	0,50	0,50	0,20	0,40
Electrical Data						
Motor type			Brushless DC	Brushless DC	Servo	Servo
Nominal voltage	U	V DC	40	40	N/A	N/A
Nominal current	I	A	7,0	12,7	1,4	1,3
Peak current	I_{peak}	A	20,0	50,0	1,8	1,9
Nominal power	P	kW	0,236	0,450	0,400	0,600
Environment and Standards						
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50	0...+50
Degree of protection	IP	–	54S	54S	54S	54S
Standards	–	–	ISO 15552	ISO 15552	ISO 15552	ISO 15552

Ordering information

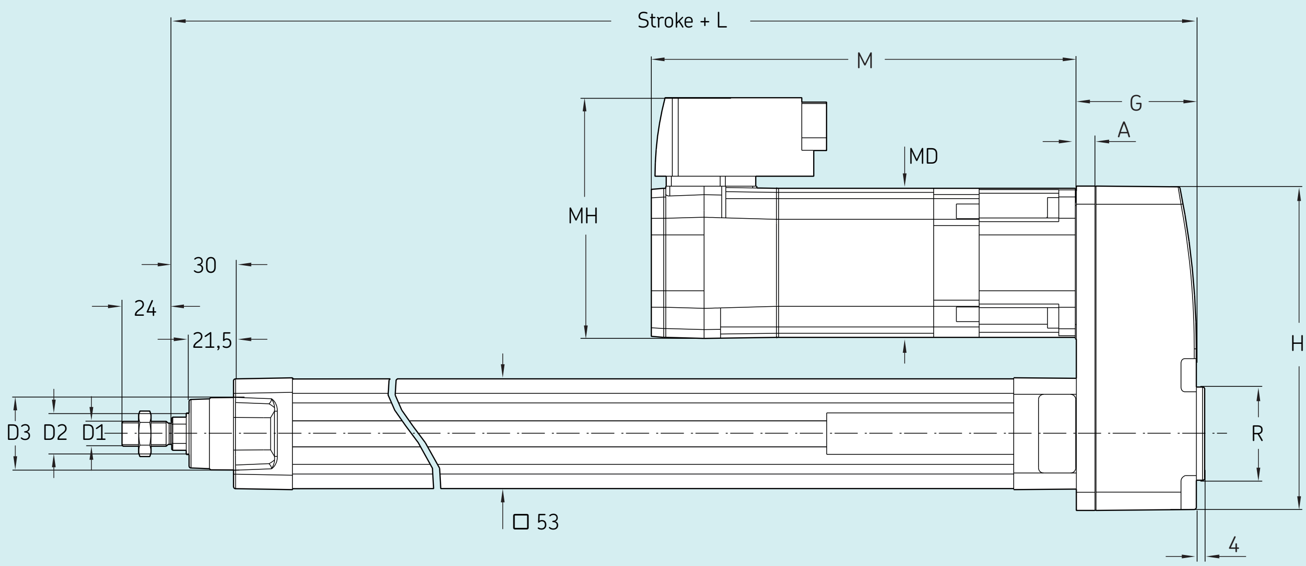
	BG65S	BG75	1FK7022	1FK7034
Linear unit	see page 64	see page 64	see page 64	see page 64
Motor	BG65SX50PI	BG75X75PI	1FK7022-5AK71-1UH3	1FK7034-2AK71-1UH0
Adapter	ZBE-375574	ZBE-375578	ZBE-375546	ZBE-375603

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing



Motor	D1	D2	D3	L	G	A	H	M	MD	MH	R
		mm									
BG65S	M12 × 1,25	∅ 20	∅ 35	223	46.5	7	115,3	201	65	96,5	∅35
BG75	M12 × 1,25	∅ 20	∅ 35	234,5	58	7	156,6	234	75	100	∅45
1FK7022	M12 × 1,25	∅ 20	∅ 35	223,6	47.1	7	115,3	175	55	103	∅35
1FK7034	M12 × 1,25	∅ 20	∅ 35	234,6	58.1	9	157,3	200	72	117	∅45

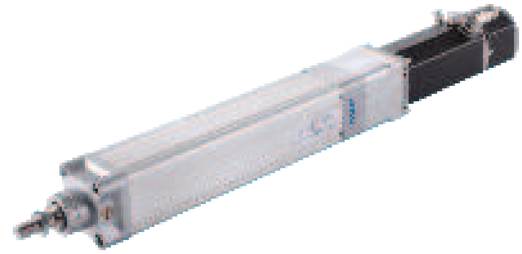
Ordering key

See page 112

C

CASM-63-LS

Electric cylinder
servo motor, inline configuration



Technical data

Designation	Symbol	Unit	BLDC motor BG75	Servo motor 1FK7034
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,711	0,980
Continuous force @ max. speed	F_c	kN	0,114	0,114
Peak force @ zero speed	F_{p0}	kN	1,000	1,000
Peak force @ max. speed	F_p	kN	1,000	1,000
Dynamic load capacity	C	kN	N/A	N/A
Holding force (motorbrake option)	F_{Hold}	kN	–	–
Max. linear speed	v_{max}	mm/s	70	70
Max. acceleration	a_{max}	m/s^2	1	1
Duty cycle	D	%	60	60
Mechanical Data				
Screw type	–	–	Lead screw	Lead screw
Screw diameter	d_{screw}	mm	20	20
Screw lead	p_{screw}	mm	4	4
Lead accuracy	–	–	N/A	N/A
Stroke	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	N/A	N/A
Gear reduction	i	–	1	1
Efficiency	η	%	35	34
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	1,6120	1,8600
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0809	0,0809
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,1000
Weight @ 0 mm stroke	m	kg	5,95	6,65
Δ weight per 100 mm stroke	Δm	kg	0,81	0,81
Weight of optional brake	m_{brake}	kg	0,50	0,40
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	40	N/A
Nominal current	I	A	12,7	1,3
Peak current	I_{peak}	A	50,0	1,9
Nominal power	P	kW	0,450	0,600
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

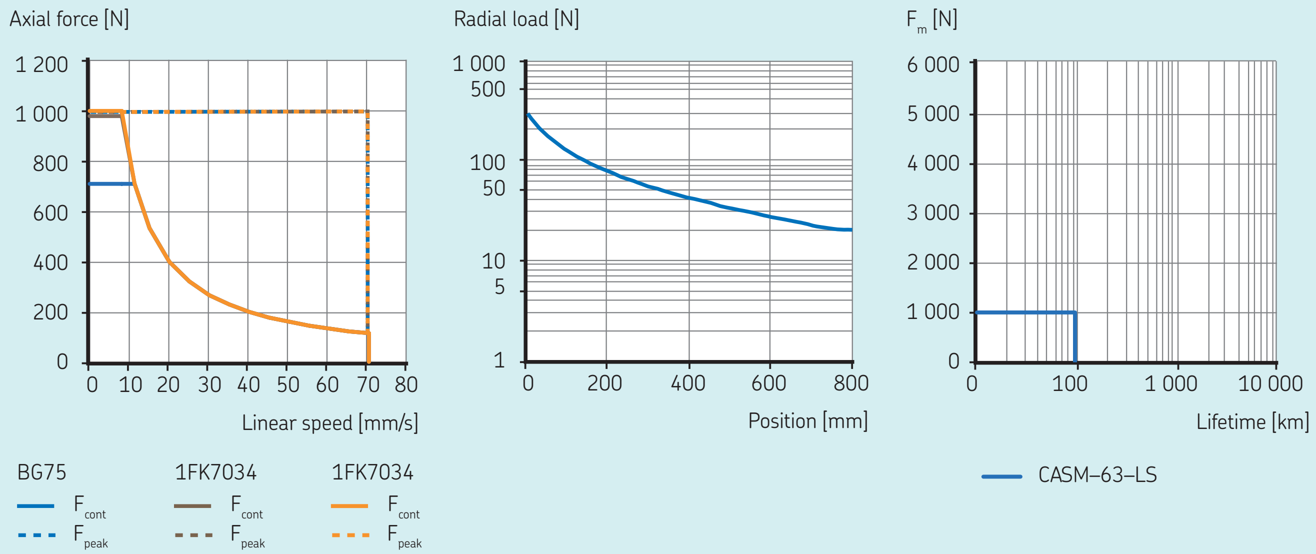
Ordering information

	BG75	1FK7034
Linear unit	see page 64	see page 64
Motor	BG75X75PI	1FK7034-2AK71-1UH0
Adapter	ZBE-375572	ZBE-375544

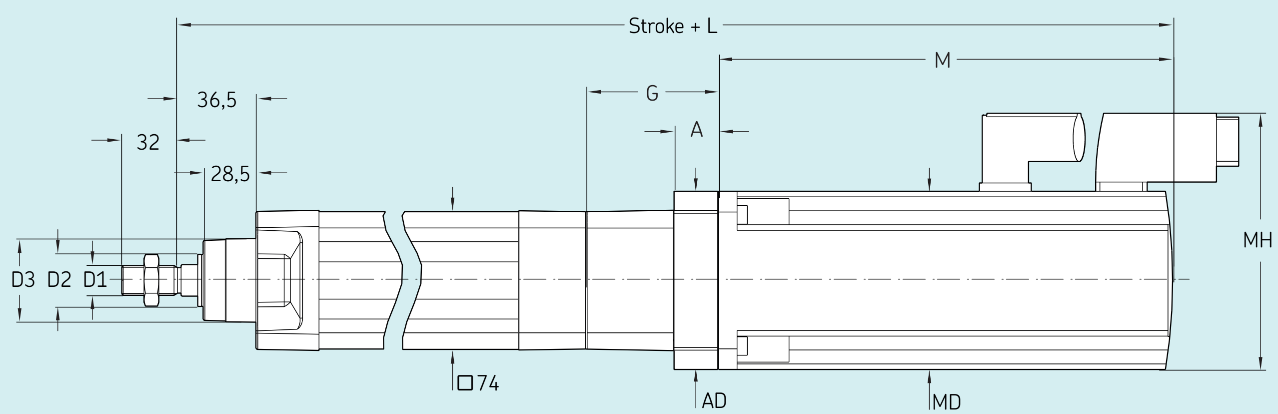
For more information regarding motors and motor adapters, please visit page 62

SKF

Performance diagrams



Dimensional drawing

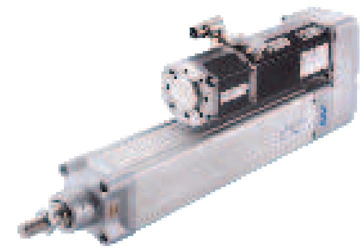


Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG75	M16 × 1,5	∅ 28	∅ 45	515,1	67,1	20	75	234	75	100
1FK7034	M16 × 1,5	∅ 28	∅ 45	476,4	62,4	15	75	200	72	117

Ordering key

See page 112

CASM-63-LS



Electric cylinder
servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	BLDC motor BG75	Servo motor 1FK7034
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,704	0,970
Continuous force @ max. speed	F_c	kN	0,114	0,114
Peak force @ zero speed	F_{p0}	kN	1,000	1,000
Peak force @ max. speed	F_p	kN	1,000	1,000
Dynamic load capacity	C	kN	N/A	N/A
Holding force (motorbrake option)	F_{Hold}	kN		
Max. linear speed	v_{max}	mm/s	70	70
Max. acceleration	a_{max}	m/s^2	1	1
Duty cycle	D	%	60	60
Mechanical Data				
Screw type	–	–	Lead screw	Lead screw
Screw diameter	d_{screw}	mm	20	20
Screw lead	p_{screw}	mm	4	4
Lead accuracy	–	–	N/A	N/A
Stroke	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	N/A	N/A
Gear reduction	i	–	1	1
Efficiency	η	%	35	34
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	1,4668	1,7148
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0809	0,0809
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,1000
Weight @ 0 mm stroke	m	kg	6,05	6,75
Δ weight per 100 mm stroke	Δm	kg	0,81	0,81
Weight of optional brake	m_{brake}	kg	0,50	0,40
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	40	N/A
Nominal current	I	A	12,7	1,3
Peak current	I_{peak}	A	50,0	1,9
Nominal power	P	kW	0,450	0,600
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

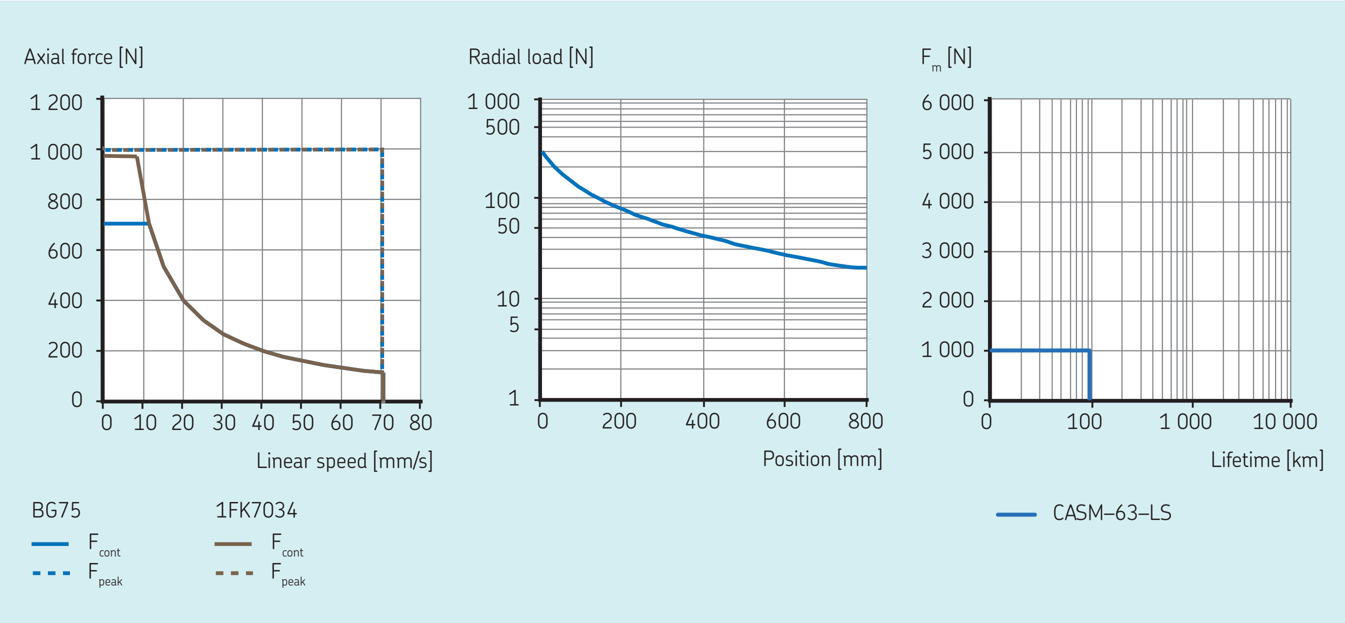
Ordering information

	BG75	1FK7034
Linear unit	see page 64	see page 64
Motor	BG75X75PI	1FK7034-2AK71-1UH0
Adapter	ZBE-375575	ZBE-375543

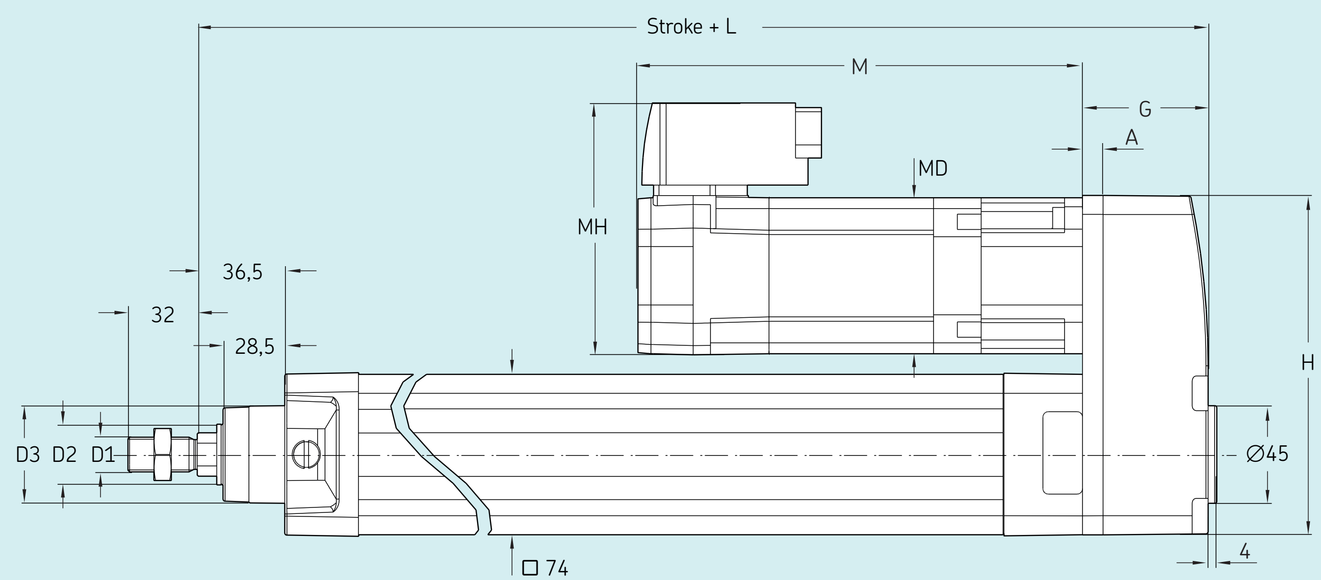
For more information regarding motors and motor adapters, please visit page 62

SKF

Performance diagrams



Dimensional drawing

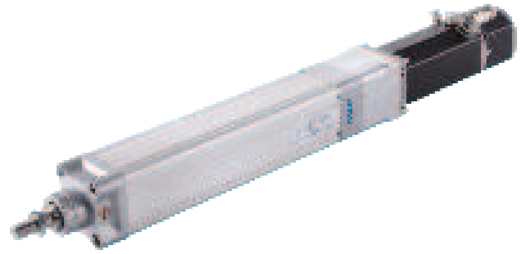


Motor	D1	D2	D3	L	G	A	H	M	MD	MH
		mm								
BG75	M16 × 1,5	Ø 28	Ø 45	281,1	39,5	9	157,3	234	75	100
1FK7034	M16 × 1,5	Ø 28	Ø 45	272,1	58,1	9	157,3	200	72	117

Ordering key

See page 112

CASM-63-BN



Electric cylinder
servo motor, inline configuration

Technical data

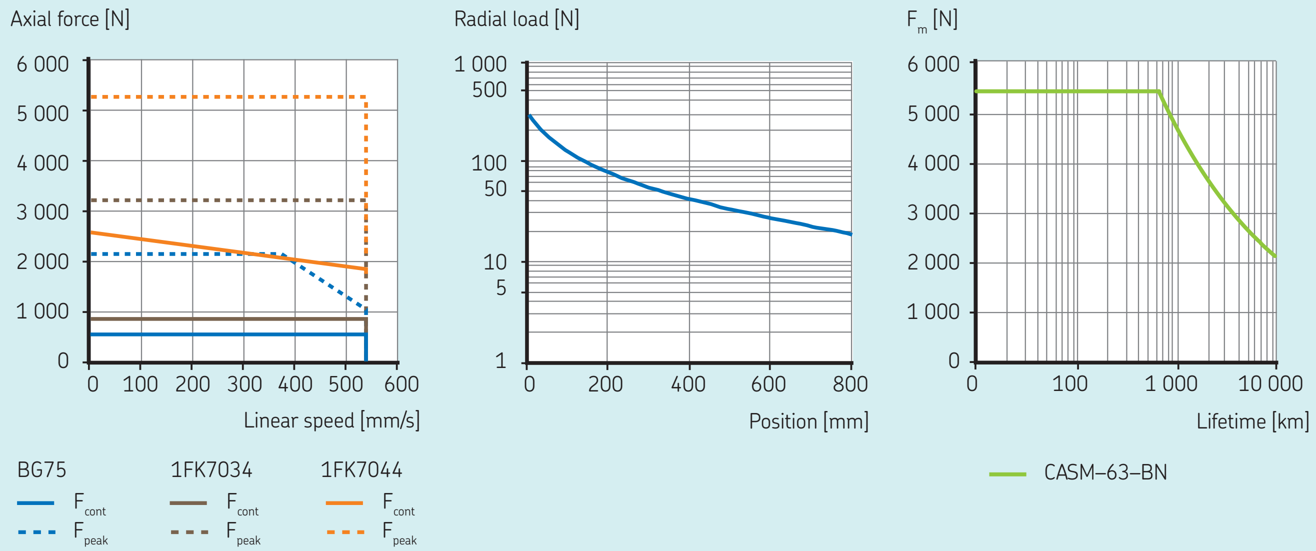
Designation	Symbol	Unit	BLDC motor BG75	Servo motor 1FK7034	Servo motor 1FK7044
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	0,620	0,855	2,403
Continuous force @ max. speed	F_c	kN	0,620	0,769	1,933
Peak force @ zero speed	F_{p0}	kN	2,190	3,471	5,400
Peak force @ max. speed	F_p	kN	1,081	3,471	5,400
Dynamic load capacity	C	kN	21	21	21
Holding force (motorbrake option)	F_{Hold}	kN	0,739	1,404	2,956
Max. linear speed	v_{max}	mm/s	533	533	533
Max. acceleration	a_{max}	m/s^2	6	6	6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	20	20	20
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G7	G7	G7
Stroke	s	mm	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	1	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07	0,07
Gear reduction	i	–	1	1	1
Efficiency	η	%	77	75	77
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	1,6120	1,8600	2,2200
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0809	0,0809	0,0809
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,1000	0,3600
Weight @ 0 mm stroke	m	kg	6,05	6,75	10,65
Δ weight per 100 mm stroke	Δm	kg	0,81	0,81	0,81
Weight of optional brake	m_{brake}	kg	0,50	0,40	0,60
Electrical Data					
Motor type	–	–	Brushless DC	Servo	Servo
Nominal voltage	U	V DC	40	N/A	N/A
Nominal current	I	A	12,7	1,3	3,9
Peak current	I_{peak}	A	50,0	1,9	5,4
Nominal power	P	kW	0,450	0,600	1,400
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50
Degree of protection	IP	–	54S	54S	54S
Standards	–	–	ISO 15552	ISO 15552	ISO 15552

Ordering information

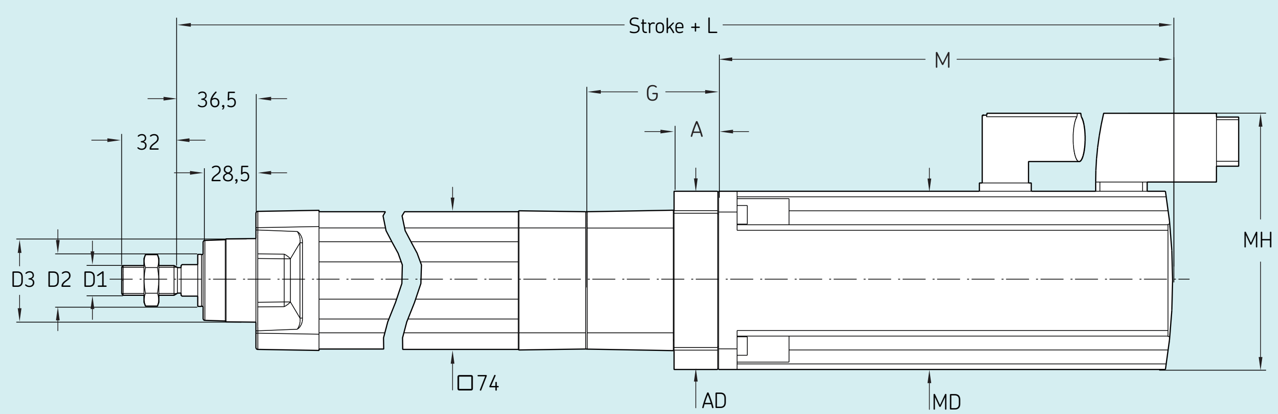
	BG75	1FK7034	1FK7044
Linear unit	see page 64	see page 64	see page 64
Motor	BG75X75PI	1FK7034-2AK71-1UH0	1FK7044-4CH71-1UH0
Adapter	ZBE-375572	ZBE-375544	ZBE-375535

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing

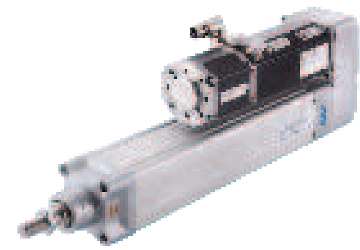


Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG75	M16 × 1,5	∅ 28	∅ 45	515,1	67,1	20	75	234	75	100
1FK7034	M16 × 1,5	∅ 28	∅ 45	476,4	62,4	15	75	200	72	117
1FK7044	M16 × 1,5	∅ 28	∅ 45	529,9	70,9	23,5	96	245	96	138

Ordering key

See page 112

CASM-63-BN



Electric cylinder
servo motor, parallel configuration

Technical data

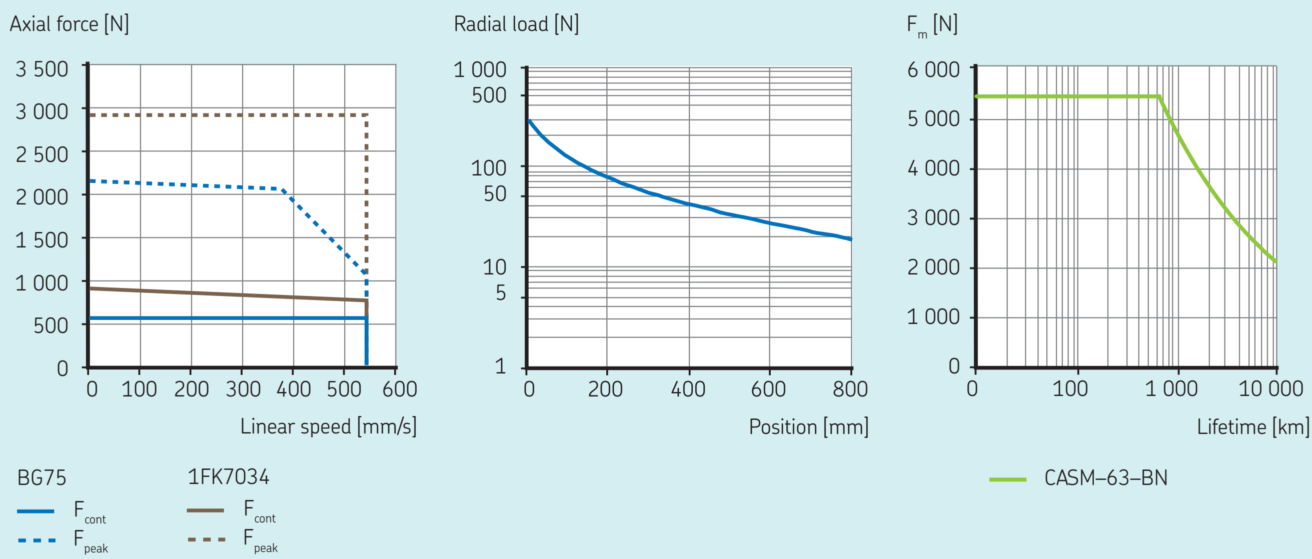
Designation	Symbol	Unit	BLDC motor BG75	Servo motor 1FK7034
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,613	0,846
Continuous force @ max. speed	F_c	kN	0,613	0,761
Peak force @ zero speed	F_{p0}	kN	2,168	2,937
Peak force @ max. speed	F_p	kN	1,070	2,937
Dynamic load capacity	C	kN	21	21
Holding force (motorbrake option)	F_{Hold}	kN	0,739	1,404
Max. linear speed	v_{max}	mm/s	533	533
Max. acceleration	a_{max}	m/s^2	6	6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	20	20
Screw lead	p_{screw}	mm	10	10
Lead accuracy	–	–	G7	G7
Stroke	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07
Gear reduction	i	–	1	1
Efficiency	η	%	76	74
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	1,4668	1,7148
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0809	0,0809
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,1000
Weight @ 0 mm stroke	m	kg	6,15	6,85
Δ weight per 100 mm stroke	Δm	kg	0,81	0,81
Weight of optional brake	m_{brake}	kg	0,50	0,40
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	40	N/A
Nominal current	I	A	12,7	1,3
Peak current	I_{peak}	A	50,0	1,9
Nominal power	P	kW	0,450	0,600
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

Ordering information

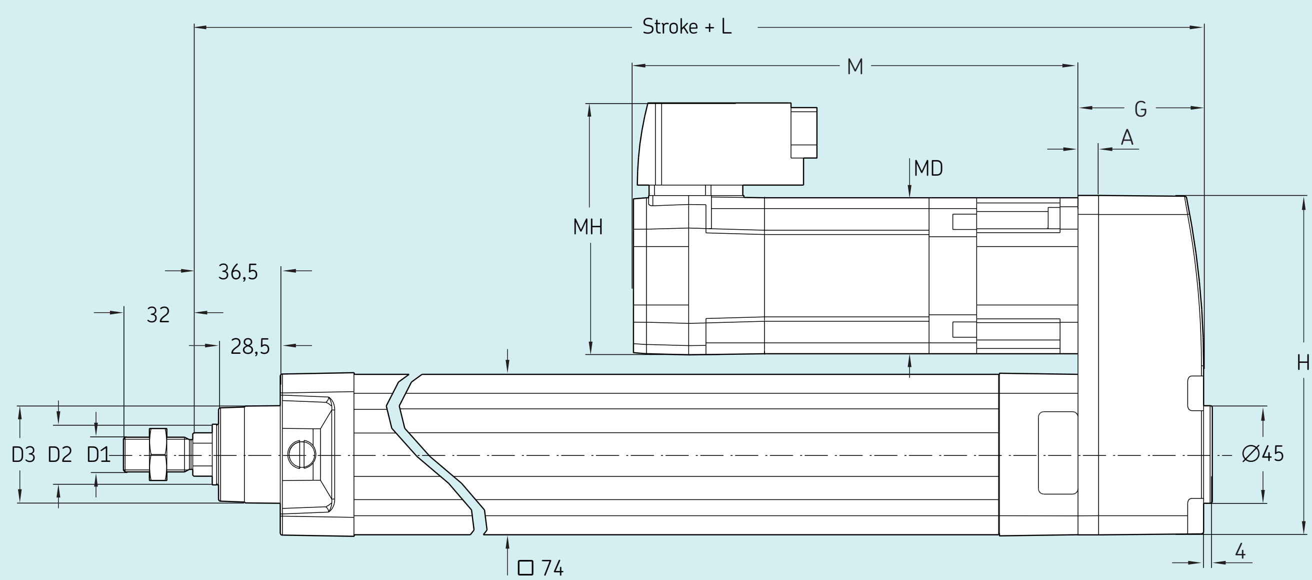
	BG75	**1FK7034**
Linear unit	see page 64	see page 64
Motor	BG75X75PI	1FK7034-2AK71-1UH0
Adapter	ZBE-375575	ZBE-375543

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing



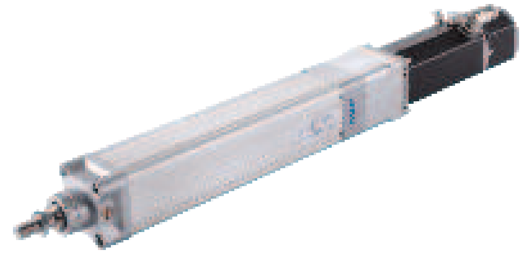
Motor	D1	D2	D3	L	G	A	H	M	MD	MH
		mm								
BG75	M16 × 1,5	∅ 28	∅ 45	281,1	39,5	9	157,3	234	75	100
1FK7034	M16 × 1,5	∅ 28	∅ 45	272,1	58,1	9	157,3	200	72	117

Ordering key

See page 112

CASM-63-BF

Electric cylinder
servo motor, inline configuration



Technical data

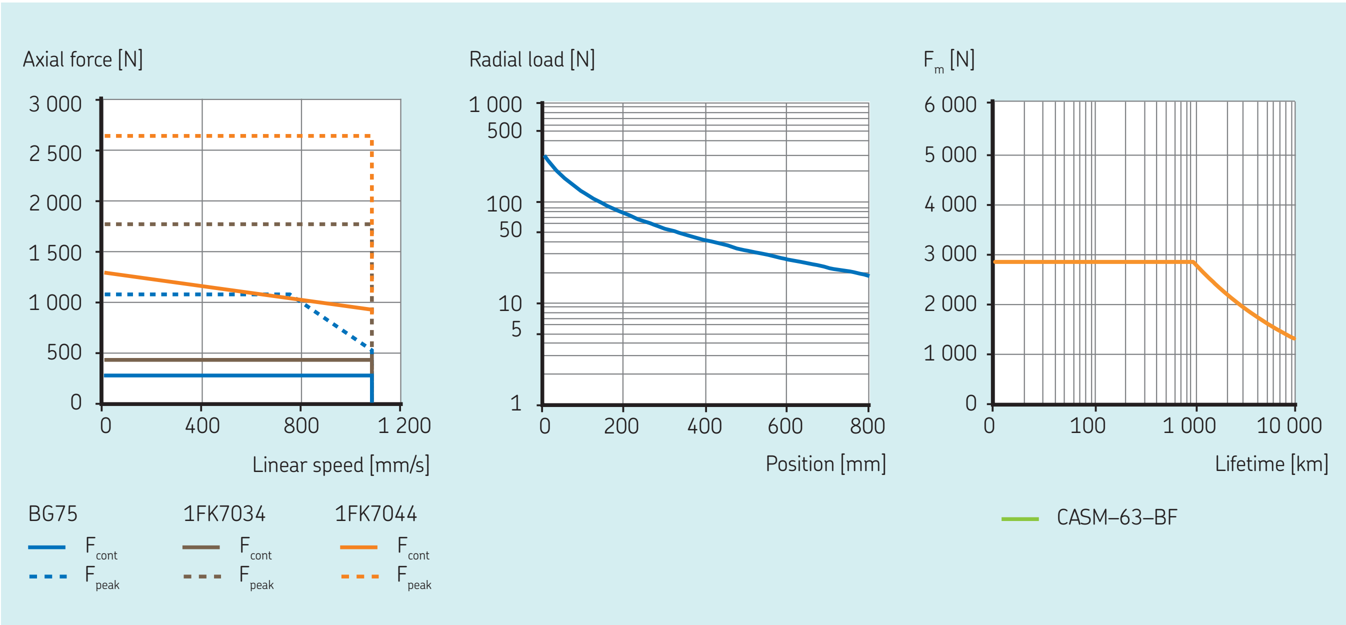
Designation	Symbol	Unit	BLDC motor BG75	Servo motor 1FK7034	Servo motor 1FK7044
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	0,313	0,432	1,216
Continuous force @ max. speed	F_c	kN	0,313	0,389	0,978
Peak force @ zero speed	F_{p0}	kN	1,108	1,756	2,800
Peak force @ max. speed	F_p	kN	0,547	1,756	2,800
Dynamic load capacity	C	kN	10	10	10
Holding force (motorbrake option)	F_{Hold}	kN	0,365	0,694	1,461
Max. linear speed	v_{max}	mm/s	1 067	1 067	1 067
Max. acceleration	a_{max}	m/s^2	6	6	6
Duty cycle	D	%	100%	100	100
Mechanical Data					
Screw type	–	–	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	20	20	20
Screw lead	p_{screw}	mm	20	20	20
Lead accuracy	–	–	G7	G7	G7
Stroke	s	mm	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	1	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07	0,07
Gear reduction	i	–	1	1	1
Efficiency	η	%	77	76	78
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	1,6156	1,8636	2,2236
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0855	0,0855	0,0855
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,1000	0,3600
Weight @ 0 mm stroke	m	kg	6,05	6,75	10,65
Δ weight per 100 mm stroke	Δm	kg	0,81	0,81	0,81
Weight of optional brake	m_{brake}	kg	0,50	0,40	0,60
Electrical Data					
Motor type	–	–	Brushless DC	Servo	Servo
Nominal voltage	U	V DC	40	N/A	N/A
Nominal current	I	A	12,7	1,3	3,9
Peak current	I_{peak}	A	50,0	1,9	5,4
Nominal power	P	kW	0,450	0,600	1,400
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50
Degree of protection	IP	–	54S	54S	54S
Standards	–	–	ISO 15552	ISO 15552	ISO 15552

Ordering information

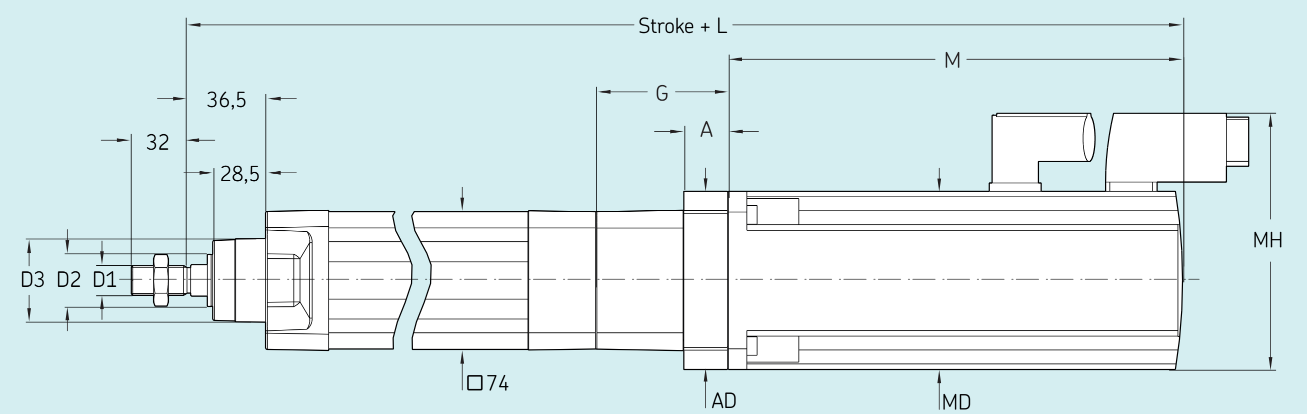
	BG75	1FK7034	1FK7044
Linear unit	see page 64	see page 64	see page 64
Motor	BG75X75PI	1FK7034-2AK71-1UH0	1FK7044-4CH71-1UH0
Adapter	ZBE-375572	ZBE-375544	ZBE-375535

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing



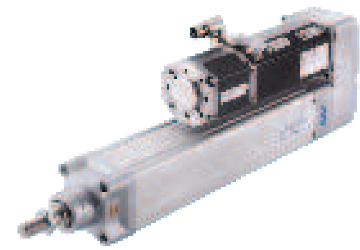
Motor	D1	D2	D3	L	G	A	AD	M	MD	MH
		mm								
BG75	M16 × 1,5	∅ 28	∅ 45	515,1	67,1	20	75	234	75	100
1FK7034	M16 × 1,5	∅ 28	∅ 45	476,4	62,4	15	75	200	72	117
1FK7044	M16 × 1,5	∅ 28	∅ 45	529,9	70,9	23,5	96	245	96	138

Ordering key

See page 112

CASM-63-BF

Electric cylinder
servo motor, parallel configuration



Technical data

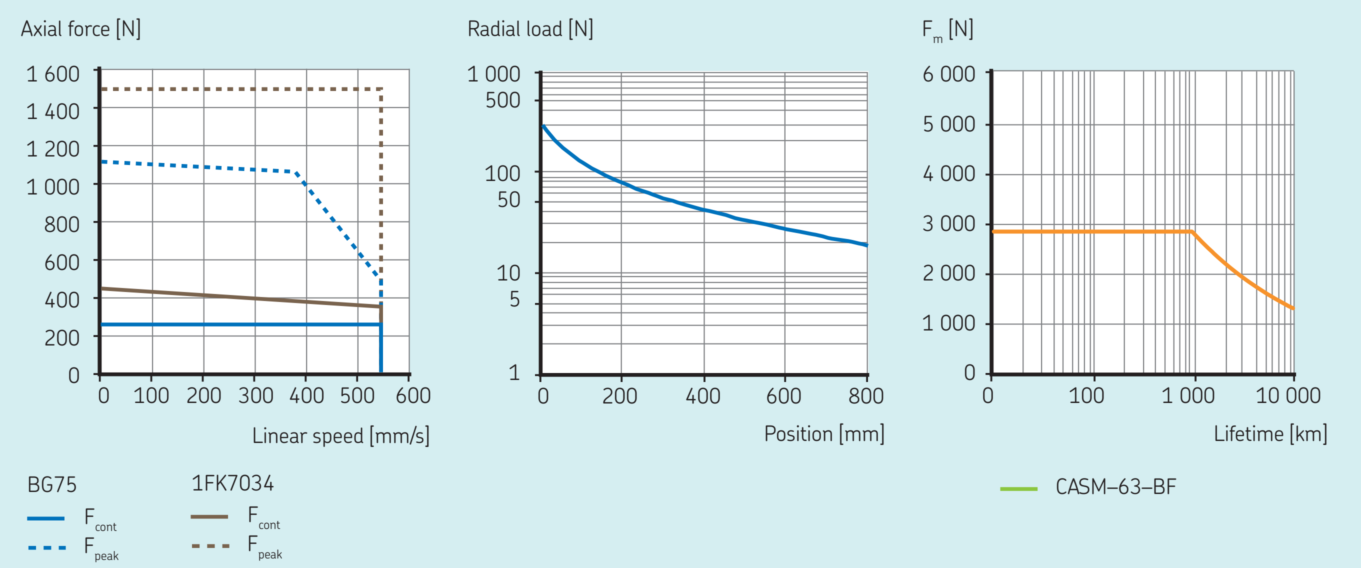
Designation	Symbol	Unit	BLDC motor BG75	Servo motor 1FK7034
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	0,310	0,428
Continuous force @ max. speed	F_c	kN	0,310	0,385
Peak force @ zero speed	F_{p0}	kN	1,097	1,486
Peak force @ max. speed	F_p	kN	0,541	1,486
Dynamic load capacity	C	kN	10	10
Holding force (motorbrake option)	F_{Hold}	kN	0,365	0,694
Max. linear speed	v_{max}	mm/s	1 067	1 067
Max. acceleration	a_{max}	m/s^2	6	6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	20	20
Screw lead	p_{screw}	mm	20	20
Lead accuracy	–	–	G7	G7
Stroke	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07
Gear reduction	i	–	1	1
Efficiency	η	%	77	75
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	1,4704	1,7184
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0855	0,0855
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0000	0,1000
Weight @ 0 mm stroke	m	kg	6,15	6,85
Δ weight per 100 mm stroke	Δm	kg	0,81	0,81
Weight of optional brake	m_{brake}	kg	0,50	0,40
Electrical Data				
Motor type	–	–	Brushless DC	Servo
Nominal voltage	U	V DC	40	N/A
Nominal current	I	A	12,7	1,3
Peak current	I_{peak}	A	50,0	1,9
Nominal power	P	kW	0,450	0,600
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50
Degree of protection	IP	–	54S	54S
Standards	–	–	ISO 15552	ISO 15552

Ordering information

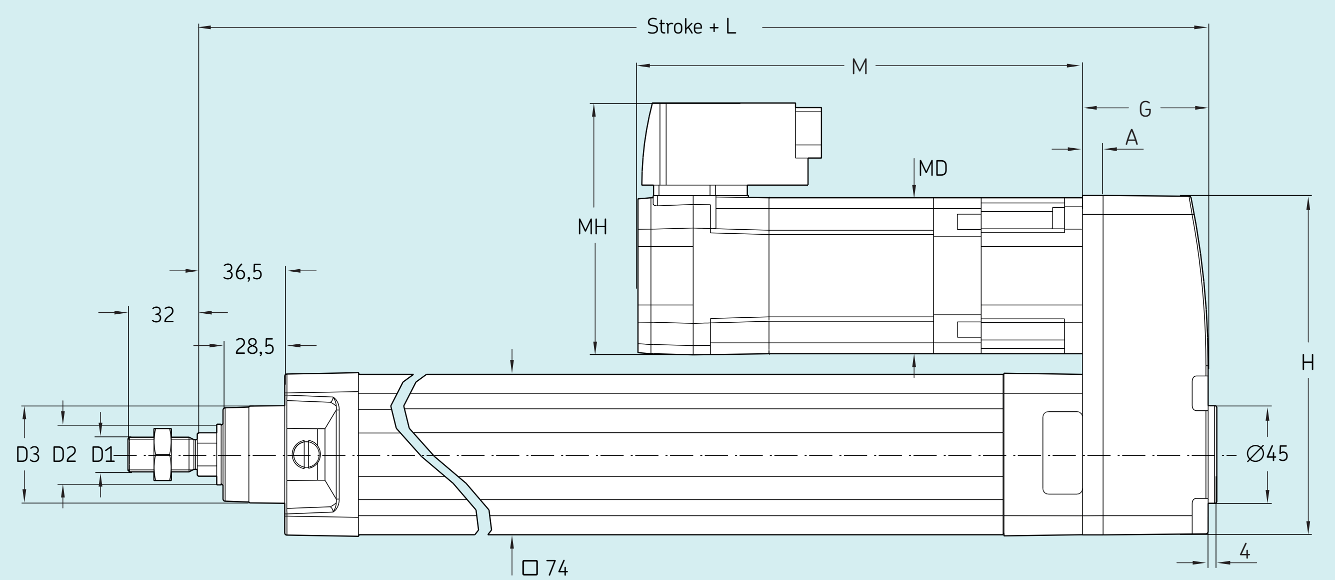
	BG75	1FK7034
Linear unit	see page 64	see page 64
Motor	BG75X75PI	1FK7034-2AK71-1UH0
Adapter	ZBE-375575	ZBE-375543

For more information regarding motors and motor adapters, please visit page 62

Performance diagrams



Dimensional drawing



Motor	D1	D2	D3	L	G	A	H	M	MD	MH
		mm								
BG75	M16 × 1,5	∅ 28	∅ 45	281,1	39,5	9	157,3	234	75	100
1FK7034	M16 × 1,5	∅ 28	∅ 45	272,1	58,1	9	157,3	200	72	117

Ordering key

See page 112

Ordering key

Linear units

C A S M - 3 2 - L S - 0 4 0 0 A A - 0 0 0

Screw:
LS Lead screw 9×1,5 mm
BS Ball screw 10×3 mm
BN Ball screw 10×10 mm

Stroke:
50 mm
100 mm
150 mm
200 mm
300 mm
400 mm

Option[1]
A Motor, adapter and accessories separately delivered
M Motor, adapter and foot mountings[2] pre-mounted

C A S M - 4 0 - B N - 0 2 0 0 A M - 0 0 0

Screw:
LS Lead screw 12,5×2,5 mm
BS Ball screw 12×5 mm
BN Ball screw 12,7×12,7 mm

Stroke:
100 mm
200 mm
300 mm
400 mm
500 mm
600 mm

Option[1]
A Motor, adapter and accessories separately delivered
M Motor, adapter and foot mountings[2] pre-mounted

C A S M - 6 3 - B F - 0 5 0 0 A A - 0 0 0

Screw:
LS Lead screw 20×4 mm
BN Ball screw 20×10 mm
BF Ball screw 20×20 mm

Stroke:
100 mm
200 mm
300 mm
400 mm
500 mm
600 mm
700 mm
800 mm

Option[1]
A Motor, adapter and accessories separately delivered
M Motor, adapter and foot mountings[2] pre-mounted

1) Motor, adapter kit and accessories need to be ordered separately
2) Foot mountings pre-mounted on inline version only

Servo motors

Motor
1FK7015-5AK71-1SH3
1FK7022-5AK71-1UH3
1FK7034-2AK71-1UH0
1FK7044-4CH71-1UH0

Brushless DC motors

Motor
BG45x30PI
BG65Sx50PI
BG75x75PI

Adapters for Servo motors

Motor	CASM-32		CASM-40		CASM-63	
	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter
1FK7015-5AK-71-1SH3	ZBE-375530	ZBE-375540	–	–	–	–
1FK7022-5AK71-1UH3	ZBE-375537	–	ZBE-375538	ZBE-375546	–	–
1FK7034-2AK71-1UH0	–	–	ZBE-375545	ZBE-375603	ZBE-375544	ZBE-375543
1FK7044-4CH71-1UH0	–	–	–	–	ZBE-375535	–

Adapters for brushless DC motors

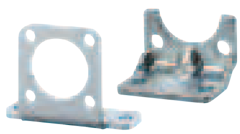
Motor	CASM-32		CASM-40		CASM-63	
	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter	Inline adapter	Parallel adapter
BG45x30PI	ZBE-375570	ZBE-375573	–	–	–	–
BG65Sx50 PI	–	–	ZBE-375571	ZBE-375574	–	–
BG75x75 PI	–	–	ZBE-375579	ZBE-375578	ZBE-375572	ZBE-375575

Example
To order a CASM-32 with BG45 motor and parallel adapter the ordering key is the following:
CASM-32-BN-0150AM-000
BG45x30PI
ZBE-375573

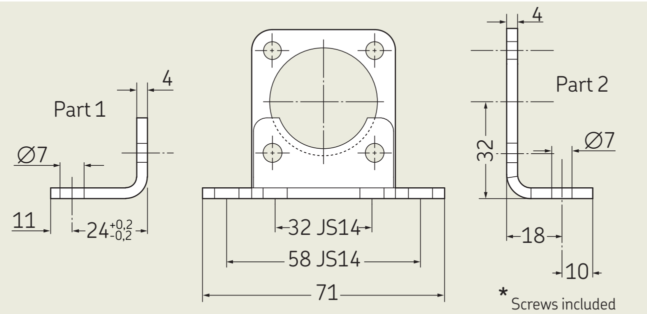
Accessories

CASM-32

Foot mounting kit*



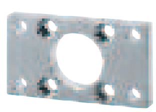
Note: The foot mounting between the linear unit and the adapter kit increases the length of the inline version by 4 mm

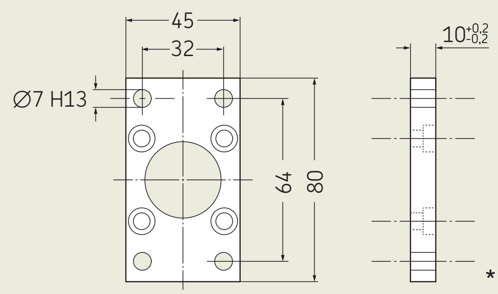


Ordering key
ZBE–375501–32
For parallel version
(2x part 1)

Ordering key
ZBE–375507–32
For inline version
(part 1 + part 2)

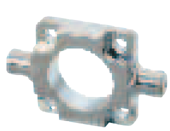
Flange mounting kit*

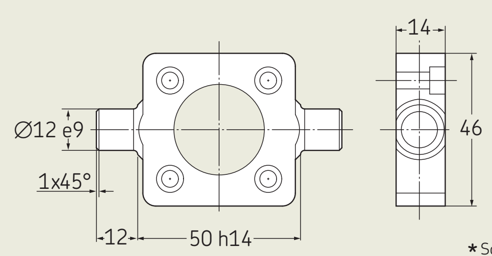




Ordering key
ZBE–375502–32

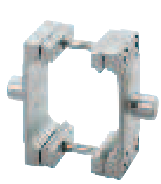
Trunnion flange kit*

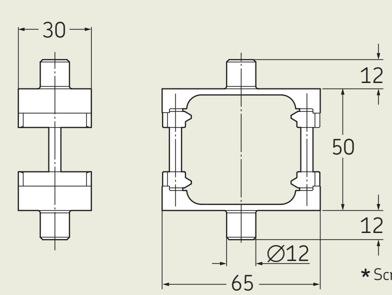




Ordering key
ZBE–375503–32

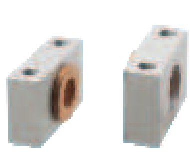
Trunnion mounting kit*



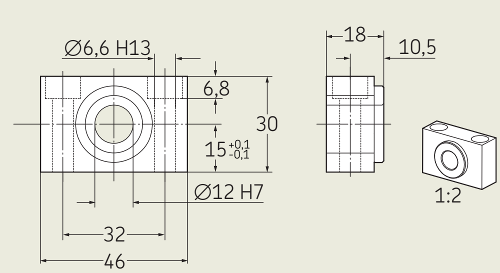


Ordering key
ZBE–375508–32

Trunnion support pair

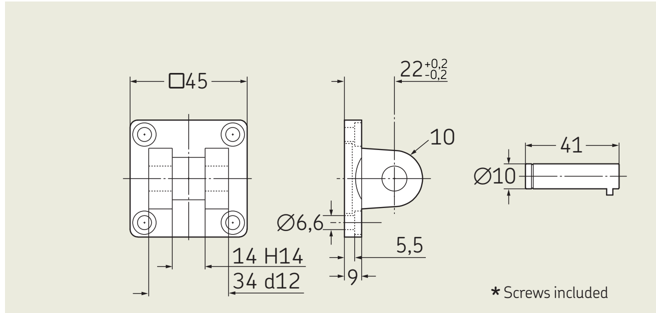


Note: to be used with trunnion flange kit or trunnion mounting kit



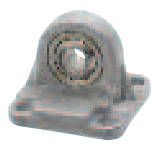
Ordering key
ZBE–375509–32

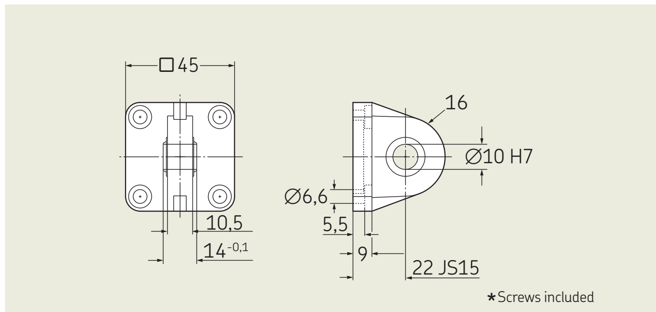
Swivel flange*



Ordering key
ZBE–375504–32
For parallel version only

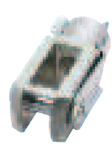
Swivel flange with rod end*

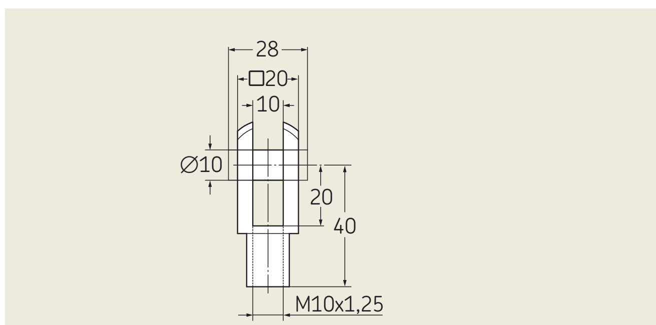




Ordering key
ZBE–375506–32
For parallel version only

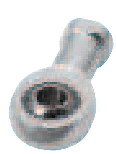
Rod clevis

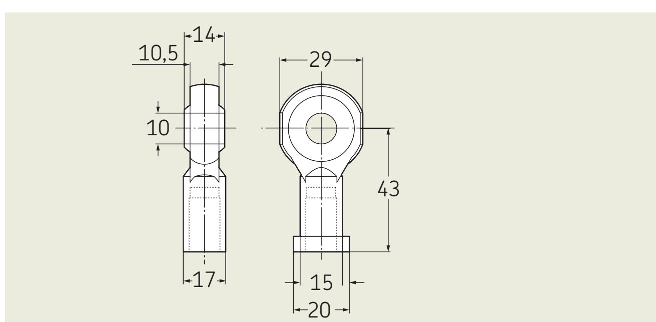




Ordering key
ZBE–375510–32

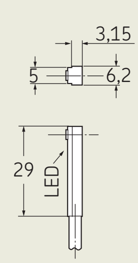
Rod end

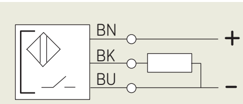




Ordering key
ZBE–375511–32

Proximity sensor



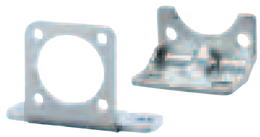


Switching function	Normally open
Output signal	PNP
Rated voltage	24 V DC
Max. current	30 mA
Cable length	5 m

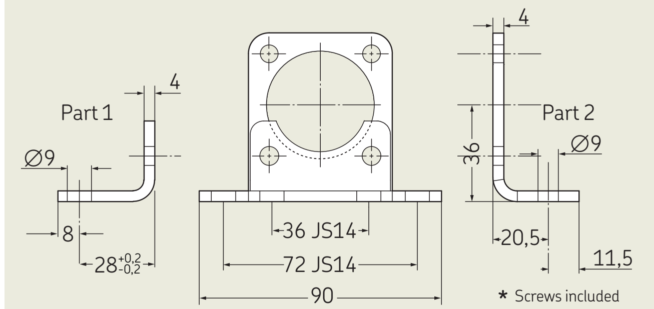
Ordering key
ZSC–375525–NO

C

Foot mounting kit*



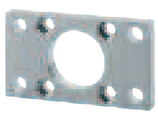
Note: The foot mounting between the linear unit and the adapter kit increases the length of the inline version by 4 mm

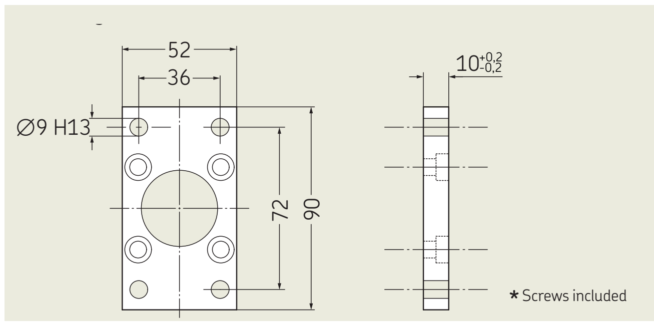


Ordering key
ZBE–375501–40
For parallel version with large adapter (dimensional information on request)

Ordering key
ZBE–375507–40
For inline version (part 1 + part 2)

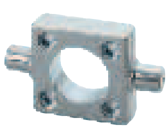
Flange mounting kit*

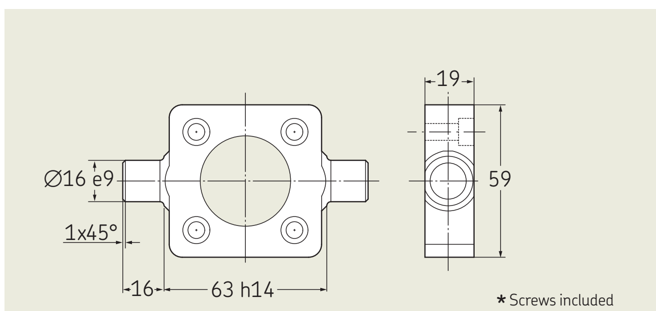




Ordering key
ZBE–375502–40

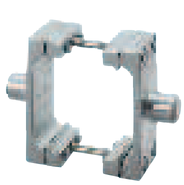
Trunnion flange kit*

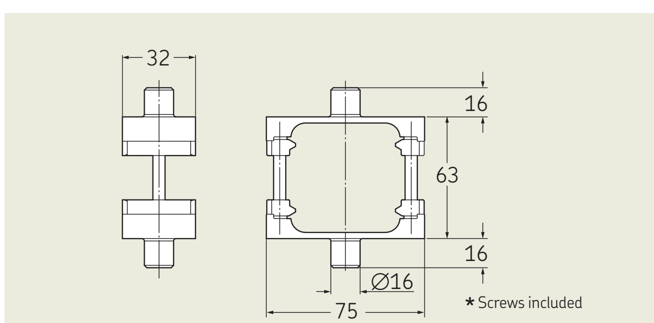




Ordering key
ZBE–375503–40

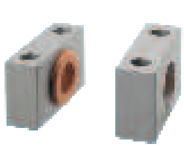
Trunnion mounting kit*



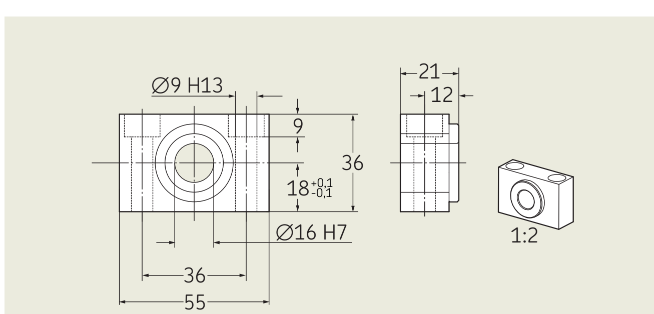


Ordering key
ZBE–375508–40

Trunnion support pair

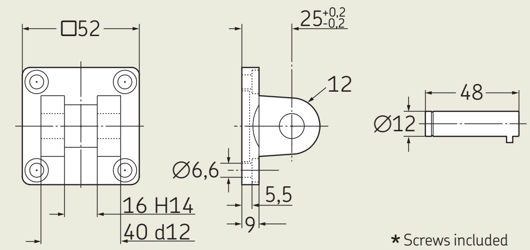


Note: to be used with trunnion flange kit or trunnion mounting kit



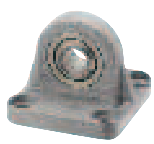
Ordering key
ZBE–375509–40

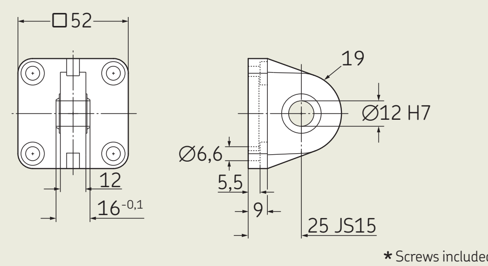
Swivel flange*



Ordering key
ZBE–375504–40
For parallel version only.
For parallel adapters ZBE-375603 and ZBE-375578 see CASM-63 equivalent accessories.

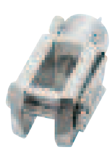
Swivel flange with rod end*

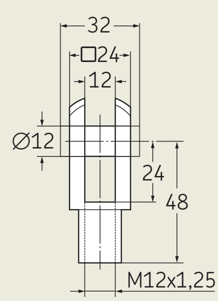




Ordering key
ZBE–375506–40
For parallel version only.
For parallel adapters ZBE-375603 and ZBE-375578 see CASM-63 equivalent accessories.

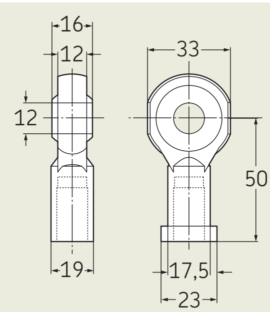
Rod clevis





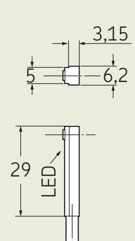
Ordering key
ZBE–375510–40

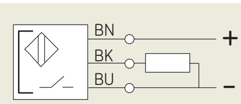
Rod end



Ordering key
ZBE–375511–40

Proximity sensor





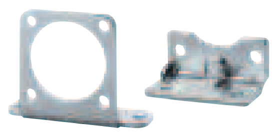
Switching function	Normally open
Output signal	PNP
Rated voltage	24 V DC
Max. current	30 mA
Cable length	5 m

Ordering key
ZSC–375525–NO

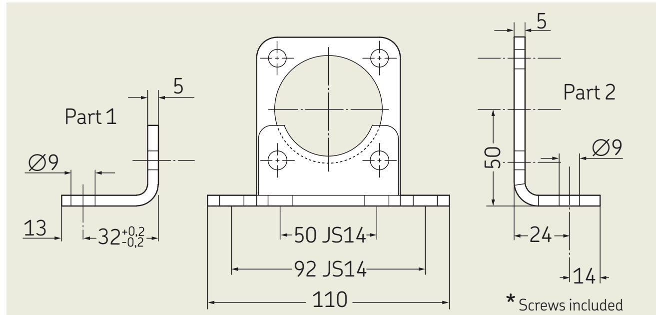
C

CASM-63

Foot mounting kit*



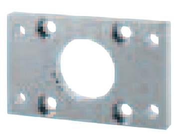
Note: The foot mounting between the linear unit and the adapter kit increases the length of the inline version by 3 mm

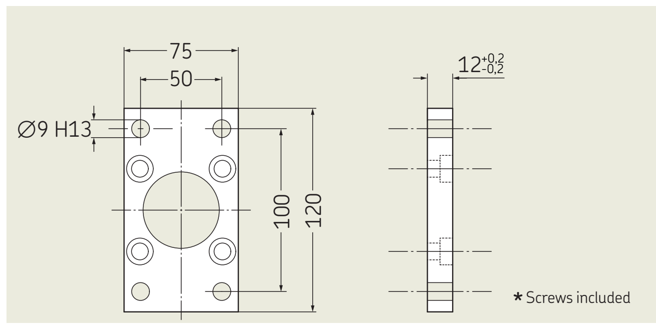


Ordering key
ZBE–375501–63
For parallel version with large adapter (dimensional information on request)

Ordering key
ZBE–375507–63
For inline version (part 1 + part 2)

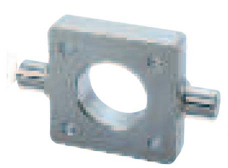
Flange mounting kit*

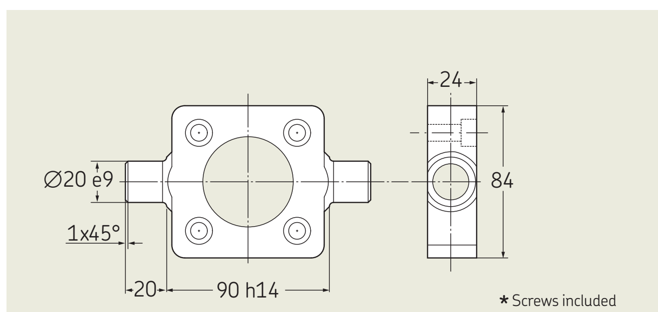




Ordering key
ZBE–375502–63

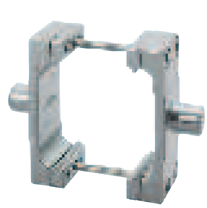
Trunnion flange kit*

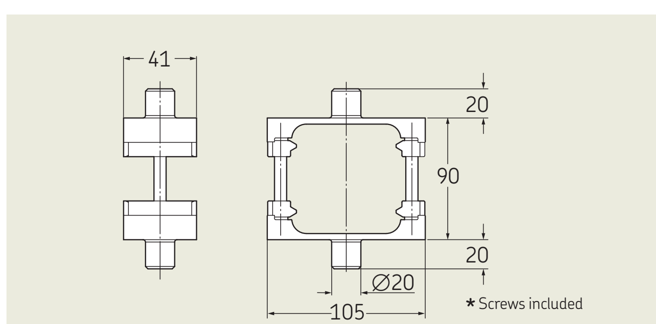




Ordering key
ZBE–375503–63

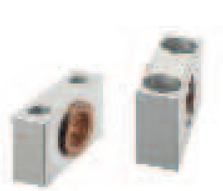
Trunnion mounting kit*



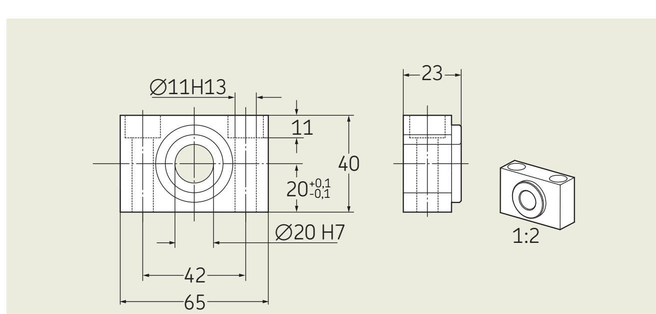


Ordering key
ZBE–375508–63

Trunnion support pair

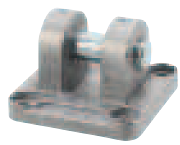


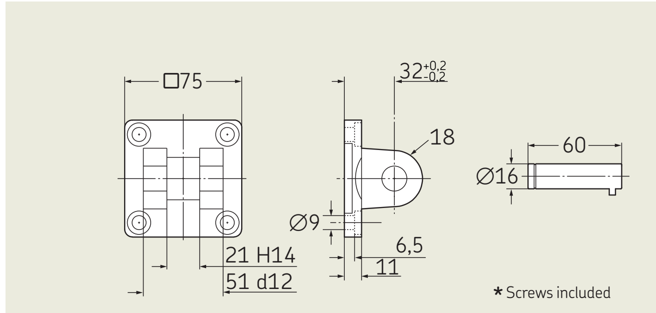
Note: to be used with trunnion flange kit or trunnion mounting kit



Ordering key
ZBE–375509–63

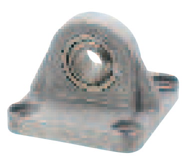
Swivel flange*

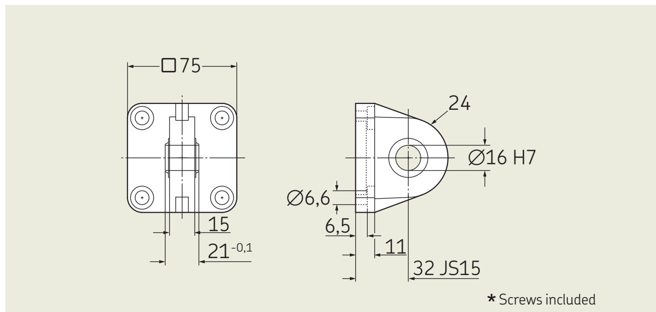




Ordering key
ZBE–375504–63
For parallel version only

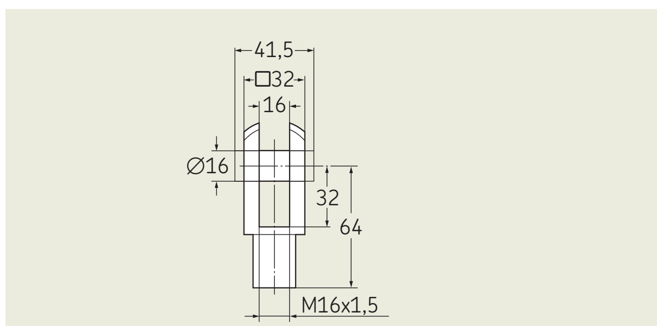
Swivel flange with rod end*





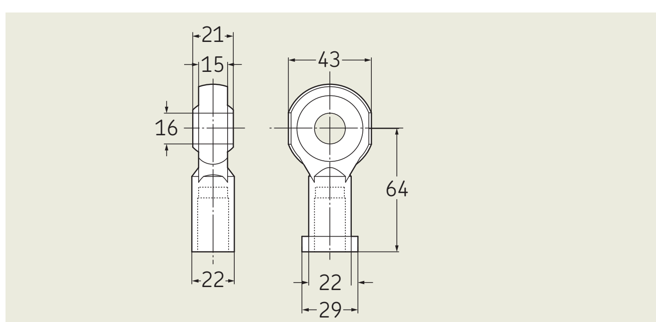
Ordering key
ZBE–375506–63
For parallel version only

Rod clevis



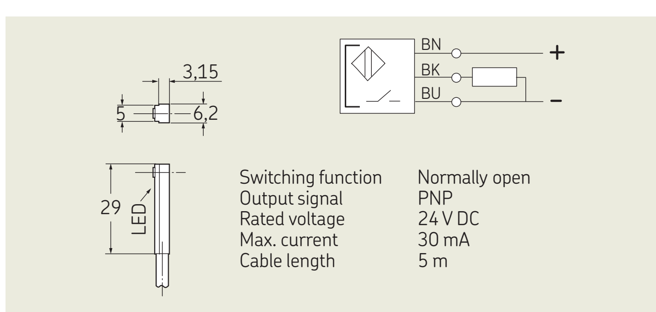
Ordering key
ZBE–375510–63

Rod end



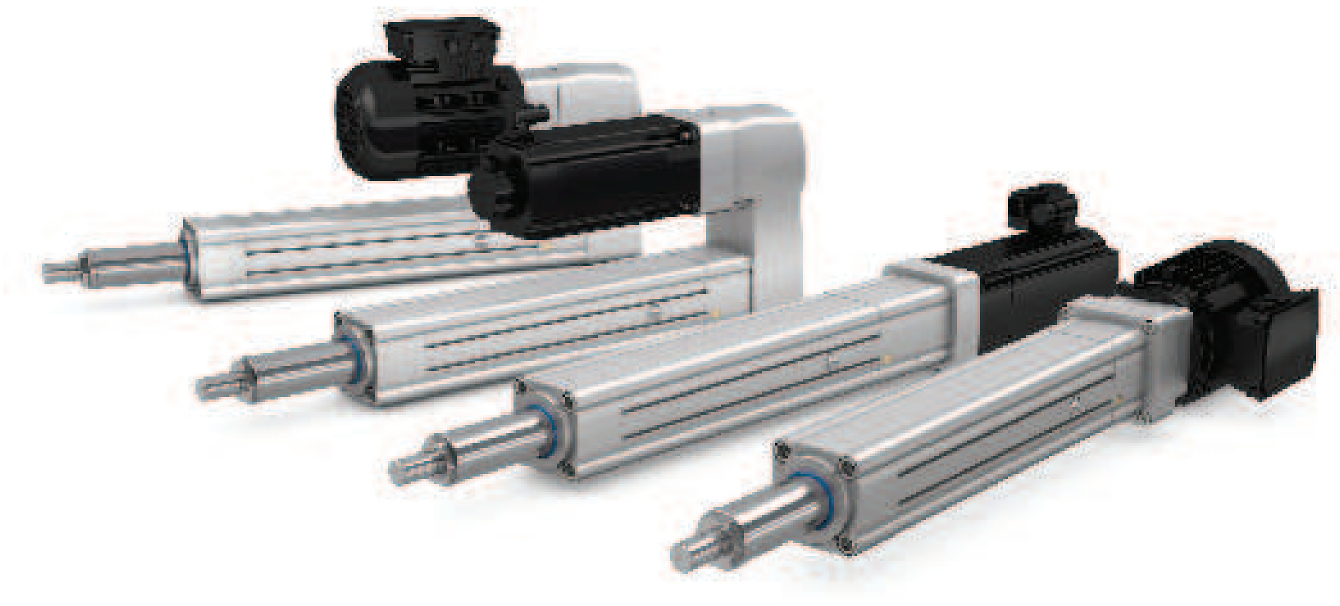
Ordering key
ZBE–375511–63

Proximity sensor



Ordering key
ZSC–375525–NO

Electric cylinders CASM-100



Features

- Electric cylinder with high modularity
- Ball-screws or roller-screws
- Inline and parallel gearboxes
- Standardized interfaces
- High level of precision and repeatability
- Wide range of accessories

Benefits

- For a wide range of applications with different power and lifetime requirements
- Optimal lifetime even at very high forces
- Mechanically fits most of the applications
- Fits AC motors and servo motors
- Accurate positioning (depends on the feed-back system of the motor)
- High level of flexibility in mounting the cylinders

Product description

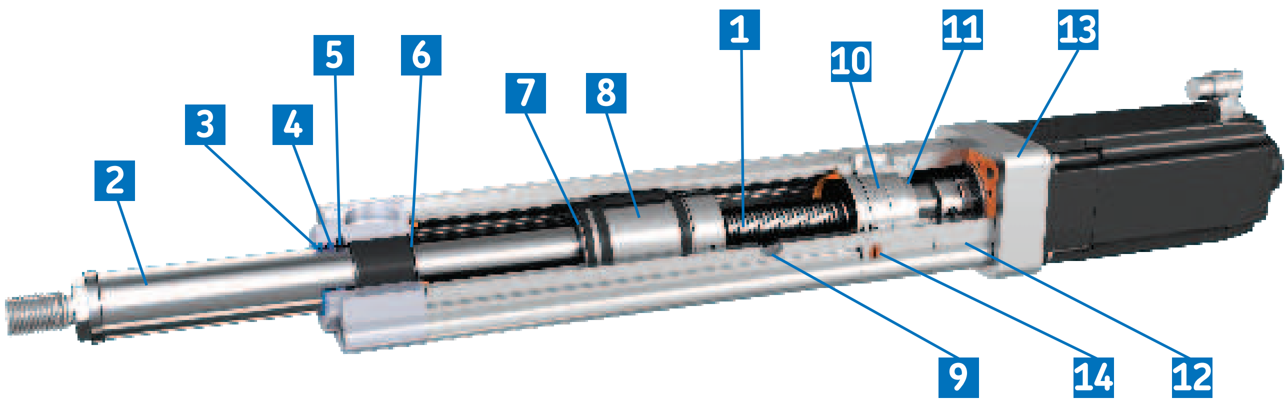
SKF developed an innovative modular electric cylinder platform to address most of the applications in the automation and heavy machinery industries, mainly replacing hydraulic solutions. In this new design, instead of limiting the selection on the "linear unit – gearbox – motor" modules only, SKF takes it a step further. The modularity has been extended to the base component level. Within each module, the customer can select the components inside to build a custom-like solution as standard. This concept makes it possible to find the optimal solution for almost every application within its power range with the best performance/cost ratio.

To facilitate customers in defining their own actuator, SKF has released an online configurator on SKF.com, where you can configure your optimal CASM-100 cylinder in just a few steps. Since the cylinders are assembled with standard components, any customer defined configuration will not influence the lead time.

To meet any space and performance requirements, SKF provides inline and parallel gearboxes as well as AC and servo motors. All motors are equipped with specific adapters to keep the same mechanical interface, independent of the selected motor type.

This standardized interface allows customers to also attach their own preferred motor. This possibility shortens the commissioning of the application, since customers are already familiar with their specific motor and drives.

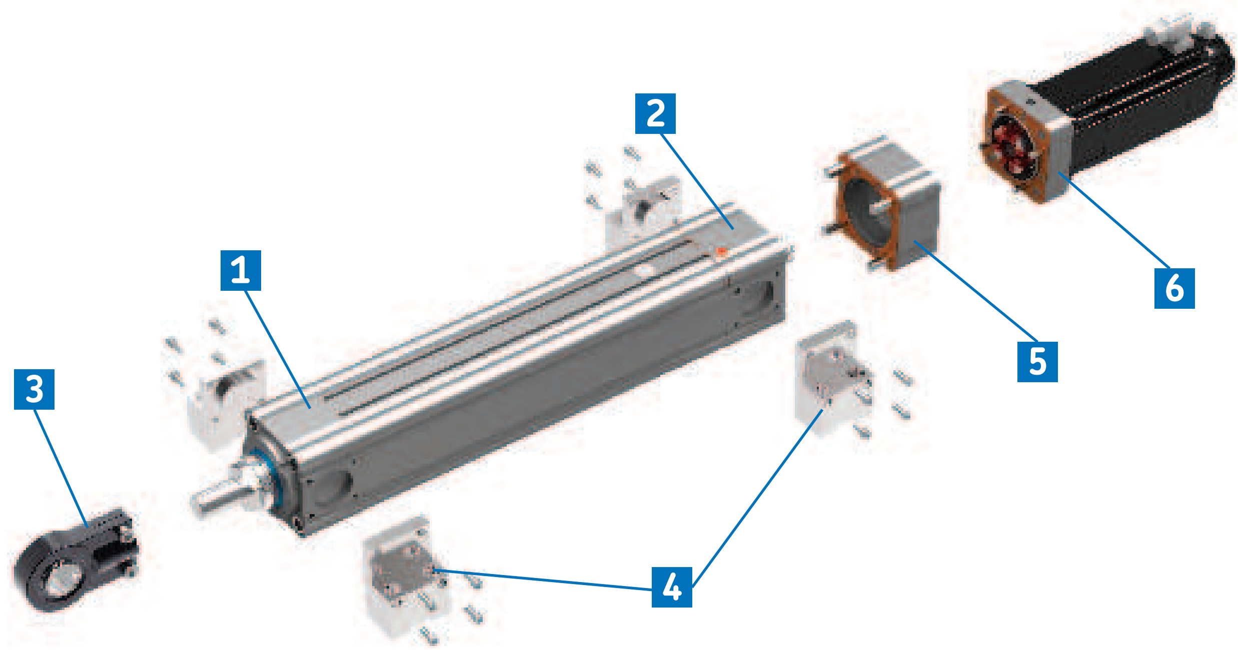
C



- **1** High quality ball and roller screws with low axial play and low friction
- **2** Push tube
- **3** Wiper ring
- **4** Solid oil ring
- **5** Sealing ring
- **6** Rubber bumper
- **7** Magnet ring for optional proximity sensors
- **8** Nut with guiding rings and anti-rotation
- **9** Relubrication port
- **10** High quality bearings
- **11** Radial shaft sealing ring
- **12** Gearbox
- **13** Motor adapter and motor
- **14** Sinter filter for high airflow

System overview

The CASM-100 modular system comprises different components that are connected to each other through standardized interfaces. Each component provides a unique function for the complete system and is connected as shown below.



1 **Front housing:** component that supports the push tube, through a dedicated bushing, also including the front sealing package
2 **Bearing housing**: component that contains the set of ball bearings that support the screw shaft
3 **Front attachment:** mechanical connection between the actuator tube and the moving part of the application. It is screwed to the push tube through the standard male thread.
4 **Housing attachments:** actuator body attachments, connected to the fix part of the application. Depending on the attachment type, they can be installed on the different housings - front, bearing or gearbox.
5 **Gearbox:** connecting module between the linear unit and the motor adapter. Is available in parallel or inline versions, with different reduction ratios
6 **Motor adapter:** connecting module between the gearbox and the electric motor

C

Performance overview of linear units

Linear unit	F_{max}	F_{0max}	V_{max}
–	kN		mm/s
CASM-100-BA	23	52	260
CASM-100-BB	48	60	210
CASM-100-BC	60	60	750
CASM-100-RA	82	82	890

Performance overview of actuator

Linear unit	Motor	Adapter	F_{c0}	F_{p0}	V_{max}
–	–	–	kN		mm/s
CASM-100-BA	1FK7044	inline	2,4	7,0	260
CASM-100-BA	1FK7064	inline	6,4	17,1	260
CASM-100-BA	1FK7086	inline	15	23,0	260
CASM-100-BA	1FK7105	inline	23,0	23,0	260
CASM-100-BB	1FK7044	inline	2,4	6,9	210
CASM-100-BB	1FK7064	inline	6,4	17,1	210
CASM-100-BB	1FK7086	inline	14,9	48,0	210
CASM-100-BB	1FK7105	inline	25,6	48,0	210
CASM-100-BC	1FK7044	inline	1,2	3,5	750
CASM-100-BC	1FK7064	inline	3,2	8,5	750
CASM-100-BC	1FK7086	inline	7,5	28,0	750
CASM-100-BC	1FK7105	inline	12,8	40,0	750
CASM-100-RA	1FK7044	inline	2,3	6,5	750
CASM-100-RA	1FK7064	inline	6,0	16,1	500
CASM-100-RA	1FK7086	inline	14,1	52,8	500
CASM-100-RA	1FK7105	inline	24,1	75,5	500

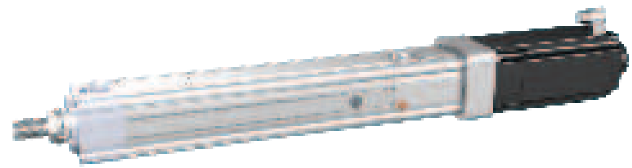
Motors

Servo motors

The Siemens motors provided by SKF come with a differential resolver or multi-turn encoder, a shaft-end with keyway and a holding brake.

In addition, they are equipped with a Drive-CLiQ interface. A rotating plug adapter simplifies the connection and cable routing in all installation positions.

For more information, please visit the following sites:



Motor:
www.siemens.com/motors
Frequency converters:
www.siemens.com/sinamics
Automation systems:
www.siemens.com/simotion
Controls:
www.siemens.com/simatic
Engineering software:
www.siemens.com/sizer
Support worldwide:
www.siemens.de/service

Motor technical data

Motor type Designation	Unit	1FK7044-4CH71-1UH0	1FK7064-4CF71-1RB0	1FK7086-4CF71-1RB0	1FK7105-2AF71-1RB0
Rated power (100K)	kW	1,4	2,5	3,75	8,2
Rated speed	min^{-1}	4 500	3 000	2 000*	3 000
Rated current	A	3,9	7,6	5,7	18
Rated torque (100K)	Nm	3	8	6,5	26
Static torque (100K)	Nm	4,5	12	28	48
Peak torque	Nm	13	32	105	150
Inertia with brake	10^{-4} kgm^2	1,62	8,5	25,5	162
Weight with brake	kg	8	16,8	26	43,5

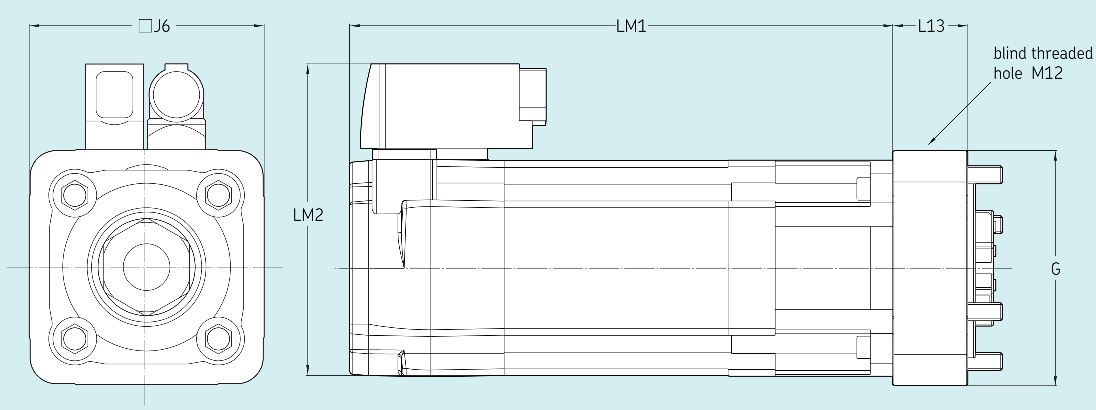
* Maximum speed is 3 000 with lower torque

Motor adapter

The modular system of CASM-100 enables the use of virtually any kind of motor.

The motor adapter module makes your motor fit the entire CASM-100 range, independent of the configuration. In fact, thanks to the standardized mechanical interface,this module can be directly attached to any inline or parallel gearbox. Sealings, screws and half coupling parts are included in the package. Each motor adapter is provided with blind threaded hole M12 to screw an eye bolt for easier actuator handling.

Dimensional drawing

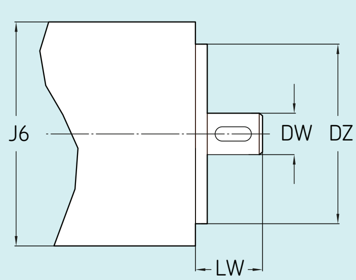


	Motor			Motor adapter	
	LM1	LM2	J6	G	L13
–	mm				
CAM-MS-B0-A11	242,5	139,5	□ 96	□ 105	33,5
CAM-MS-B0-A12	302,5	167,5	□ 126	□ 125	55,5
CAM-MS-B0-A13	309,5	216,5	□ 155	□ 155	63,5
CAM-MS-B0-A14	340	253	□ 192	□ 192,5	85,5

Third party motors

In order to attach your preferred motor to the gearbox, SKF offers tailor made solutions within the specifications below.

For motor specifications which are not covered by the specifications below, please contact SKF.



	min	max
–	mm	
LW	15	unlimited
DW	12	42
DZ	>57	unlimited
J6	>DZ	255*

* Limitation valid only with the parallel gearbox CAM-GS

Ordering key

Servo motor

C A M - M S - 0 0 - A 1 1 - 0 0 0

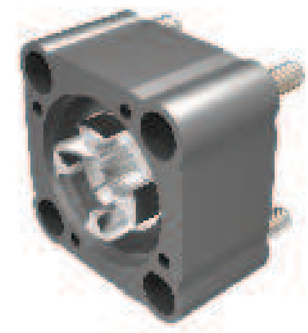
Motor option

0	Delivery without motor
B	Motor supplied and mounted by SKF

Motor Type

A11	Siemens 1FK7044-4CH71-1UH0
A12	Siemens 1FK7064-4CF71-1RB0
A13	Siemens 1FK7086-4CF71-1RB0
A14	Siemens 1FK7105-2AF71-1RB0

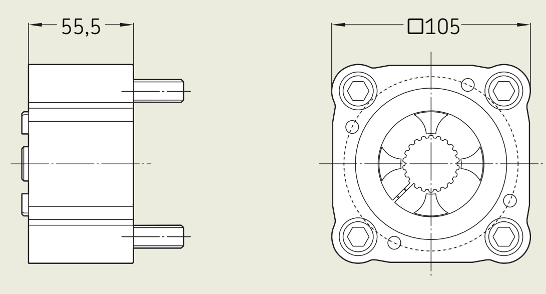
Inline gearbox



Inline gearboxes consist of a housing which fits on one side to the linear unit and on the other side to the motor adapter with the matching coupling. The coupling can be pushed on the shaft of the linear unit and locked by a screw. The counterpart of the coupling is delivered with the motor adapter.

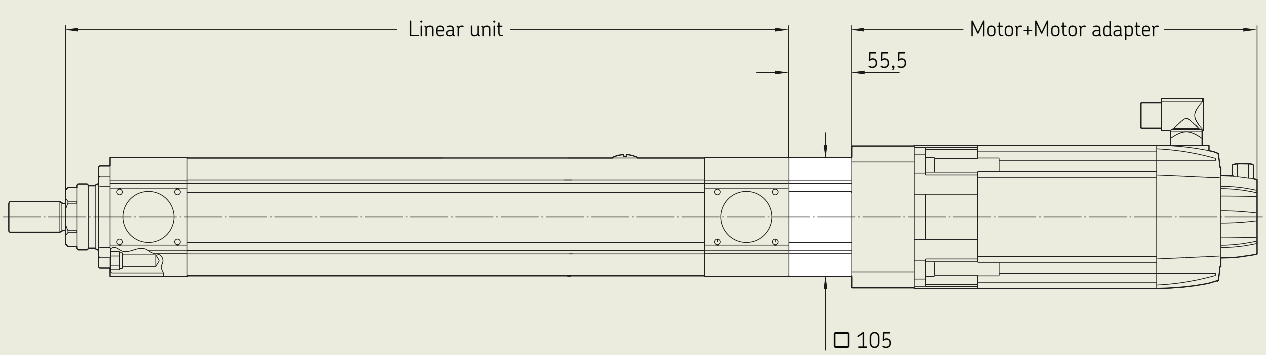
The inline gearbox transmits the motor torque (max. 150 Nm) directly to the linear unit with a gear ratio 1:1 and is maintenance-free.

Dimensional drawing



All dimensions in mm

Complete actuator



All dimensions in mm

Parallel gearbox

Parallel gearbox consists of one housing which fits on one side to the linear unit and on the other side to the motor adapter with the matching coupling. The coupling is already mounted on the input shaft of the gearbox and locked by a screw. The counterpart of the coupling is delivered with the motor adapter.

The parallel gearbox transmits the motor torque through three stage spur gear directly to the linear unit (max. output torque 300 Nm). Three gear ratios are available and it is maintenance free.

Technical data

Gearbox type Short designation	Unit	CAM-GS-CBA-XX	CAM-GS-CCA-XX	CAM-GS-CDA-XX
Type	–	Parallel	Parallel	Parallel
Gear reduction	–	3,89	9,82	24,95
Nominal output torque	Nm	100	100	100
Max. output torque	Nm	300	300	300
Max. input power	W	3 000	3 000	3 000
Max. input speed	r/min	4 500	4 500	4 500
Efficiency	%	85	85	85
Duty cycle [1]	%	100	100	100
Weight	kg	9	9	9
Length	mm	98,5	98,5	98,5

1) Can be limited by temperature, power and force combination

Manual override

The parallel gearbox has a manual override as built-in functionality. The gearbox can be manually operated through a hexagonal key located on the gearbox motor axis. As standard, the access to this key is covered by a plate (→ **fig. 1**). On request, it is possible to have a round opening for direct access (→ **fig. 2**) or to mount an electro-magnetic brake (→ **fig. 3**).

Fig. 1

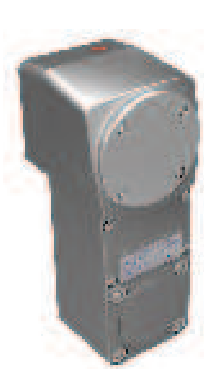


Fig. 2

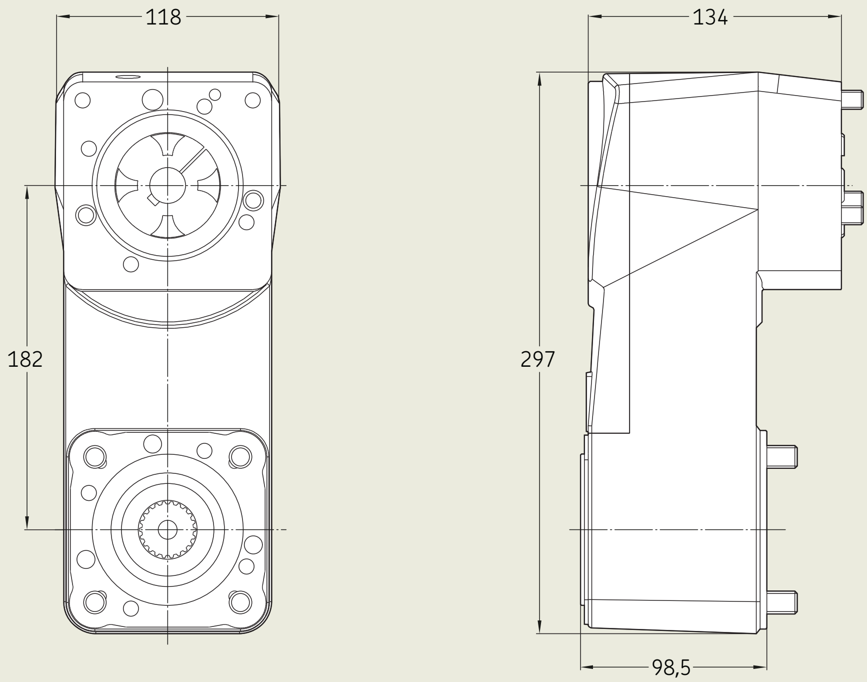
On request

Fig. 3

On request

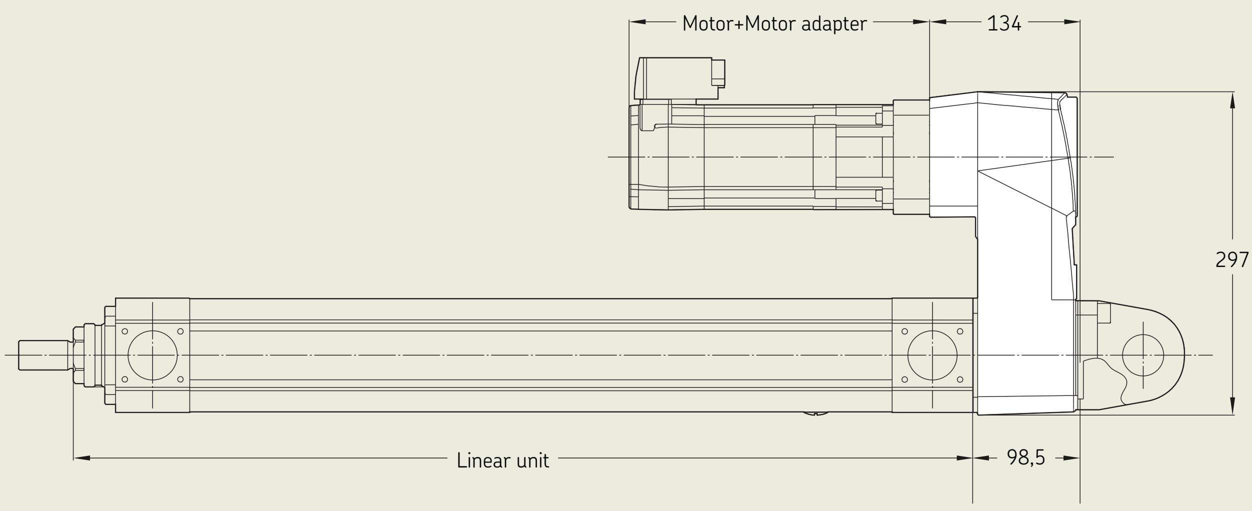
SKF

Dimensional drawing



All dimensions in mm

Complete actuator



All dimensions in mm

Examples of linear unit, parallel gearbox and IEC AC motor combinations

The table below is a guidance to understand the performance levels that can be reached by using CAM-G5 gearbox with standard IEC AC asynchronous motors, in terms of maximum dynamic axial force and linear speed.

In particular, by selecting the desired force and speed range, it's possible to quickly see which combination of screw, gearbox and asynchronous AC motors fulfills the application needs. This is a general guidance, while the detailed performance values of each mentioned combination should be calculated.

Max. axial force [kN] \ Linear speed [mm/s]	5-10	11-20	21-40	41-80	81-160	161-300
60–82	i=24,95 RS 30×10 IECAC100	i=24,95 RS 30×10				
48–60	i=24,95 BS 40×20 IECAC90	i=24,95 BS 40×20 IECAC90	i=24,95 BS 40×20			
34–48	i=24,95 BS 40×10 IECAC90	i=9,82 BS 40×10 IECAC90	i=9,82 BS 40×10			
23–34	i=24,95 BS 40×10 IECAC90	i=9,82 BS 40×10 IECAC90	i=9,82 BS 40×10			
16–23	i=24,95 BS 40×10 IECAC80	i=9,82 BS 40×10 IECAC90	i=9,82 BS 40×10 IECAC90	i=3,89 BS 40×10		
11–16	i=24,95 BS 32×10 IECAC71	i=9,82 BS 32×10 IECAC80	i=9,82 BS 32×10 IECAC90	i=3,89 BS 32×10		
8–11	i=24,95 BS 32×10 IECAC71	i=9,82 BS 32×10 IECAC80	i=9,82 BS 32×10 IECAC80	i=3,89 BS 32×10 IECAC90	i=3,89 BS 32×10	
0–8	i=24,95 BS 32×10 IECAC71	i=9,82 BS 32×10 IECAC71	i=9,82 BS 32×10 IECAC71	i=3,89 BS 32×10 IECAC90	i=3,89 BS 32×10	i=3,89 BS 40×20

i = Gear reduction
BS = Ball screw diameter x lead
RS = Roller screw diameter x lead
IEC = International Electrotechnical Commission AC motor standard

Third party motor required, with higher power than SKF selected motors

Example

Selected performance values
- Max dynamic axial force: = 34 kN
- Linear speed: = 11 - 20 mm/s

Resulting combination
- Gear reduction: 9,82
- Screw type: Ball screw
- Screw diameter: 40 mm
- Screw lead: 10 mm
- Motor type: Asynchronous AC
- Motor size: IEC AC 90

Ordering key

Gearbox

C A M - G I - A A A - 0 0 - 0 0 0

Type:

I	Inline
S	Parallel (Spurgear)

Gear size

A	Inline Servo
B	Inline AC
C	Parallel (Spurgear)

Ratio

A	1:1 (Inline)
B	3,89:1 (Only for parallel)
C	9,82:1 (Only for parallel)
D	24,95:1 (Only for parallel)

Housing Material

A	Aluminium

Attachment [1)]

0	No
B	Rear 0° (Only for parallel)
C	Rear 90° (Only for parallel)

Accessories

0	No
B	Brake (Only for parallel)

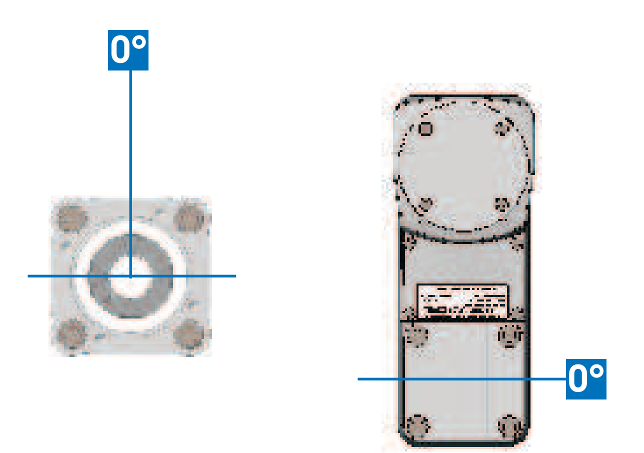
1) See fig. 4.

Mounting position parallel gearbox rear attachment

The 0° reference for the parallel gearbox rear attachment is the gearbox itself.

The rear attachment can be turned in 90° step.(→ **fig. 4**).

Fig. 4



Gearbox orientation

Complete actuator combinations

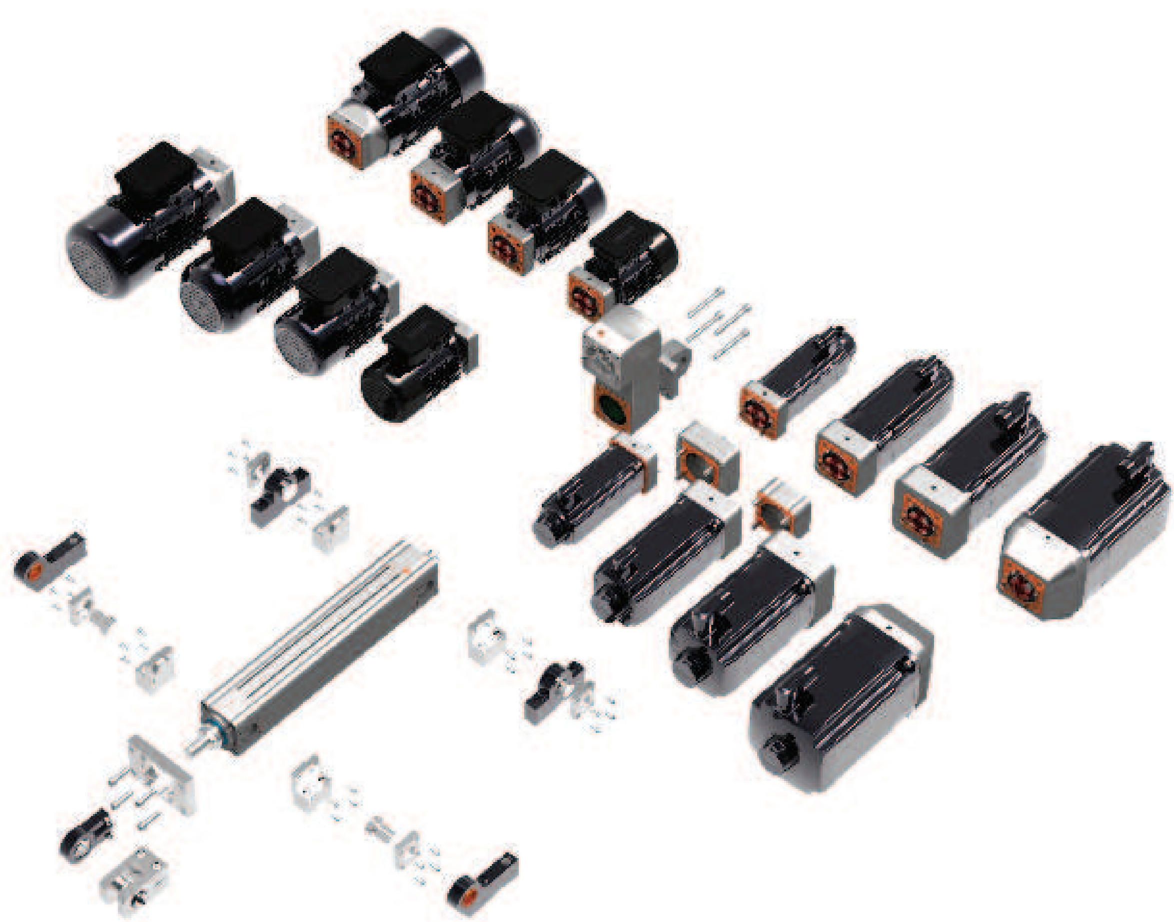
The built-in modularity of the CASM-100 actuator allows customers to create tailor-made solutions through a vast number of standard components.

Considering the different types and sizes of screws, gearboxes, motors, push tubes, bearing units, sealing kits and attachments available, hundreds of combinations are possible.

Each of them can deliver a unique performance to fulfill even the most demanding application requirements.

For that reason, the following pages are presenting datasheets only or the linear units for one of the possible actuator combinations (i.e. linear units with 4 screws - inline adapter - servo motors), as an example.

To create the optimal actuator combination for your application, the CASM-100 configurator is the best supporting tool. The software is available on www.skf.com/actuator-select in the section CASM-100 CONFIGURATOR.



Manuals

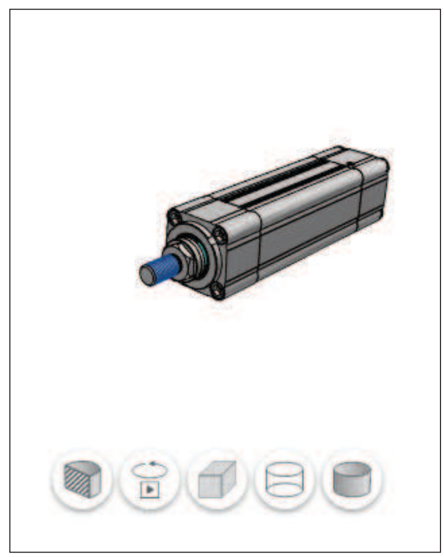
Supporting documents are available for download on skf.com/casm-100:

- operating manual

3D models

Product configurators for 3D models are available on skf.com/casm-100

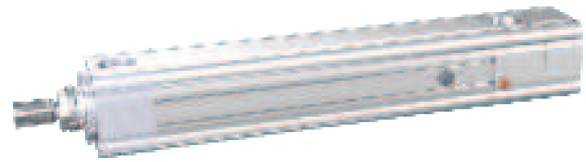
Operating manual



3D models

CASM-100

Linear unit

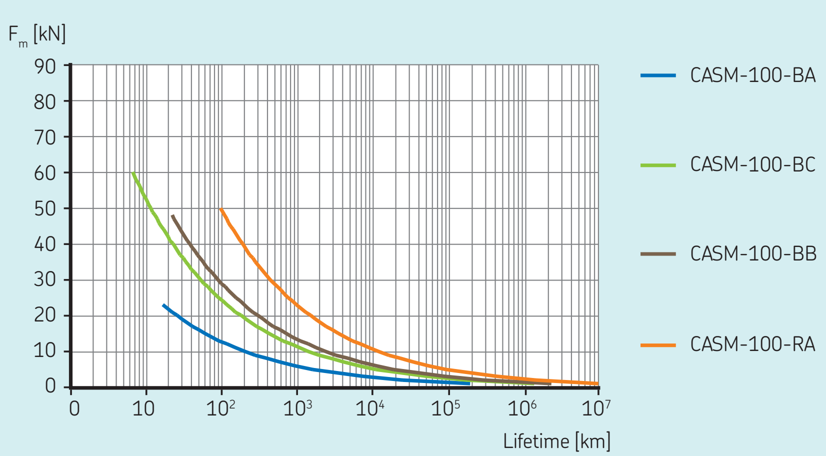


Technical data

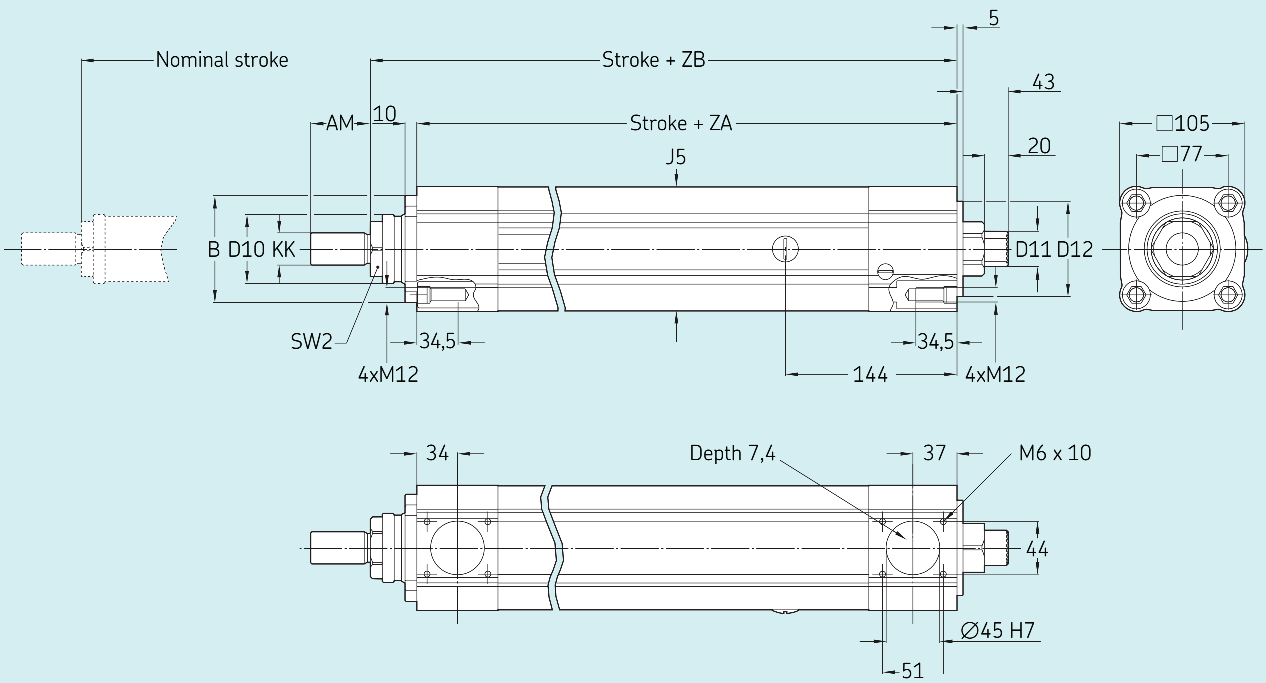
Designation	Symbol	Unit	CASM-100-BA	CASM-100-BB	CASM-100-BC	CASM-100-RA
Performance Data						
Max. dynamic axial force [1]	F_{max}	kN	23	48	60	82
Max. dynamic axial force L_{10} [2]	F_{L10}	kN	22	47	60	50
Max. static axial force	F_{0max}	kN	52	60	60	82
Dynamic load capacity	C	kN	27,1	61,5	41,3	106
Maximum torque to reach F_{max}	T_{max}	Nm	43	90	225	163
Max. linear speed	v_{max}	mm/s	260	210	750	890
Max. rotational speed	n_{max}	1/min	1 560	1 260	2 250	5 340
Max. acceleration	a_{max}	m/s^2	6	6	12	12
Duty cycle	D_{unit}	%	100	100	100	100
Mechanical Data						
Screw type	-	-	Ball screw	Ball screw	Ball screw	Roller screw
Screw diameter	d_{screw}	mm	32	40	40	30
Screw lead	p_{screw}	mm	10	10	20	10
Lead accuracy	-	-	G9	G9	G9	G5
Stroke [3]	s	mm	100...2 000	100...2 000	100...2 000	100...2 000
Internal overstroke each side	s_0	mm	2	2	2	2
Backlash	$s_{backlash}$	mm	0,2	0,2	0,2	0,2
Efficiency	η_{lu}	%	>85	>85	>85	>80
Inertia @ 0 mm stroke	J_{lu}	kgm^2	0,00041	0,00051	0,00051	0,00045
Δ Inertia per 100 mm	ΔJ	kgm^2	0,000064	0,000144	0,000138	0,000063
Weight @ 0 mm stroke	m_{lu}	kg	11	12,7	12,3	12,5
Δ weight per 100 mm	Δm	kg	2,4	2,7	2,7	2,4
Environment						
Ambient temperature	$T_{ambient}$	°C	-40...+50	-40...+50	-40...+50	-40...+50
Max. humidity	ϕ	%	95	95	95	95
Degree of protection	IP	-	54S	54S	54S	54S

1) buckling limitation for long strokes, also limited by accessories and configurations. Please check the CASM-100 configuration tool on skf.com
2) Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L_{10})
3) standard stroke lengths: 50; 100; 150; 200; 250; 300; 350; 400; 450; 500; 600; 700; 800; 900; 1 000; 1 500; 2 000 mm.
Other stroke lengths on request

Performance diagrams



Dimensional drawing



Linear Unit	KK	SW2	J5	ZA	ZB	B	D10	AM	D12	D11
–	–	–	mm							
CASM-100-xx-xxxx-A...	M27× 2	AF46	□ 104	287±1,5	326±2	Ø 90 $^{-0,10}_{-0,35}$	Ø 58	50	Ø 80 $^{-0}_{-0,05}$	Spline DIN 5480 W 30 × 1,25 × 22 × 8f
CASM-100-xx-xxxx-B...	M42× 2	AF 60	□ 104	336±1,5	326±2	Ø 90 $^{-0,10}_{-0,35}$	Ø 73	65	Ø 80 $^{-0}_{-0,05}$	Spline DIN 5480 W 30 × 1,25 × 22 × 8f

Ordering key

See page 136

C

Ordering key

Linear unit

C A S M - 1 0 0 - B C - 0 1 0 0 - A A 0 C 1 0 A - B A 1 1 0 0 - 0 0 0

Size

Screw type
BA Ball screw 32×10
BB Ball screw 40×10
BC Ball screw 40×20
RA Roller screw 30×10

Stroke
– Stroke in mm

Push tube
A Steel E355 chrome plated, ∅55
B Steel E355 chrome plated, ∅70 (for high forces & long strokes)

Front housing and attachments
A Aluminum, no mounting option
B Aluminium, with body attachment

Front housing attachment [1)]
0 None
A Front plate 90° mounting position
B Front plate 0° mounting position
C Pivot attachment (trunnion brackets to be ordered separately)
D Foot mount, 0° mounting position
E Foot mount, 180° mounting position

Rear housing [2)]
A1 [3)] Aluminium, no mounting option, DGBB set, for screw type BA
B1 [3)] Aluminium, prepared for pivot or foot mounting, DGBB set, for screw type BA
C1 Aluminium, no mounting option, ACBB set, for all screw types
D1 Aluminium, prepared for pivot or foot mounting, ACBB set, for all screw types

Rear housing attachment [1)]
0 None
C Pivot attachment (trunnion brackets to be ordered separately)
D Foot mount, 0° mounting position
E Foot mount, 180° mounting position

Protection tube
A Aluminium, 90°, recommended for parallel
B Aluminium, 180°
C Aluminium, 270°
D Aluminium, 0°, recommended for inline

1) See fig. 5, page 137.
2) DGBB means Deep Groove Ball Bearing; ACBB means Angular Contact Ball Bearing.
3) Maximum static axial force limited to 31 kN.

C	A	S	M	-	1	0	0	-	B	C	-	0	1	0	0	-	A	A	0	C	1	0	A	-	B	A	1	1	0	0	-	0	0	0

Sealing
A IP30 with gasket
B IP54S with wiper and gasket
C IP65 with wiper, shaft seal and gasket

Lubrication
A0 Lubrication for -40 °C ...+50 °C, no re-lubrication possibility
A1 Lubrication for -40 °C ...+50 °C, with re-lubrication possibility

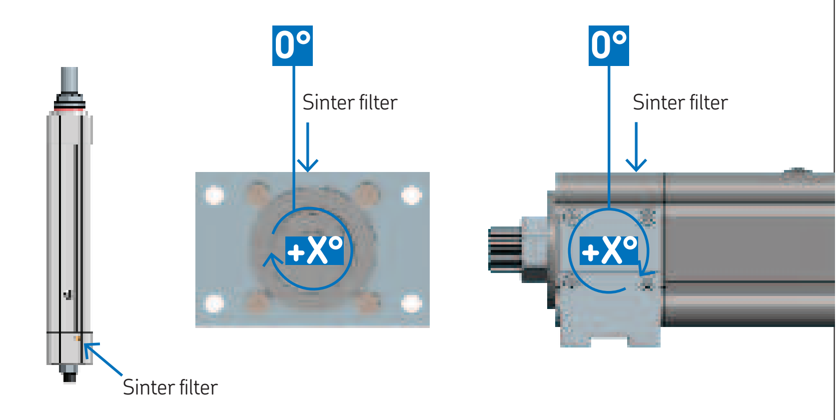
Anti-rotation
0 No anti-rotation
1 With anti-rotation

Free Parameter
00 Empty

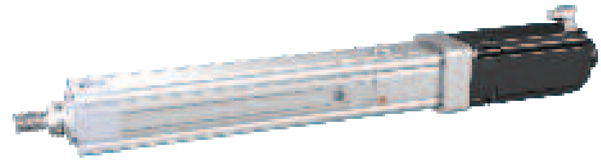
C

Mounting position front plate and foot mount
The 0° reference for the linear unit is the sinter filter position. The front plate can be turned in 90° steps clockwise. The foot mount can be turned in 180° steps clockwise.

Fig. 5



CASM-100-BA



Electric cylinder
servo motor, inline configuration

Technical data

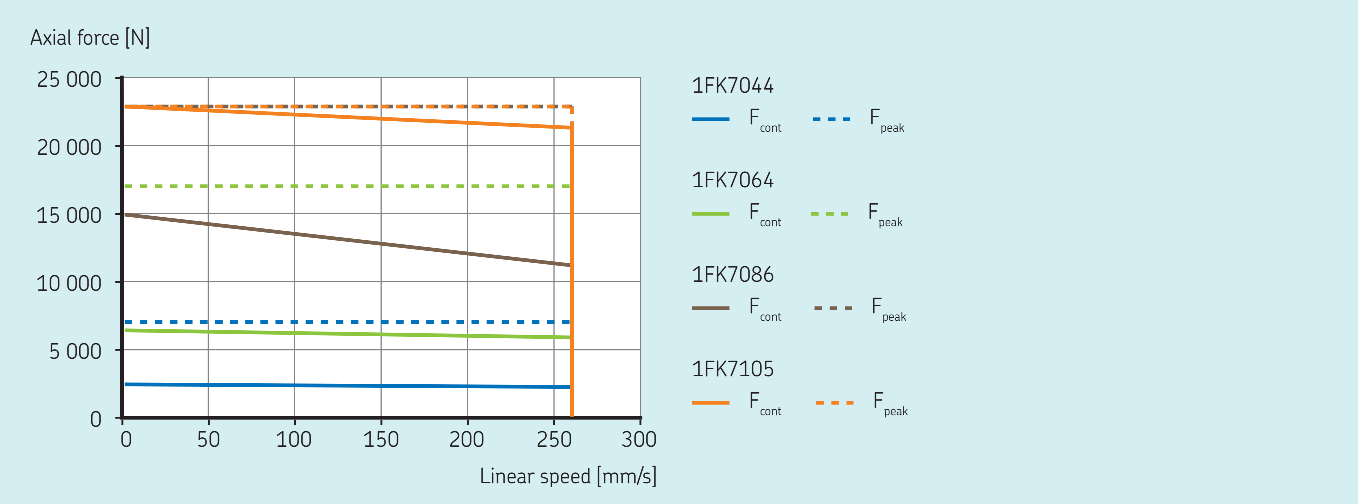
Designation	Symbol	Unit	1FK7044	1FK7064	1FK7086	1FK7105
Performance Data						
Continuous force @ zero speed	F_{c0}	kN	2,4	6,4	15,0	23,0
Continuous force @ max. speed	F_c	kN	2,2	5,9	11,2	21,4
Peak force @ zero speed	F_{p0}	kN	7,0	17,1	23,0	23,0
Peak force @ max. speed	F_p	kN	7,0	17,1	23,0	23,0
Dynamic load capacity	C	kN	27,1	27,1	27,1	27,1
Holding force	F_{Hold}	kN	3,5	9,1	16,1	23
Max. linear speed	v_{max}	mm/s	260	260	260	260
Max. acceleration	a_{max}	m/s^2	6	6	6	6
Duty cycle	D	%	100	100	100	100
Mechanical Data						
Screw type	-	-	Ball screw	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	32	32	32	32
Screw lead	p_{screw}	mm	10	10	10	10
Lead accuracy	-	-	G9	G9	G9	G9
Stroke [1]	s	mm	100...2 000	100...2 000	100...2 000	100...2 000
Internal overstroke each side	s_0	mm	2	2	2	2
Backlash	$s_{backlash}$	mm	0,2	0,2	0,2	0,2
Gear reduction	i	-	1	1	1	1
Efficiency	η	%	77	79	79	80
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	6,16	12,4	26,9	159
Δ Inertia per 100 mm	ΔJ	10^{-4} kgm^2	0,64	0,64	0,64	0,64
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,36	1	3,50	8
Weight @ 0 mm stroke	m	kg	19,8	28,7	37,8	56,4
Δ weight per 100 mm	Δm	kg	2,4	2,4	2,4	2,4
Weight of optional brake	m_{brake}	kg	0,6	1,4	3,0	4,5
Electrical Data						
Motor type	-	-	Servo	Servo	Servo	Servo
Nominal voltage	U	V DC	600	600	600	600
Nominal current	I	A	3,9	7,6	5,7	18
Peak current	Ipeak	A	5,4	10,8	21,5	31
Nominal power	P	kW	1,4	2,5	3,75	8,2
Environment & Standards						
Ambient temperature	$T_{ambient}$	°C	-40...+50	-40...+50	-40...+50	-40...+50
Max. humidity	φ	%	95	95	95	95
Degree of protection	IP	-	64	64	64	64

1) standard stroke lengths: 100; 200; 300; 400; 500; 600; 800; 1 000; 1 500; 2 000 mm. Other stroke lengths on request

Ordering key

See page 150

Performance diagrams

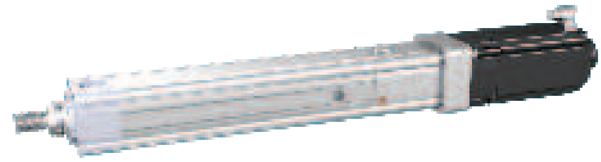


Dimensional drawing

See page 146

C

CASM-100-BB



Electric cylinder
servo motor, inline configuration

Technical data

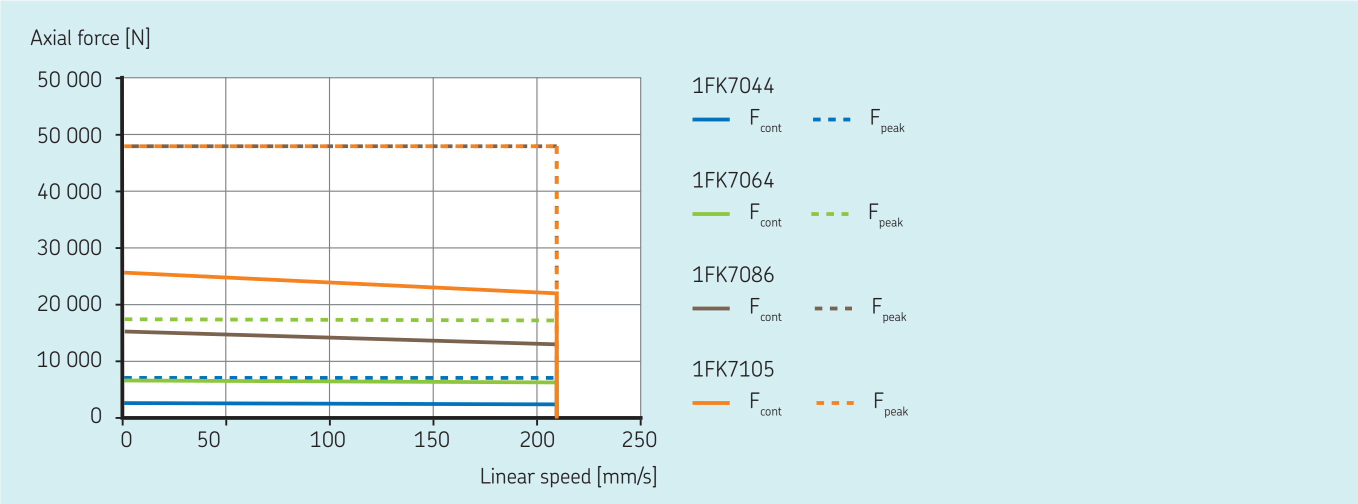
Designation	Symbol	Unit	1FK7044	1FK7064	1FK7086	1FK7105
Performance Data						
Continuous force @ zero speed	F_{c0}	kN	2,4	6,4	14,9	25,6
Continuous force @ max. speed	F_c	kN	2,2	6,1	12,8	21,9
Peak force @ zero speed	F_{p0}	kN	6,9	17,1	48,0	48,0
Peak force @ max. speed	F_p	kN	6,9	17,1	48,0	48,0
Dynamic load capacity	C	kN	61,5	61,5	61,5	61,5
Holding force	F_{Hold}	kN	3,5	9,1	16,1	29,3
Max. linear speed	v_{max}	mm/s	210	210	210	210
Max. acceleration	a_{max}	m/s^2	6	6	6	6
Duty cycle	D	%	100	100	100	100
Mechanical Data						
Screw type	–	–	Ball screw	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	40	40	40	40
Screw lead	p_{screw}	mm	10	10	10	10
Lead accuracy	–	–	G9	G9	G9	G9
Stroke [1]	s	mm	100...2 000	100...2 000	100...2 000	100...2 000
Internal overstroke each side	s_0	mm	2	2	2	2
Backlash	$s_{backlash}$	mm	0,2	0,2	0,2	0,2
Gear reduction	i	–	1	1	1	1
Efficiency	η	%	77	79	79	80
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	7,16	13,4	27,9	160
Δ Inertia per 100 mm	ΔJ	10^{-4} kgm^2	1,44	1,44	1,44	1,44
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,36	1	3,5	8
Weight @ 0 mm stroke	m	kg	21,5	30,4	39,5	58,1
Δ weight per 100 mm	Δm	kg	2,7	2,7	2,7	2,7
Weight of optional brake	m_{brake}	kg	0,6	1,4	3,0	4,5
Electrical Data						
Motor type	–	–	Servo	Servo	Servo	Servo
Nominal voltage	U	V DC	600	600	600	600
Nominal current	I	A	3,9	7,6	5,7	18
Peak current	Ipeak	A	5,4	10,8	21,5	31
Nominal power	P	kW	1,4	2,5	3,75	8,2
Environment & Standards						
Ambient temperature	Tambient	°C	-40...+50	-40...+50	-40...+50	-40...+50
Max. humidity	φ	%	95	95	95	95
Degree of protection	IP		64	64	64	64

[1] standard stroke lengths: 100; 200; 300; 400; 500; 600; 800; 1 000; 1 500; 2 000 mm. Other stroke lengths on request

Ordering key

See page 150

Performance diagrams



Dimensional drawing

See page 146

CASM-100-BC

Electric cylinder
servo motor, inline configuration

Technical data

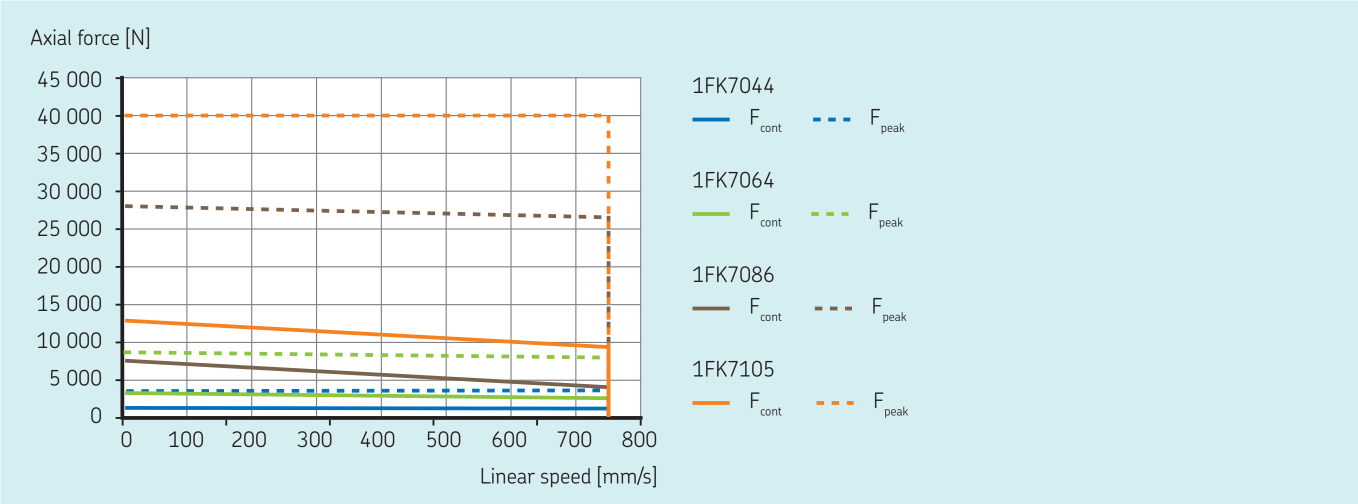
Designation	Symbol	Unit	1FK7044	1FK7064	1FK7086	1FK7105
Performance Data						
Continuous force @ zero speed	F_{c0}	kN	1,2	3,2	7,5	12,8
Continuous force @ max. speed	F_c	kN	1,1	2,5	4,0	9,3
Peak force @ zero speed	F_{p0}	kN	3,5	8,5	28,0	40,0
Peak force @ max. speed	F_p	kN	3,5	8,0	26,7	40,0
Dynamic load capacity	C	kN	41,3	41,3	41,3	41,3
Holding force	F_{Hold}	kN	1,7	4,5	8	14,7
Max. linear speed	v_{max}	mm/s	750	750	750	750
Max. acceleration	a_{max}	m/s^2	12	12	12	12
Duty cycle	D	%	100	100	100	100
Mechanical Data						
Screw type	–	–	Ball screw	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	40	40	40	40
Screw lead	p_{screw}	mm	20	20	20	20
Lead accuracy	–	–	G9	G9	G9	G9
Stroke [1]	s	mm	100...2 000	100...2 000	100...2 000	100...2 000
Internal overstroke each side	s0	mm	2	2	2	2
Backlash	$s_{backlash}$	mm	0,2	0,2	0,2	0,2
Gear reduction	i		1	1	1	1
Efficiency	η	%	77	79	79	80
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	7,16	13,4	27,9	160
Δ Inertia per 100 mm	ΔJ	10^{-4} kgm^2	1,38	1,38	1,38	1,38
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,36	1	3,5	8
Weight @ 0 mm stroke	m	kg	21,1	30	39,1	57,7
Δ weight per 100 mm	Δm	kg	2,7	2,7	2,7	2,7
Weight of optional brake	m_{brake}	kg	0,6	1,4	3,0	4,5
Electrical Data						
Motor type	–	–	Servo	Servo	Servo	Servo
Nominal voltage	U	V DC	600	600	600	600
Nominal current	I	A	3,9	7,6	5,7	18
Peak current	I_{peak}	A	5,4	10,8	21,5	31
Nominal power	P	kW	1,4	2,5	3,75	8,2
Environment & Standards						
Ambient temperature	$T_{ambient}$	°C	-40...+50	-40...+50	-40...+50	-40...+50
Max. humidity	φ	%	95	95	95	95
Degree of protection	IP	-	64	64	64	64

[1] standard stroke lengths: 100; 200; 300; 400; 500; 600; 800; 1 000; 1 500; 2 000 mm. Other stroke lengths on request

Ordering key

See page 150

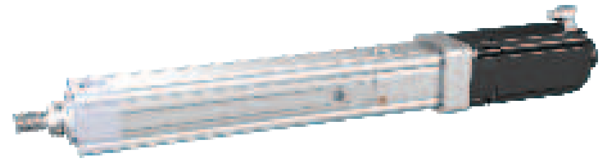
Performance diagrams



Dimensional drawing

See page 146

CASM-100-RA



Electric cylinder
servo motor, inline configuration

Technical data

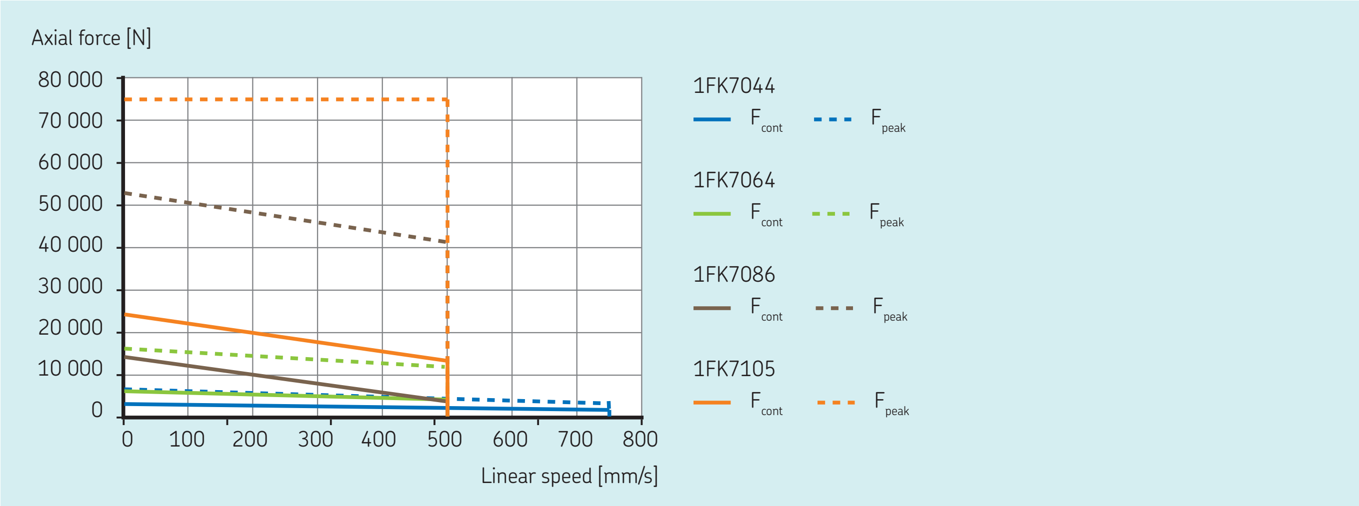
Designation	Symbol	Unit	1FK7044	1FK7064	1FK7086	1FK7105
Performance Data						
Continuous force @ zero speed	F_{c0}	kN	2,3	6,0	14,1	24,1
Continuous force @ max. speed	F_c	kN	1,5	4,0	3,5	13,1
Peak force @ zero speed	F_{p0}	kN	6,5	16,1	52,8	75,5
Peak force @ max. speed	F_p	kN	6,3	11,6	39,2	75,0
Dynamic load capacity	C	kN	106,0	106,0	106,0	106,0
Holding force	F_{Hold}	kN	3,7	9,6	17	31
Max. linear speed	v_{max}	mm/s	750	500	500	500
Max. acceleration	a_{max}	m/s^2	12	12	12	12
Duty cycle	D	%	100	100	100	100
Mechanical Data						
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	30	30	30	30
Screw lead	p_{screw}	mm	10	10	10	10
Lead accuracy	–	–	G5	G5	G5	G5
Stroke 1)	s	mm	100...2 000	100...2 000	100...2 000	100...2 000
Internal overstroke each side	s_0	mm	2	2	2	2
Backlash	$s_{backlash}$	mm	0,2	0,2	0,2	0,2
Gear reduction	i		1	1	1	1
Efficiency	η	%	73	74	74	75
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	6,56	12,8	27,3	159
Δ Inertia per 100 mm	ΔJ	10^{-4} kgm^2	0,63	0,63	0,63	0,63
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,36	1	3,5	8
Weight @ 0 mm stroke	m	kg	21,3	30,2	39,3	57,9
Δ weight per 100 mm	Δm	kg	2,4	2,4	2,4	2,4
Weight of optional brake	m_{brake}	kg	0,6	1,4	3,0	4,5
Electrical Data						
Motor type	–	–	Servo	Servo	Servo	Servo
Nominal voltage	U	V DC	600	600	600	600
Nominal current	I	A	3,9	7,6	5,7	18
Peak current	I_{peak}	A	5,4	10,8	21,5	31
Nominal power	P	kW	1,4	2,5	3,75	8,2
Environment & Standards						
Ambient temperature	$T_{ambient}$	°C	-40...+50	-40...+50	-40...+50	-40...+50
Max. humidity	φ	%	95	95	95	95
Degree of protection	IP	-	64	64	64	64

1) standard stroke lengths: 100; 200; 300; 400; 500; 600; 800; 1 000; 1 500; 2 000 mm. Other stroke lengths on request

Ordering key

See page 150

Performance diagrams

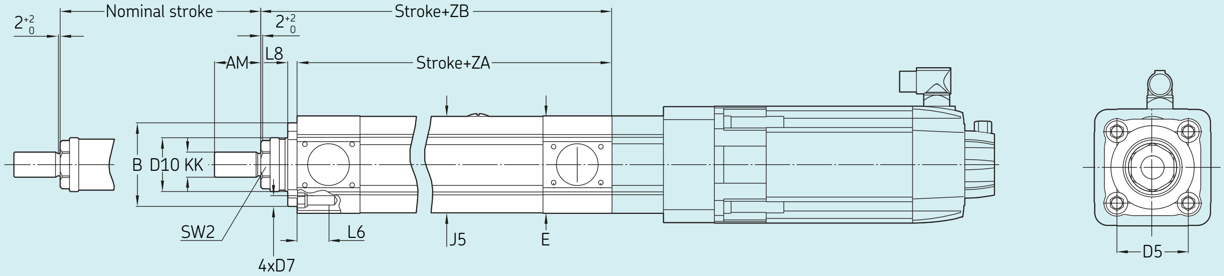


Dimensional drawing

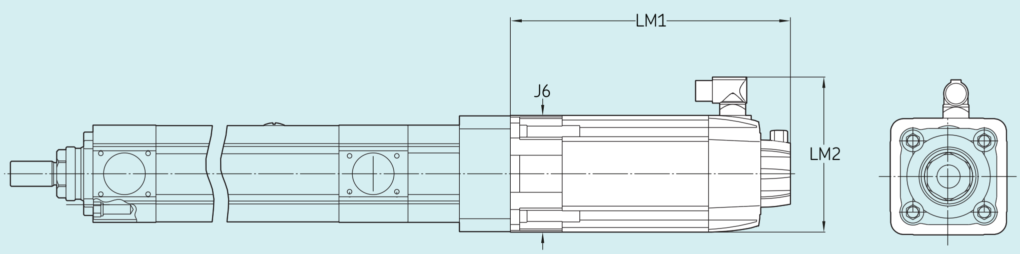
See page 146

C

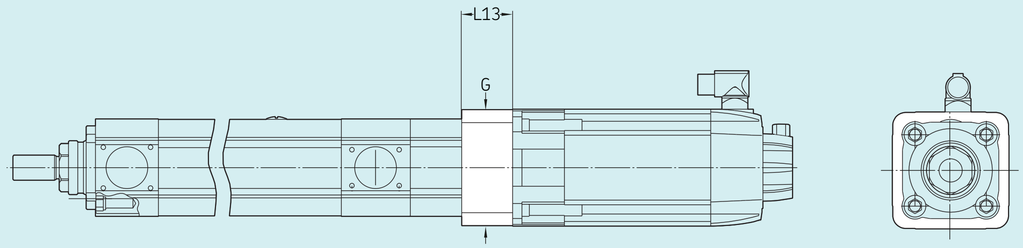
Dimensional drawing



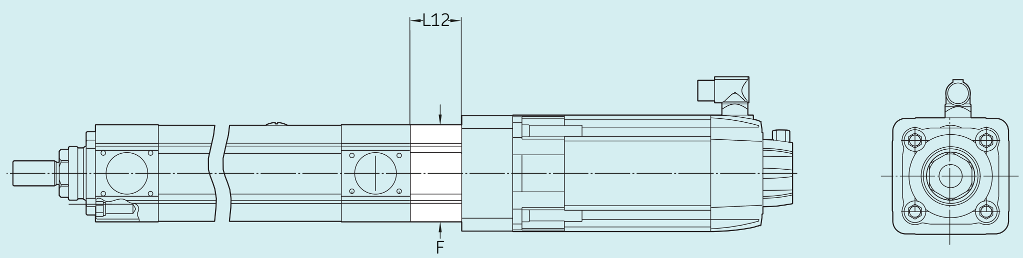
Linear Unit	KK	SW 2	D7	J5	E	ZA	ZB	L8	B	D10	AM	D5	L6
–	–	–	–	mm									
CASM-100-xx-xxxx-A...	M27 × 2	AF 46	M12	□ 104	□ 105	287±1,5	326±2	10	Ø 90 $^{-0,10}_{-0,35}$	Ø 58	50	□ 77	34,5
CASM-100-xx-xxxx-B...	M42 × 2	AF 60	M12	□ 104	□ 105	287±1,5	336±2	10	Ø 90 $^{-0,10}_{-0,35}$	Ø 73	65	□ 77	34,5



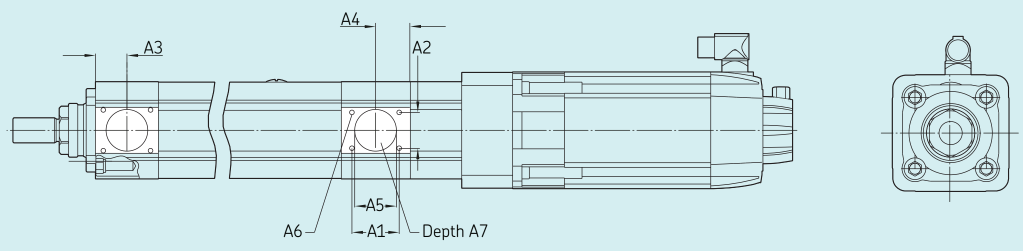
Motor	LM1	LM2	J6
–	mm		
CAM-MS-x0-A11-000	242,5	139,5	□ 96
CAM-MS-x0-A12-000	302,5	167,5	□ 126
CAM-MS-x0-A13-000	309,5	216,5	□ 155
CAM-MS-x0-A14-000	340	253	□ 192



Motor adapter	G	L13
–	mm	
CAM-MS-x0-A11-000	☐ 105	33,5
CAM-MS-x0-A12-000	☐ 125	55,5
CAM-MS-x0-A13-000	☐ 155	63,5
CAM-MS-x0-A14-000	☐ 192,5	85,5



Gearbox	i	F	L12
–	–	mm	
CAM-GI-AAA-00-000	1:1	☐ 105	55,5

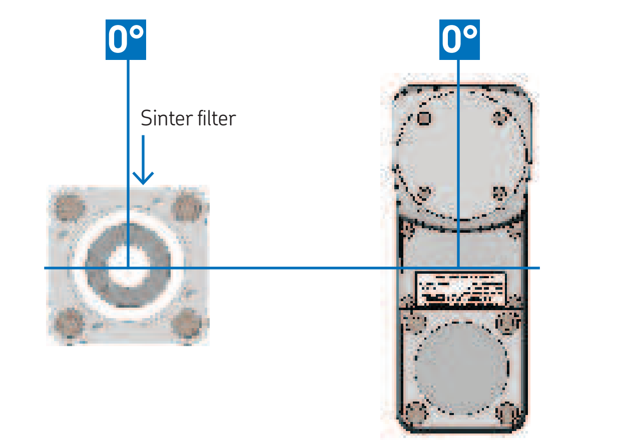


Optional Mounting Possibility	A6	A1	A2	A3	A4	A5	A7
–	–	mm					
CASM-100-xx-xxxx-...	M6 × 10	51	44	34	37	∅ 45 H7	7,4

Mounting positions

For a complete actuator assembly, the gearbox is used as the 0° reference for all connected modules (→ **fig. 6**).

Fig. 6

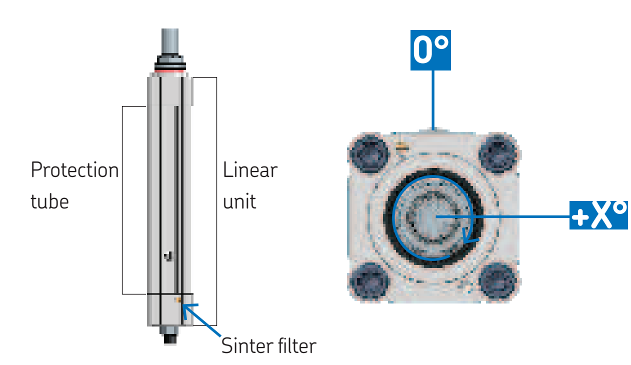


Gearbox reference

Mounting position protection tube

The 0° reference for the protection tube is the sinter filter position. The protection tube can be turned in 90° steps clockwise (→ **fig. 7**). Parallel gearbox mounting positions have some limitations: protection with relubrication port can be mounted at 90° - 180° - 270° (0° is not possible) (→ **fig. 8**).

Fig. 7

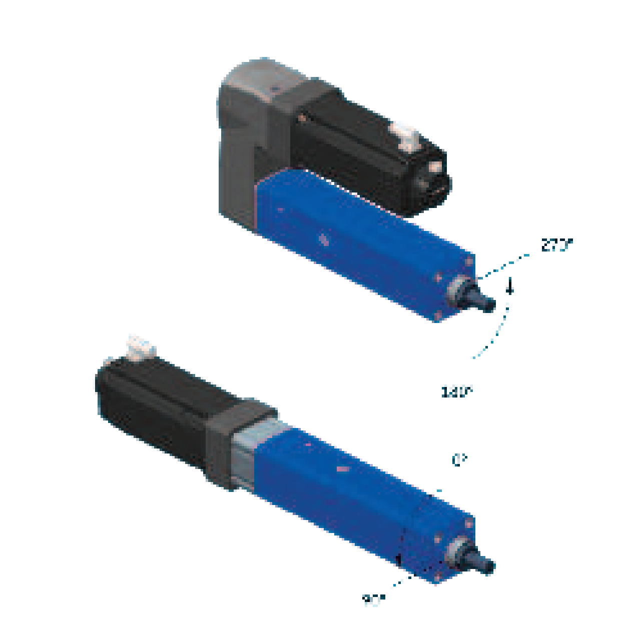


Linear unit reference

Orientation recommendation

For parallel version, recommended linear unit mounting position is 0° and protection tube mounting position is 90° (270° also possible).

Fig. 8



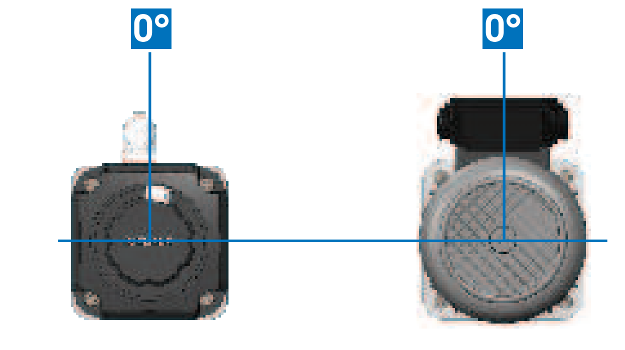
Linear unit orientation

Mounting position motor

The 0° reference for the motor is the electric connector outlet position. The motor can be turned in 90° steps clockwise (→ **fig. 9**).

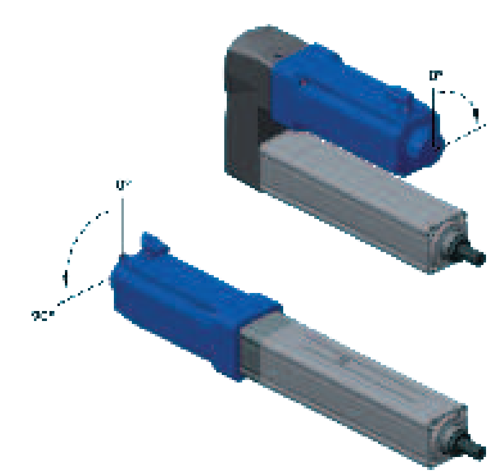
Parallel gearbox mounting position have some limitations: Motor from sizes Servo 8x / IEC AC 80 and bigger can be mounted at 0° - 90° - 270° (180° is not possible), (→ **fig. 10**).

Fig. 9



Reference motor adapter

Fig. 10



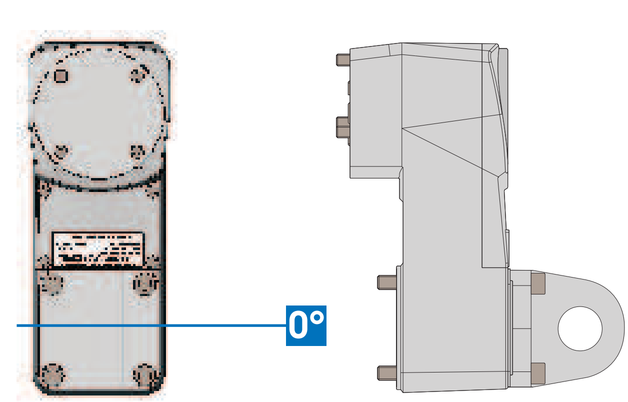
Motor adapter orientation

Mounting position parallel gearbox rear attachment

The 0° reference for the parallel gearbox rear attachment is the gearbox itself.

The rear attachment can be turned in 90° step (→ **fig. 11)**.

Fig. 11



Gearbox orientation

C

Ordering key

Complete actuator

CASM - 100 - BC - 0100 - AA0C10A - BA1100 -

Size

Screw type

BA	Ball screw 32×10
BB	Ball screw 40×10
BC	Ball screw 40×20
RA	Roller screw 30×10

Stroke

– Stroke in mm

Push tube

A	Steel E355 chrome plated, ∅55
B	Steel E355 chrome plated, ∅70 (for high forces and long strokes)

Front housing and attachments

A	Aluminum, no mounting option
B	Aluminium, with body attachment

Front housing attachment [1]

0	None
A	Front plate 90° mounting position
B	Front plate 0° mounting position
C	Pivot attachment (trunnion brackets to be ordered separately)
D	Foot mount, 0° mounting position
E	Foot mount, 180° mounting position

Rear housing [2]

A1 [3]	Aluminium, no mounting option, DGBB set, for screw type BA
B1 [3]	Aluminium, prepared for pivot or foot mounting, DGBB set, for screw type BA
C1	Aluminium, no mounting option, ACBB set, for all screw types
D1	Aluminium, prepared for pivot or foot mounting, ACBB set, for all screw types

Rear housing attachment [1]

0	None
C	Pivot attachment (trunnion brackets to be ordered separately)
D	Foot mount, 0° mounting position
E	Foot mount, 180° mounting position

Protection tube

A	Aluminium, 90°, recommended for parallel
B	Aluminium, 180°
C	Aluminium, 270°
D	Aluminium, 0°, recommended for inline

Sealing

A	IP30 with gasket
B	IP54S with wiper and gasket
C	IP65 with wiper, shaft seal and gasket

Lubrication

A0	Lubrication for -40 °C ...+50 °C, no re-lubrication possibility
A1	Lubrication for -40 °C ...+50 °C, with re-lubrication possibility

Anti-rotation

0	No anti-rotation
1	With anti-rotation

Free Parameter

00	Empty

[1] See fig. 12, page 151.
[2] DGBB means Deep Groove Ball Bearing; ACBB means Angular Contact Ball Bearing.
[3] Maximum static axial force limited to 31 kN.

G I - A A A - 0 0 - M S - 0 0 - A 1 1 - B B - 0 0 0

Gearbox type
GI Inline
GS Parallel (Spur gear)

Gear size
A Inline Servo
B Inline AC
C Parallel (Spur gear)

Ratio
A 1:1 (Inline)
B 3,89:1 (Only for parallel)
C 9,82:1 (Only for parallel)
D 24,95:1 (Only for parallel)

Housing Material
A Aluminium

Rear attachment [4)]
0 No
B Rear 0° (Only for parallel)
C Rear 90° (Only for parallel)

Accessories
0 No

Servo motors

Motor option
0 Delivery without motor
B Motor supplied and mounted by SKF

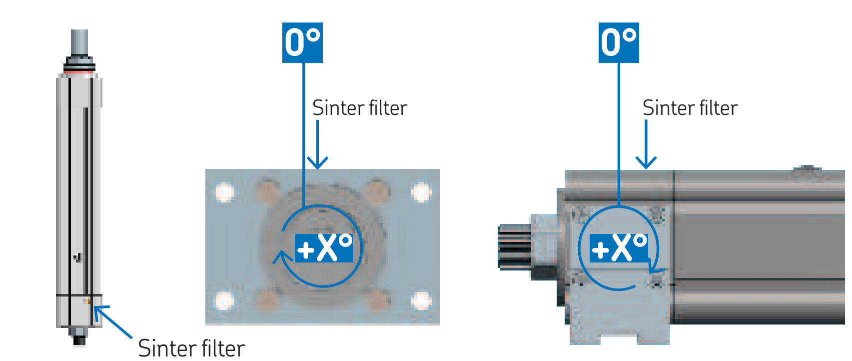
Motor type
A11 Siemens 1FK7044-4CH71-1UH0
A12 Siemens 1FK7064-4CF71-1RB0
A13 Siemens 1FK7086-4CF71-1RB0
A14 Siemens 1FK7105-2AF71-1RB0

Mounting position linear unit [5)]
A 0°, recommended for parallel
B 90°
C 180°
D 270°

Mounting position motor [6)]
A 0°
B 90°
C 180°
D 270°

[4)] See fig. 11, page 139.
[5)] See fig 7 and 8, page 138
[6)] See fig 9 and 19, page 139

Fig. 5



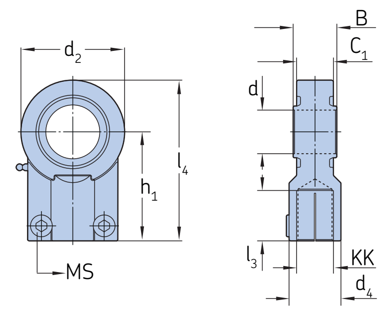
Mounting position front plate and foot mount
The 0° reference for the linear unit is the sinter filter position. The front plate can be turned in 90° steps clockwise. The foot mount can be turned in 180° steps clockwise.

Accessories

CASM-100

Push tube attachments

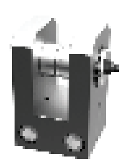
Rod End

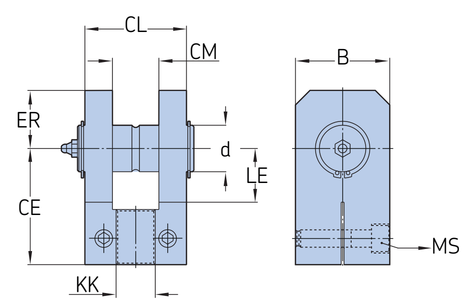


Ordering key
Rod End Ø 32:
ZBE-377900
Rod End Ø 50:
ZBE-377912
(According to DIN8132 standard)

Type	KK	MS	L_3	B	C_1	d	d_4	l_4	h_1	d_2	m
–	–	mm									kg
ZBE-377900	M27 × 2	M10	37	32H7	29	Ø 32	Ø 40	116,5	80	76	1,1
ZBE-377912	M42 × 2	M12	57	50H7	42	Ø 50	Ø 60,5	175,5	120	110	3,7

Rod Clevis



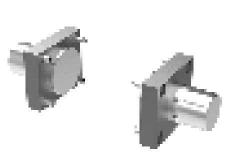


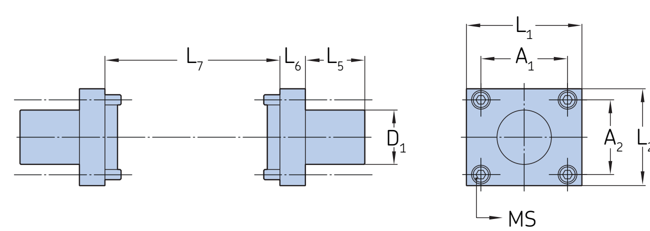
Ordering key
Rod Clevis Ø 32:
ZBE-377917
Rod Clevis Ø 50:
ZBE-377916
(According to DIN8132 standard)

Type	KK	MS	CL	CM	LE	CE	ER	d	B	m
–	–	mm								kg
ZBE-377917	M27 × 2	M12	70	32	42	80	40	Ø 32f8	65	2,7
ZBE-377916	M42 × 2	M20	110	50	64	120	63	Ø 50f8	100	6

Mounting kits

Pivot Attachment

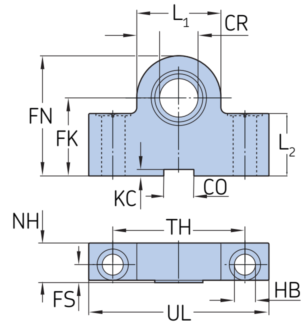




Ordering key
ZBE-377919

Type	MS	L_1	L_2	A_1	A_2	L_5	L_6	L_7	D_1	m
–	–	mm								kg
ZBE-377919	M6 × 16	68	57	51	44	35	15	103	Ø 32f7	1,5

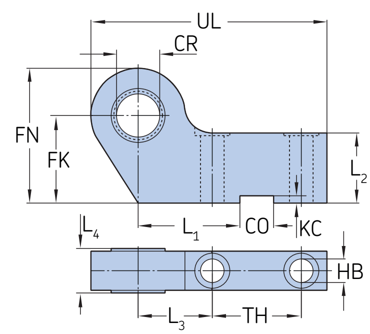
Trunnion Bracket Centric



Ordering key
ZBE-377902
(According to DIN8132 standard)

Type	CR	FN	FK	HB	NH	TH	UL	CO	KC	FS	L_1	L_2	m
–	mm												kg
ZBE-377902	∅ 32 H7	100	65	∅ 17,5	33	110	150	25	5,4	15	70	52	4,4
ZBE-377913	∅ 50 H7	140	95	∅ 26	51	160	210	36	8,4	20	100	75	9

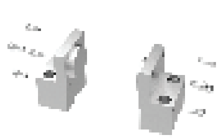
Trunnion Bracket Eccentric

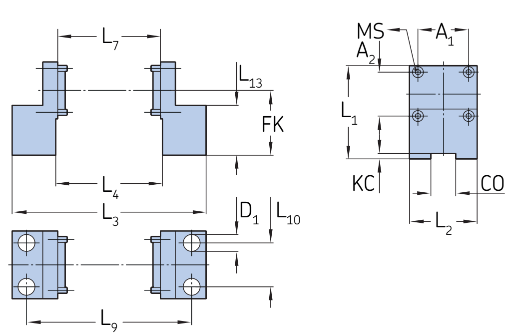


Ordering key
ZBE-377910

Type	CR	FN	FK	TH	HB	L_3	UL	CO	KC	L_4	L_2	L_1	m
–	mm												kg
ZBE-377910	∅ 32 E10	100	65	66	∅ 17,5	55	175	25	5,4	33	52	75,5	4,2

Foot Mount

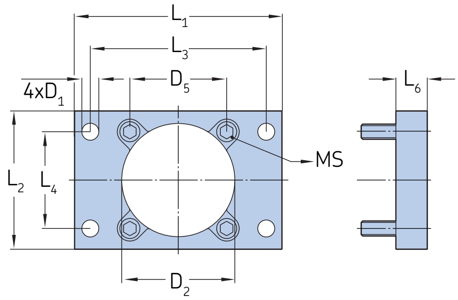




Ordering key
ZBE-377920

Type	MS	L_1	L_2	L_3	L_4	L_7	FK	A_1	A_2	L_9	L_{10}	KC	CO	L_{13}	D_1	m
–	–	mm														kg
ZBE-377920	M6 × 16	93,5	68	195	107	103	65	51	44	166	44	5,4	25	50	∅ 17	2,8

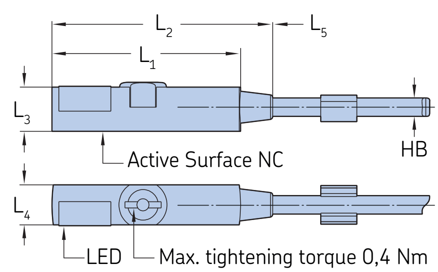
Front Plate



Ordering key
ZBE-377918

Type	MS	L_1	L_2	L_3	L_4	D_1	D_5	D_2	L_6	m
–	–	mm								kg
ZBE-377918	M12 × 40	165	110	140	77	∅ 13,5	□ 77	∅ 90	25	2,1

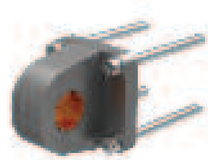
Proximity Switch

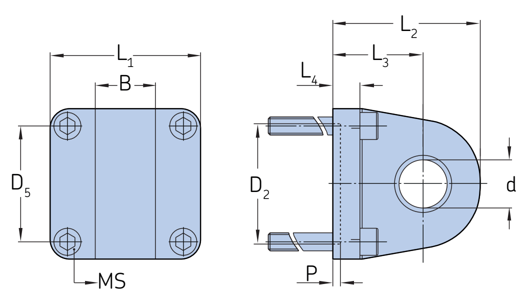


Ordering key
ZSC-377901-NC

Type	L1	L2	L3	L4	L5	D1	m
–	mm						kg
ZSC-377901-NC	23,5	27	5,5	5	2 000	∅ 2,5	0,016

Accessories Rear Attachment





Ordering key
ZBE-377921

Type	MS	d	B	L_1	L_2	L_3	L_4	D_2	P	D_5	m
–	–	mm									kg
ZBE-377921	M12x140	∅ 32 H7	40	□ 100	98	60	11	∅ 80	5	□ 77	3

C

Electric cylinders LEMC

Features

- High performance roller screw
- Steel push tube and aluminium protection tube
- Modular concept
- Possible to relubricate the roller screw nut with direct access
- Servo motors, asynchronous motors and customized motor adapters

Benefits

- High load and lifetime capacity, as well as high acceleration and speed capabilities
- High stiffness and robustness
- Multiple combinations allow for use in wide range of applications
- Low maintenance requirements
- Optimal solution for a wide variety of applications, either with SKF-provided motors or with the motor of your choice

Product description

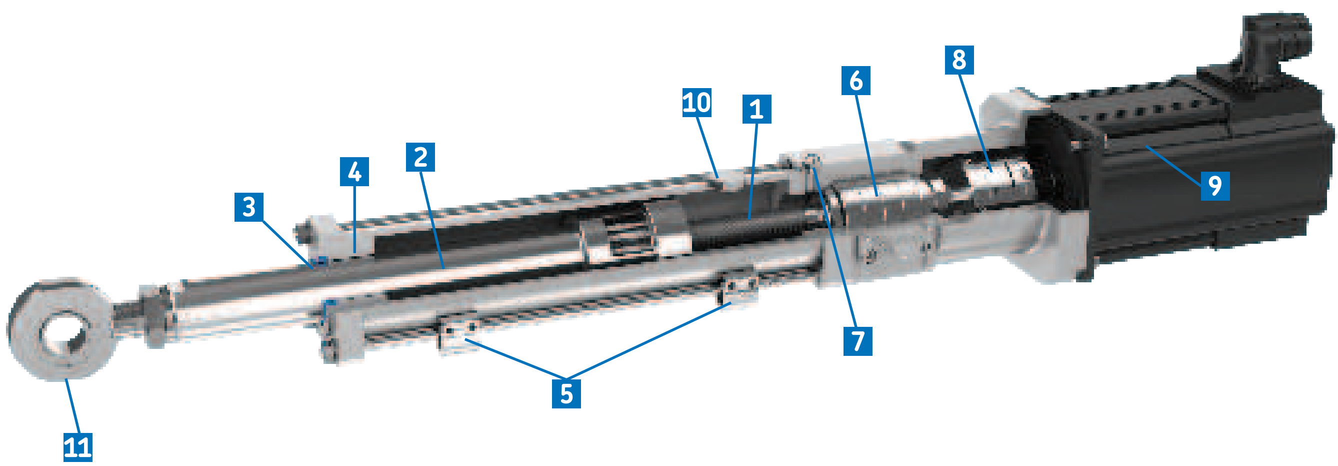
For generations, hydraulic cylinders were often the first choice for large forces or to move heavy loads. Today, hydraulic systems have a powerful rival in the linear motion world – the electric cylinder.

In many applications, electromechanical systems provide a host of advantages over their hydraulic counterparts. They are smaller and lighter, and since the motor powering the actuator is connected directly, electromechanical systems do away with bulky pumps, accumulators, oil tanks and pipework. The absence of pressurised oil has safety and environmental benefits too, minimizing the risk of fire, pollution or injury associated with leaks and spills.

LEMC electric cylinders replace hydraulic systems with a precision roller screw, driven by a locally mounted electric motor and gearbox.

This technology results in an actuator with a higher power density than conventional designs. LEMC actuators use a modular design that can be configured for many different applications and a range of motor types.

In addition to conventional servo motors, they can be supplied with an integrated gearbox and smart asynchronous motor. This provides additional safety and machine protection capabilities, with integrated soft start and motor protection functions. As a further benefit for operations and maintenance staff, the controller incorporates near field communication (NFC) capabilities, allowing it to be adjusted wirelessly using a smartphone.



1 High quality SKF planetary roller screw for highest axial loads with low play and high efficiency
2 Steel push tube and aluminium protection tube
3 Scraper to keep out contaminants
4 Guiding bushing
5 Adjustable Home and limit switches
6 High quality SKF bearings
7 Sinter filter for high airflow
8 Coupling
9 Servo motor or Asynchronous motor
10 Re-lubrication access
11 Rod end

Performance overview of linear units

Linear unit	F_{max}	F_{0max}	V_{max}
–	kN		mm
LEMC-U-2105	40	40	500
LEMC-U-2110	40	40	1 000
LEMC-U-3005	80	80	440
LEMC-U-3010	80	80	880

Performance overview of actuators with servo motors

Linear unit	Interface and gear ratio	Motor	F_{c0}	F_{p0}	V_{max}
–	–	–	kN		mm/s
LEMC-S-2105	L10/P10	LA1	6,1/6	17,3/16,8	163
LEMC-S-2105	L10/P10	LA2	6,1/6	17,3/16,8	338
LEMC-S-2105	L10/P10	LA3	10,9/10,6	27,8/27	125
LEMC-S-2105	L10/P10	LA4	10,9/10,6	27,8/27	294
LEMC-S-2105	P15	LA9	13,5	29,3	194
LEMC-S-2105	L10	LA5	14,4	33,5	163
LEMC-S-2105	L10/P10	LA6	14,4/14	31/30,1	338
LEMC-S-2110	L10/P10	LA1	3/2,9	8,5/8,3	325
LEMC-S-2110	L10/P10	LA2	3/2,9	8,5/8,3	675
LEMC-S-2110	L10/P10/P20	LA3	5,4/5,2/10,5	13,7/13,3/26,7	250/250/125
LEMC-S-2110	L10/P10/P20	LA4	5,4/5,2/10,5	13,7/13,3/26,7	588/588/294
LEMC-S-2110	L10	LA7	7,1	26,5	325
LEMC-S-2110	L10	LA8	7,1	26,1	675
LEMC-S-3005	L10/P10	LA3	10,5/10,2	26,6/25,8	125
LEMC-S-3005	L10/P10	LA4	10,5/10,2	26,6/25,8	294
LEMC-S-3005	L10	LB1	19,3	50,5	125
LEMC-S-3005	L10	LB2	19,3	50,5	269
LEMC-S-3005	P15	LA5	20,0	46,6	108
LEMC-S-3005	P15	LA6	20,0	43,1	225
LEMC-S-3005	L10/P10	LB5	34/32,9	69/67	113
LEMC-S-3005	L10/P10	LB6	32,9/31,9	54,9/53,3	269
LEMC-S-3010	L10	LA3	5,6	14,4	250
LEMC-S-3010	L10	LA4	5,6	14,4	588
LEMC-S-3010	L10	LB1	10,4	27,2	250
LEMC-S-3010	L10	LB2	10,4	27,2	538
LEMC-S-3010	L10	LB7	18,3	52,0	225
LEMC-S-3010	L10	LB8	18,3	52,0	538
LEMC-S-3010	P20	LA1	6,2	17,3	163
LEMC-S-3010	P20	LA2	6,2	17,3	338
LEMC-S-3010	P20	LA5	14,4	33,5	163
LEMC-S-3010	P20	LA6	14,4	31,0	338
LEMC-S-3010	P15	LB5	26,7	54,2	150
LEMC-S-3010	P15	LC2	26,7	49,6	358

Motors and gearboxes

Servo motors

The LEMC can be ordered with a servo motor. In this case, SKF has selected a series of Lenze motors and drives that best matches the performance of the actuator to the end-user application. To complete the design, several options can be selected such as absolute encoder (EnDat, Hyperface), safety brake or associated servodrive. It is also possible to equip the LEMC with your preferred brand of servo motor so that it integrates best into your system. Please contact SKF to check the feasibility of your configuration.

For more information please visit the following sites:

Motors:
http://www.lenze.com/en-us/products/motors/
Drives:
http://www.lenze.com/en-us/products/inverters/

Drive options

The performance attributes shown in the table on the previous page are the result of specific Lenze servo motor and drive combinations. The LEMC can be offered with or without the servodrive. The servodrive can be in the recommended configuration or any other configuration that fits your installation.

In the case of a different combination, please contact SKF to determine what effect the different configuration will have on the performance of the actuator.

C

Standard Motor types

Motor	Lenze servo motor	Lenze 9400 Highline servoamplifier
LA1	MCS12D20	E94ASHE0044
LA2	MCS12D41	E94ASHE0134
LA3	MCS12H15	E94ASHE0074
LA4	MCS12H35	E94ASHE0134
LA5	MCS12L20	E94ASHE0074
LA6	MCS12L41	E94ASHE0134
LA7	MCS12L20	E94ASHE0134
LA8	MCS12L41	E94ASHE0324
LA9	MCS12H35	E94ASHE0074
LB1	MCS14H15	E94ASHE0134
LB2	MCS14H32	E94ASHE0324
LB5	MCS14P14	E94ASHE0134
LB6	MCS14P32	E94ASHE0244
LB7	MCS14P14	E94ASHE0244
LB8	MCS14P32	E94ASHE0474
LC2	MCS14P32	E94ASHE0324

Asynchronous motors

The LEMC with asynchronous motor is the combination of an LEMC linear unit, a gearbox and a Lenze smart asynchronous motor. The gearboxes are available with several ratios to either favor speed or load for any linear unit size. They are available packaged in parallel and right angle configurations. The gearboxes are oil lubricated. When ordering a LEMC with asynchronous motor, the proper configuration must be identified so that the drains and vents are located correctly.

Smart functions

The asynchronous Lenze motor is equipped with a smart control box with the following features:

- Rotating speed can be adjusted freely between 500 and 2 600 r/min
- 3 digital inputs for changing speed and direction of movement
- 1 digital output for status message
- Integrated ramps for soft start and stop functions, to protect the system mechanics and full motor protection
- Less wiring thanks to electronic contactor and motor protection function
- Excellent energy efficiency
- Can be operated with an NFC-capable smartphone

Performance overview of actuators with asynchronous motors

Linear unit	Interface and gear ratio	Motor	F_{c0}	V_{min}	V_{max}
–			kN	mm/s	
LEMC-A-2110	B054/ B151	LAA2	4,3/ 12	15,5/ 5,5	80,2/ 28,7
LEMC-A-2110	B319/ P129	LBA2	25,4/ 10,3	2,7/ 6,5	13,5/ 33,3
LEMC-A-2110	P187/ P328	LBA2	14,9/ 26,2	4,5/ 2,5	23/ 13,2
LEMC-A-3005	B051/ B155	LBA2	8/ 24	8/ 2,7	41,7/ 13,9
LEMC-A-3005	B319/ P129	LBA2	49,2/ 20	1,3/ 3,2	6,7/ 16,7
LEMC-A-3005	P187/ P328	LBA2	29/ 50,7	2,2/ 1,2	11,5/ 6,6

Standard motor and gearbox types

Interface, gear ratio and motor	Lenze gearbox	Gearbox ratio	Lenze Smart motor
P129LBA2SN	G500-S220	12,992	M300-063-42
P187LBA2SN	G500-S220	18,776	M300-063-42
P328LBA2SN	G500-S220	32,867	M300-063-42
B054LAA2SN	G500-B45	5,411	M300-063-42
B151LAA2SN	G500-B45	15,111	M300-063-42
B319LBA2SN	G500-B110	31,919	M300-063-42
B051LBA2SN	G500-B110	5,185	M300-063-42
B155LBA2SN	G500-B110	15,556	M300-063-42

Standard Motor interface

Layout	**Inline**		**Parallel**					
[illegible]	21	30	21			30		
Ratio	1:1	1:1	1:1	3:2	2:1	1:1	3:2	2:1
Lenze								
MCS12	L1019110L	L1019110L	P1019110L	P1519110L	P2019110L	P1019110L	P1519110L	P2019110L
	-	-	-	-	-	-	-	P2019110H
MCS14	-	L1024130L	-	-	-	P1024130L	-	-
	-	-	-	-	-	P1024130H	P1524130H	P2024130H
Siemens								
1FK706x	L1024110L	L1024110L	P1024110L	P1524110L	P2024110L	P1024110L	P1524110L	P2024110L
	-	-	-	-	-	-	-	P2024110H
1FK708x	-	L1032130L	-	-	-	P1032130L	-	-
	-	-	-	-	-	P1032130H	P1532130H	P2032130H
Parker								
NX6	L1024110L	L1024110L	P1024110L	P1524110L	P2024110L	P1024110L	P1524110L	P2024110L
	-	-	-	-	-	-	-	P2024110H
NX8	-	L1032130L	-	-	-	P1032130L	-	-
	-	-	-	-	-	P1032130H	P1532130H	P2032130H
Kollmorgen								
AKM5x	L1019110L	L1019110L	P1019110L	P1519110L	P2019110L	P1019110L	P1519110L	P2019110L
	-	-	-	-	-	-	-	P2019110H
	L1024110L	L1024110L	P1024110L	P1524110L	P2024110L	P1024110L	P1524110L	P2024110L
	-	-	-	-	-	-	-	P2024110H
AKM6x	-	L1024130L	-	-	-	P1024130L	-	-
	-	-	-	-	-	P1024130H	P1524130H	P2024130H
	-	L1032130L	-	-	-	P1032130L	-	-
	-	-	-	-	-	P1032130H	P1532130H	P2032130H
Rockwell / Allen Bradley								
MPL-A/B45x	L1024110L	L1024110L	P1024110L	P1524110L	P2024110L	P1024110L	P1524110L	P2024110L
	-	-	-	-	-	-	-	P2024110H
MPL-A/B52x	-	L1028130L	-	-	-	P1028130L	-	-
MPL-A/B52x & B54x & B56x	-	L1028130L	-	-	-	P1028130H	P1528130H	P2028130H

For other motors, please contact SKF

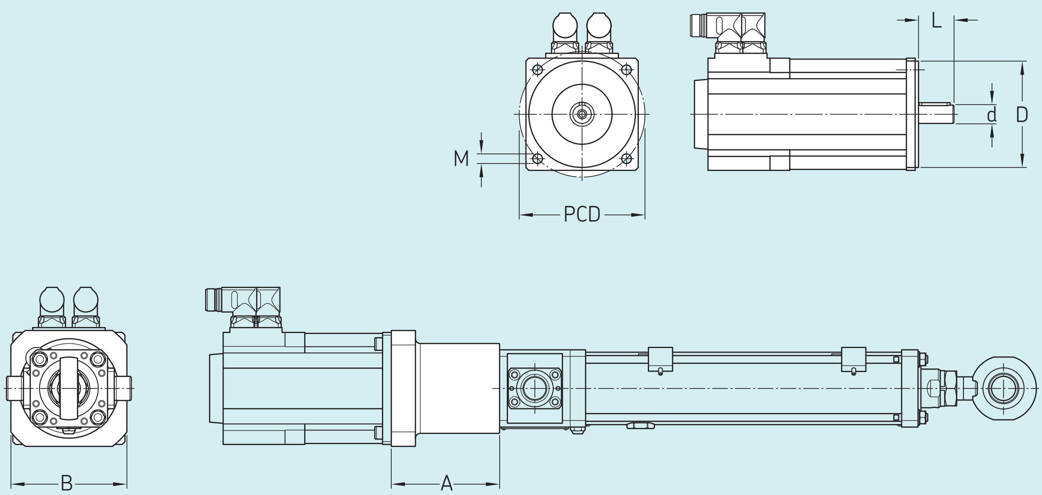
C

Third party motors

In order to attach your preferred motor to the linear unit, SKF offers tailor made solutions within the specifications below.

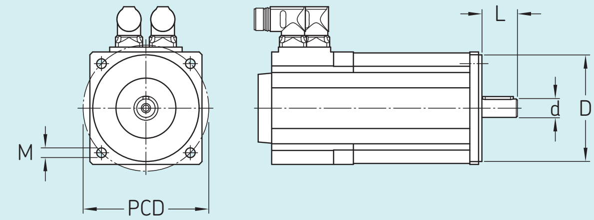
For motor specifications which are not covered by the specifications below, please contact SKF.

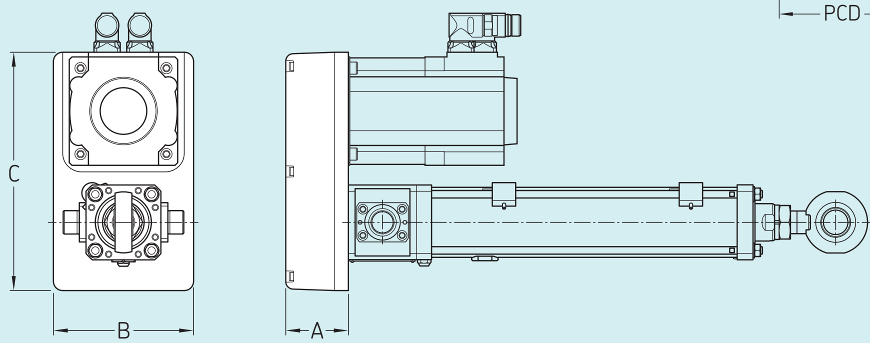
Inline interface



LEMC	Interface	d	D	L	PCD	M	A	B	Torque max	Inertia	Weight
–		mm				–	mm		Nm	10^{-4} kgm^2	kg
21	L1019110L	19	110 H8$^{0}_{+0,054}$	40 ... 50	130	M8	112	120	60	1,6	1,7
21	L1024110L	24	110 H8$^{0}_{+0,054}$	40 ... 50	130	M8	112	120	60	1,6	1,7
30	L1019110L	19	110 H8$^{0}_{+0,054}$	40 ... 50	130	M8	106	120	60	1,6	2,9
30	L1024110L	24	110 H8$^{0}_{+0,054}$	40 ... 50	130	M8	106	120	60	1,6	2,9
30	L1024130L	24	130 H8$^{0}_{+0,063}$	50 ... 58	165	M10	118	150	120	3	2,6
30	L1028130L	28	130 H8$^{0}_{+0,063}$	50 ... 60	165	M10	121	150	120	3	2,6
30	L1032130L	32	130 H8$^{0}_{+0,063}$	50 ... 58	165	M10	118	150	120	3	2,6

Parallel interface





LEMC	Interface	d	D	L	PCD	M	A	B	C	Torque max	Inertia	Weight
–		mm				–	mm			Nm	10^{-4} kgm^2	kg
21	P1019110L	19	$110\ G8^{+0,012}_{+0,066}$	40 ... 50	130	M8	67	150	255	40	14,4	3,5
21	P1024110L	24	$110\ G8^{+0,012}_{+0,066}$	40 ... 50	130	M8	67	150	255	40	14,4	3,5
21	P1519110L	19	$110\ G8^{+0,012}_{+0,066}$	40 ... 50	130	M8	67	150	255	25	7,55	3,4
21	P1524110L	24	$110\ G8^{+0,012}_{+0,066}$	40 ... 50	130	M8	67	150	255	25	7,55	3,4
21	P2019110L	19	$110\ G8^{+0,012}_{+0,066}$	40 ... 50	130	M8	67	150	255	20	9,55	4,3
21	P2024110L	24	$110\ G8^{+0,012}_{+0,066}$	40 ... 50	130	M8	67	150	255	20	9,55	4,3
30	P1019110L	19	$110\ G8^{+0,012}_{+0,066}$	40 ... 50	130	M8	72	180	325	55	37,6	5,8
30	P1024110L	24	$110\ G8^{+0,012}_{+0,066}$	40 ... 50	130	M8	72	180	325	55	37,6	5,8
30	P1024130L	24	$130\ G8^{+0,014}_{+0,077}$	50 ... 58	165	M10	72	180	325	55	37,6	5,6
30	P1024130H	24	$130\ G8^{+0,014}_{+0,077}$	50 ... 58	165	M10	72	180	325	90	37,6	5,6
30	P1028130L	28	$130\ G8^{+0,014}_{+0,077}$	50 ... 60	165	M10	72	180	325	55	37,6	5,6
30	P1028130H	28	$130\ G8^{+0,014}_{+0,077}$	50 ... 60	165	M10	72	180	325	99	37,6	5,6
30	P1032130L	32	$130\ G8^{+0,014}_{+0,077}$	50 ... 58	165	M10	72	180	325	55	37,6	5,6
30	P1032130H	32	$130\ G8^{+0,014}_{+0,077}$	50 ... 58	165	M10	72	180	325	90	37,6	5,6
30	P1519110L	19	$110\ G8^{+0,012}_{+0,06}$	40 ... 50	130	M8	72	180	325	40	27,5	6,3
30	P1524110L	24	$110\ G8^{+0,012}_{+0,06}$	40 ... 50	130	M8	72	180	325	40	27,5	6,3
30	P1524130H	24	$110\ G8^{+0,012}_{+0,06}$	50 ... 58	165	M10	72	180	325	100	70,3	9
30	P1528130H	28	$130\ G8^{+0,014}_{+0,077}$	50 ... 60	165	M10	72	180	325	100	70,3	9
30	P1532130H	32	$130\ G8^{+0,014}_{+0,077}$	50 ... 58	165	M10	72	180	325	100	70,3	9
30	P2019110L	19	$110\ G8^{+0,012}_{+0,06}$	40 ... 50	130	M8	72	180	325	35	25	7
30	P2019110H	19	$110\ G8^{+0,012}_{+0,06}$	40 ... 50	130	M8	72	180	325	70	34,5	8,5
30	P2024110L	24	$110\ G8^{+0,012}_{+0,06}$	40 ... 50	130	M8	72	180	325	35	25	7
30	P2024130H	24	$130\ G8^{+0,014}_{+0,077}$	50 ... 58	165	M10	72	180	325	70	34,5	8,3
30	P2028130H	28	$130\ G8^{+0,014}_{+0,077}$	50 ... 60	165	M10	72	180	325	70	34,5	8,3
30	P2032130H	32	$130\ G8^{+0,014}_{+0,077}$	50 ... 58	165	M10	72	180	325	70	34,5	8,3

C

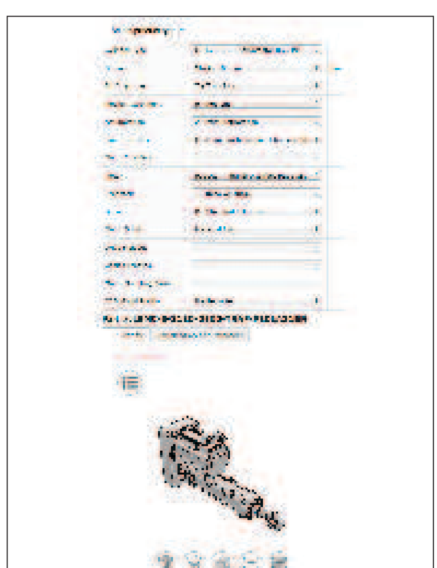
Manuals

Supporting documents are available for downloading on skf.com/lemc

3D models

Product configurators for 3D models download are available on skf.com/lemc

Instruction for maintenance, limit switch and motor assembly
PUB MT/I4 17034 EN

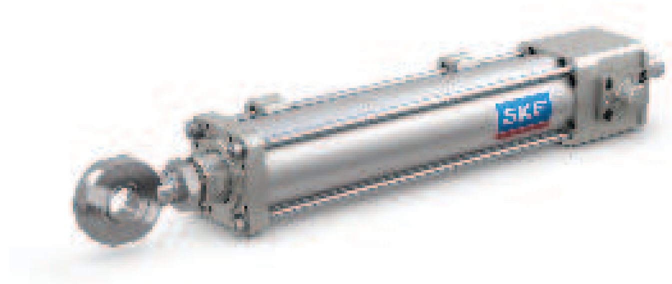


3D model configurator

C

LEMC-U-21

Linear unit

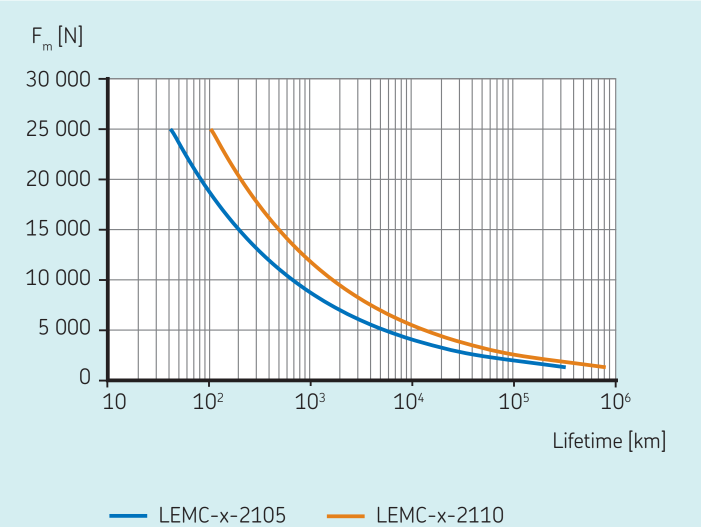


Technical data

Designation	Symbol	Unit	LEMC-U-2105	LEMC-U-2110
Performance Data				
Max. dynamic axial force	F_{max}	kN	40	40
Max. dynamic axial force L_{10} 1)	F_{L10}	kN	25	25
Max. static axial force	F_{0max}	kN	40	40
Dynamic load capacity	C	kN	50,5	54,3
Maximum torque to reach F_{max}	M_{max}	Nm	41,7	84,4
Max. linear speed	v_{max}	mm/s	500	1 000
Max. rotational speed	n_{max}	1/min	6 000	6 000
Max. acceleration	a_{max}	m/s^2	6	12
Duty cycle	D_{unit}	%	100	100
Mechanical Data				
Screw type	–	–	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	21	21
Screw lead	p_{screw}	mm	5	10
Lead accuracy	–	–	G5	G5
Stroke 2)	s	mm	100...600	100...600
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0,02	0,04
Efficiency	η_{lu}	%	76	75
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	1,45	1,45
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,15	0,15
Weight @ 0 mm stroke	m_{lu}	kg	7,3	7,3
Δ weight per 100 mm stroke	Δm	kg	1,2	1,2
Weight of anti-rotation	m_{arot0}	kg	0,9	0,9
Environment				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection	IP	–	54S	54S

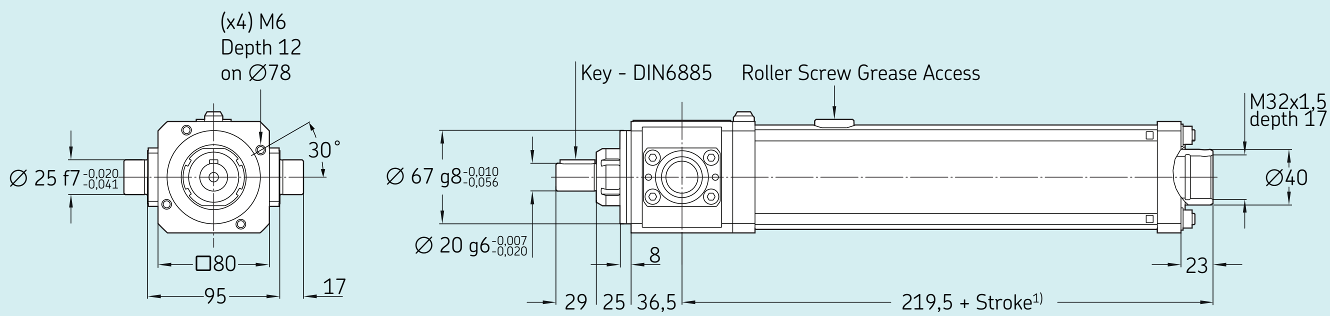
1) Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L10)
2) By 100 mm steps

Performance diagrams

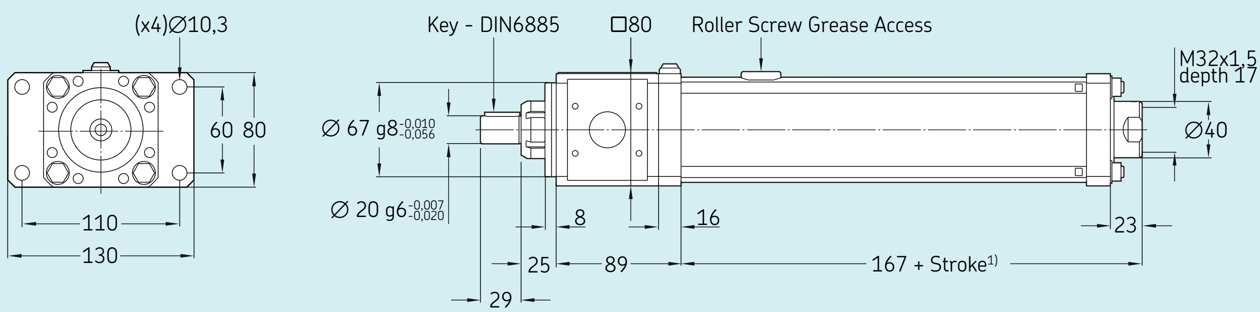


Dimensional drawing

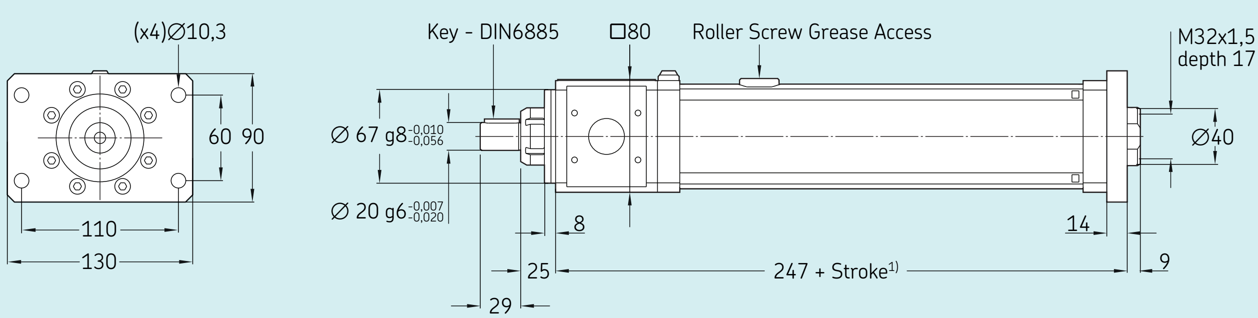
LEMC-U-21xx-xxxx-TNNx-NNN (Trunnions)



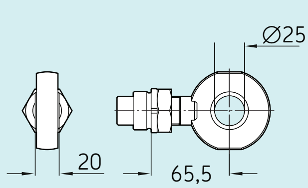
LEMC-U-21xx-xxxx-BNNx-NNN (Back plate)



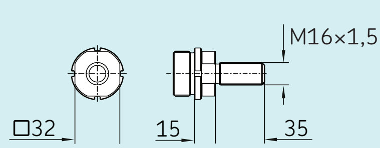
LEMC-U-21xx-xxxx-FNNx-NNN (Front plate)



LEMC-U-21xx-xxxx-xRxx (Rod end)



LEMC-U-21xx-xxxx-xMxx (Male attachement)



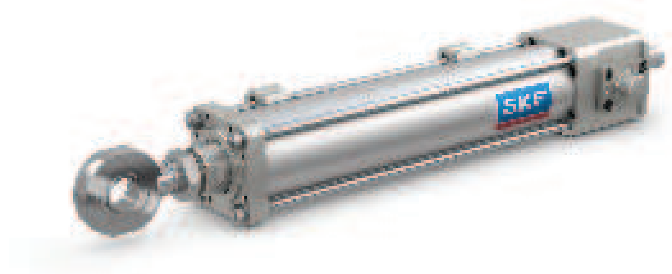
1) Add 30 mm for anti-rotation option

Ordering key

See page 170

LEMC-U-30

Linear unit

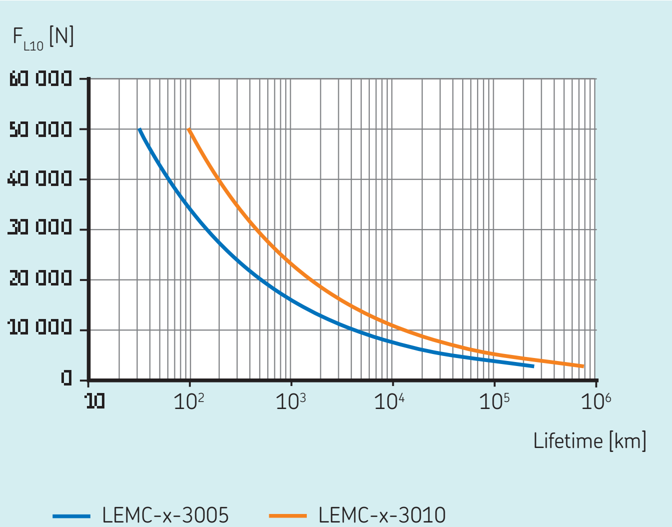


Technical data

Designation	Symbol	Unit	LEMC-U-3005	LEMC-U-3010
Performance Data				
Max. dynamic axial force	F_{max}	kN	80	80
Max. dynamic axial force L_{10} [1]	F_{L10}	kN	50	50
Max. static axial force	F_{0max}	kN	80	80
Dynamic load capacity	C	kN	91,9	106,3
Maximum torque to reach F_{max}	M_{max}	Nm	87,1	161,5
Max. linear speed	v_{max}	mm/s	440	880
Max. rotational speed	n_{max}	1/min	5 280	5 280
Max. acceleration	a_{max}	m/s^2	6	12
Duty cycle	D_{unit}	%	100	100
Mechanical Data				
Screw type	–	–	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	30	30
Screw lead	p_{screw}	mm	5	10
Lead accuracy	–	–	G5	G5
Stroke [2]	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0,02	0,04
Efficiency	η_{lu}	%	73	79
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	5,00	5,00
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,65	0,65
Weight @ 0 mm stroke	m_{lu}	kg	14,7	14,7
Δ weight per 100 mm stroke	Δm	kg	2,1	2,1
Weight of anti-rotation	m_{arot0}	kg	1,3	1,3
Environment				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection	IP	–	54S	54S

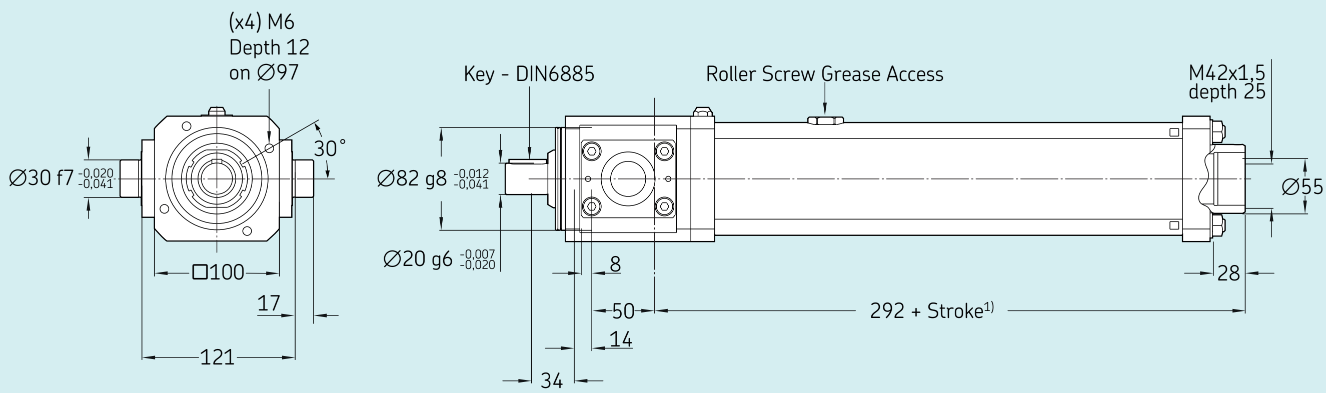
1) Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L_{10})
2) By 100 mm steps

Performance diagrams

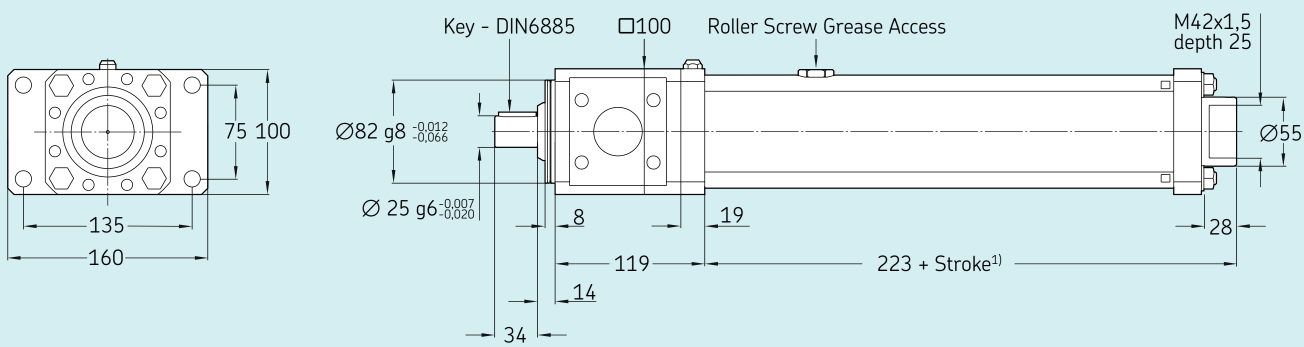


Dimensional drawing

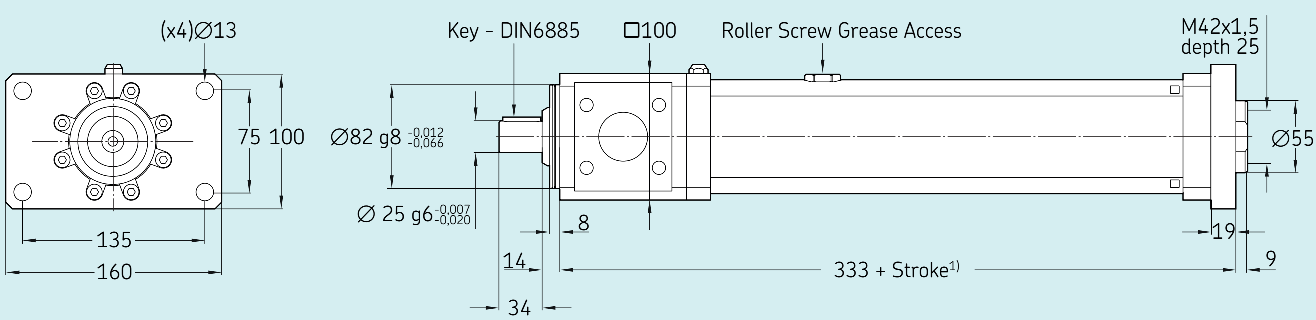
LEMC-U-30xx-xxxx-TNNx-NNN (Trunnions)



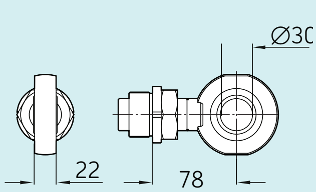
LEMC-U-30xx-xxxx-BNNx-NNN (Back plate)



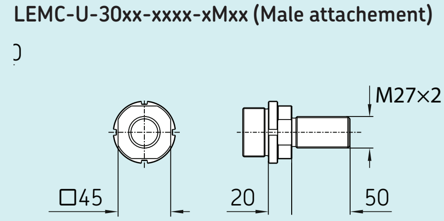
LEMC-U-30xx-xxxx-FNNx-NNN (Front plate)



LEMC-U-30xx-xxxx-xRxx (Rod end)



LEMC-U-30xx-xxxx-xMxx (Male attachement)



1) Add 30 mm for anti-rotation option

Ordering key

See page 170

Ordering key

Linear units

L E M C - U - 2 1 0 5 - 0 1 0 0 - T R A F - x x x x x x x x x

Linear unit only

Screw diameter

Screw lead

Stroke

Rear attachment

T Trunnions
F Front plate
B Back plate
N No attachment

Front attachment

M Male attachment
N No attachment (female thread)
R Rod end

Anti-rotation

A Anti-rotation
N No anti-rotation

Limit switches

F 2 limit switches and 1 home switch
S 2 limit switches only
M 1 limit switch and 1 home switch
L 1 limit switch only
H Home switch only
N No switch

Motor interface

N No interface (only one digit)
for standard motor, see page 159
for third party motor with inline interface, see page 162
for third party motor with parallel interface, see page 163

Example

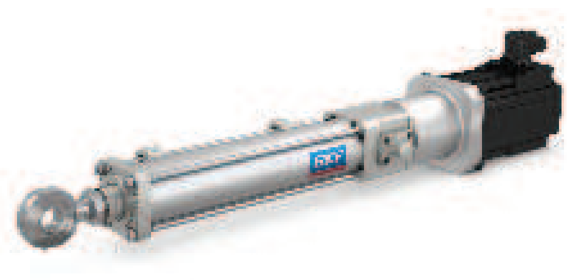
Linear unit only
LEMC–U–2105–0100–TRAF–N

Linear unit with motor interface
LEMC–U–2105–0100–TRAF–L1019110L

C

LEMC-S-2105

Electric cylinder
servo motor, inline configuration



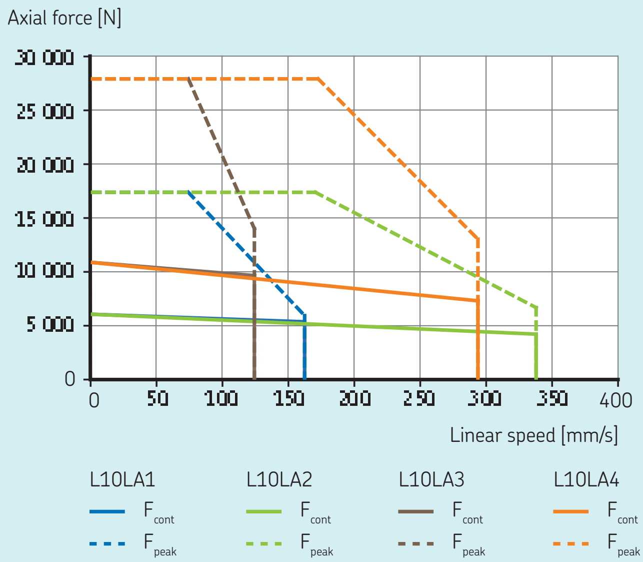
Technical data

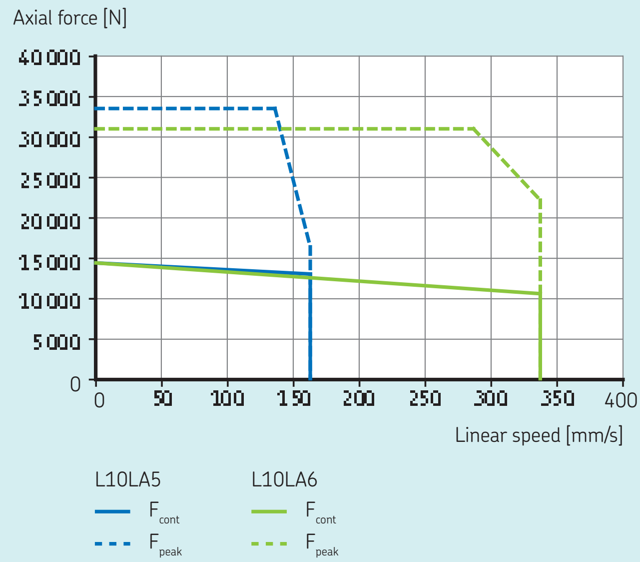
Designation	Symbol	Unit	Inline adapter and servo motor L10 LA1	 L10 LA2	 L10 LA3	 L10 LA4	 L10 LA5	 L10 LA6
Performance Data								
Continuous force @ zero speed	F_{c0}	kN	6,1	6,1	10,9	10,9	14,4	14,4
Continuous force @ max. speed	F_c	kN	5,3	4,1	9,6	7,2	13,0	10,6
Peak force @ zero speed	F_{p0}	kN	17,3	17,3	27,8	27,8	33,5	31
Peak force @ max. speed	F_p	kN	5,9	6,6	13,9	13,0	16,3	22,2
Dynamic load capacity	C	kN	50,5	50,5	50,5	50,5	50,5	50,5
Holding force (motorbrake option)	F_{Hold}	kN	17,1	17,1	17,1	17,1	17,1	17,1
Max. linear speed	v_{max}	mm/s	163	338	125	294	163	338
Max. acceleration	a_{max}	m/s^2	6	6	6	6	6	6
Duty cycle	D	%	100	100	100	100	100	100
Mechanical Data								
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	21	21	21	21	21	21
Screw lead	p_{screw}	mm	5	5	5	5	5	5
Lead accuracy	–	–	G5	G5	G5	G5	G5	G5
Stroke 1)	s	mm	100...600	100...600	100...600	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	5	5	5	5	5	5
Backlash	$s_{backlash}$	mm	0,02	0,02	0,02	0,02	0,02	0,02
Gear reduction	i	–	1	1	1	1	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	7,05	7,05	10,40	10,40	13,70	13,70
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,15	0,15	0,15	0,15	0,15	0,15
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07	1,07	1,07	1,07	1,07
Weight @ 0 mm stroke	m	kg	15,3	15,3	18,4	18,4	21,5	21,5
Δ weight per 100 mm stroke	Δm	kg	1,15	1,15	1,15	1,15	1,15	1,15
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90	0,90	0,90	0,90
Weight of anti-rotation	m_{arot0}	kg	0,90	0,90	0,90	0,90	0,90	0,90
Electrical Data								
Motor type	–	–	Servo	Servo	Servo	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400	400	400	400
Nominal current	I	A	2,7	5,5	4,1	8,2	6,2	12,4
Peak current	I_{peak}	A	10	20	12	24	16,8	31,2
Nominal power	P	kW	1,12	1,82	1,57	2,77	2,76	4,67
Environment								
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S	54S	54S	54S

1) By 100 mm steps

For more information regarding motors and motor adapters, please visit page 158

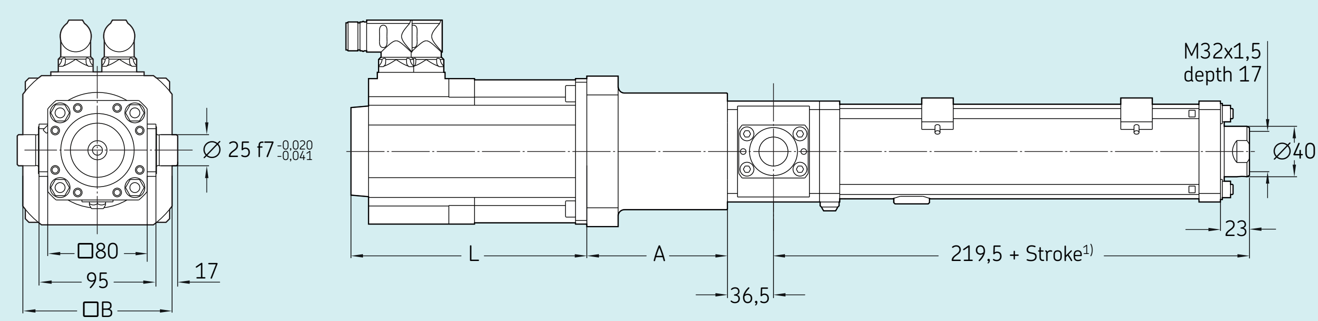
Performance diagrams





For Force / Lifetime diagrams see page 154

Dimensional drawing



Reference	L[2]	A	B
	mm		
L10LA1	188	112	120
L10LA2	188	112	120
L10LA3	228	112	120
L10LA4	228	112	120
L10LA5	268	112	120
L10LA6	268	112	120

1) Add 30 mm for anti-rotation option
2) For brake option add 20 mm. For absolute encoder option add 49 mm

Ordering key

See page 188

C

LEMC-S-2105

Electric cylinder servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	Parallel adapter and servo motor P10 LA1	P10 LA2	P10 LA3	P10 LA4	P15 LA9	P10 LA6
Performance Data								
Continuous force @ zero speed	F_{c0}	kN	6	6	10,6	10,6	13,5	14
Continuous force @ max. speed	F_c	kN	5,1	4	9,3	7	10,5	10,2
Peak force @ zero speed	F_{p0}	kN	16,8	16,8	27	27	29,3	30,1
Peak force @ max. speed	F_p	kN	5,7	6,4	13,5	12,6	18,9	21,5
Dynamic load capacity	C	kN	50,5	50,5	50,5	50,5	50,5	50,5
Holding force (motorbrake option)	F_{Hold}	kN	17,6	17,6	17,6	17,6	26,5	17,6
Max. linear speed	v_{max}	mm/s	163	338	125	294	194	338
Max. acceleration	a_{max}	m/s^2	6	6	6	6	6	6
Duty cycle	D	%	100	100	100	100	100	100
Mechanical Data								
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	21	21	21	21	21	21
Screw lead	p_{screw}	mm	5	5	5	5	5	5
Lead accuracy	–	–	G5	G5	G5	G5	G5	G5
Stroke [1]	s	mm	100...600	100...600	100...600	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	5	5	5	5	5	5
Backlash	$s_{backlash}$	mm	0,02	0,02	0,02	0,02	0,02	0,02
Gear reduction	i	–	1	1	1	1	1,5	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	19,90	19,90	23,20	23,20	15,50	26,50
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,15	0,15	0,15	0,15	0,07	0,15
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07	1,07	1,07	1,07	1,07
Weight @ 0 mm stroke	m	kg	17,2	17,2	20,3	20,3	20,2	23,4
Δ weight per 100 mm stroke	Δm	kg	1,15	1,15	1,15	1,15	1,15	1,15
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90	0,90	0,90	0,90
Weight of anti-rotation	m_{arot0}	kg	0,90	0,90	0,90	0,90	0,90	0,90
Electrical Data								
Motor type	–	–	Servo	Servo	Servo	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400	400	400	400
Nominal current	I	A	2,7	5,5	4,1	8,2	7	12,4
Peak current	I_{peak}	A	10	20	12	24	16,8	31,2
Nominal power	P	kW	1,12	1,82	1,57	2,77	2,75	4,67
Environment								
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S	54S	54S	54S

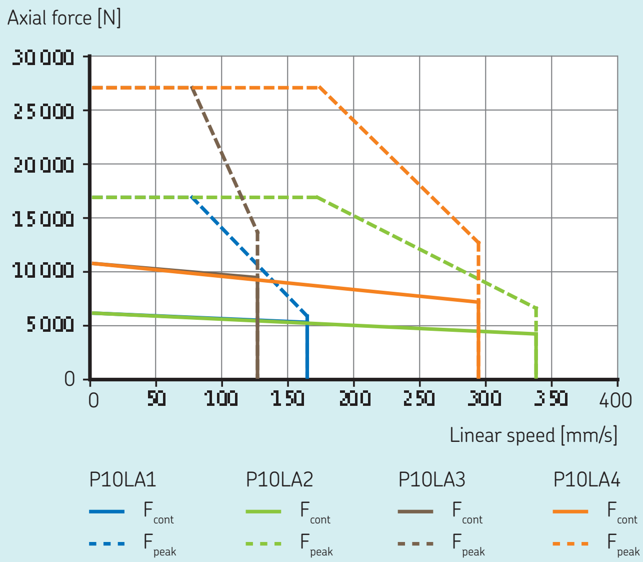
[1] By 100 mm steps

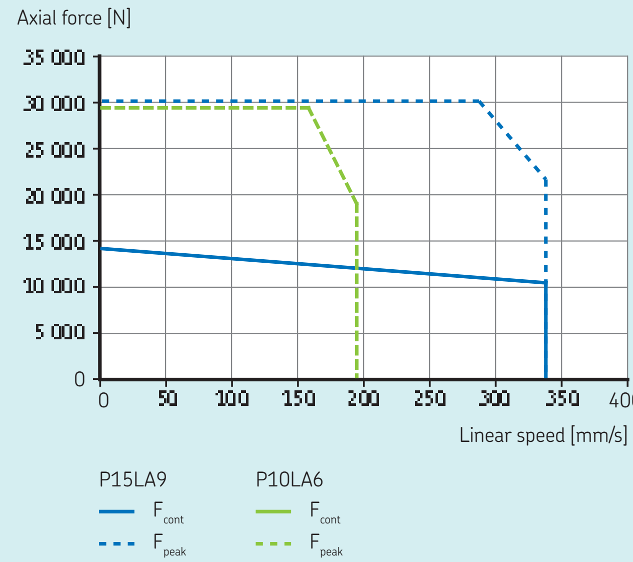
For more information regarding motors and motor adapters, please visit page 158

Ordering key

See page 188

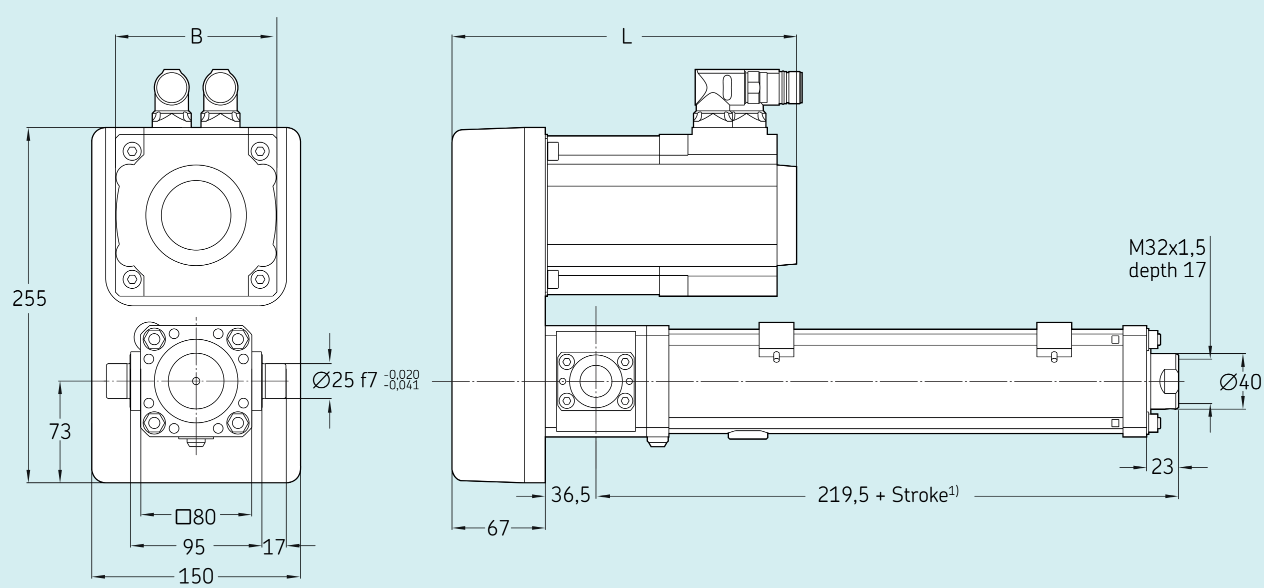
Performance diagrams





For Force / Lifetime diagrams see page 154

Dimensional drawing

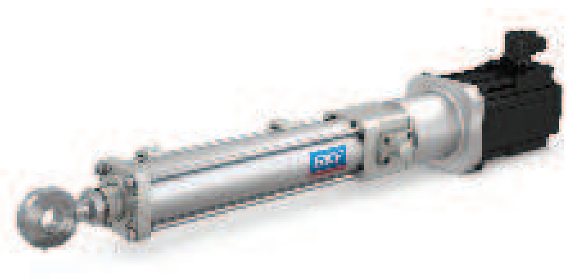


Reference	L[2]	A	B	C
	mm			
P10LA1	247,5	67	116	255
P10LA2	247,5	67	116	255
P10LA3	287,5	67	116	255
P10LA4	287,5	67	116	255
P15LA9	287,5	67	116	255
P10LA6	327,5	67	116	255

1) Add 30 mm for anti-rotation option
2) For brake option add 20 mm. For absolute encoder option add 49 mm

LEMC-S-2110

Electric cylinder
servo motor, inline configuration



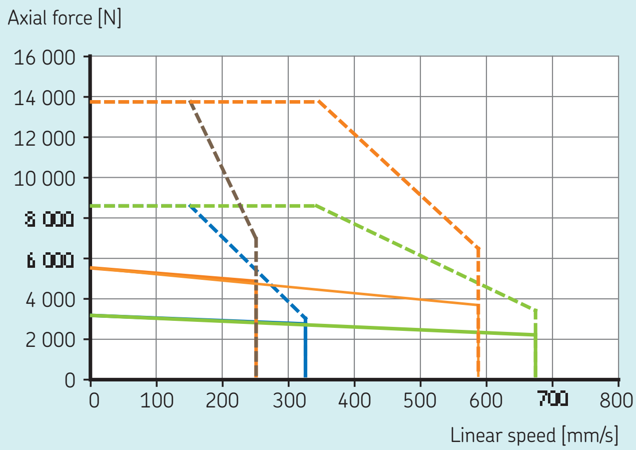
Technical data

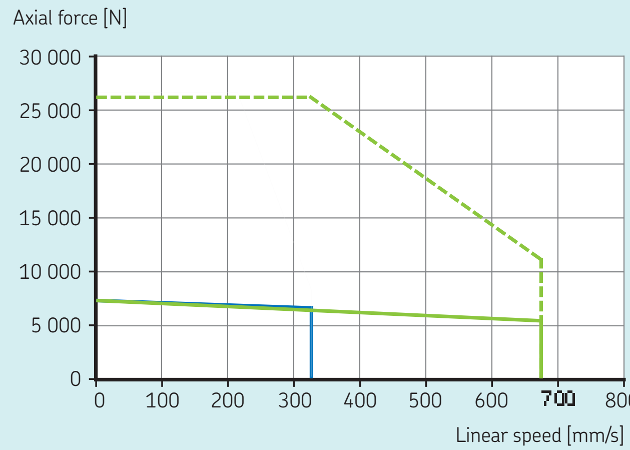
Designation	Symbol	Unit	Inline adapter and servo motor L10 LA1	 L10 LA2	 L10 LA3	 L10 LA4	 L10 LA7	 L10 LA8
Performance Data								
Continuous force @ zero speed	F_{c0}	kN	3	3	5,4	5,4	7,1	7,1
Continuous force @ max. speed	F_c	kN	2,6	2	4,7	3,6	6,4	5,2
Peak force @ zero speed	F_{p0}	kN	8,5	8,5	13,7	13,7	26,5	26,1
Peak force @ max. speed	F_p	kN	2,9	3,3	6,9	6,4	8,1	10,9
Dynamic load capacity	C	kN	54,3	54,3	54,3	54,3	54,3	54,3
Holding force (motorbrake option)	F_{Hold}	kN	8,7	8,7	8,7	8,7	8,7	8,7
Max. linear speed	v_{max}	mm/s	325	675	250	588	325	675
Max. acceleration	a_{max}	m/s^2	12	12	12	12	12	12
Duty cycle	D	%	100	100	100	100	100	100
Mechanical Data								
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	21	21	21	21	21	21
Screw lead	p_{screw}	mm	10	10	10	10	10	10
Lead accuracy	–	–	G5	G5	G5	G5	G5	G5
Stroke [1]	s	mm	100...600	100...600	100...600	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	5	5	5	5	5	5
Backlash	$s_{backlash}$	mm	0,04	0,04	0,04	0,04	0,04	0,04
Gear reduction	i	–	1	1	1	1	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	7,05	7,05	10,40	10,40	13,70	13,70
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,15	0,15	0,15	0,15	0,15	0,15
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07	1,07	1,07	1,07	1,07
Weight @ 0 mm stroke	m	kg	15,3	15,3	18,4	18,4	21,5	21,5
Δ weight per 100 mm stroke	Δm	kg	1,15	1,15	1,15	1,15	1,15	1,15
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90	0,90	0,90	0,90
Weight of anti-rotation	m_{arot0}	kg	0,90	0,90	0,90	0,90	0,90	0,90
Electrical Data								
Motor type	–	–	Servo	Servo	Servo	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400	400	400	400
Nominal current	I	A	2,7	5,5	4,1	8,2	6,2	12,4
Peak current	I_{peak}	A	10	20	12	24	28	56
Nominal power	P	kW	1,12	1,82	1,57	2,77	2,76	4,67
Environment								
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S	54S	54S	54S

[1] By 100 mm steps

For more information regarding motors and motor adapters, please visit page 158

Performance diagrams

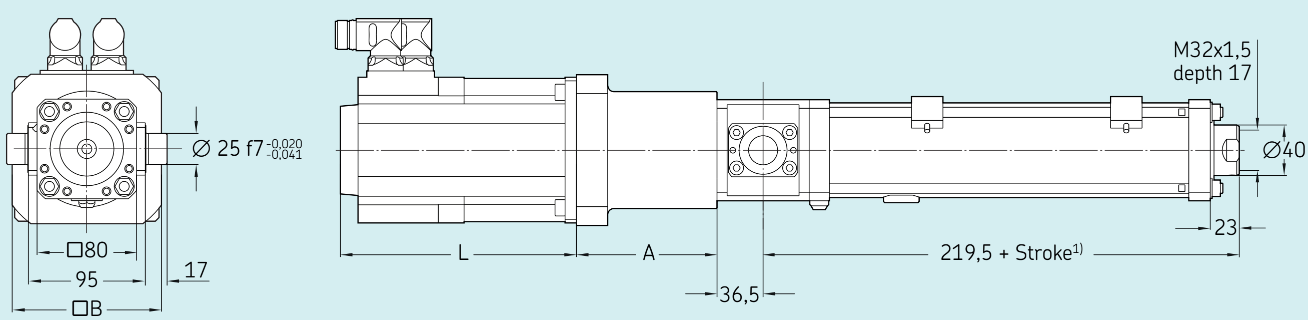




L10LA1	L10LA2	L10LA3	L10LA4	L10LA7	L10LA8
F_{cont}	F_{cont}	F_{cont}	F_{cont}	F_{cont}	F_{cont}
F_{peak}	F_{peak}	F_{peak}	F_{peak}	F_{peak}	F_{peak}

For Force / Lifetime diagrams see page 154

Dimensional drawing



Reference	L[2]	A	B
	mm		
L10LA1	188	112	120
L10LA2	188	112	120
L10LA3	228	112	120
L10LA4	228	112	120
L10LA7	268	112	120
L10LA8	268	112	120

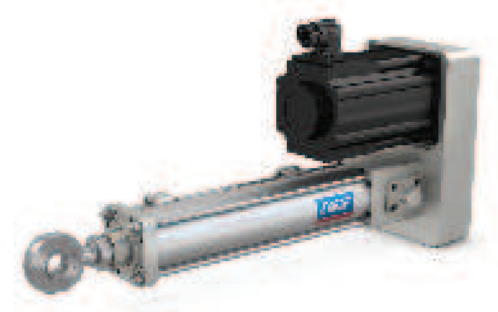
1) Add 30 mm for anti-rotation option
2) For brake option add 20 mm. For absolute encoder option add 49 mm

Ordering key

See page 188

LEMC-S-2110

Electric cylinder
servo motor, parallel configuration



Technical data

Designation	Symbol	Unit	Parallel adapter and servo motor P10 LA1	P10 LA2	P10 LA3	P20 LA3	P10 LA4	P20 LA4
Performance Data								
Continuous force @ zero speed	F_{c0}	kN	2,9	2,9	5,2	10,5	5,2	10,5
Continuous force @ max. speed	F_c	kN	2,5	2	4,6	9,2	3,4	6,9
Peak force @ zero speed	F_{p0}	kN	8,3	8,3	13,3	26,7	13,3	26,7
Peak force @ max. speed	F_p	kN	2,8	3,2	6,7	13,3	6,2	12,4
Dynamic load capacity	C	kN	54,3	54,3	54,3	54,3	54,3	54,3
Holding force (motorbrake option)	F_{Hold}	kN	9	9	9	18	9	18
Max. linear speed	v_{max}	mm/s	325	675	250	125	588	294
Max. acceleration	a_{max}	m/s^2	12	12	12	12	12	12
Duty cycle	D	%	100	100	100	100	100	100
Mechanical Data								
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	21	21	21	21	21	21
Screw lead	p_{screw}	mm	10	10	10	10	10	10
Lead accuracy	–	–	G5	G5	G5	G5	G5	G5
Stroke [1]	s	mm	100...600	100...600	100...600	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	5	5	5	5	5	5
Backlash	$s_{backlash}$	mm	0,04	0,04	0,04	0,04	0,04	0,04
Gear reduction	i	–	1	1	1	2	1	2
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	19,90	19,90	23,20	17,20	23,20	17,20
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,15	0,15	0,15	0,04	0,15	0,04
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07	1,07	1,07	1,07	1,07
Weight @ 0 mm stroke	m	kg	17,2	17,2	20,3	16,8	20,3	16,8
Δ weight per 100 mm stroke	Δm	kg	1,15	1,15	1,15	1,15	1,15	1,15
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90	0,90	0,90	0,90
Weight of anti-rotation	m_{arot0}	kg	0,90	0,90	0,90	0,90	0,90	0,90
Electrical Data								
Motor type	–	–	Servo	Servo	Servo	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400	400	400	400
Nominal current	I	A	2,7	5,5	4,1	4,1	8,2	8,2
Peak current	I_{peak}	A	10	20	12	12	24	24
Nominal power	P	kW	1,12	1,82	1,57	1,57	2,77	2,77
Environment								
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S	54S	54S	54S

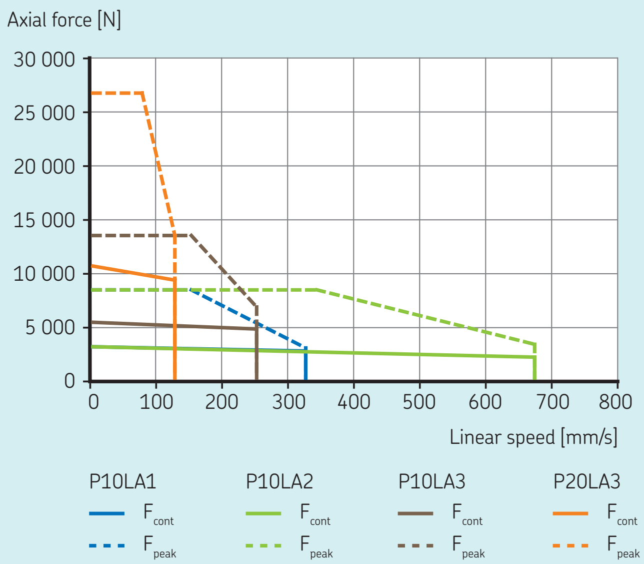
[1] By 100 mm steps

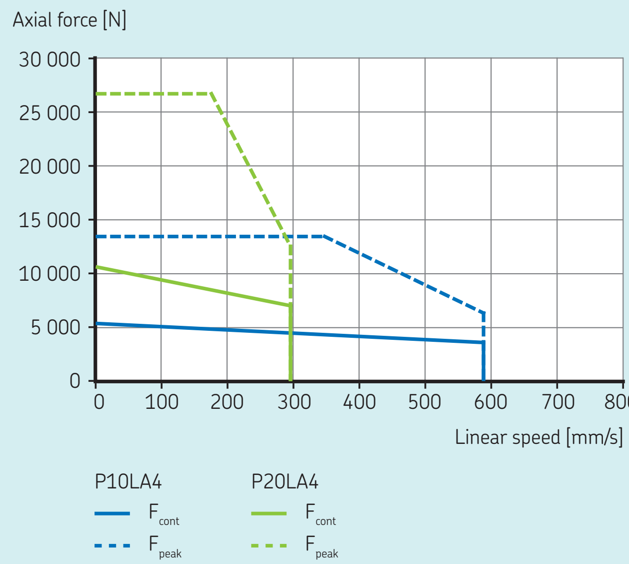
For more information regarding motors and motor adapters, please visit page 158

Ordering key

See page 188

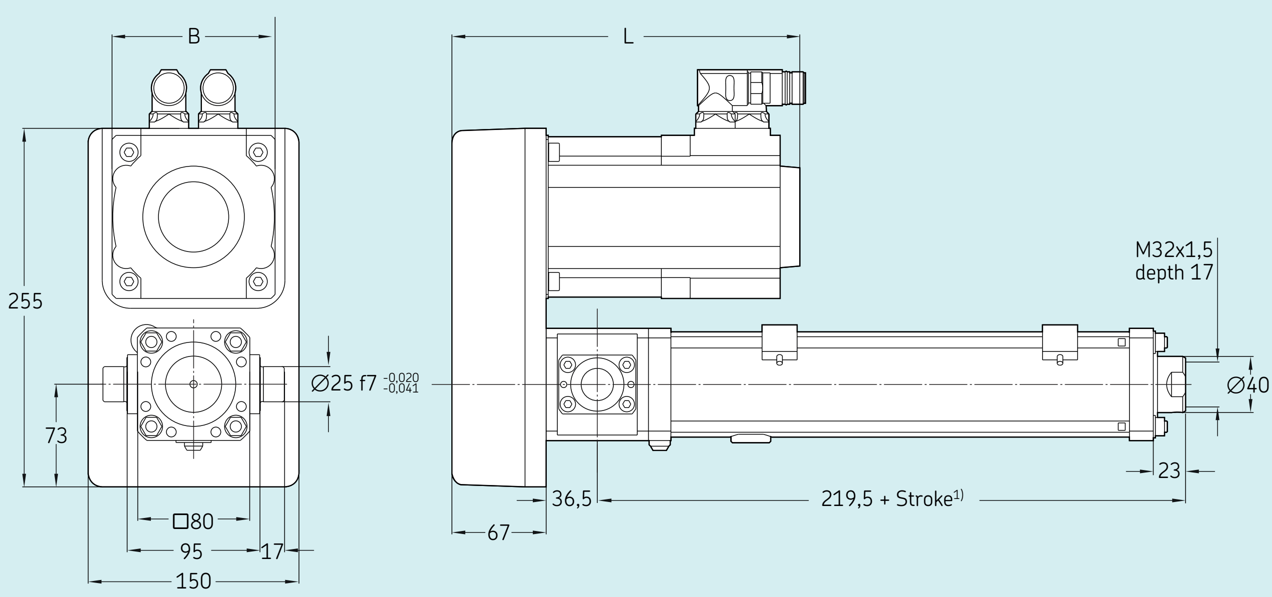
Performance diagrams





For Force / Lifetime diagrams see page 154

Dimensional drawing

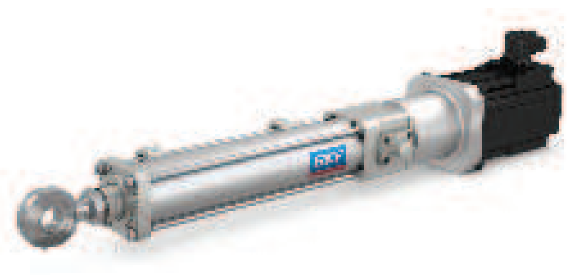


Reference	L2)	A	B	C
	mm			
P10LA1	247,5	67	116	255
P10LA2	247,5	67	116	255
P10LA3	287,5	67	116	255
P20LA3	287,5	67	116	255
P10LA4	287,5	67	116	255
P20LA4	287,5	67	116	255

1) Add 30 mm for anti-rotation option
2) For brake option add 20 mm. For absolute encoder option add 49 mm

LEMC-S-3005

Electric cylinder
servo motor, inline configuration



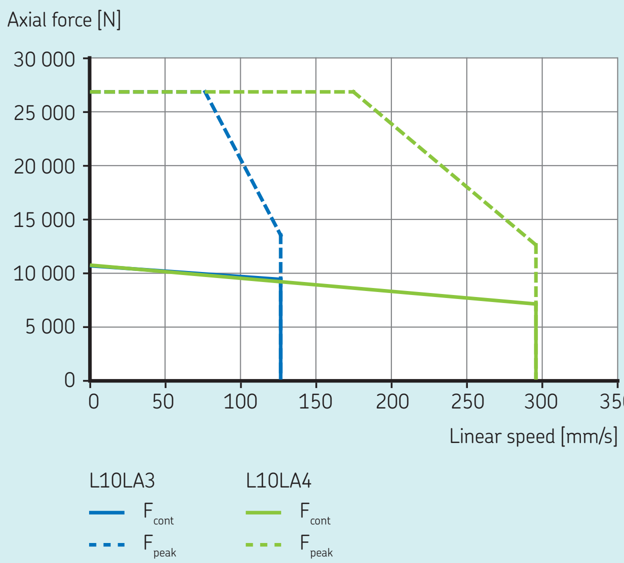
Technical data

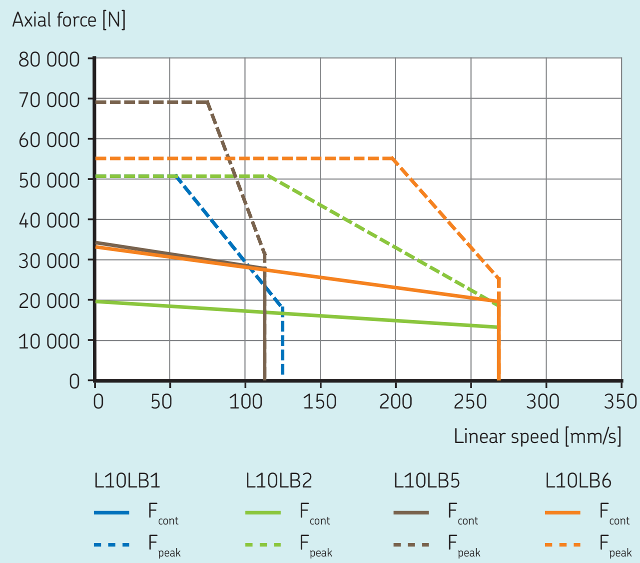
Designation	Symbol	Unit	Inline adapter and servo motor L10 LA3	L10 LA4	L10 LB1	L10 LB2	L10 LB5	L10 LB6
Performance Data								
Continuous force @ zero speed	F_{c0}	kN	10,5	10,5	19,3	19,3	34	32,9
Continuous force @ max. speed	F_c	kN	9,2	6,9	14,7	12,9	27,5	19,3
Peak force @ zero speed	F_{p0}	kN	26,6	26,6	50,5	50,5	69	54,9
Peak force @ max. speed	F_p	kN	13,3	12,4	17,6	18,2	31,2	24,9
Dynamic load capacity	C	kN	91,9	91,9	91,9	91,9	91,9	91,9
Holding force (motorbrake option)	F_{Hold}	kN	18,2	18,2	33,3	33,3	33,3	33,3
Max. linear speed	v_{max}	mm/s	125	294	125	269	113	269
Max. acceleration	a_{max}	m/s^2	6	6	6	6	6	6
Duty cycle	D	%	100	100	100	100	100	100
Mechanical Data								
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	30	30	30	30	30	30
Screw lead	p_{screw}	mm	5	5	5	5	5	5
Lead accuracy	–	–	G5	G5	G5	G5	G5	G5
Stroke [1]	s	mm	100...800	100...800	100...800	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	5	5	5	5	5	5
Backlash	$s_{backlash}$	mm	0,02	0,02	0,02	0,02	0,02	0,02
Gear reduction	i	–	1	1	1	1	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm²	13,90	13,90	22,20	22,20	42,70	42,70
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm²	0,65	0,65	0,65	0,65	0,65	0,65
Inertia of optional brake	J_{brake}	10^{-4} kgm²	1,07	1,07	3,20	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	27,1	27,1	33,1	33,1	42,5	42,5
Δ weight per 100 mm stroke	Δm	kg	2,05	2,05	2,05	2,05	2,05	2,05
Weight of optional brake	m_{brake}	kg	0,90	0,90	1,90	1,90	1,90	1,90
Weight of anti-rotation	m_{arot0}	kg	1,30	1,30	1,30	1,30	1,30	1,30
Electrical Data								
Motor type	–	–	Servo	Servo	Servo	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400	400	400	400
Nominal current	I	A	4,1	8,2	8,5	16,9	12,2	23,5
Peak current	I_{peak}	A	12	24	26	52	31,2	47
Nominal power	P	kW	1,57	2,77	2,51	4,73	4,24	7,09
Environment								
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S	54S	54S	54S

[1] By 100 mm steps

For more information regarding motors and motor adapters, please visit page 158

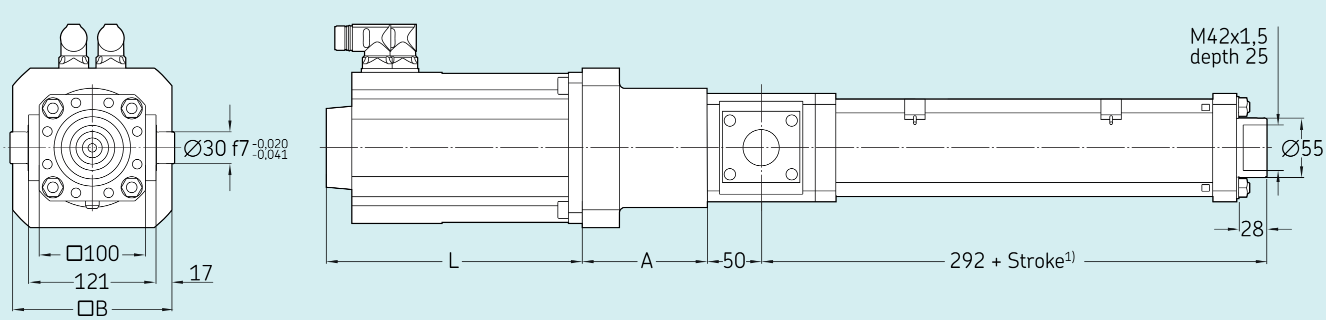
Performance diagrams





For Force / Lifetime diagrams see page 154

Dimensional drawing



Reference	L[1]	A	B
	mm		
L10LA3	228	106	120
L10LA4	228	106	120
L10LB1	241	113	150
L10LB2	241	113	150
L10LB5	321	113	150
L10LB6	321	113	150

[1] For brake option add 20 mm. For absolute encoder option add 49 mm

Ordering key

See page 188

LEMC-S-3005

Electric cylinder
servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	Parallel adapter and servo motor P10 LA3	 P10 LA4	 P15 LA5	 P15 LA6	 P10 LB5	 P10 LB6
Performance Data								
Continuous force @ zero speed	F_{c0}	kN	10,2	10,2	20	20	32,9	31,9
Continuous force @ max. speed	F_c	kN	8,9	6,7	18	14,7	26,7	18,7
Peak force @ zero speed	F_{p0}	kN	25,8	25,8	46,6	43,1	67	53,3
Peak force @ max. speed	F_p	kN	12,9	12	22,7	30,9	30,3	24,1
Dynamic load capacity	C	kN	91,9	91,9	91,9	91,9	91,9	91,9
Holding force (motorbrake option)	F_{Hold}	kN	18,7	18,7	28,1	28,1	34,3	34,3
Max. linear speed	v_{max}	mm/s	125	294	108	225	113	269
Max. acceleration	a_{max}	m/s^2	4,6	4,6	4,6	4,2	6,0	6,0
Duty cycle	D	%	100%	100%	100%	100%	100%	100%
Mechanical Data								
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	30	30	30	30	30	30
Screw lead	p_{screw}	mm	5	5	5	5	5	5
Lead accuracy	–	–	G5	G5	G5	G5	G5	G5
Stroke 1)	s	mm	100...800	100...800	100...800	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	5	5	5	5	5	5
Backlash	$s_{backlash}$	mm	0,02	0,02	0,02	0,02	0,02	0,02
Gear reduction	i	–	1	1	1,5	1,5	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	49,90	49,90	40,30	40,30	77,30	77,30
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,65	0,65	0,3	0,3	0,65	0,65
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07	1,07	1,07	3,20	3,20
Weight @ 0 mm stroke	m	kg	29,9	29,9	33,6	33,6	45,1	45,1
Δ weight per 100 mm stroke	Δm	kg	2,05	2,05	2,05	2,05	2,05	2,05
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90	0,90	1,90	1,90
Weight of anti-rotation	m_{arot0}	kg	1,30	1,30	1,30	1,30	1,30	1,30
Electrical Data								
Motor type	–	–	Servo	Servo	Servo	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400	400	400	400
Nominal current	I	A	4,1	8,2	6,2	12,4	12,2	23,5
Peak current	I_{peak}	A	12	24	16,8	31,2	31,2	47
Nominal power	P	kW	1,57	2,77	2,76	4,67	4,24	7,09
Environment								
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S	54S	54S	54S

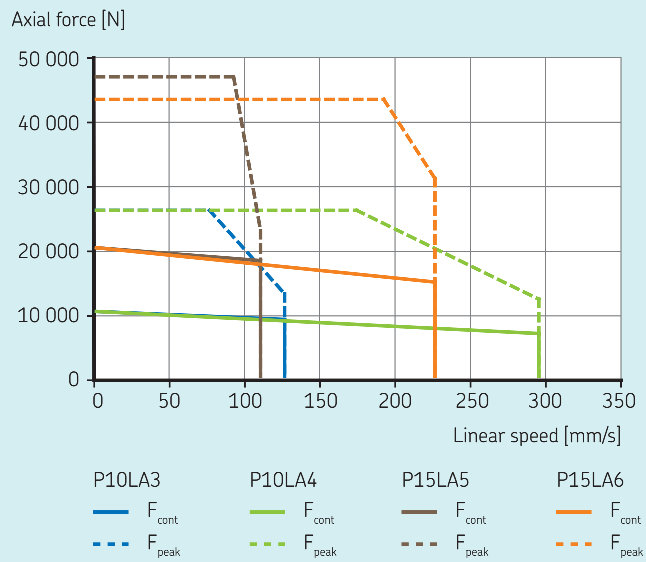
1) By 100 mm steps

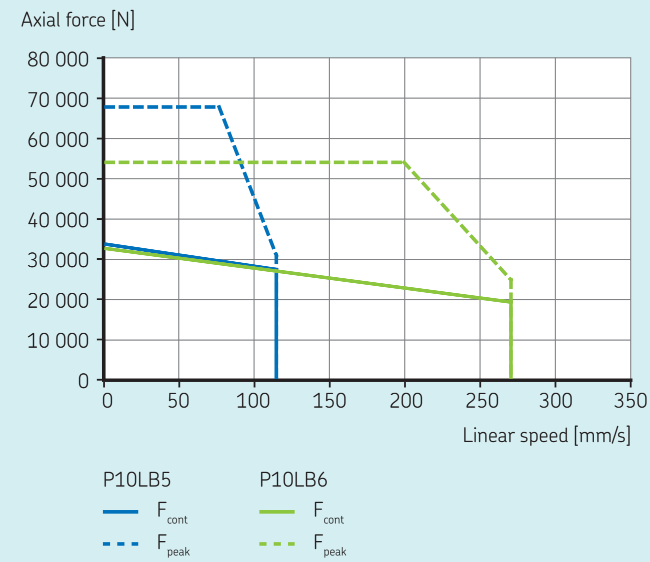
For more information regarding motors and motor adapters, please visit page 158

Ordering key

See page 188

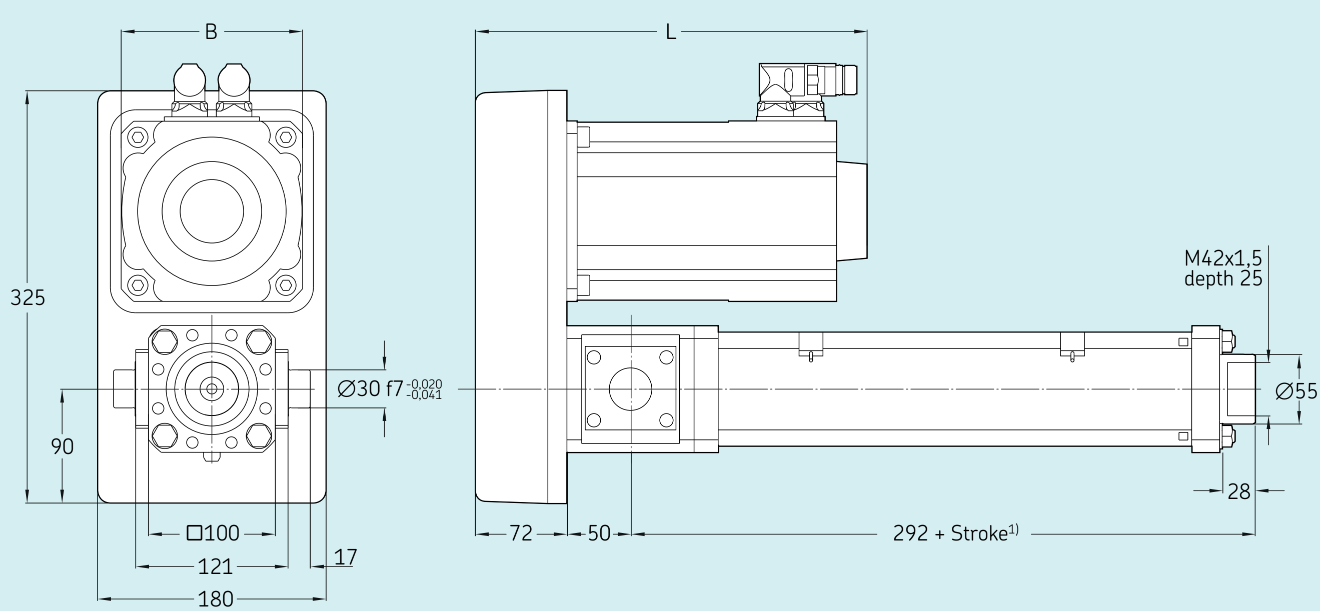
Performance diagrams





For Force / Lifetime diagrams see page 154

Dimensional drawing

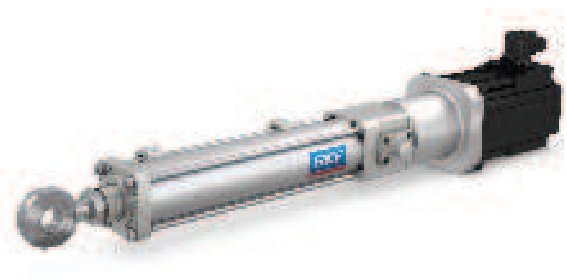


Reference	L2)	A	B	C
	mm	mm	mm	mm
P10LA3	292	72	116	325
P10LA4	292	72	116	325
P15LA5	332	72	116	325
P15LA6	332	72	116	325
P10LB5	388	72	143	325
P10LB6	388	72	143	325

1) Add 30 mm for anti-rotation option
2) For brake option, add 20 mm for B = 116, add 28 mm for B = 143. For absolute encoder option, add 49 mm for B = 116, add 50 mm for B = 143.

LEMC-S-3010

Electric cylinder
servo motor, inline configuration



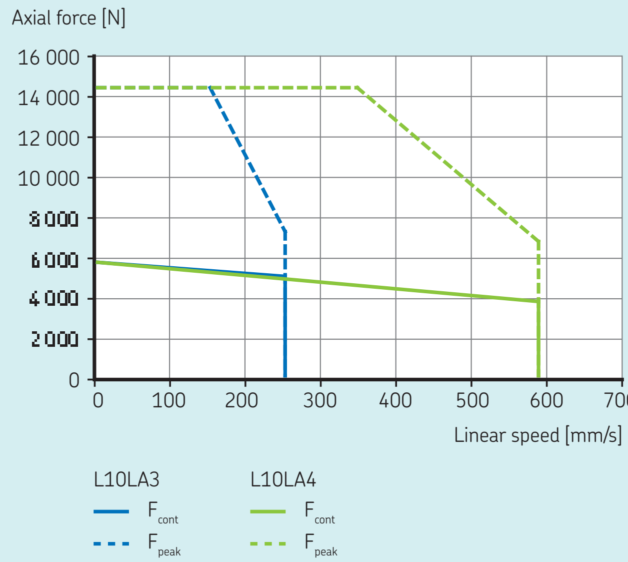
Technical data

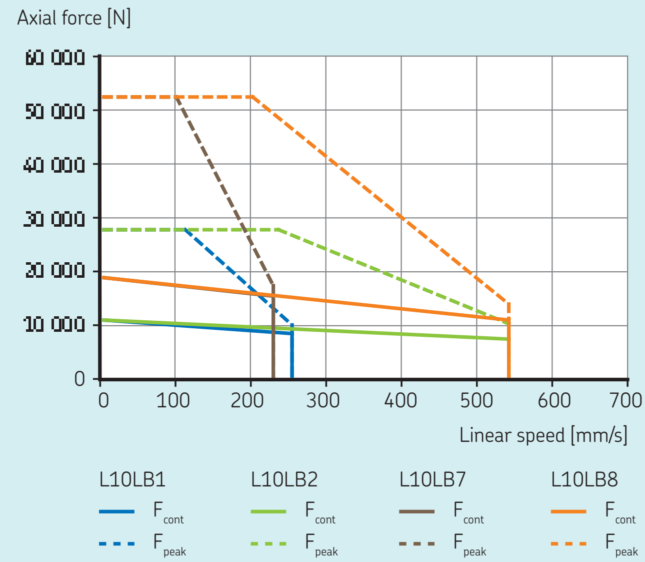
Designation	Symbol	Unit	Inline adapter and servo motor					
			L10 LA3	L10 LA4	L10 LB1	L10 LB2	L10 LB7	L10 LB8
Performance Data								
Continuous force @ zero speed	F_{c0}	kN	5,6	5,6	10,4	10,4	18,3	18,3
Continuous force @ max. speed	F_c	kN	5	3,7	7,9	6,9	14,9	10,4
Peak force @ zero speed	F_{p0}	kN	14,4	14,4	27,2	27,2	52	52
Peak force @ max. speed	F_p	kN	7,2	6,7	9,5	9,8	16,8	13,4
Dynamic load capacity	C	kN	106,3	106,3	106,3	106,3	106,3	106,3
Holding force (motorbrake option)	F_{Hold}	kN	8,2	8,2	15,1	15,1	15,1	15,1
Max. linear speed	v_{max}	mm/s	250	588	250	538	225	538
Max. acceleration	a_{max}	m/s^2	12	12	12	12	12	12
Duty cycle	D	%	100	100	100	100	100	100
Mechanical Data								
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	30	30	30	30	30	30
Screw lead	p_{screw}	mm	10	10	10	10	10	10
Lead accuracy	–	–	G5	G5	G5	G5	G5	G5
Stroke [1]	s	mm	100...800	100...800	100...800	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	5	5	5	5	5	5
Backlash	$s_{backlash}$	mm	0,04	0,04	0,04	0,04	0,04	0,04
Gear reduction	i	–	1	1	1	1	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	13,90	13,90	22,20	22,20	42,70	42,70
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,65	0,65	0,65	0,65	0,65	0,65
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07	3,20	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	27,1	27,1	33,1	33,1	42,5	42,5
Δ weight per 100 mm stroke	Δm	kg	2,05	2,05	2,05	2,05	2,05	2,05
Weight of optional brake	m_{brake}	kg	0,90	0,90	1,90	1,90	1,90	1,90
Weight of anti-rotation	m_{arot0}	kg	1,30	1,30	1,30	1,30	1,30	1,30
Electrical Data								
Motor type	–	–	Servo	Servo	Servo	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400	400	400	400
Nominal current	I	A	4,1	8,2	8,5	16,9	12,2	24,3
Peak current	I_{peak}	A	12	24	26	52	46	92
Nominal power	P	kW	1,57	2,77	2,51	4,73	4,24	7,09
Environment								
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S	54S	54S	54S

[1] By 100 mm steps

For more information regarding motors and motor adapters, please visit page 158

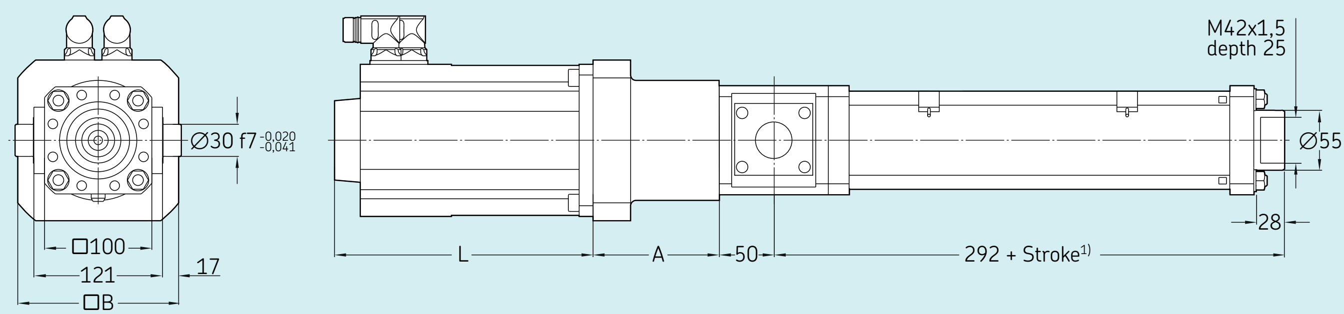
Performance diagrams





For Force / Lifetime diagrams see page 156

Dimensional drawing



Reference	L2)	A	B
	mm		
L10LA3	228	106	120
L10LA4	228	106	120
L10LB1	241	113	150
L10LB2	241	113	150
L10LB7	321	113	150
L10LB8	321	113	150

1) Add 30 mm for anti-rotation option
2) For brake option, add 20 mm for B = 116, add 28 mm for B = 143. For absolute encoder option, add 49 mm for B = 116, add 50 mm for B = 143.

Ordering key

See page 188

LEMC-S-3010

Electric cylinder
servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	Parallel adapter and servo motor P20 LA1	P20 LA2	P20 LA5	P20 LA6	P15 LB5	P15 LC2
Performance Data								
Continuous force @ zero speed	F_{c0}	kN	6,2	6,2	14,4	14,4	26,7	26,7
Continuous force @ max. speed	F_c	kN	5,3	4,1	13	10,6	21,6	15,1
Peak force @ zero speed	F_{p0}	kN	17,3	17,3	33,5	31	54,2	49,6
Peak force @ max. speed	F_p	kN	5,9	6,6	16,3	22,2	24,5	19,5
Dynamic load capacity	C	kN	106,3	106,3	106,3	106,3	106,3	106,3
Holding force (motorbrake option)	F_{Hold}	kN	17	17	17	17	23,4	23,3
Max. linear speed	v_{max}	mm/s	163	338	163	338	150	358
Max. acceleration	a_{max}	m/s^2	4,7	4,7	6,0	5,5	7,4	6,8
Duty cycle	D	%	100	100	100	100	100	100
Mechanical Data								
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	30	30	30	30	30	30
Screw lead	p_{screw}	mm	10	10	10	10	10	10
Lead accuracy	–	–	G5	G5	G5	G5	G5	G5
Stroke [1]	s	mm	100...800	100...800	100...800	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	5	5	5	5	5	5
Backlash	$s_{backlash}$	mm	0,04	0,04	0,04	0,04	0,04	0,04
Gear reduction	i	–	2	2	2	2	1,5	1,5
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	30,20	30,20	46,30	46,30	107,00	107,00
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,16	0,16	0,16	0,16	0,29	0,29
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07	1,07	1,07	3,20	3,20
Weight @ 0 mm stroke	m	kg	21,1	21,1	35,8	35,8	48,5	48,5
Δ weight per 100 mm stroke	Δm	kg	2,05	2,05	2,05	2,05	2,05	2,05
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90	0,90	1,90	1,90
Weight of anti-rotation	m_{arot0}	kg	1,30	1,30	1,30	1,30	1,30	1,30
Electrical Data								
Motor type	–	–	Servo	Servo	Servo	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400	400	400	400
Nominal current	I	A	2,7	5,5	6,2	12,4	12,2	24,3
Peak current	I_{peak}	A	10	20	16,8	31,2	31,2	56
Nominal power	P	kW	1,12	1,82	2,76	4,67	4,24	7,09
Environment								
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S	54S	54S	54S

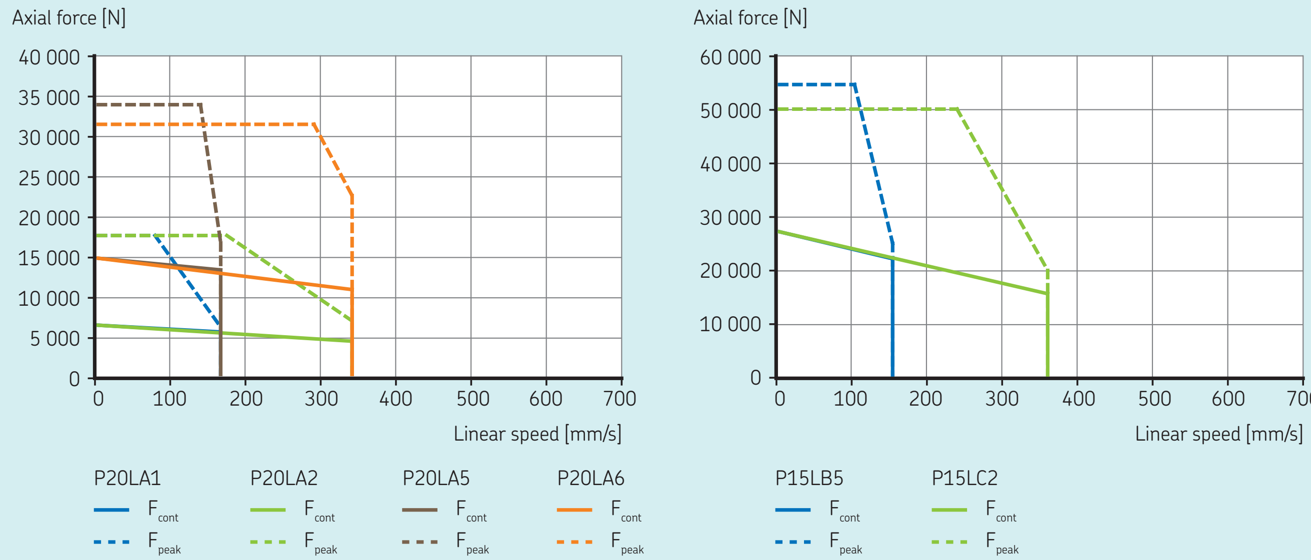
[1] By 100 mm steps

For more information regarding motors and motor adapters, please visit page 158

Ordering key

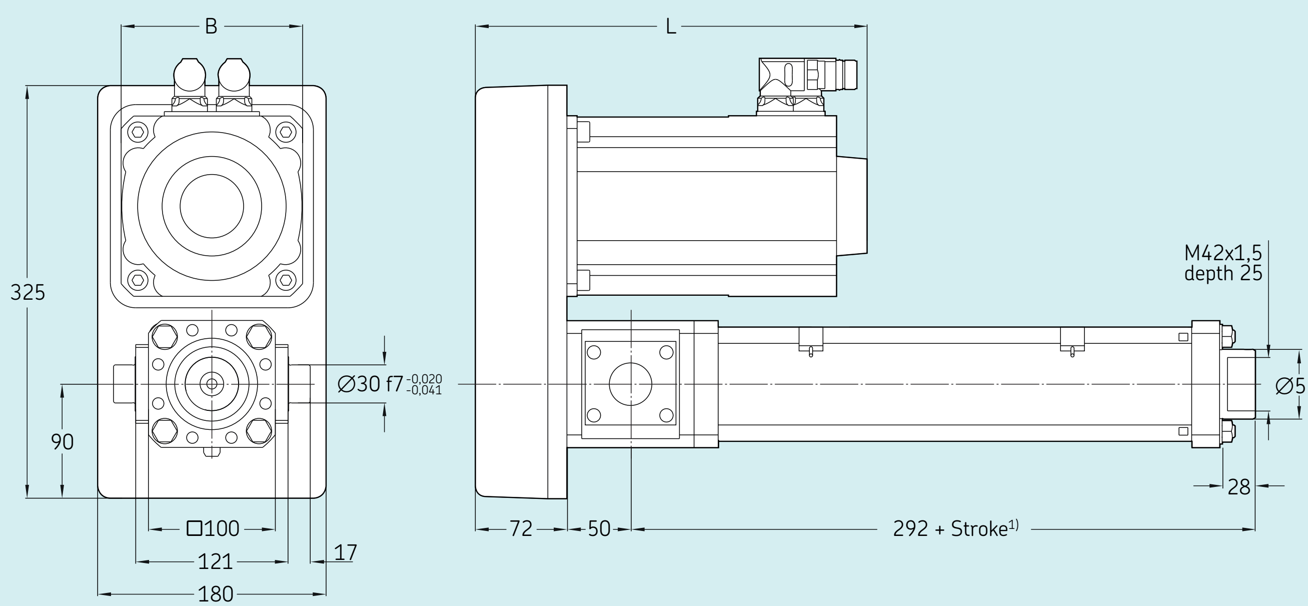
See page 188

Performance diagrams



For Force / Lifetime diagrams see page 156

Dimensional drawing



Reference	L1)	A	B	C
	mm			
P20LA1	252	72	116	325
P20LA2	252	72	116	325
P20LA5	332	72	116	325
P20LA6	332	72	116	325
P15LB5	388	72	143	325
P15LC2	338	72	143	325

1) Add 30 mm for anti-rotation option
2) For brake option, add 20 mm for B = 116, add 28 mm for B = 143. For absolute encoder option, add 49 mm for B = 116, add 50 mm for B = 143.

Ordering key

Actuators with servo motors

LEMC - S - 2105 - 0100 - TRAF - P10LA11BYA1

Servo motor

Screw diameter

Screw lead

Stroke

Rear attachment
- T Trunnions
- F Front plate
- B Back plate
- N No attachment

Front attachment
- M Male attachment
- N No attachment (female thread)
- R Rod end

Anti-rotation
- A Anti-rotation
- N No anti-rotation

Limit switches
- F 2 limit switches and 1 home switch
- S 2 limit switches only
- M 1 limit switch and 1 home switch
- L 1 limit switch only
- H Home switch only
- N No switch

L E M C - S - 2 1 0 5 - 0 1 0 0 - T R A F - P 1 0 L A 1 1 B Y A 1

Interface and gear ratio
See page 158 – Table: Performance overview of actuators with servo motors

Motor
See page 158 – Table: Performance overview of actuatorss with servo motors

Feedback

1	Resolver
2	Absolute encoder Hiperface
3	Absolute encoder EnDat

EM brake

B	Brake 24 V DC
N	No brake

Motor Drive

Y	Drive included
N	No drive

Drive fieldbus

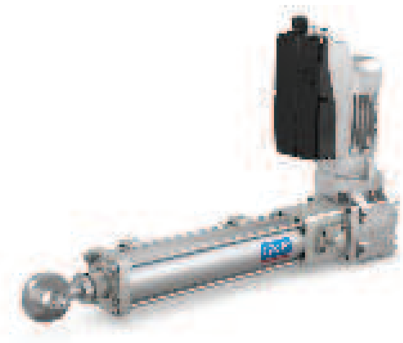
A	CANopen
B	DeviceNet
C	EtherCAT
D	Ethernet
E	Powerlink MN/CN
F	Powerlink CN
G	Profibus
H	Profinet
N	No fieldbus

Power and signal cables

1	5 m
2	10 m
3	15 m
4	20 m
N	No cable

LEMC-A-2110

Electric cylinder
asynchronous motor, L-configuration



Technical data

Designation	Symbol	Unit	L-configuration adapter and asynchronous motor B054 LAA2	 B151 LAA2	 B319 LBA2
Performance Data					
Continuous force @ max. speed	F_c	kN	4,3	12	25,4
Dynamic load capacity	C	kN	54,3	54,3	54,3
Holding force (motorbrake option)	F_{Hold}	kN	16	40	40
Min. linear speed	v_{min}	mm/s	15,5	5,5	2,7
Max. linear speed	v_{max}	mm/s	80,2	28,7	13,5
Duty cycle	D	%	100%	100%	100%
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	21	21	21
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy			G5	G5	G5
Stroke [1]	s	mm	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	5	5	5
Backlash	$s_{backlash}$	mm	0,04	0,04	0,04
Gear reduction	i	–	5,411	15,111	31,919
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	4,0600	3,7700	3,7400
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0051	0,0007	0,0001
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0150	0,0150	0,0150
Weight @ 0 mm stroke	m	kg	17,3	17,3	18,7
Δ weight per 100 mm stroke	Δm	kg	1,15	1,15	1,15
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90
Weight of anti-rotation	m_{arot0}	kg	0,90	0,90	0,90
Electrical Data					
Motor type	–	–	Asynchronous	Asynchronous	Asynchronous
Nominal voltage	U	V AC	3x400	3x400	3x400
Nominal current	I	A	1	1	1
Nominal power	P	kW	0,47	0,47	0,47
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S

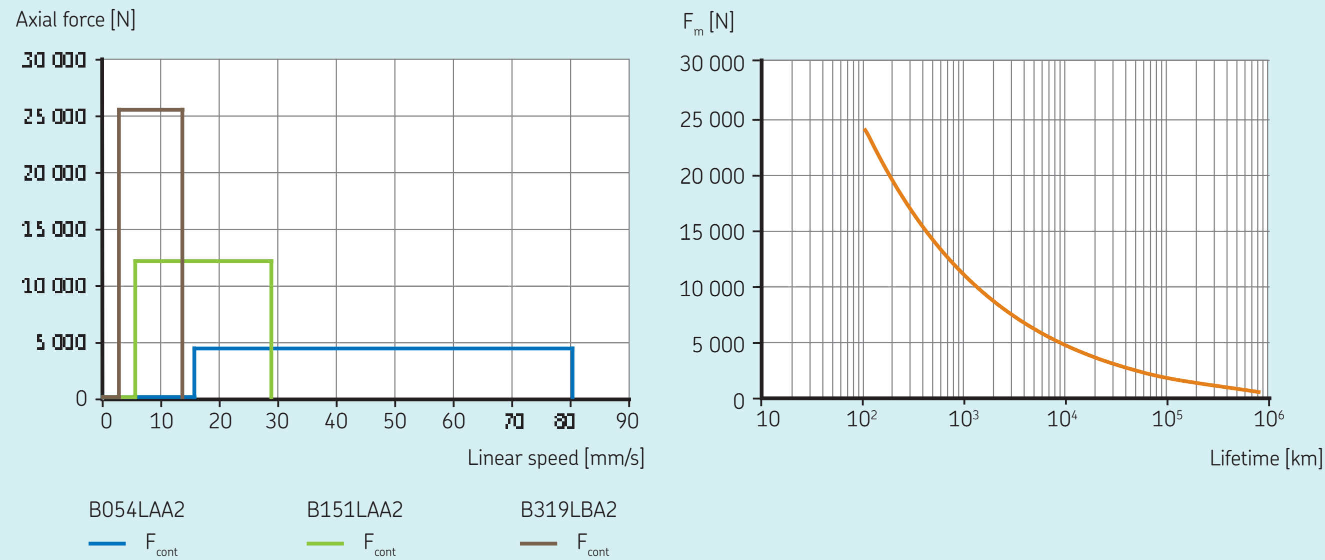
[1] By 100 mm steps

For more information regarding motors and motor adapters, please visit page 148

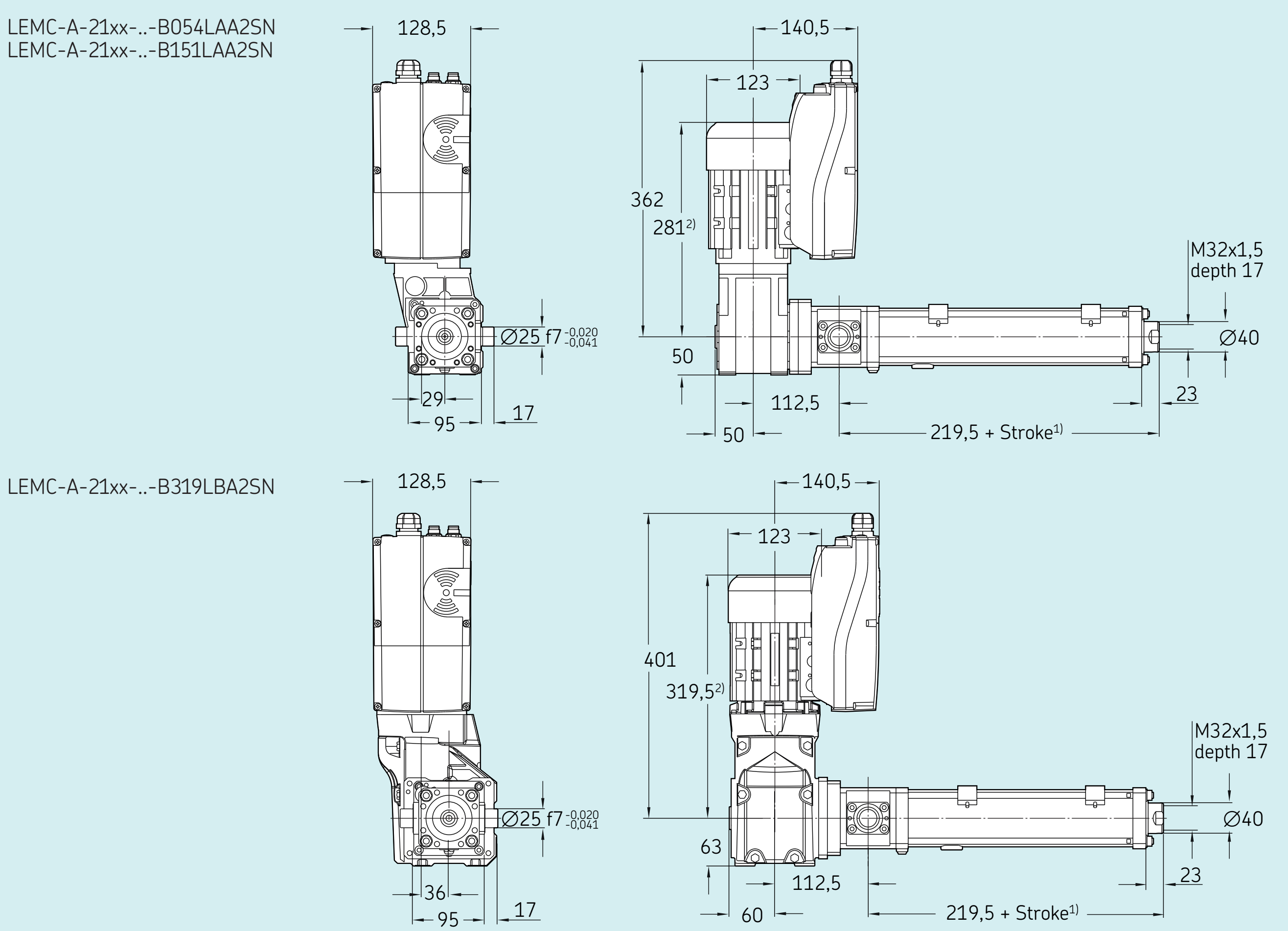
Ordering key

See page 200

Performance diagrams



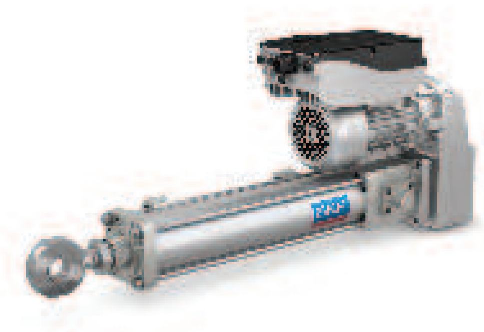
Dimensional drawing



1) Add 30 mm for anti-rotation option
2) Add 40 mm for Brake option

LEMC-A-2110

Electric cylinder
asynchronous motor, parallel configuration



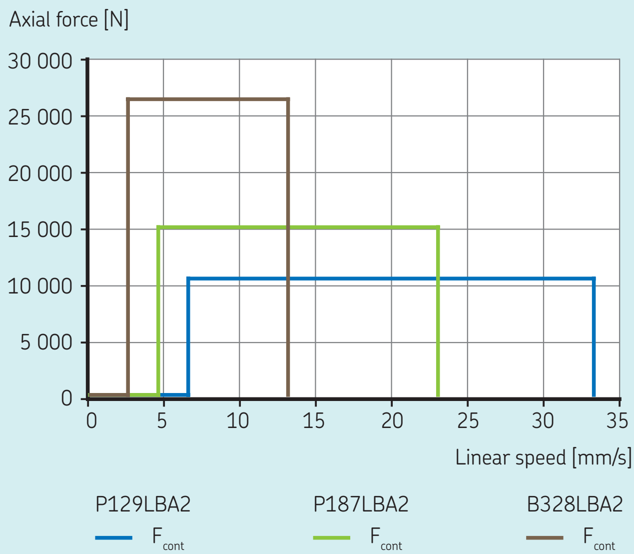
Technical data

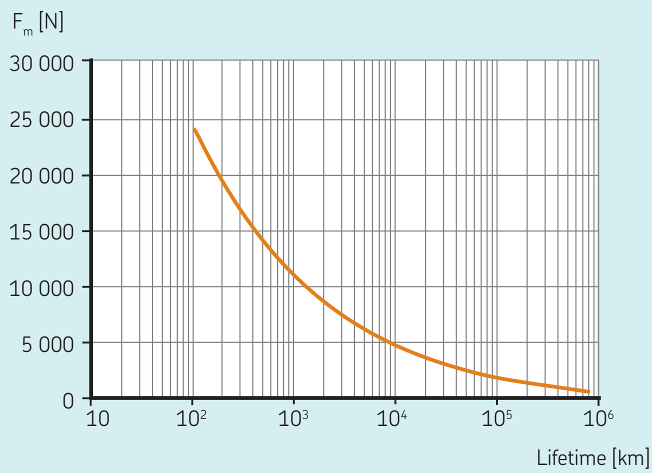
Designation	Symbol	Unit	Parallel adapter and asynchronous motor P129 LBA2	 P187 LBA2	 P328 LBA2
Performance Data					
Continuous force @ max. speed	F_c	kN	10,3	14,9	26,2
Dynamic load capacity	C	kN	54,3	54,3	54,3
Holding force (motorbrake option)	F_{Hold}	kN	39	40	40
Min. linear speed	v_{min}	mm/s	6,5	4,5	2,5
Max. linear speed	v_{max}	mm/s	33,3	23,0	13,2
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	21	21	21
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy			G5	G5	G5
Stroke [1]	s	mm	100...600	100...600	100...600
Internal overstroke each side	s_0	mm	5	5	5
Backlash	$s_{backlash}$	mm	0,04	0,04	0,04
Gear reduction	i	–	12,992	18,776	32,867
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	4,3300	4,1200	3,8500
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0009	0,0004	0,0001
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0150	0,0150	0,0150
Weight @ 0 mm stroke	m	kg	20,7	20,7	20,7
Δ weight per 100 mm stroke	Δm	kg	1,15	1,15	1,15
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90
Weight of anti-rotation	m_{arot0}	kg	0,90	0,90	0,90
Electrical Data					
Motor type	–	–	Asynchronous	Asynchronous	Asynchronous
Nominal voltage	U	V AC	3x400	3x400	3x400
Nominal current	I	A	1	1	1
Nominal power	P	kW	0,47	0,47	0,47
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S

[1] By 100 mm steps

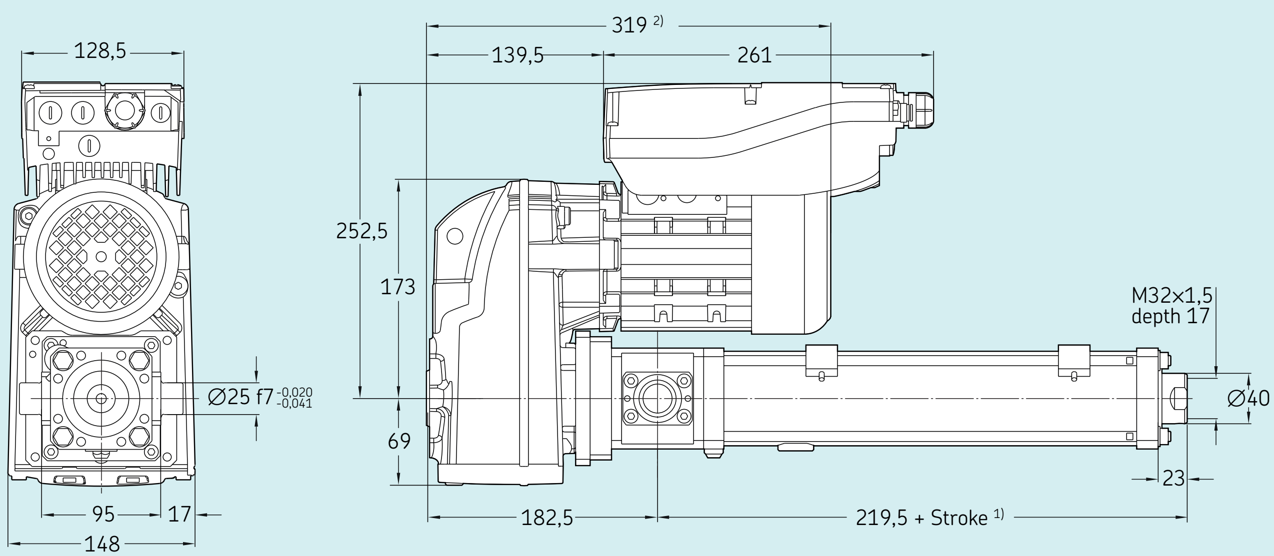
For more information regarding motors and motor adapters, please visit page 148

Performance diagrams





Dimensional drawing



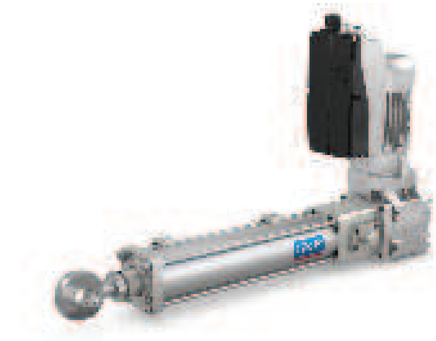
1) Add 30 mm for anti-rotation option
2) Add 40 mm for Brake option

Ordering key

See page 200

LEMC-A-3005

Electric cylinder
asynchronous motor, L-configuration



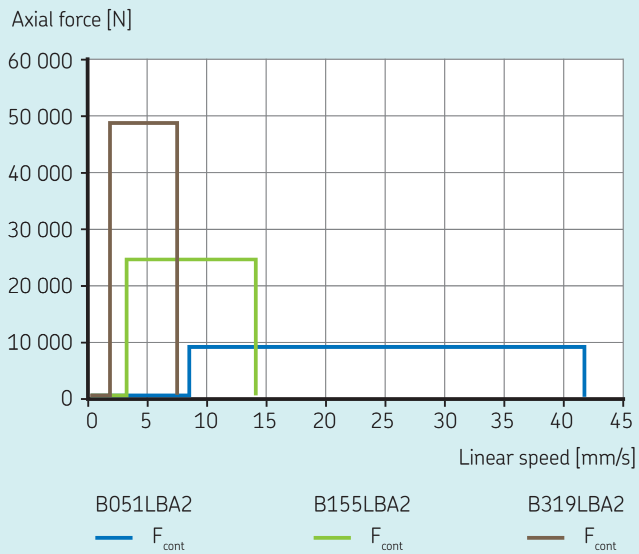
Technical data

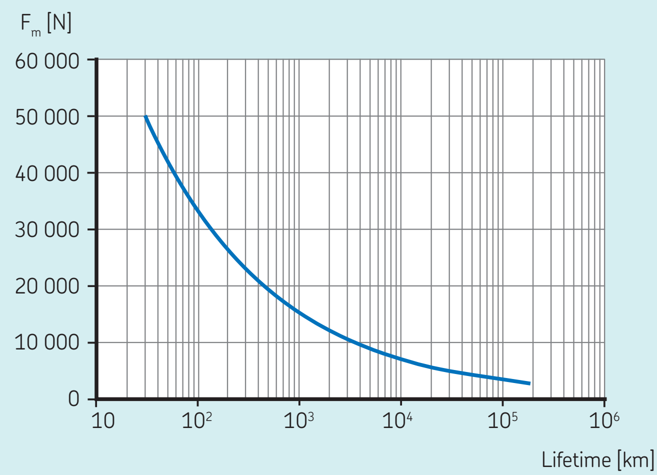
Designation	Symbol	Unit	L-configuration adapter and asynchronous motor		
			B051 LBA2	B155 LBA2	B319 LBA2
Performance Data					
Continuous force @ max. speed	F_c	kN	8,0	24	49,2
Dynamic load capacity	C	kN	91,9	91,9	91,9
Holding force (motorbrake option)	F_{Hold}	kN	32	80	80
Min. linear speed	v_{min}	mm/s	8,0	2,7	1,3
Max. linear speed	v_{max}	mm/s	41,8	13,9	6,8
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	30	30	30
Screw lead	p_{screw}	mm	5	5	5
Lead accuracy			G5	G5	G5
Stroke [1]	s	mm	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	5	5	5
Backlash	$s_{backlash}$	mm	0,02	0,02	0,02
Gear reduction	i	–	5,185	15,556	31,919
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	4,6800	3,8600	3,7500
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0242	0,0027	0,0006
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0150	0,0150	0,0150
Weight @ 0 mm stroke	m	kg	25,8	25,8	25,8
Δ weight per 100 mm stroke	Δm	kg	2,05	2,05	2,05
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90
Weight of anti-rotation	m_{arot0}	kg	1,30	1,30	1,30
Electrical Data					
Motor type	–	–	Asynchronous	Asynchronous	Asynchronous
Nominal voltage	U	V AC	3x400	3x400	3x400
Nominal current	I	A	1	1	1
Nominal power	P	kW	0,47	0,47	0,47
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S

[1] By 100 mm steps

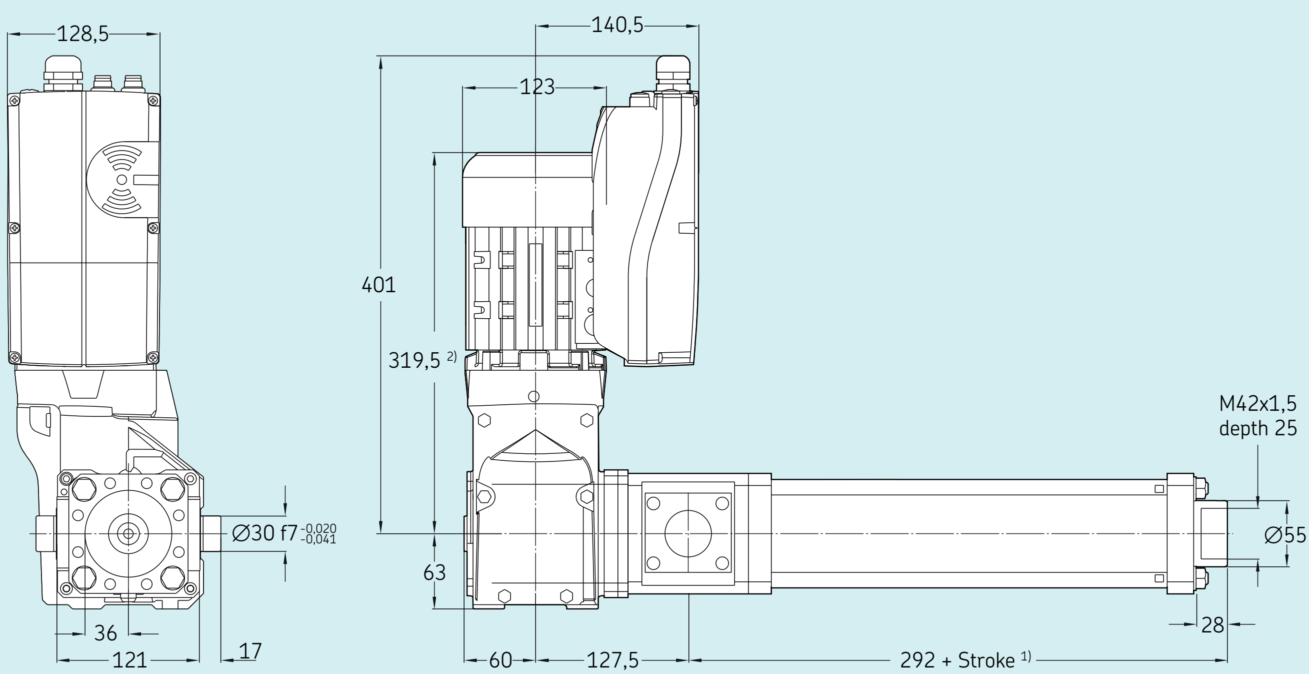
For more information regarding motors and motor adapters, please visit page 148

Performance diagrams





Dimensional drawing



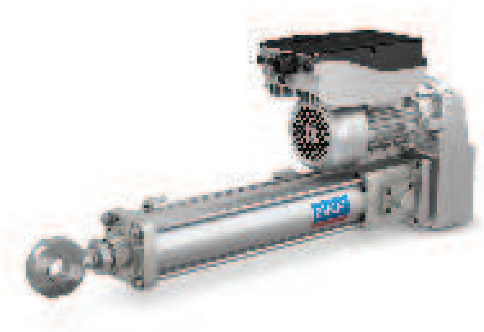
1) Add 30 mm for anti-rotation option
2) Add 40 mm for Brake option

Ordering key

See page 200

LEMC-A-3005

Electric cylinder asynchronous motor, parallel configuration



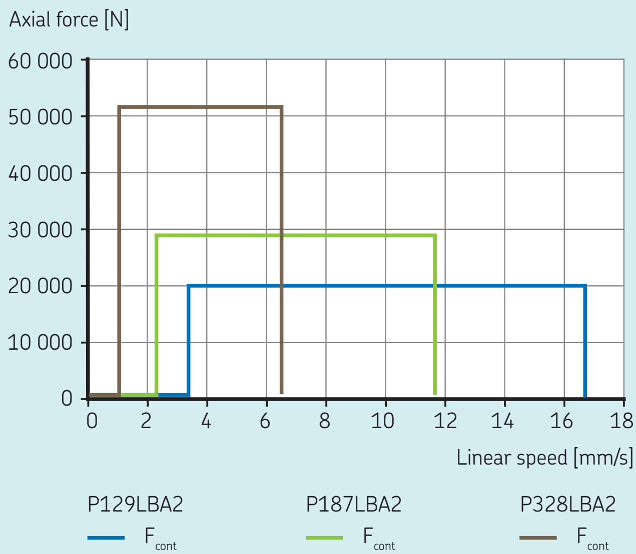
Technical data

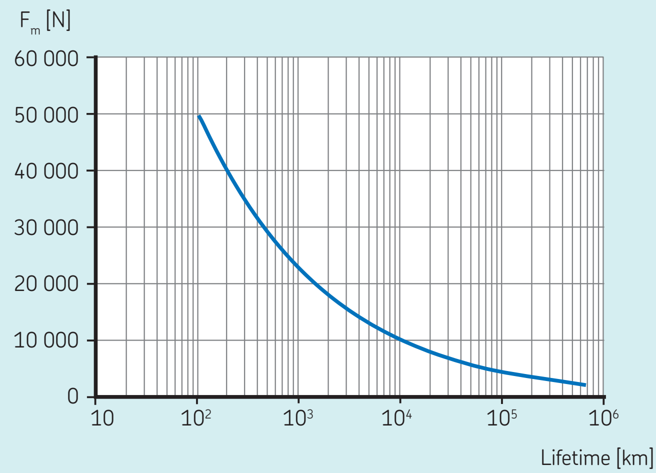
Designation	Symbol	Unit	Parallel adapter and asynchronous motor P129 LBA2	P187 LBA2	P328 LBA2
Performance Data					
Continuous force @ max. speed	F_c	kN	20	29	50,7
Dynamic load capacity	C	kN	91,9	91,9	91,9
Holding force (motorbrake option)	F_{Hold}	kN	80	80	80
Min. linear speed	v_{min}	mm/s	3,3	2,3	1,3
Max. linear speed	v_{max}	mm/s	16,7	11,5	6,6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	30	30	30
Screw lead	p_{screw}	mm	5	5	5
Lead accuracy			G5	G5	G5
Stroke [1)]	s	mm	100...800	100...800	100...800
Internal overstroke each side	s_0	mm	5	5	5
Backlash	$s_{backlash}$	mm	0,02	0,02	0,02
Gear reduction	i	–	12,992	18,776	32,867
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	4,3500	4,1300	3,8500
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,0039	0,0018	0,0006
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,0150	0,0150	0,0150
Weight @ 0 mm stroke	m	kg	27,8	27,8	27,8
Δ weight per 100 mm stroke	Δm	kg	2,05	2,05	2,05
Weight of optional brake	m_{brake}	kg	0,90	0,90	0,90
Weight of anti-rotation	m_{arot0}	kg	1,30	1,30	1,30
Electrical Data					
Motor type	–	–	Asynchronous	Asynchronous	Asynchronous
Nominal voltage	U	V AC	3x400	3x400	3x400
Nominal current	I	A	1	1	1
Nominal power	P	kW	0,47	0,47	0,47
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection	IP	–	54S	54S	54S

1) By 100 mm steps

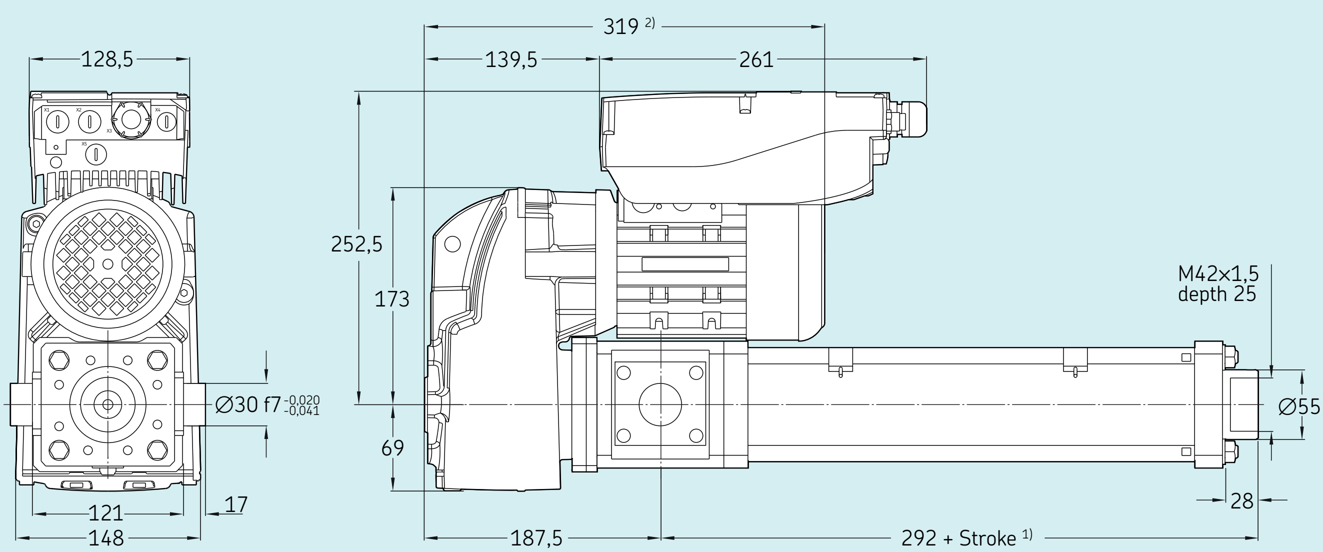
For more information regarding motors and motor adapters, please visit page 148

Performance diagrams





Dimensional drawing



1) Add 30 mm for anti-rotation option
2) Add 40 mm for Brake option

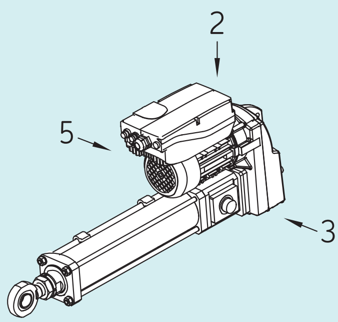
Ordering key

See page 200

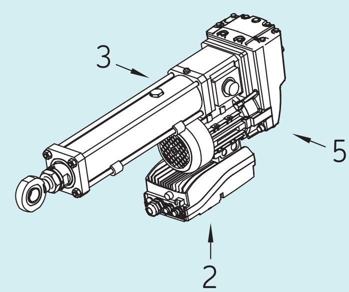
Mounting positions

Parallel adapter and motor

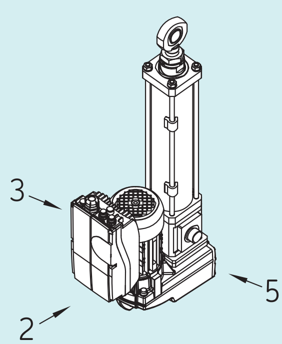
A



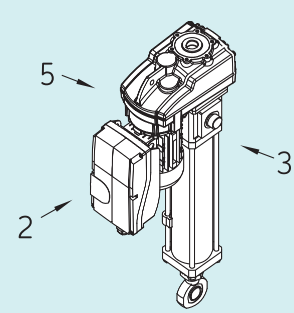
B



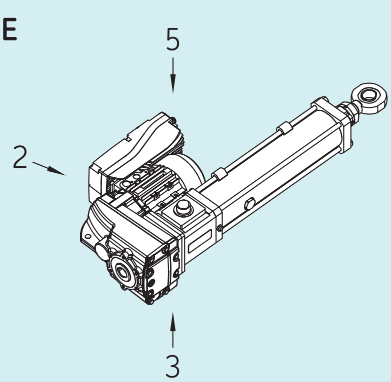
C



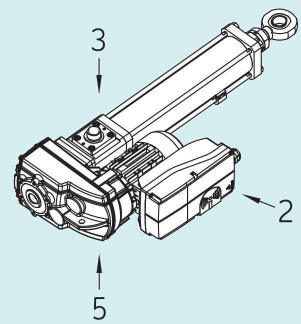
D



E

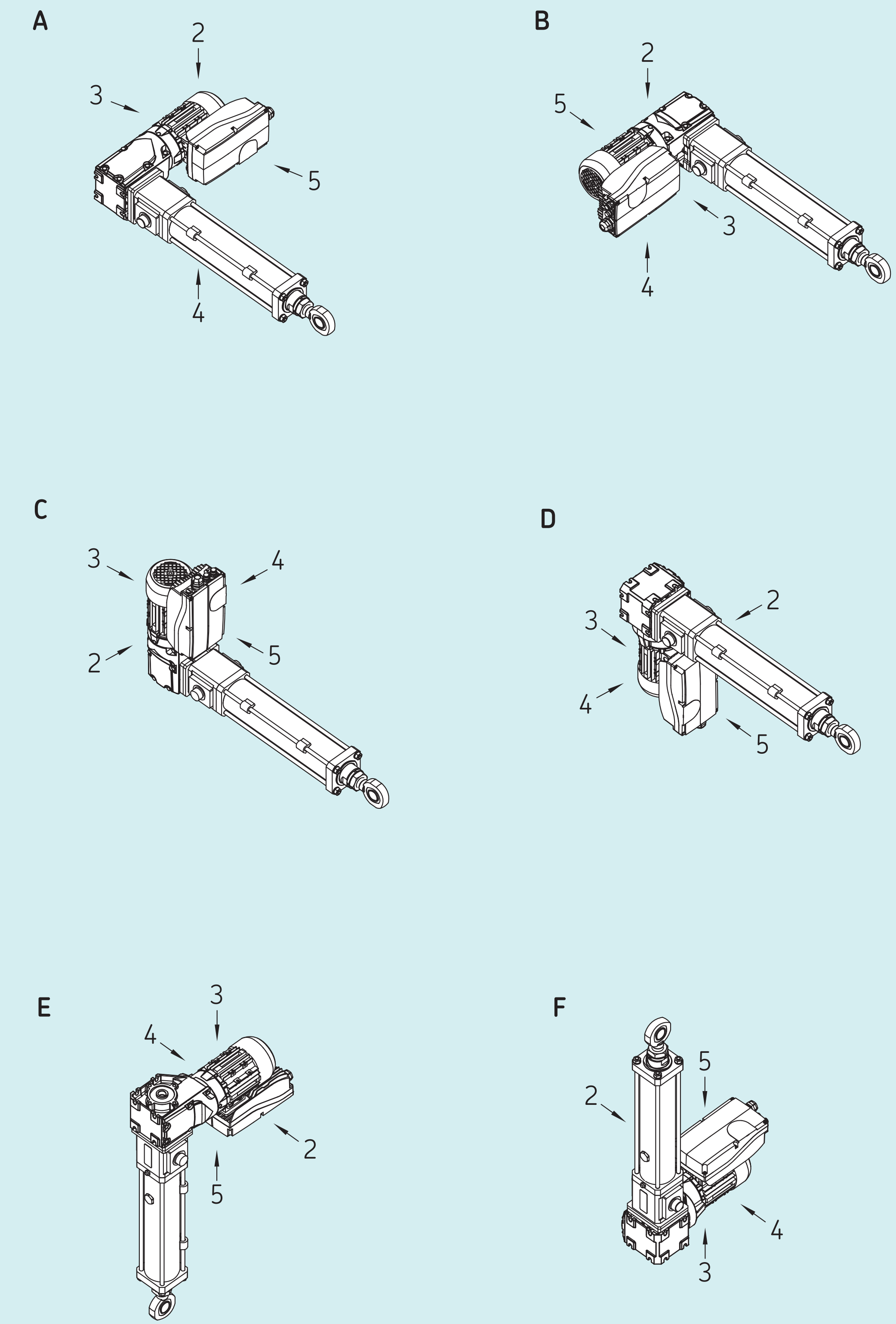


F



SKF

L-configuration and motor



Ordering key

Actuators with asynchronous motors

L E M C - A - 2 1 1 0 - 0 1 0 0 - T R A F - P 1 2 9 L B A 2 S N B A 2

Asynchronous motor

Screw diameter

Screw lead

Stroke

Rear attachment
T Trunnions
F Front plate
B Back plate
N No attachment

Front attachment
M Male attachment
N No attachment (female thread)
R Rod end

Anti-rotation
A Anti-rotation
N No anti-rotation

Limit switches
F 2 limit switches and 1 home switch
S 2 limit switches only
M 1 limit switch and 1 home switch
L 1 limit switch only
H Home switch only
N No switch

Interface and gear ratio
See page 160 – Table: Performance overview of actuators with asynchronous motors

Motor selection
See page 160 – Table: Performance overview of actuators with asynchronous motors

Smart motor
S Smart asynchronous motor

Feedback
N No feedback

EM brake
B Standard EM brake
M Manual release brake
N No brake

Motor mounting position
See page 198 and 199

Accessories

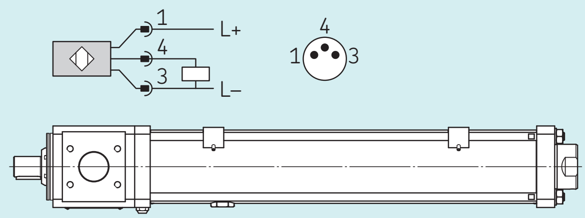
Limit/Home switches

Sensor type: magnetic
Technology: DC PNP

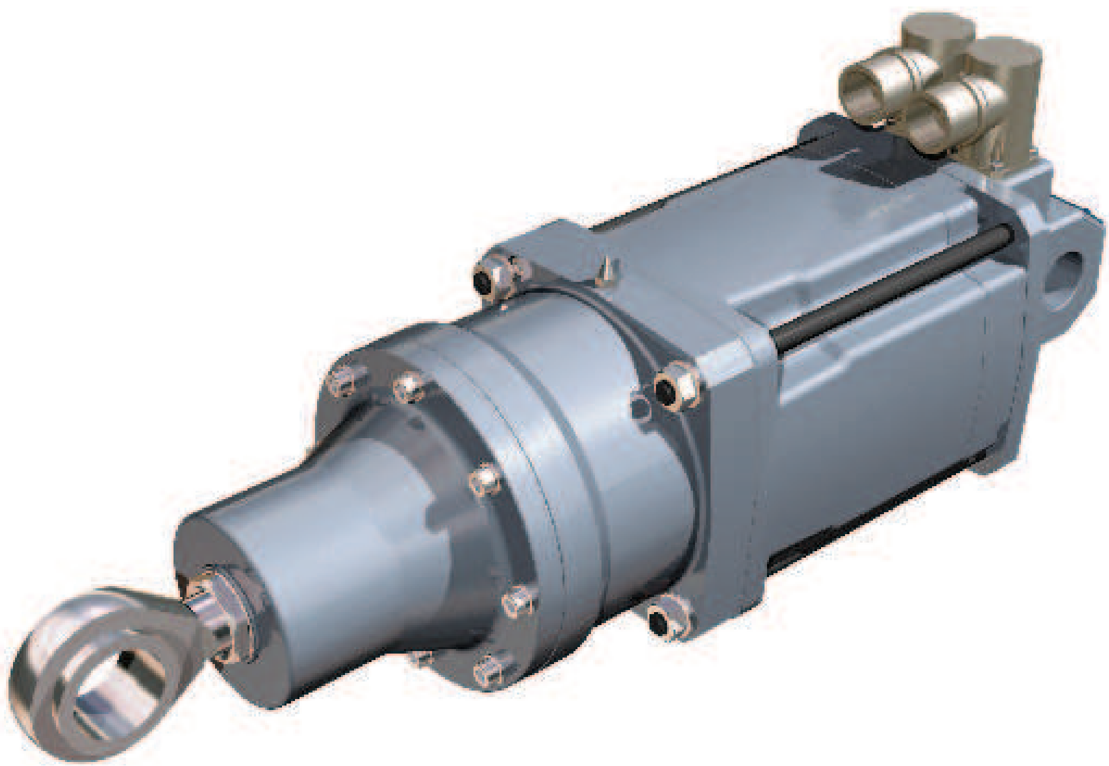
Limit switch output: normally closed
Home switch output: normally open

Supply voltage (V DC): 24 V
Consumption (mA): <10 (under 24 V DC)
Max current output (mA): 100
Connection: M8x1 plug
Cable lenghth PUR 0,3 m

The location of the home and limit switches can be adjusted easily on the linear unit.



Electric cylinders CEMC



Features

- Very compact, fully integrated design
- Inverted roller screw
- Lightweight material
- Highly efficient
- High-resolution position feedback system
- High-speed and acceleration capabilities
- Low maintenance requirements
- High quality

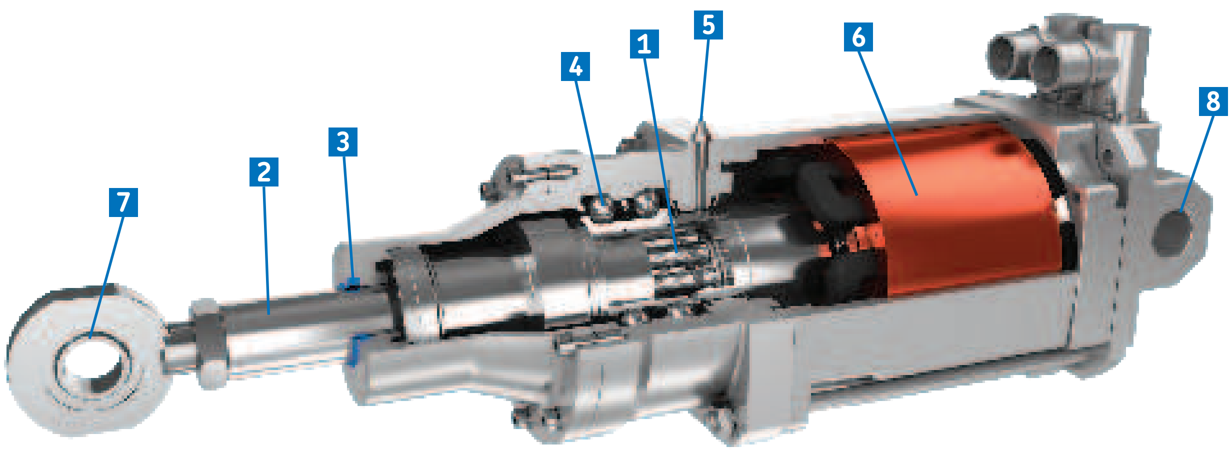
Benefits

- Saves space
- Very high load capabilities compared to actua-tors with similar dimensions
- Allows for higher acceleration and higher speed of the robot arm
- Reduces energy consumption by 90% com-pared to pneumatic solutions
- Better quality through greater control of the process
- Faster production cycles
- Low noise

Product description

The CEMC actuators are based on inverted roller screw core technology that allows integration of the servo motor directly on the screw nut, resulting in a very compact yet powerful solution. Besides dimensions, this design also minimizes inertia, thus allowing excellent control, responsive performance, significantly improved cycle times, and high productivity.

This product range provides high power density in a small package. Approximately 40 % shorter than typical electromechanical cylinders, they are an ideal solution when compactness and power density are needed to replace fluid powered cylinders. Moreover, there is the added advantage of reduced weight, an important feature for robot arms installations. The automotive industry is a heavy user of industrial robots with an average of 300 welding robots in operation per production line. Even though the installed base of industrial welding robots uses pneumatic and hydraulic actuators, there is a growing trend toward the electromechanical process. This is not only because of the increased desire for energy savings but also because of the enhanced speed and quality of the welding operation that CEMC actuators can provide.



- **1** High quality SKF planetary and inverted roller screw for highest axial loads with low play and high efficiency
- **2** Push tube
- **3** Scraper to keep out contaminants
- **4** High quality angular contact ball bearings
- **5** Lubrication nipple
- **6** Integrated servo motor
- **7** Rod end
- **8** Back attachment (rear clevis)

Drive options

The performance attributes shown in the table on the previous page are the result of specific Lenze servo motor and drive combinations. The CEMC can be offered with or without the servodrive. The servodrive can be in the recommended configuration or any other configuration that fits your installation.

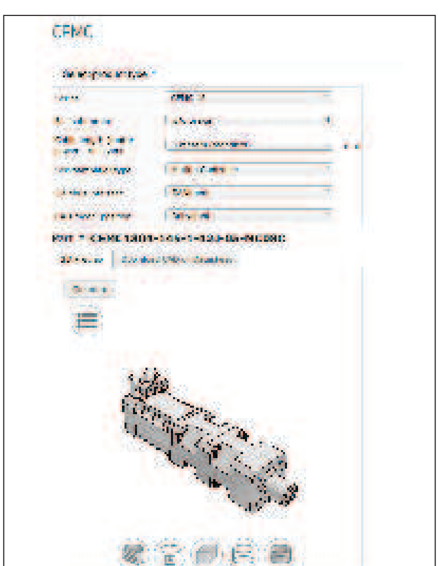
In the case of a different combination, please contact SKF to determine what effect the different configuration will have on the performance of the actuator.

Performance overview of actuators

Linear unit	Motor	SKF drive ref.	Lenze drive ref.	Housing	F_{c0}	F_{p0}	V_{max}
–					kN		mm/s
CEMC-1804	42J	LC07	E94ASHE0074	Compact	4,7	10,3	350
CEMC-2404	62L	LC13	E94ASHE0134	Compact	8,8	23,8	333
CEMC-2404	63I	LC13	E94ASHE0134	Compact	13,2	28,0	333
CEMC-2406	62L	LC13	E94ASHE0134	Compact	5,8	15,9	500
CEMC-2406	63I	LC13	E94ASHE0134	Compact	8,8	18,6	500

3D models

Product configurators for 3D models download are available on skf.com/cemc

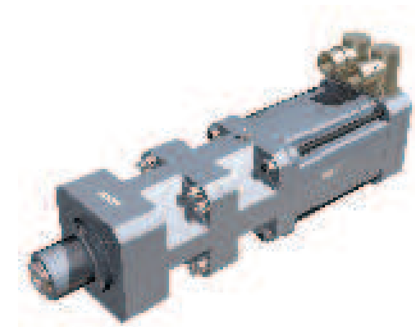


3D model configurator

C

CEMC-1804

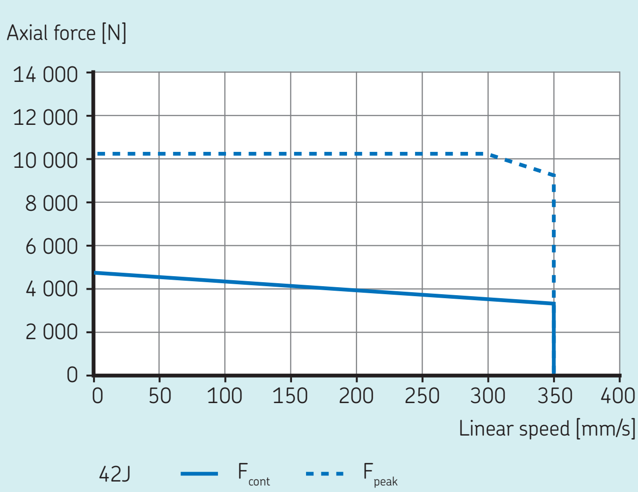
Electric cylinder

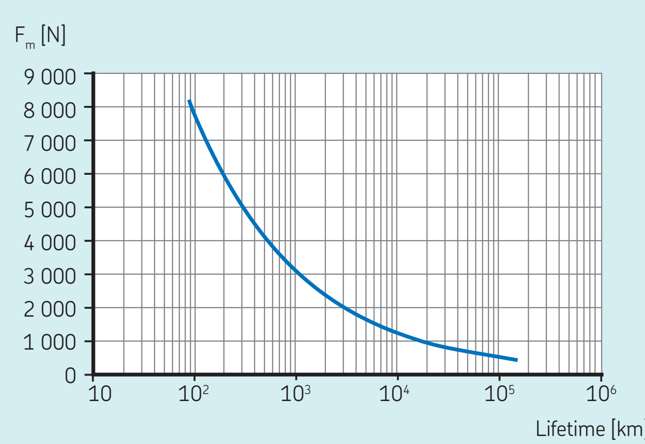


Technical data

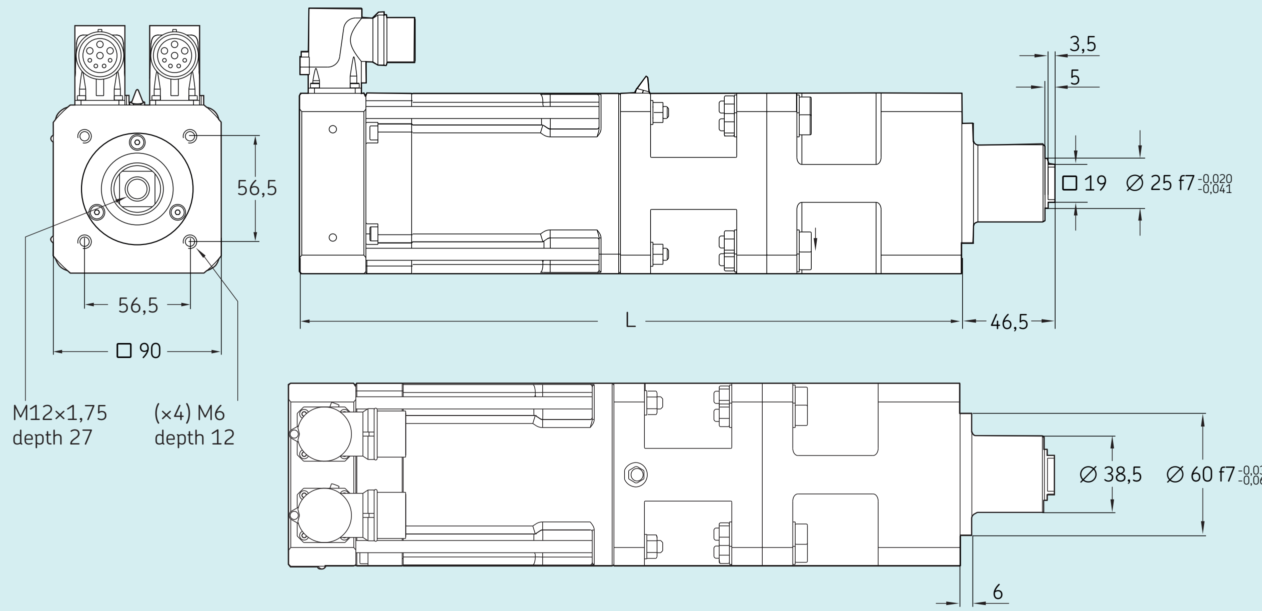
Designation	Symbol	Unit	Motor 42J
Performance Data			
Continuous force @ zero speed	F_{c0}	kN	4,7
Continuous force @ max. speed	F_c	kN	3,3
Peak force @ zero speed	F_{p0}	kN	10,3
Peak force @ max. speed	F_p	kN	9,6
Dynamic load capacity	C	kN	26,6
Holding force (motorbrake option)	F_{Hold}	kN	12,9
Max. linear speed	v_{max}	mm/s	350
Max. acceleration	a_{max}	m/s^2	5,3
Duty cycle	D	%	100
Mechanical Data			
Screw type	–	–	IRS
Screw diameter	d_{screw}	mm	18
Screw lead	p_{screw}	mm	3,75
Lead accuracy	–	–	G5
Stroke	s	mm	145
Internal overstroke each side	s_0	mm	1
Backlash	$s_{backlash}$	mm	0,02
Gear reduction	i	–	Direct drive
Inertia	J	10^{-4} kgm^2	9,9
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,2
Weight	m	kg	See dimensional drawing
Weight of optional brake	m_{brake}	kg	0,8
Electrical Data			
Motor type	–	–	Servo
Nominal voltage	U	V AC	400
Nominal current	I	A	3,6
Peak current	I_{peak}	A	11,3
Nominal power	P	kW	1,6
Environment			
Ambient temperature	$T_{ambient}$	°C	0...+40
Degree of protection	IP	–	54S

Performance diagrams





Dimensional drawing



Reference	Standard stroke	L1)	Weight 2)
	mm		kg
CEMC1804–145–1–42J	145	330,3	9,1

1) For brake option add 50,7 mm.
2) For brake option add 0,8 kg.

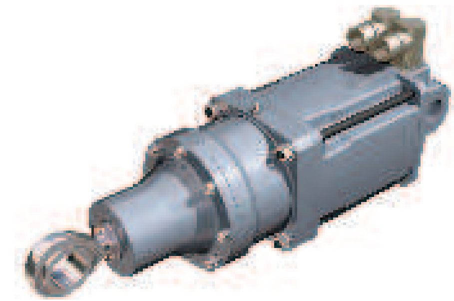
Ordering key

See page 212

C

CEMC-2404

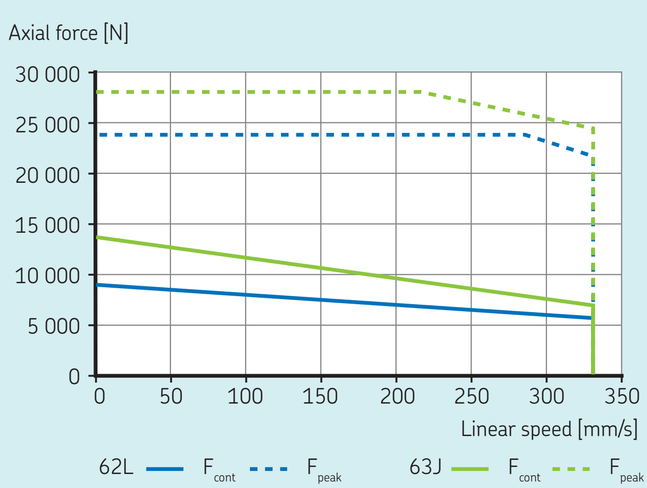
Electric cylinder

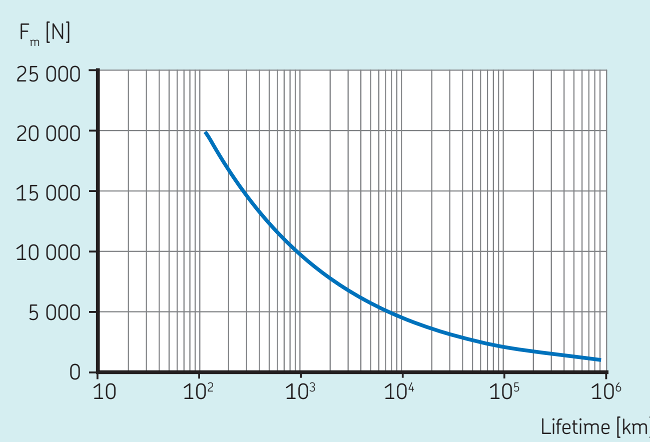


Technical data

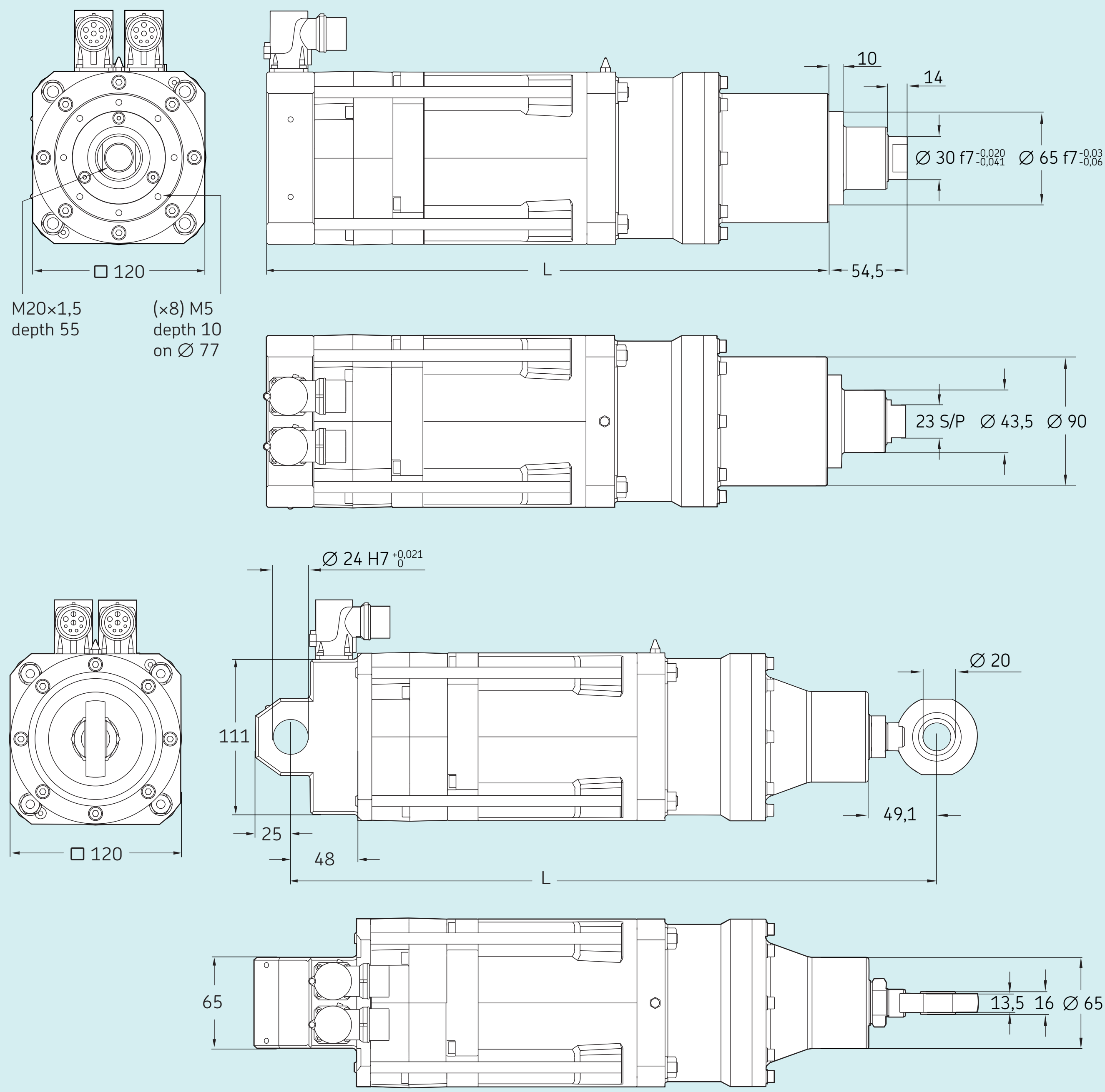
Designation	Symbol	Unit	Motor 62L	63I
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	8,8	13,2
Continuous force @ max. speed	F_c	kN	5,5	6,7
Peak force @ zero speed	F_{p0}	kN	23,8	28,0
Peak force @ max. speed	F_p	kN	22,1	24,7
Dynamic load capacity	C	kN	61,0	61,0
Holding force (motorbrake option)	F_{Hold}	kN	26,5	26,5
Max. linear speed	v_{max}	mm/s	333	333
Max. acceleration	a_{max}	m/s^2	5,8/ 5,7/ 5,4	5,6/ 5,5/ 5,3
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	IRS	IRS
Screw diameter	d_{screw}	mm	24	24
Screw lead	p_{screw}	mm	4	4
Lead accuracy	–	–	G5	G5
Stroke	s	mm	125/ 135/ 170	125/ 135/ 170
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	0,02	0,02
Gear reduction	i		Direct drive	Direct drive
Inertia	J	10^{-4} kgm^2	24,0/ 24,4/ 25,5	28,9/ 29,3/ 30,4
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,6	0,6
Weight	m	kg	See dimensional drawing	See dimensional drawing
Weight of optional brake	m_{brake}	kg	2,5	2,5
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	7,8	10,6
Peak current	I_{peak}	A	22,6	22,6
Nominal power	P	kW	2,6	3,3
Environment				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection	IP	–	54S	54S

Performance diagrams





Dimensional drawing



Reference	Standard stroke	L Design 1 1)	L Design 2 1)	Weight Design 1 2)	Weight Design 2 2)
	mm			kg	
CEMC2404–xxx–x–62L	125 / 135 / 170	336,9 / 344,9 / 379,9	408 / 416 / 451	13,8 / 13,9 / 14,6	12,6 / 12,7 / 13,1
CEMC2404–xxx–x–63I	125 / 135 / 170	365,9 / 373,9 / 408,9	437 / 445 / 480	15,8 / 15,9 / 16,6	14,6 / 14,7 / 15,1

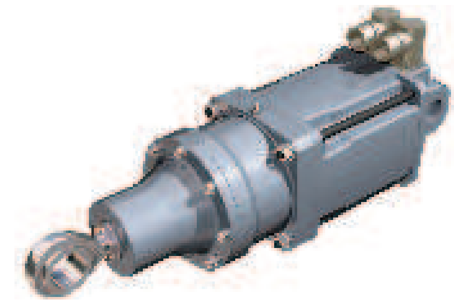
1) For brake option add 54,2 mm.
2) For brake option add 2,5 kg

Ordering key

See page 212

CEMC-2406

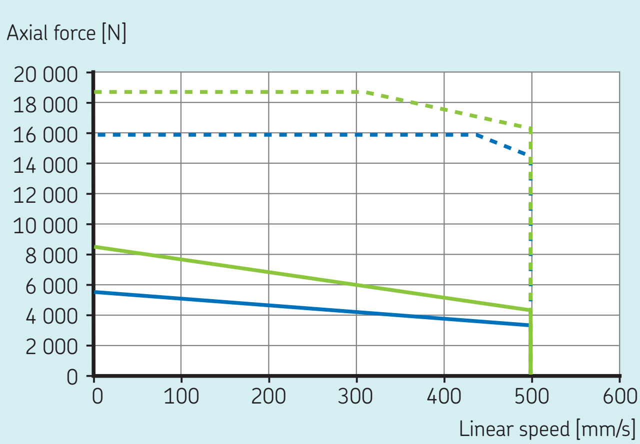
Electric cylinder

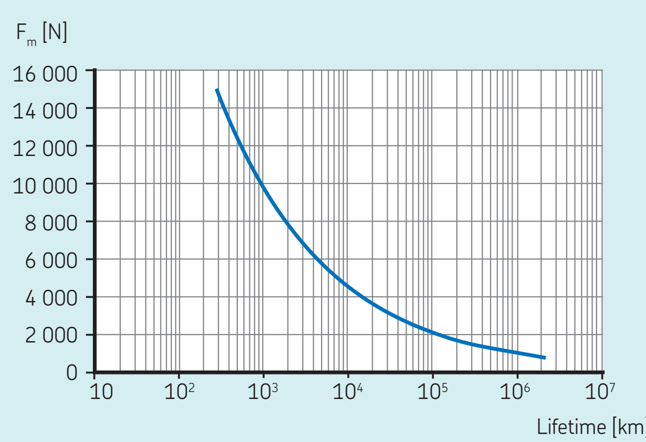


Technical data

Designation	Symbol	Unit	Motor 62L	63I
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	5,8	8,8
Continuous force @ max. speed	F_c	kN	3,6	4,4
Peak force @ zero speed	F_{p0}	kN	15,9	18,6
Peak force @ max. speed	F_p	kN	14,7	16,5
Dynamic load capacity	C	kN	61,0	61,0
Holding force (motorbrake option)	F_{Hold}	kN	17,7	17,7
Max. linear speed	v_{max}	mm/s	500	500
Max. acceleration	a_{max}	m/s^2	8,6	8,4
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	IRS	IRS
Screw diameter	d_{screw}	mm	24	24
Screw lead	p_{screw}	mm	6	6
Lead accuracy	–	–	G5	G5
Stroke	s	mm	125	125
Internal overstroke each side	s_0	mm	1	1
Backlash	$s_{backlash}$	mm	0,02	0,02
Gear reduction	i	–	Direct drive	Direct drive
Inertia	J	10^{-4} kgm^2	24,0	28,9
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	0,6	0,6
Weight	m	kg	See dimensional drawing	See dimensional drawing
Weight of optional brake	m_{brake}	kg	2,5	2,5
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	7,8	10,6
Peak current	I_{peak}	A	22,6	22,6
Nominal power	P	kW	2,6	3,3
Environment				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection	IP	–	54S	54S

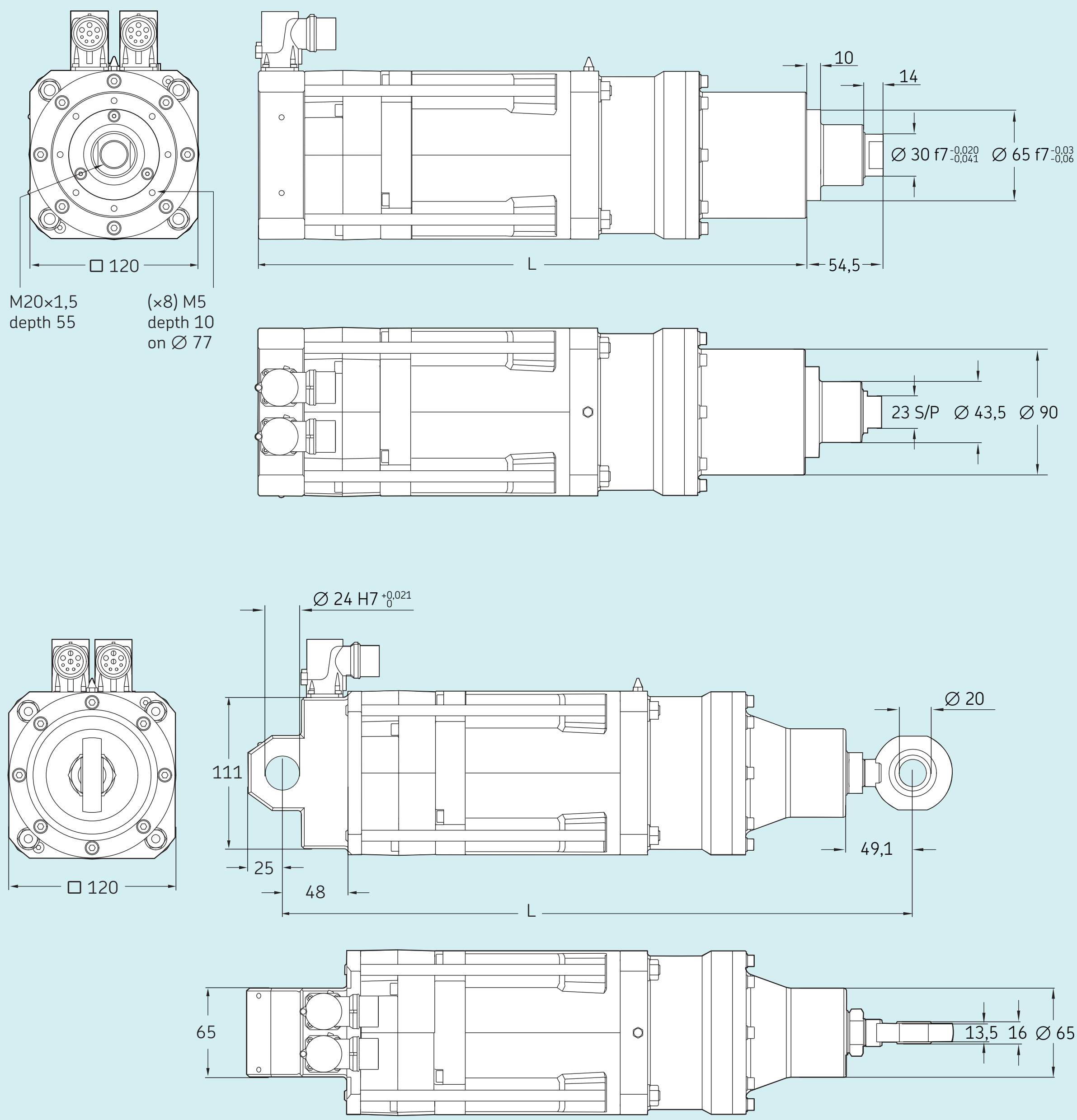
Performance diagrams





62L — F_{cont} - - - F_{peak} 63J — F_{cont} - - - F_{peak}

Dimensional drawing



Reference	Standard stroke	L Design 1 1)	L Design 2 1)	Weight Design 1 2)	Weight Design 2 2)
	mm			kg	
CEMC2406–xxx–x–62L	125	336,9	408	13,8	12,6
CEMC2406–xxx–x–63I	125	365,9	437	15,8	14,6

1) For brake option add 54,2 mm.
2) For brake option add 2,5 kg

Ordering key

See page 212

Ordering key

Actuators

C E M C - 2 4 0 4 - 1 2 5 - 1 - 6 2 L B - 1 L C 1 3 A

Cylinder type
CEMC Compact electromechanical cylinder

Screw diameter
18 18 mm diameter
24 24 mm diameter

Screw lead
04 3,75 or 4 mm lead
06 6 mm lead

Stroke
125 125 mm stroke
135 135 mm stroke
145 145 mm stroke (only for the CEMC1804)
170 170 mm stroke

Attachment
1 Front mount
2 Rod end + rear clevis

Motor
see page 204

Electromechanical brake
B Brake 24 VDC
N No brake

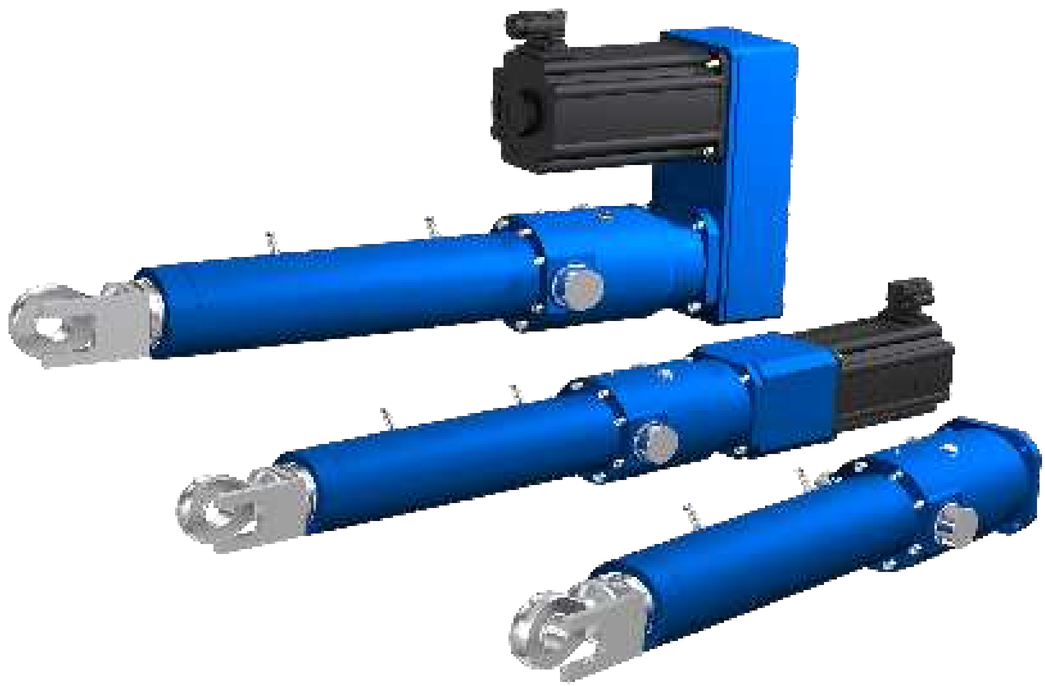
Power and signal cables
1 5 meters (standard)
2 10 meters
3 15 meters
4 20 meters
N No cable

Drive
LCxx Motion controller (see page 204 for drive size)
N No drive

Drive fieldbus
A CANopen
B Devicenet
C Ethercat
D Ethernet
E Powerlink MN/CN
F Powerlink CN
G Profibus
H Profinet
N No fieldbus

C

Electric cylinders SRSA, SVSA and SLSA



Features

- High performance roller screw
- Steel push tube and protection tube
- Modular concept
- Anti-rotation with profile rail guide
- Possibility to re-lubricate the roller screw nut with direct access
- Optional low lead roller screw or high-lead ball screw available.
- Brushless servo motors and customized motor adapters

Benefits

- High load with long life capacity as well as high acceleration and speed capabilities
- High stiffness and robustness
- Multiple combinations to fit a wide range of applications
- Extreme push tube torque resistance
- Low maintenance requirements
- Optimal solution for a wide range of applications where high load, high positioning accuracy or high speed is needed.

Product description

Electric cylinders SRSA are a straightforward combination of SKF's high quality planetary roller screws, SKF's angular contact ball bearings that will hold load and servomotors so they can perform highly efficient linear movements with full controllability. The SRSA housing is made of steel for high stiffness and robustness. The wide range consists of cylinders with screw sizes from 39 mm up to 75 mm. This enables the use of electric SRSA cylinders in applications with peak forces up to 500 kN, where – in the past – only hydraulic cylinders were an option.

For long strokes, the free end of the screw shaft is supported and guided inside the push-tube to prevent any vibration.

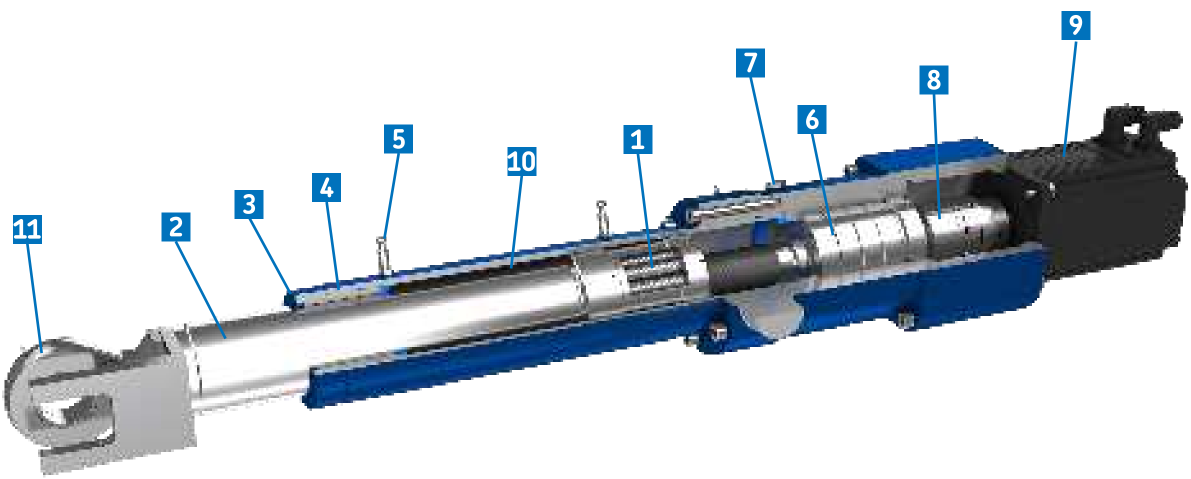
The optional anti-rotation device is made of profile rail guides. This pre-loaded design provides very high torsional stiffness and durability.

Two internal bumpers secure the mechanism during the adjustment phase, protecting the screw nut from damage due to impact with the mechanical end stops.

For very high positioning accuracy, SKF offers the slow moving SVSA range with high precision recirculating roller-screws. Thanks to the very short screw lead of 1 mm only, it is easier to control the actuator while doing fine positioning adjustments.

To cover the high speed applications as well, SKF equipped the SLSA versions with high lead ball screws. Those cylinders provide fast acceleration and speeds up to 1,5 m/s thanks to the long screw lead of up to 40 mm.

The full range of SRSA, SVSA and SLSA is available in inline configurations as well as in parallel configurations to fit most applications.



1 High quality SKF planetary roller screw for highest axial loads with low play and high efficiency
2 Steel push tube
3 Scraper seal to protect against contaminants
4 Guiding bushing
5 Home and limit switches
6 High quality SKF angular contact ball bearings
7 Sinter filter for high airflow
8 Coupling
9 Servomotor
10 Steel protection tube
11 Rod end

Motors and gearboxes

Servo motors

The SRSA can be ordered with a servo motor. In this case, SKF has selected a series of Lenze motors and drives that best matches the performance of the actuator to the end-user application. To complete the design, several options can be selected such as absolute encoder (EnDat, Hyperface), safety brake or associated servodrive. It is also possible to equip the SRSA with your preferred brand of servo motor so that it integrates best into your system. Please contact SKF to check the feasibility of your configuration.

For more information, please visit the following sites:

Motors:
http://www.lenze.com/en-us/products/motors/
Drives:
http://www.lenze.com/en-us/products/inverters/

Drive options

The performance attributes shown in the table on the previous page are the result of specific Lenze servo motor and drive combinations. The SRSA can be offered with or without the servodrive. The servodrive can be in the recommended configuration or any other configuration that fits your installation.

In the case of a different combination, please contact SKF to determine what effect the different configuration will have on the performance of the actuator.

Performance overview of linear units

Linear unit	F_{max}	F_{max0}	V_{max}
	kN		mm/s
SRSA-U-3905	150	150	342
SRSA-U-3910	150	150	683
SRSA-U-3915	150	150	1 025
SRSA-U-4805	260	260	278
SRSA-U-4810	260	260	556
SRSA-U-4815	260	260	833
SRSA-U-4820	260	260	1 111
SRSA-U-6010	370	370	444
SRSA-U-6015	370	370	667
SRSA-U-6020	370	370	889
SRSA-U-7510	500	500	356
SRSA-U-7515	500	500	533
SRSA-U-7520	500	500	711
SVSA-U-3201	60	60	10,4
SVSA-U-4001	80	80	8,3
SVSA-U-5001	175	175	6,7
SLSA-U-2525	22	22	1 500
SLSA-U-4040	50	50	1 500

Performance overview of actuators with servomotors

Linear unit	Interface and gear ratio	Motor	F_{c0}	F_{p0}	V_{max}
			kN		mm/s
SRSA3905	L10/ P10	LC9	25,8 / 25	47,2 / 45,7	269
SRSA3905	L30/ P30	LA6	41,1 / 39,9	88,5 / 85,8	113
SRSA3905	L40/ P40	LA6	54,8 / 53,1	118 / 114,4	84
SRSA3910	L30/ P30	LC1	29,8 / 28,9	62,4 / 60,6	179
SRSA3910	L50/ P50	LC1	49,6 / 48,1	104,1 / 100,9	108
SRSA3910	L70/ P70	LC1	69,5 / 67,4	145,7 / 141,3	77
SRSA3915	L10/ P10	LB6	12 / 11,7	20,1 / 19,5	806
SRSA3915	L30/ P30	LD3	42,6 / 41,3	68,7 / 66,7	219
SRSA3915	L50/ P50	LD3	71 / 68,9	114,6 / 111,1	131
SRSA4805	L10/ P10	LD3	40 / 38,8	64,5 / 62,6	219
SRSA4805	L30/ P30	LD1	61,2 / 59,4	117,6 / 114,1	77
SRSA4805	L40/ P40	LD1	81,6 / 79,2	156,8 / 152,1	58
SRSA4810	L30/ P30	LD2	49,5 / 48	87 / 84,4	167
SRSA4810	L40/ P40	LD2	66 / 64,1	116 / 112,5	125
SRSA4810	L50/ P50	LD2	82,5 / 80,1	145 / 140,6	100
SRSA4815	L10/ P10	LD6	28,9 / 28,1	51,8 / 50,3	713
SRSA4815	L50/ P50	LD5	83,2 / 80,7	137,8 / 133,6	150
SRSA4815	L70/ P70	LD5	116,5 / 113	192,9 / 187,1	107
SRSA4820	L10/ P10	LD6	21,7 / 21,1	38,9 / 37,7	950
SRSA4820	L50/ P50	LD7	78,3 / 76	185,4 / 179,9	200
SRSA4820	L70/ P70	LD7	109,7 / 106,4	259,6 / 251,8	143
SRSA6010	L30/ P30	LD2	49 / 47,5	86 / 83,4	167
SRSA6010	L40/ P40	LD5	96,5 / 93,6	159,8 / 155	125
SRSA6010	L50/ P50	LD5	120,6 / 117	199,7 / 193,7	100
SRSA6015	L30/ P30	LD6	83,3 / 80,8	149,2 / 144,7	238
SRSA6015	L50/ P50	LD7	103,3 / 100,2	244,4 / 237,1	150
SRSA6015	L70/ P70	LD7	144,6 / 140,2	342,2 / 331,9	107
SRSA6020	L10/ P10	LD6	21,7 / 21,1	38,9 / 37,7	889
SRSA6020	L70/ P70	LD7	109,7 / 106,4	259,6 / 251,8	143
SRSA6020	L100/ P100	LD7	156,7 / 152	370,8 / 359,7	100
SRSA7510	L30/ P30	LD7	88,7 / 86,1	210 / 203,7	167
SRSA7510	L50/ P50	LD7	147,9 / 143,4	350 / 339,5	100
SRSA7510	L70/ P70	LD7	207 / 200,8	490 / 475,3	71
SRSA7515	L30/ P30	LD6	82,3 / 79,8	147,5 / 143,1	238
SRSA7515	L50/ P50	LD6	137,2 / 133,1	245,8 / 238,4	143
SRSA7515	L70/ P70	LD6	192,1 / 186,3	344,1 / 333,8	102
SRSA7520	L10/ P10	LD6	21,5 / 20,8	38,4 / 37,3	711
SRSA7520	L70/ P70	LD6	145,7 / 141,3	261,1 / 253,2	136
SRSA7520	L100/ P100	LD6	208,1 / 201,9	373 / 361,8	95
SVSA3201	L10/ P10	LC7	13,8 / 13,4	42,8 / 41,5	10
SVSA3201	L10/ P10	LD9	24,7 / 23,9	57,8 / 56,1	10
SVSA4001	L10/ P10	LA1	19,2 / 18,7	54,1 / 52,5	8
SVSA4001	L10/ P10	LA3	34,3 / 33,2	79,1 / 79,1	8
SVSA5001	L10/ P10	LA5	40 / 38,8	93 / 90,2	7
SVSA5001	L10/ P10	LE3	74,6 / 72,4	174,2 / 169,6	7
SLSA2525	L10/ P10	LA4	2,4 / 2,3	6,1 / 5,9	1 469
SLSA2525	L10/ P10	LC9	5,8 / 5,6	10,6 / 10,2	1 344
SLSA4040	L10/ P10	LD3	5,7 / 5,6	9,2 / 9	1 500
SLSA4040	L10/ P10	LD6	11,3 / 11	20,3 / 19,7	1 500

C

Standard motor types

Motor	Lenze servo motor	Lenze 9400 Highline servoamplifier
LA1	MCS12D20	E94ASHE0044
LA3	MCS12H15	E94ASHE0074
LA4	MCS12H35	E94ASHE0134
LA5	MCS12L20	E94ASHE0074
LA6	MCS12L41	E94ASHE0134
LB6	MCS14P32	E94ASHE0244
LC1	MCS14H32	E94ASHE0174
LC7	MCS09F38	E94ASHE0044
LC9	MCS14L32	E94ASHE0244
LD1	MCS14H28	E94ASHE0174
LD2	MCS14L30	E94ASHE0324
LD3	MCS14P26	E94ASHE0324
LD5	MCS19J30	E94ASHE0324
LD6	MCS19P29	E94ASHE0474
LD7	MCS19P30	E94ASHE0474
LD9	MCS09L41	E94ASHE0074
LE3	MCS14L15	E94ASHE0134

Manuals

Supporting documents are available for downloading on skf.com/srsa

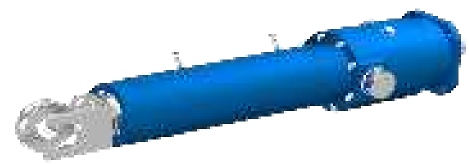
3D Models

Product configurators for 3D models download are available on skf.com/srsa

3D Model Configurator

C

SRSA-U-39xx



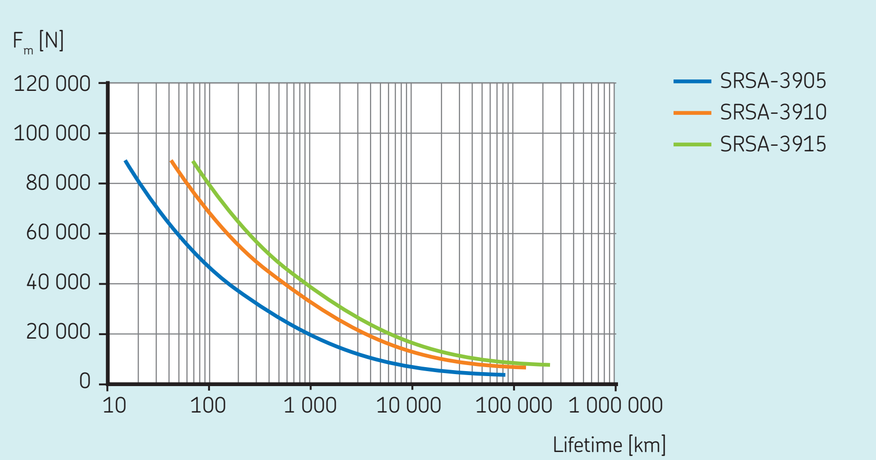
Linear unit

Technical data

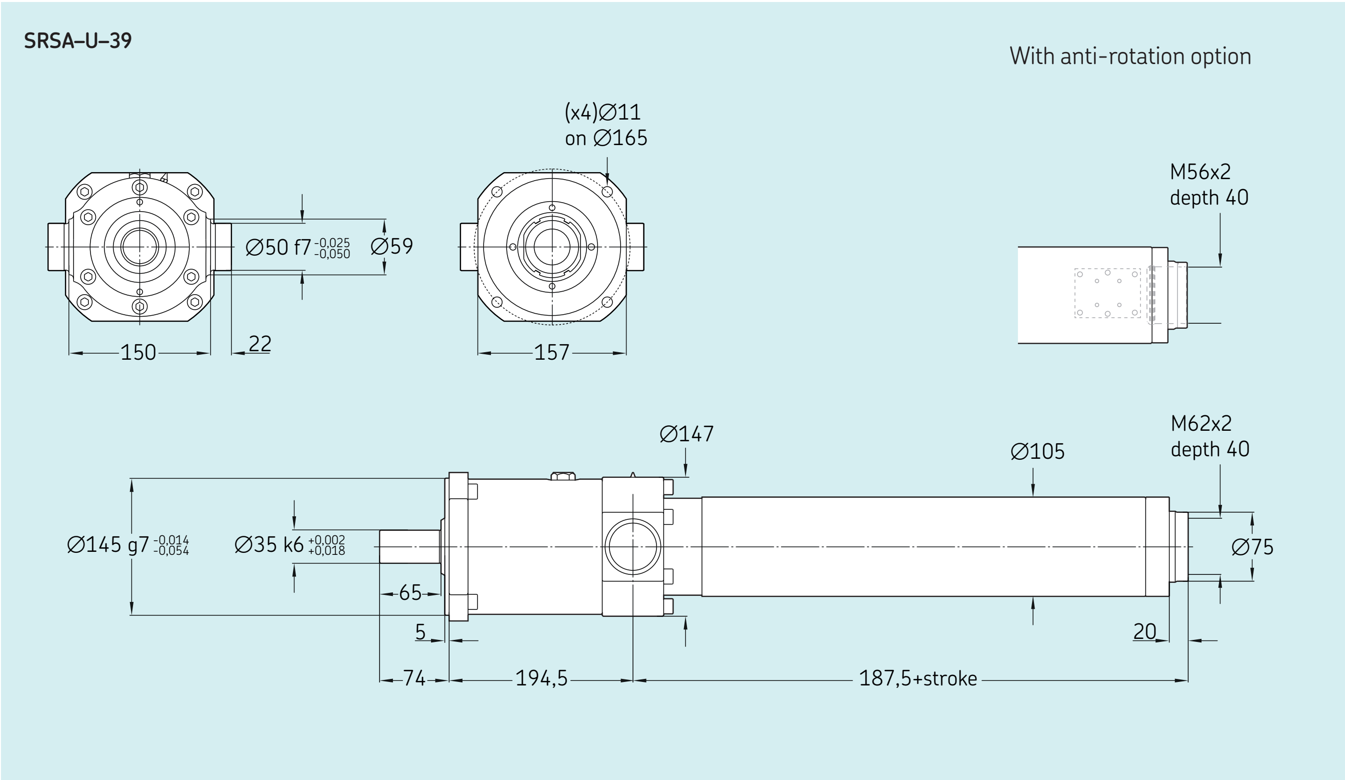
Designation	Symbol	Unit	SRSA-U-3905	SRSA-U-3910	SRSA-U-3915
Performance Data					
Max. dynamic axial force	F_{max}	kN	150	150	150
Max. dynamic axial force L_{10}[1]	F_{L10}	kN	90	90	90
Max. static axial force	F_{max0}	kN	150	150	150
Dynamic load capacity	C	kN	129	153	168
Maximum torque to reach Fmax	M_{max}	Nm	159	301	446
Max. linear speed	v_{max}	mm/s	342	683	1 025
Max. rotational speed	n_{max}	1/min	4 100	4 100	4 100
Max. acceleration	a_{max}	m/s^2	9,5	19,1	28,6
Duty cycle	D_{unit}	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	39	39	39
Screw lead	p_{screw}	mm	5	10	15
Lead accuracy	–	–	G5	G5	G5
Stroke [2]	s	mm	100...900	100...900	100...900
Internal overstroke each side	s_0	mm	5	5	5
Backlash [3]	$s_{backlash}$	mm	0	0	0
Efficiency	η_{lu}	%	75	79	80
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	21,3	21,3	21,3
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,8	1,8	1,8
Weight @ 0 mm stroke	m_{lu}	kg	33,8	33,8	33,8
Δ weight per 100 mm stroke	Δm	kg	4,3	4,3	4,3
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,5	0,5	0,5
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [4]	IP	–	54	54	54

1) Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L10)
2) By 100 mm steps
3) Backlash elimination up to stroke 500 mm. For longer strokes $s_{backlash}$ = 0,02 mm
4) With anti-rotation option IP44

Performance diagrams



Dimensional drawing

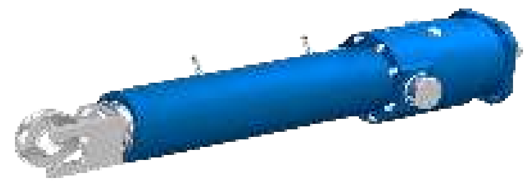


Ordering key

See page 218

SRSA-U-48xx

Linear unit

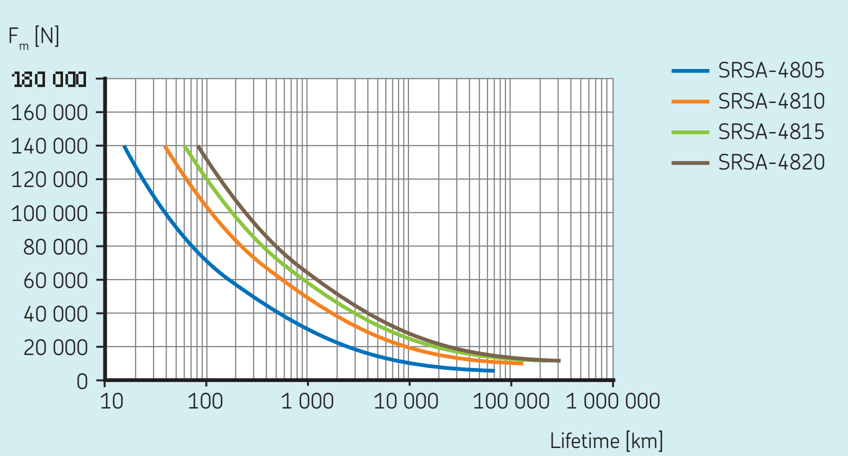


Technical data

Designation	Symbol	Unit	SRSA-U-4805	SRSA-U-4810	SRSA-U-4815	SRSA-U-4820
Performance Data						
Max. dynamic axial force	F_{max}	kN	260	260	260	260
Max. dynamic axial force L_{10} 1)	F_{L10}	kN	140	140	140	140
Max. static axial force	F_{max0}	kN	260	260	260	260
Dynamic load capacity	C	kN	198	232	258	266
Maximum torque to reach Fmax	M_{max}	Nm	283	527	773	1 031
Max. linear speed	v_{max}	mm/s	278	556	833	1 111
Max. rotational speed	n_{max}	1/min	3 333	3 333	3 333	3 333
Max. acceleration	a_{max}	m/s^2	9,5	19,1	28,6	38,2
Duty cycle	D_{unit}	%	100	100	100	100
Mechanical Data						
Screw type	–	–	Roller screw	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48	48
Screw lead	p_{screw}	mm	5	10	15	20
Lead accuracy	–	–	G5	G5	G5	G5
Stroke 2)	s	mm	100...1 200	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5	5
Backlash 3)	$s_{backlash}$	mm	0	0	0	0
Efficiency	η_{lu}	%	73%	79%	80%	80%
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm²	54,3	54,3	54,3	54,3
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm²	4,1	4,1	4,1	4,1
Weight @ 0 mm stroke	m_{lu}	kg	53,2	53,2	53,2	53,2
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7	5,7
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7	0,7
Environment						
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40
Degree of protection 4)	IP	–	54	54	54	54

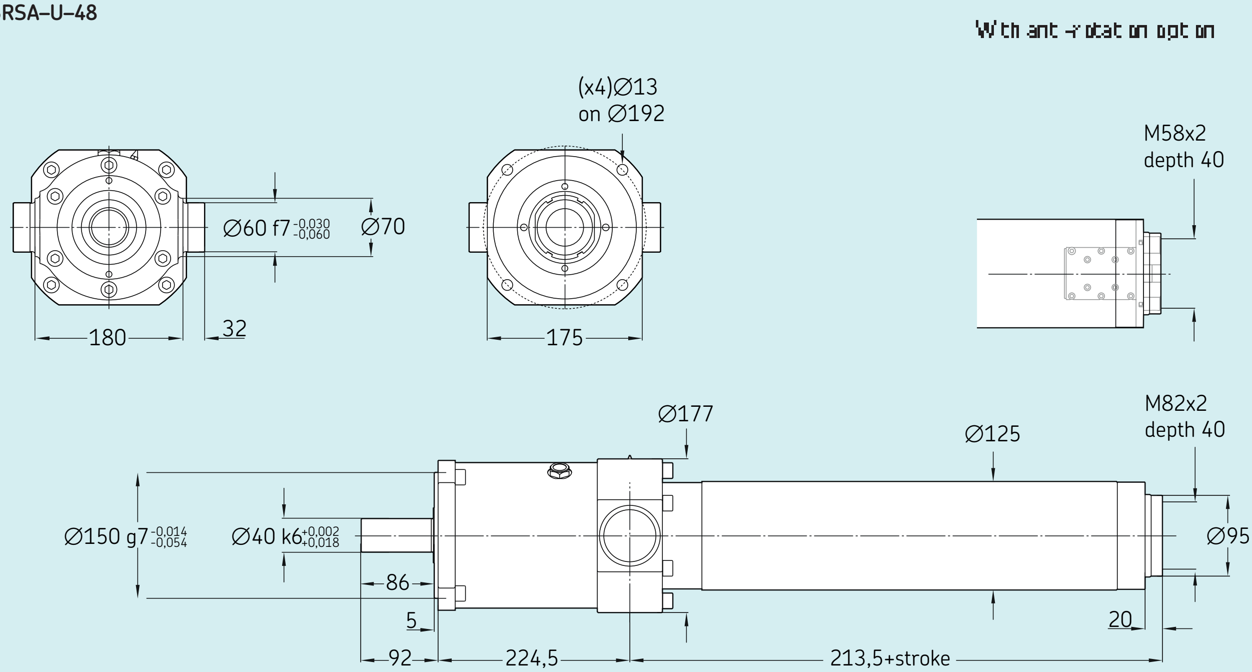
1) Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L10)
2) By 100 mm steps
3) Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
4) With anti-rotation option IP44

Performance diagrams



Dimensional drawing

SRSA–U–48

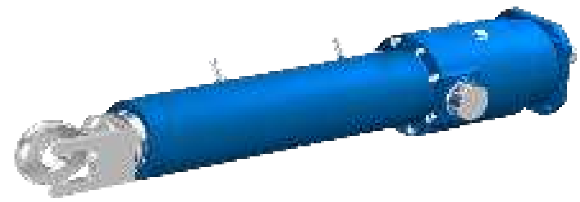


C

Ordering key

See page 232

SRSA-U-60xx



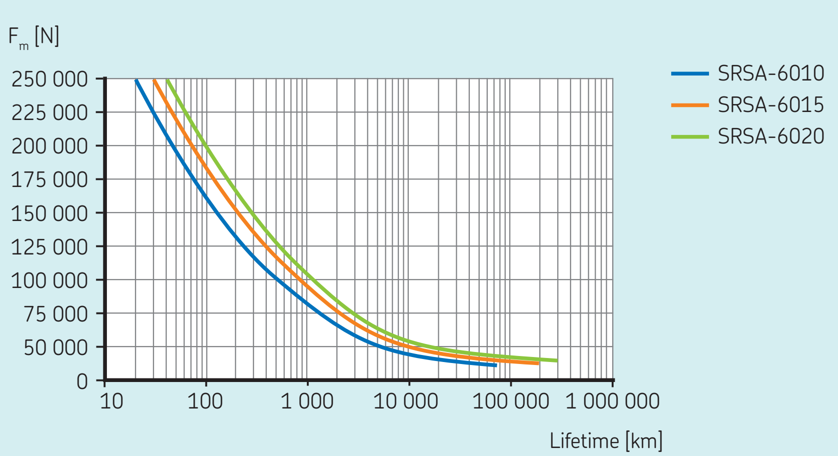
Linear unit

Technical data

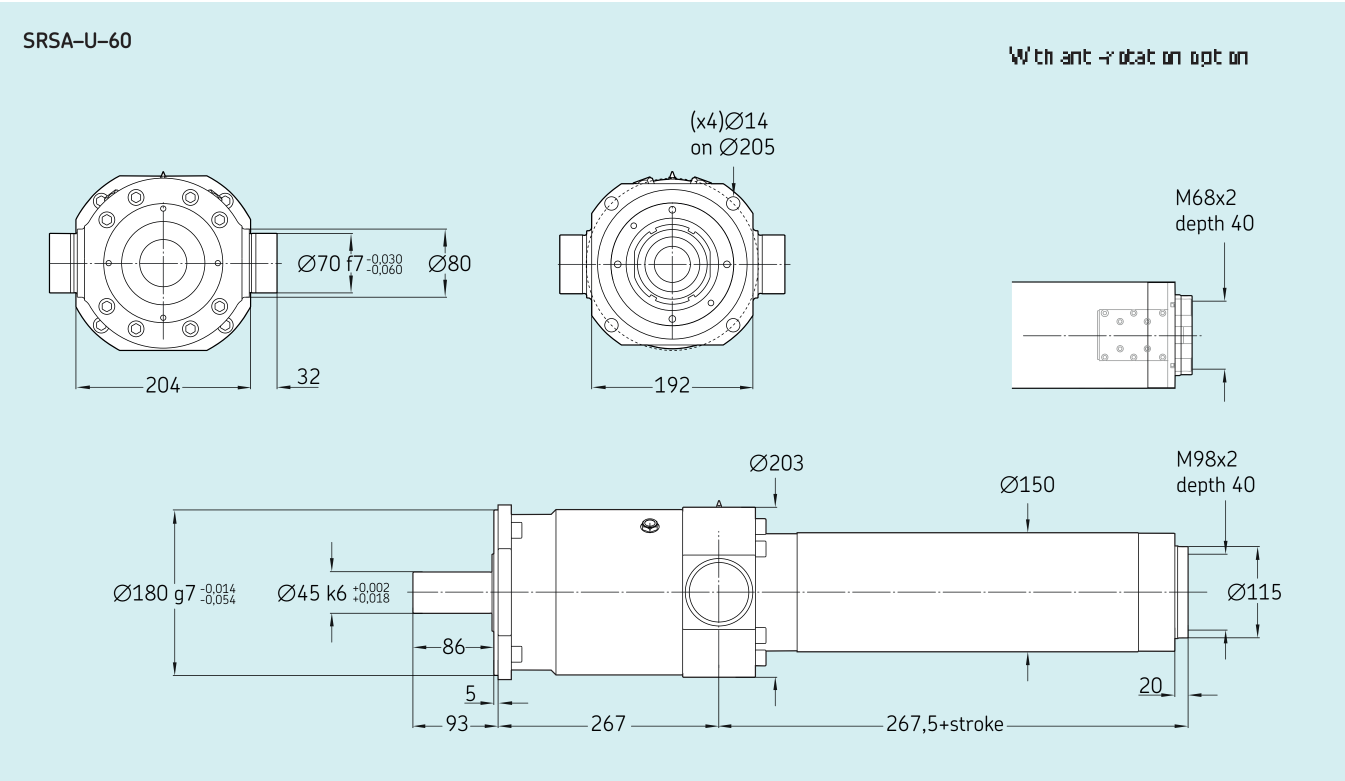
Designation	Symbol	Unit	SRSA-U-6010	SRSA-U-6015	SRSA-U-6020
Performance Data					
Max. dynamic axial force	F_{max}	kN	370	370	370
Max. dynamic axial force L_{10}[1]	F_{L10}	kN	250	250	250
Max. static axial force	F_{max0}	kN	370	370	370
Dynamic load capacity	C	kN	339	373	395
Maximum torque to reach Fmax	M_{max}	Nm	759	1 112	1 467
Max. linear speed	v_{max}	mm/s	444	667	889
Max. rotational speed	n_{max}	1/min	2 667	2 667	2 667
Max. acceleration	a_{max}	m/s^2	19,1	28,6	38,2
Duty cycle	D_{unit}	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	60	60	60
Screw lead	p_{screw}	mm	10	15	20
Lead accuracy	–	–	G5	G5	G5
Stroke [2]	s	mm	100...1 300	100...1 300	100...1 300
Internal overstroke each side	s_0	mm	10	10	10
Backlash [3]	$s_{backlash}$	mm	0	0	0
Efficiency	η_{lu}	%	78%	79%	80%
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	178	178	178
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	10,1	10,1	10,1
Weight @ 0 mm stroke	m_{lu}	kg	83,6	83,6	83,6
Δ weight per 100 mm stroke	Δm	kg	8,9	8,9	8,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	5,2	5,2	5,2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,8	0,8	0,8
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [4]	IP	–	54	54	54

1) Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L10)
2) By 100 mm steps
3) Backlash elimination up to stroke 800 mm. For longer strokes $s_{backlash}$ = 0,02 mm
4) With anti-rotation option IP44

Performance diagrams



Dimensional drawing

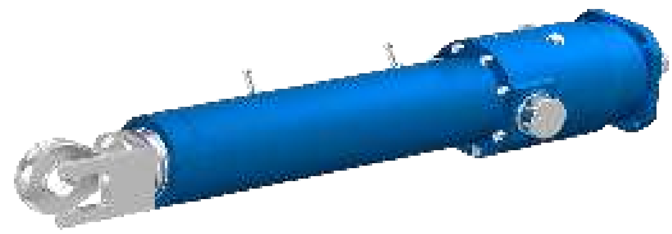


Ordering key

See page 232

SRSA-U-75xx

Linear unit

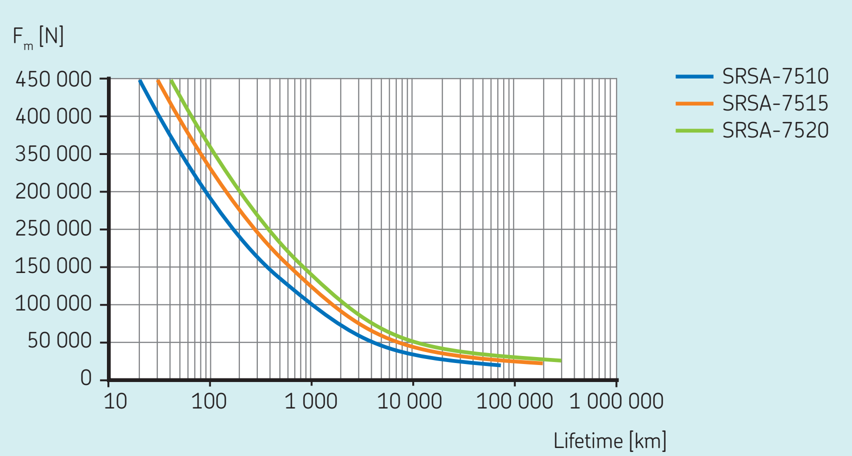


Technical data

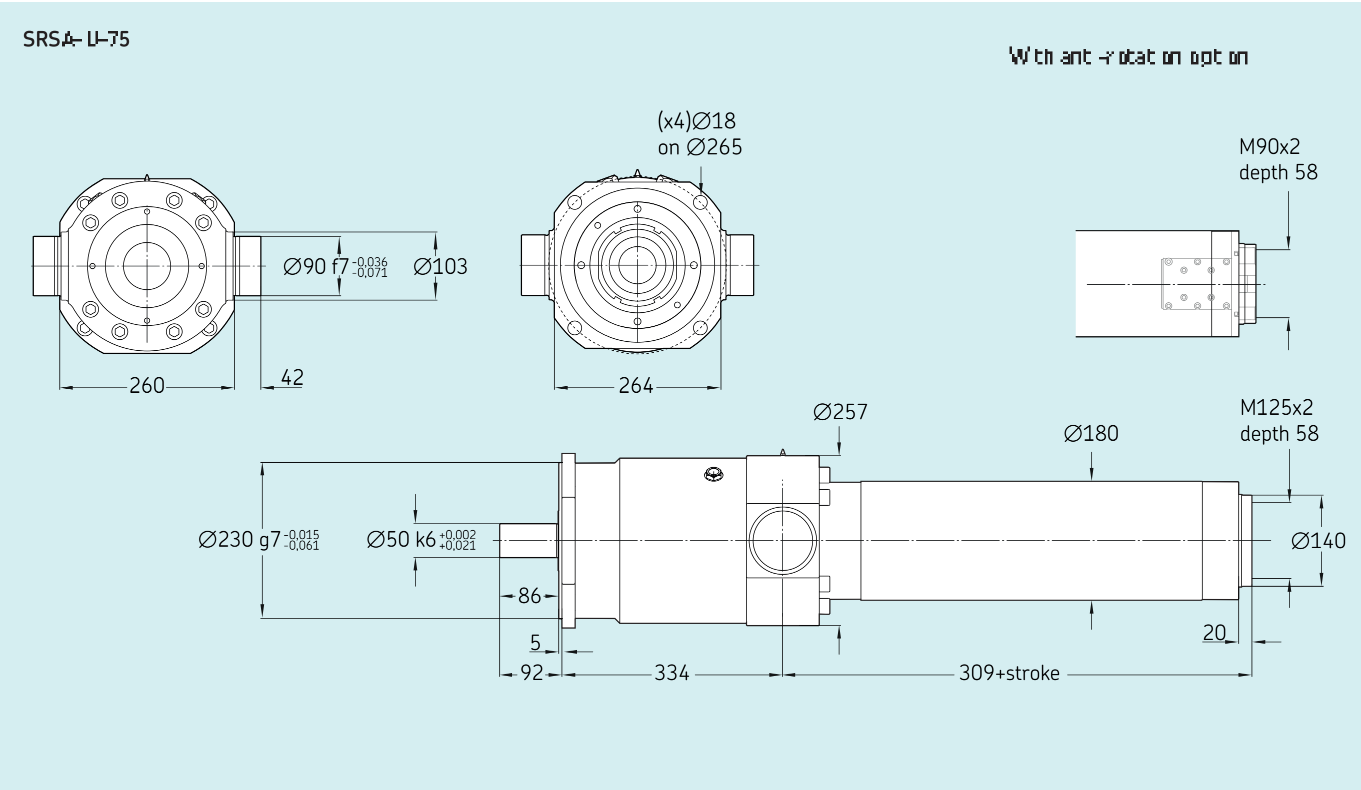
Designation	Symbol	Unit	SRSA-U-7510	SRSA-U-7515	SRSA-U-7520
Performance Data					
Max. dynamic axial force	F_{max}	kN	500	500	500
Max. dynamic axial force L_{10} 1)	F_{L10}	kN	450	450	450
Max. static axial force	F_{max0}	kN	500	500	500
Dynamic load capacity	C	kN	505	561	572
Maximum torque to reach Fmax	M_{max}	Nm	1 050	1 521	2 004
Max. linear speed	v_{max}	mm/s	356	533	711
Max. rotational speed	n_{max}	1/min	2 133	2 133	2 133
Max. acceleration	a_{max}	m/s^2	19,1	28,6	38,2
Duty cycle	D_{unit}	%	100%	100%	100%
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	75	75	75
Screw lead	p_{screw}	mm	10	15	20
Lead accuracy	–	–	G5	G5	G5
Stroke 2)	s	mm	100...1 500	100...1 500	100...1 500
Internal overstroke each side	s_0	mm	10	10	10
Backlash 3)	$s_{backlash}$	mm	0	0	0
Efficiency	η_{lu}	%	76%	79%	79%
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	625	625	625
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	24,6	24,6	24,6
Weight @ 0 mm stroke	m_{lu}	kg	156,5	156,5	156,5
Δ weight per 100 mm stroke	Δm	kg	11,3	11,3	11,3
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	7,5	7,5	7,5
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	2,7	2,7	2,7
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection 4)	IP	–	54	54	54

1) Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L10)
2) By 100 mm steps
3) Backlash elimination up to stroke 1 000 mm. For longer strokes $s_{backlash}$ = 0,02 mm
4) With anti-rotation option IP44

Performance diagrams



Dimensional drawing



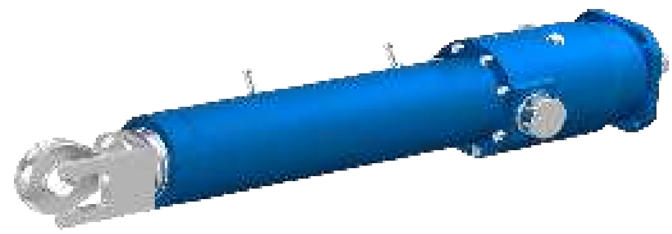
C

Ordering key

See page 232

SVSA-U-xx01

Linear unit

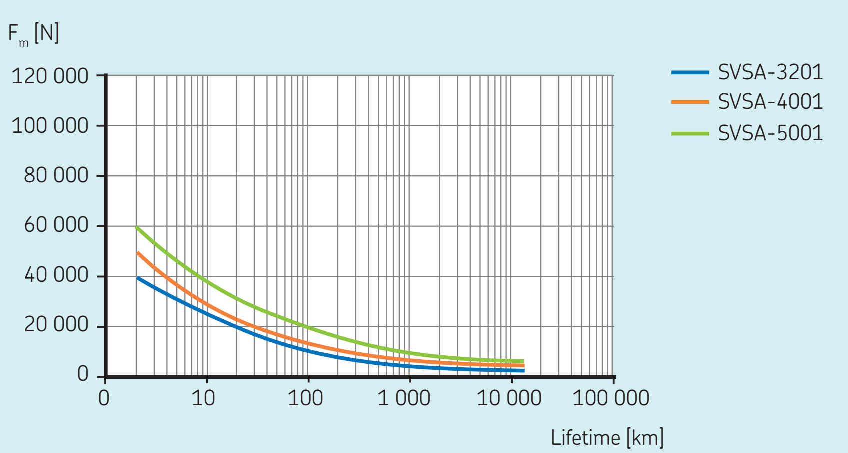


Technical data

Designation	Symbol	Unit	SVSA-U-3201	SVSA-U-4001	SVSA-U-5001
Performance Data					
Max. dynamic axial force	F_{max}	kN	60	80	175
Max. dynamic axial force L_{10} 1)	F_{L10}	kN	40	50	60
Max. static axial force	F_{max0}	kN	60	80	175
Dynamic load capacity	C	kN	64	79	174
Maximum torque to reach Fmax	M_{max}	Nm	18,3	26,6	65,7
Max. linear speed	v_{max}	mm/s	10	8	7
Max. rotational speed	n_{max}	1/min	625	500	400
Max. acceleration	a_{max}	m/s^2	0,6	0,6	0,6
Duty cycle	D_{unit}	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	32	40	50
Screw lead	p_{screw}	mm	1	1	1
Lead accuracy	–	–	G5	G5	G5
Stroke 2)	s	mm	100...600	100...800	100...900
Internal overstroke each side	s_0	mm	5	5	5
Backlash 3)	$s_{backlash}$	mm	0	0	0
Efficiency	η_{lu}	%	52%	48%	42%
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm^2	3,4	6,8	21,3
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,31	0,64	1,8
Weight @ 0 mm stroke	m_{lu}	kg	10,8	17,4	34,2
Δ weight per 100 mm stroke	Δm	kg	2,4	3,2	4,8
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	2,6	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,3	0,2	0,4
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection 4)	IP	–	54	54	54

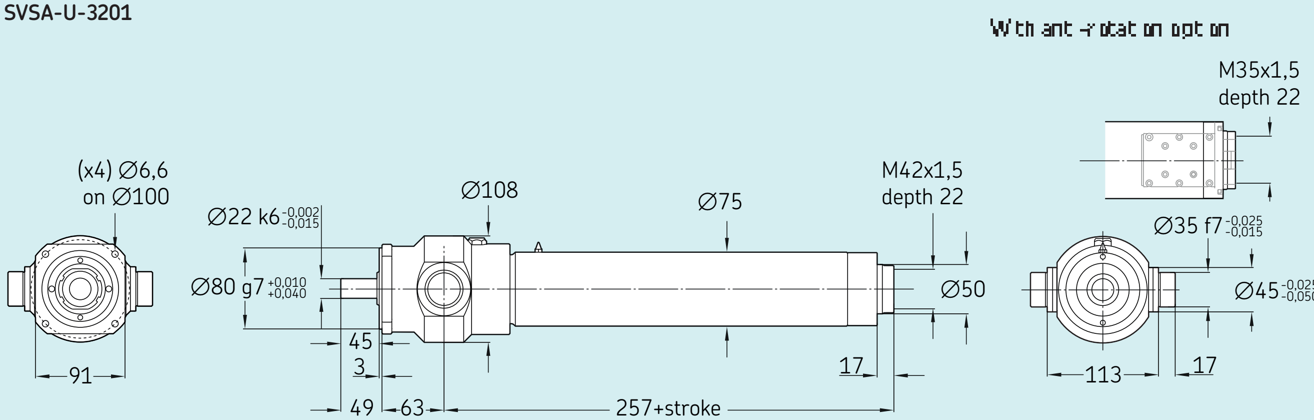
1) Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L10)
2) By 100 mm steps
3) Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
4) With anti-rotation option IP44

Performance diagrams

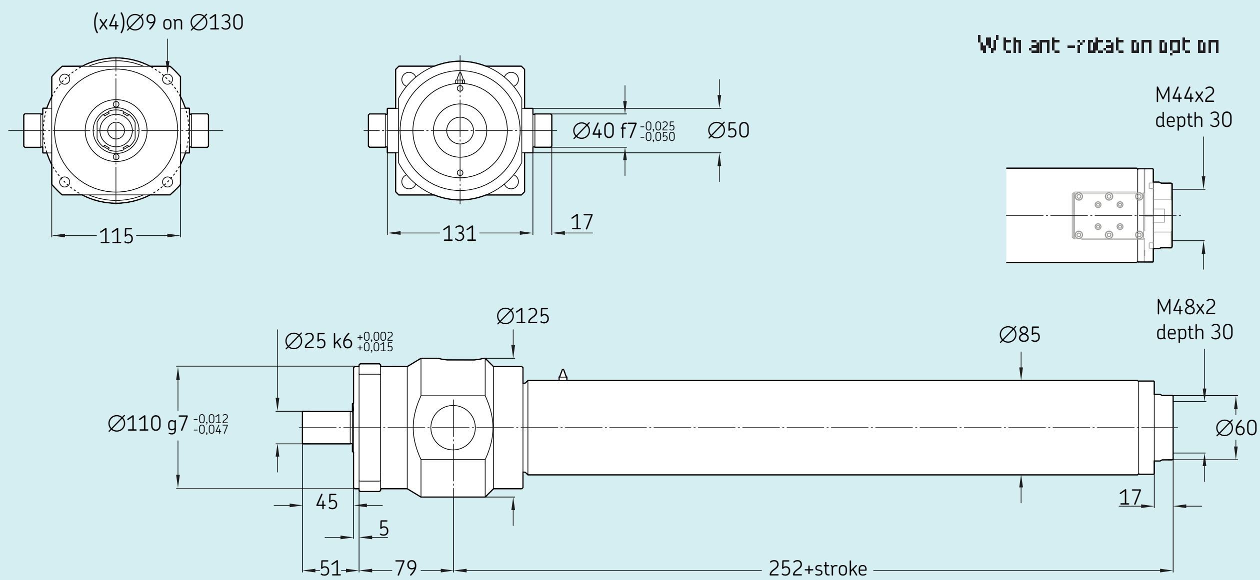


Dimensional drawing

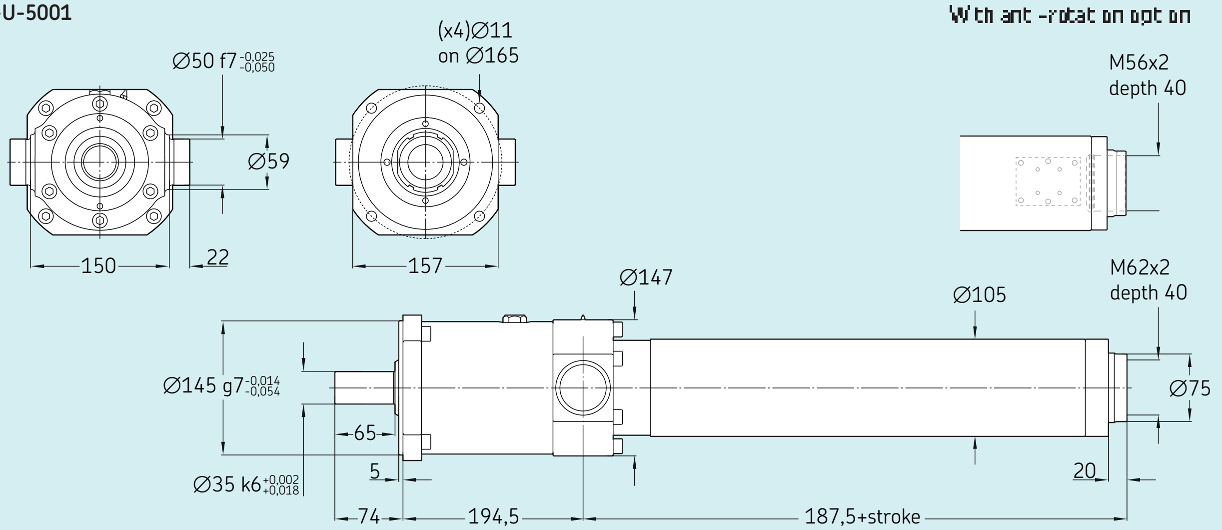
SVSA-U-3201



SVSA-U-4001



SVSA-U-5001

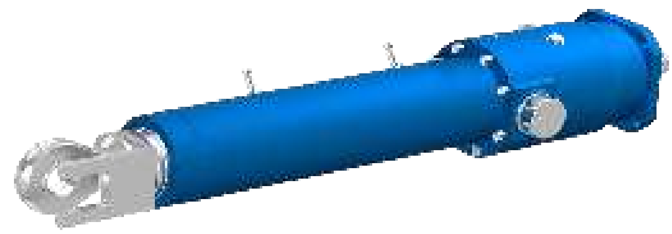


Ordering key

See page 232

SLSA-U-xxxx

Linear unit

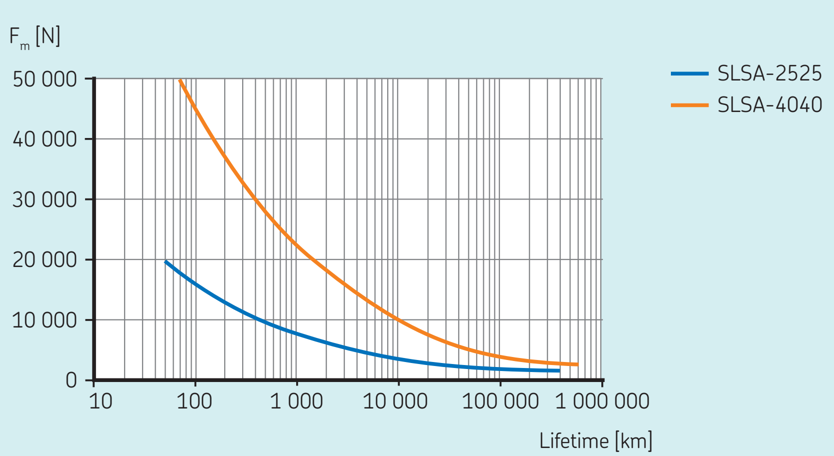


Technical data

Designation	Symbol	Unit	SLSA-U-2525	SLSA-U-4040
Performance Data				
Max. dynamic axial force	F_{max}	kN	22	50
Max. dynamic axial force L_{10}[1]	F_{L10}	kN	20	50
Max. static axial force	F_{max0}	kN	22	50
Dynamic load capacity	C	kN	22	52
Maximum torque to reach Fmax	M_{max}	Nm	104,2	378,9
Max. linear speed	v_{max}	mm/s	1 500	1 500
Max. rotational speed	n_{max}	1/min	3 600	2 250
Max. acceleration	a_{max}	m/s²	15,9	25,5
Duty cycle	D_{unit}	%	100	100
Mechanical Data				
Screw type	–	–	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	25	40
Screw lead	p_{screw}	mm	25	40
Lead accuracy	–	–	G9	G9
Stroke [2]	s	mm	100...800	100...1200
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0,08	0,1
Efficiency	η_{lu}	%	84%	84%
Inertia @ 0 mm stroke	J_{lu}	10^{-4} kgm²	6,8	54,3
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm²	0,21	1,33
Weight @ 0 mm stroke	m_{lu}	kg	14,9	49,6
Δ weight per 100 mm stroke	Δm	kg	2,6	7
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,4	-2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	-0,1	-1,3
Environment				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [3]	IP	–	54	54

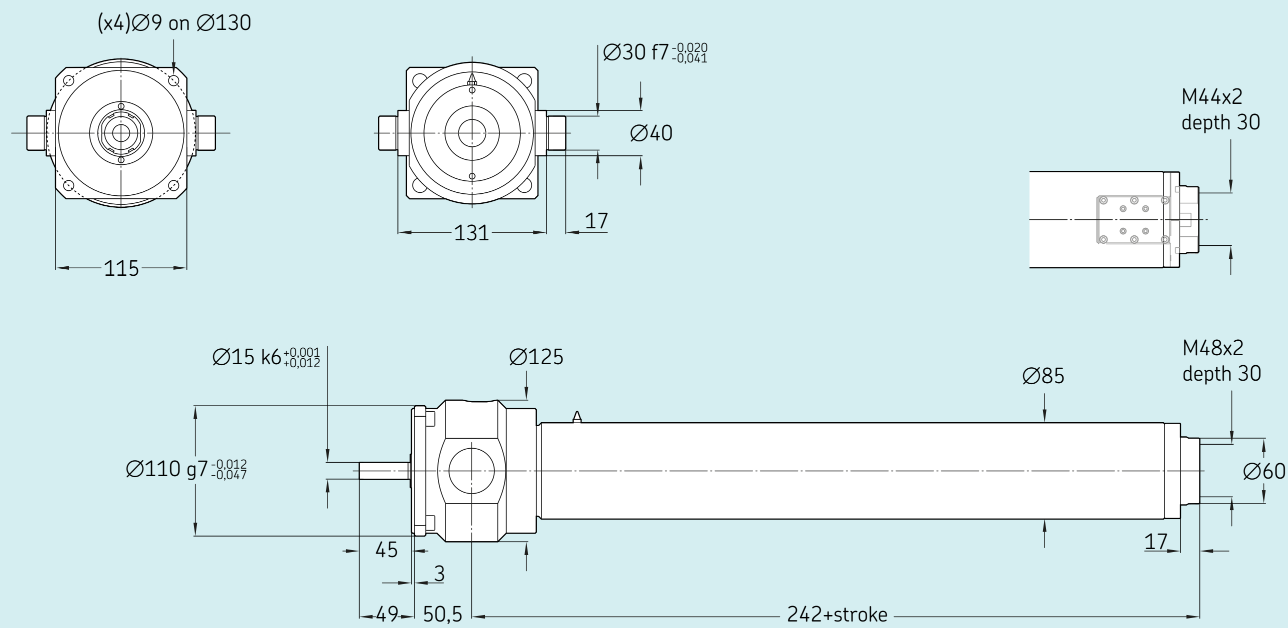
[1] Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L10)
[2] By 100 mm steps
[3] With anti-rotation option IP44

Performance diagrams

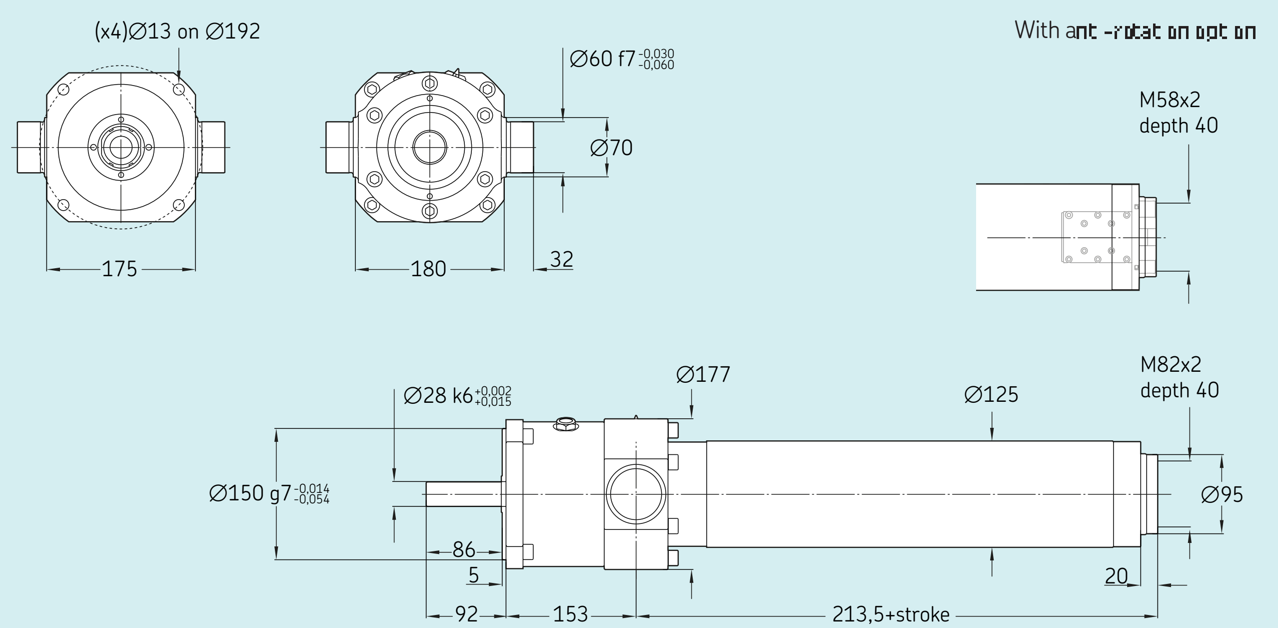


Dimensional drawing

SLSA–U–2525



SLSA–U–4040



Ordering key

See page 232

Ordering key

Linear unit

S	R	S	A	-	U	-	4	8	1	0	-	0	2	0	0	-	T	R	A	F	-	N

Type
R Planetary roller screw
V Recirculating roller screw
L Long lead ballscrew

Linear unit only

Screw diameter

Screw lead

Stroke

Rear attachment
T Trunnions
Z Special
N No attachment

Front attachment
R Rod end
F Rod end with fork
Z Non standard
N No attachment (female thread)

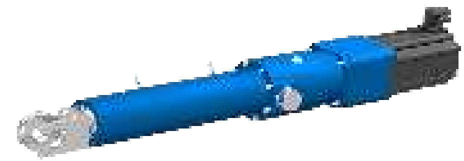
Anti-rotation
A Anti-rotation
N No anti-rotation

Limit switches
F 2 limit switches and 1 home switch
S 2 limit switches only
M 1 limit switch and 1 home switch
L 1 limit switch only
H 1 home switch only
N No switch

Motor interface
N No interface
L Inline interface (on request)
P Parallel interface (on request)

C

SRSA-S-3905



Electric cylinder servo motor, inline configuration

Technical data

Designation	Symbol	Unit	Servo motor and inline adapter L10 LC9	L30 LA6	L40 LA6
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	25,8	41,1	54,8
Continuous force @ max. speed	F_c	kN	16,2	30,1	40,2
Peak force @ zero speed	F_{p0}	kN	47,2	88,5	118
Peak force @ max. speed	F_p	kN	28,2	63,3	84,4
Dynamic load capacity	C	kN	129	129	129
Holding force (motorbrake option)	F_{Hold}	kN	35	58	78
Max. linear speed	v_{max}	mm/s	269	113	85
Max. acceleration	a_{max}	m/s^2	7,2	5,5	3,9
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	39	39	39
Screw lead	p_{screw}	mm	5	5	5
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...900	100...900	100...900
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		1	3	4
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	53,58	15,36	16,54
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,80	0,20	0,11
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	1,07	1,07
Weight @ 0 mm stroke	m	kg	65,4	66,1	74
Δ weight per 100 mm stroke	Δm	kg	4,3	4,3	4,3
Weight of optional brake	m_{brake}	kg	1,9	0,9	0,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,5	0,5	0,5
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	23,5	12,4	12,4
Peak current	I_{peak}	A	47	31,2	31,2
Nominal power	P	kW	5,81	4,67	4,67
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

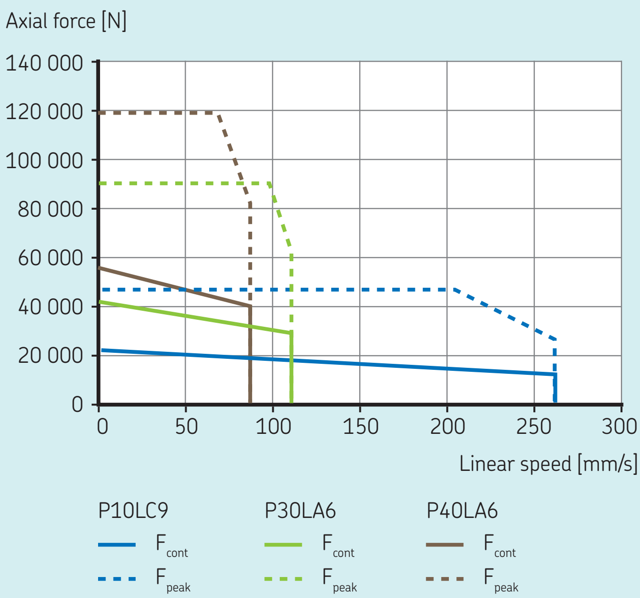
1) By 100 mm steps
2) Backlash elimination up to stroke 500 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

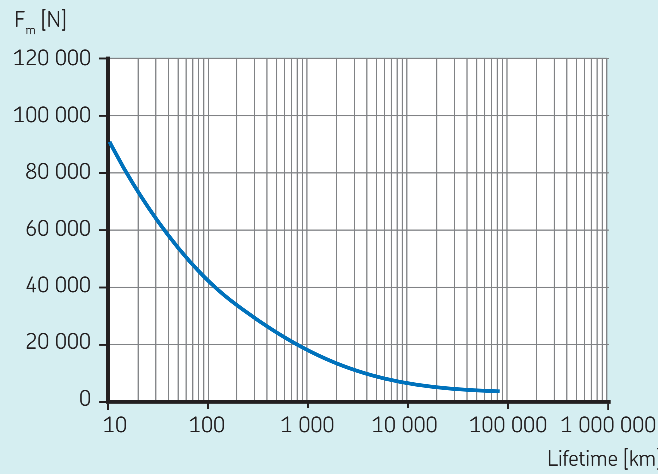
Ordering key

See page 306

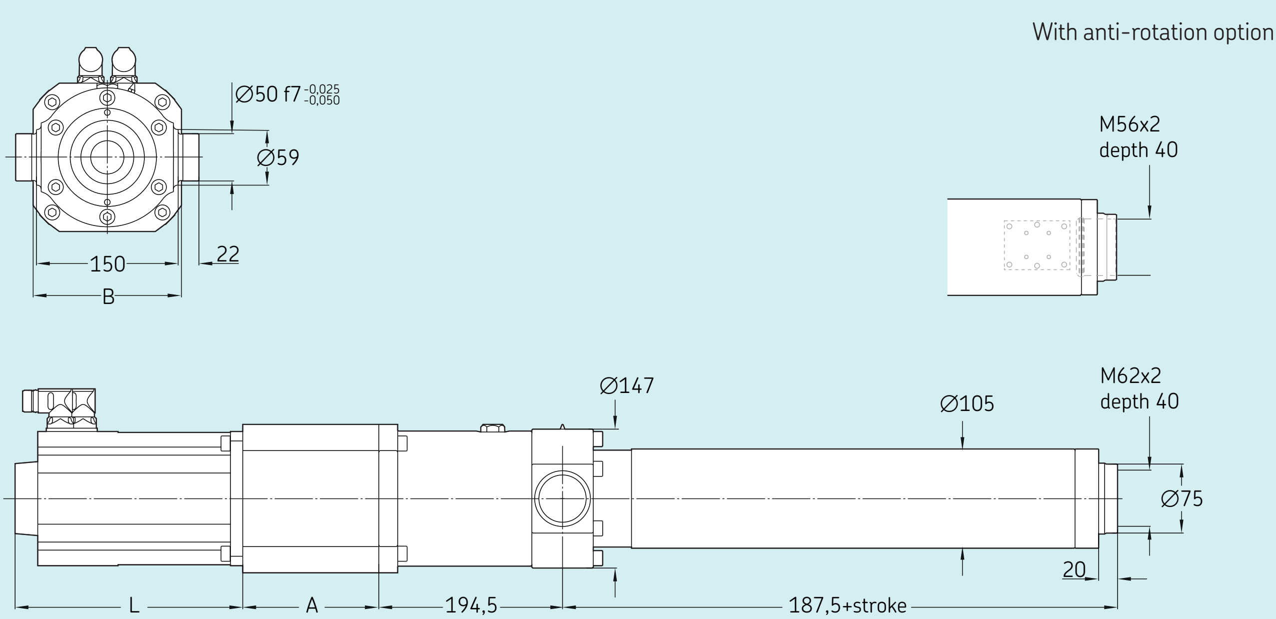
SKF

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LC9	144	281	185	28	50
L30LA6	150	403	185	20	49
L40LA6	186	415	185	20	49

SRSA-S-3905

Electric cylinder
servo motor, parallel configuration

Technical data

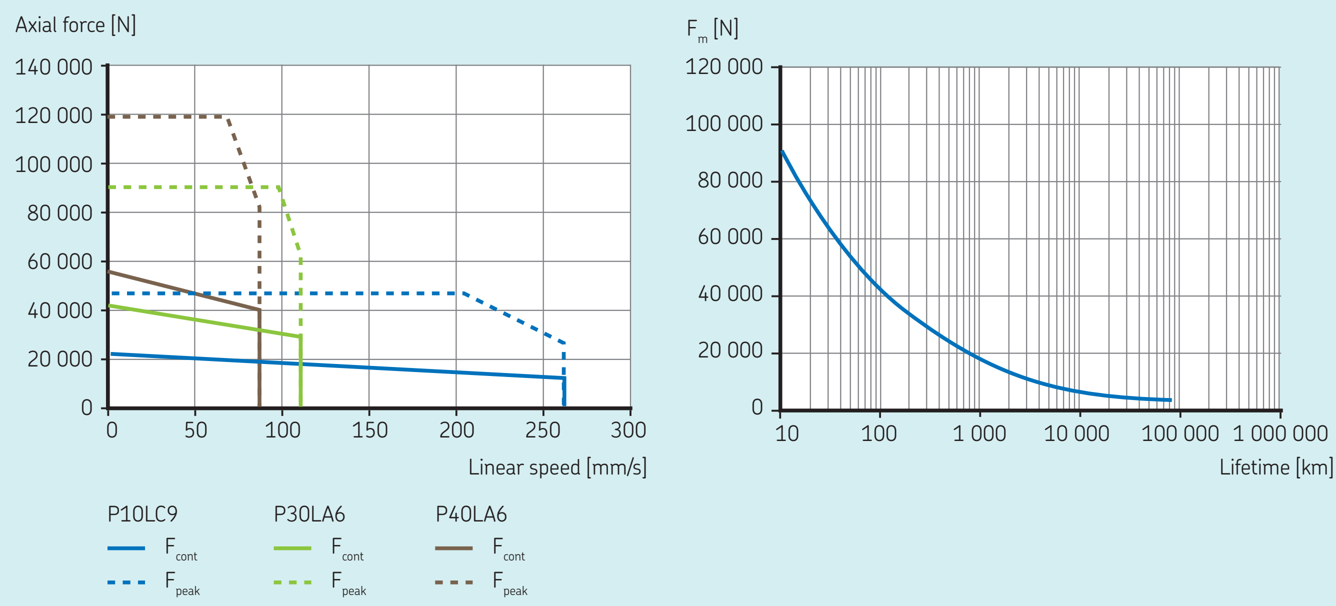
Designation	Symbol	Unit	Servo motor and parallel adapter P10 LC9	 P30 LA6	 P40 LA6
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	25	39,9	53,1
Continuous force @ max. speed	F_c	kN	15,7	29,2	39
Peak force @ zero speed	F_{p0}	kN	45,7	85,8	114,4
Peak force @ max. speed	F_p	kN	27,4	61,4	81,8
Dynamic load capacity	C	kN	129	129	129
Holding force (motorbrake option)	F_{Hold}	kN	36	60	80
Max. linear speed	v_{max}	mm/s	269	113	85
Max. acceleration	a_{max}	m/s^2	3,3	1,6	1
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	39	39	39
Screw lead	p_{screw}	mm	5	5	5
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...900	100...900	100...900
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		1	3	4
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	117,58	54,85	66,45
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,80	0,20	0,11
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	1,07	1,07
Weight @ 0 mm stroke	m	kg	79,8	76,3	80,3
Δ weight per 100 mm stroke	Δm	kg	4,3	4,3	4,3
Weight of optional brake	m_{brake}	kg	1,9	0,9	0,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,5	0,5	0,5
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	23,5	12,4	12,4
Peak current	I_{peak}	A	47	31,2	31,2
Nominal power	P	kW	5,81	4,67	4,67
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

[1] By 100 mm steps
[2] Backlash elimination up to stroke 500 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

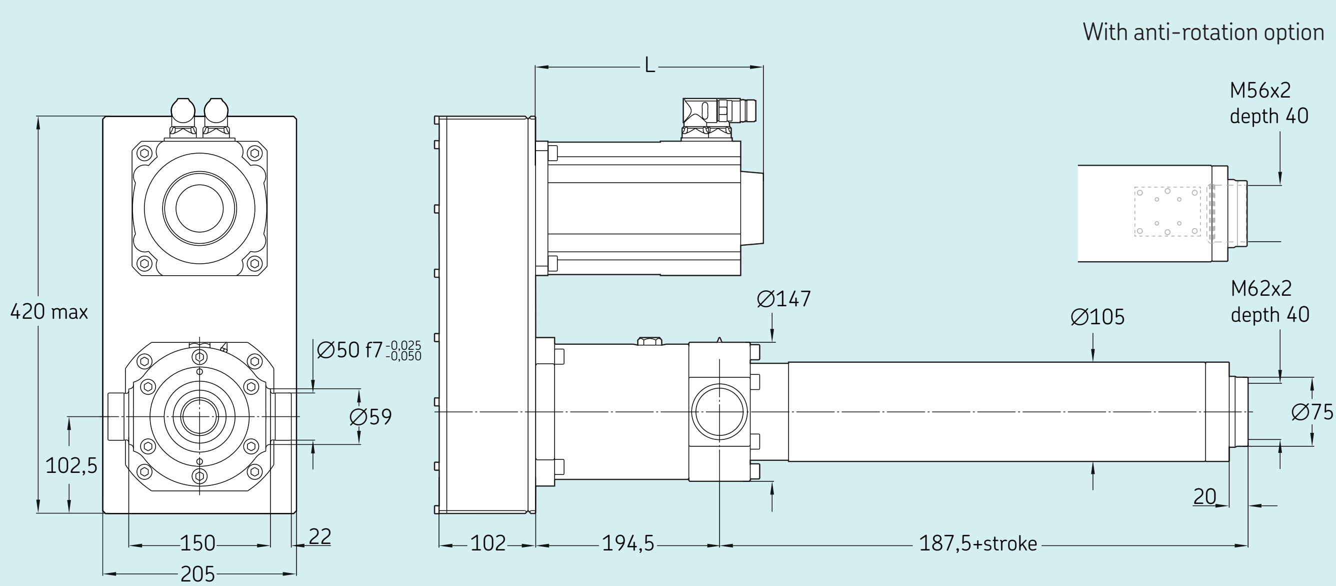
Ordering key

See page 306

Performance diagrams

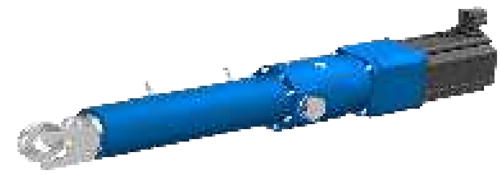


Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LC9	281	28	50
P30LA6	403	20	49
P40LA6	415	20	49

SRSA-S-3910



Electric cylinder
servo motor, inline configuration

Technical data

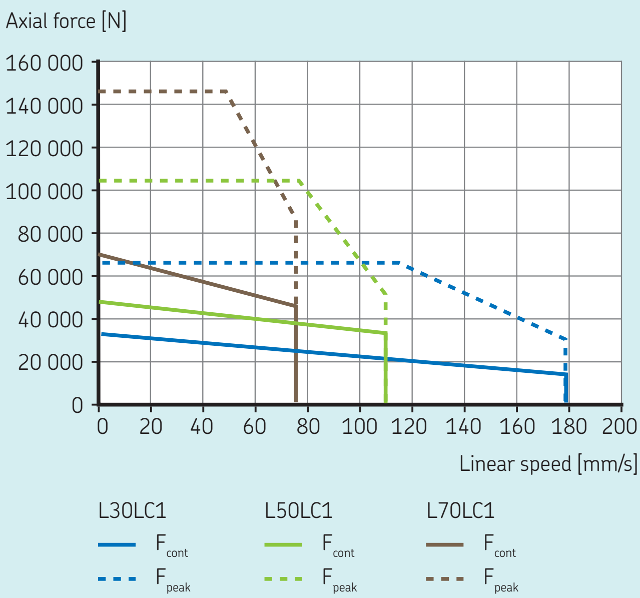
Designation	Symbol	Unit	Servo motor and Inline adapter L30 LC1	L50 LC1	L70 LC1
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	29,8	49,6	69,5
Continuous force @ max. speed	F_c	kN	20,3	33,9	47,4
Peak force @ zero speed	F_{p0}	kN	62,4	104,1	145,7
Peak force @ max. speed	F_p	kN	28,8	47,9	67,1
Dynamic load capacity	C	kN	153	153	153
Holding force (motorbrake option)	F_{Hold}	kN	49	82	115
Max. linear speed	v_{max}	mm/s	179	107	77
Max. acceleration	a_{max}	m/s^2	9,2	7,2	4,2
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	39	39	39
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...900	100...900	100...900
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		3	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	24,60	19,04	23,05
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,20	0,07	0,04
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	72,2	72,2	88,4
Δ weight per 100 mm stroke	Δm	kg	4,3	4,3	4,3
Weight of optional brake	m_{brake}	kg	1,9	1,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,5	0,5	0,5
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	16,5	16,5	16,5
Peak current	I_{peak}	A	39,6	39,6	39,6
Nominal power	P	kW	4,73	4,73	4,73
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

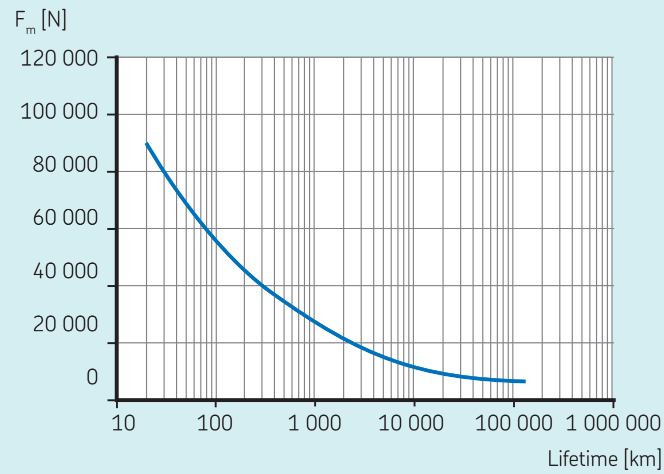
[1] By 100 mm steps
[2] Backlash elimination up to stroke 500 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

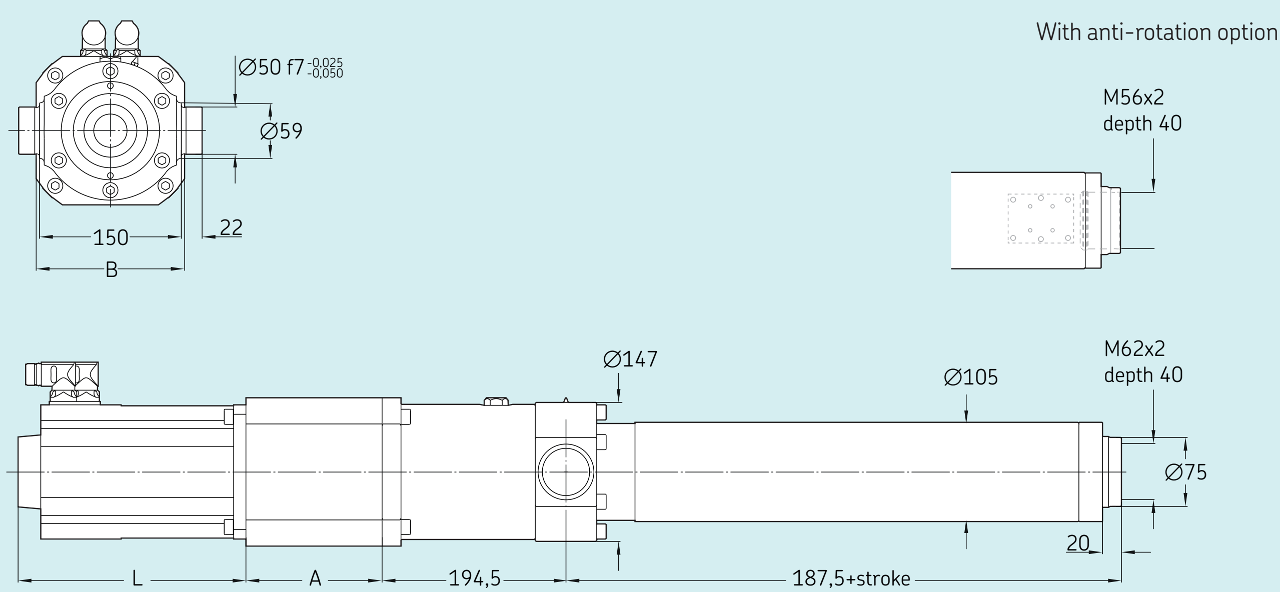
See page 306

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L30LC1	186	455	185	28	50
L50LC1	186	455	185	28	50
L70LC1	216	483	185	28	50

SRSA-S-3910

Electric cylinder
servo motor, parallel configuration

Technical data

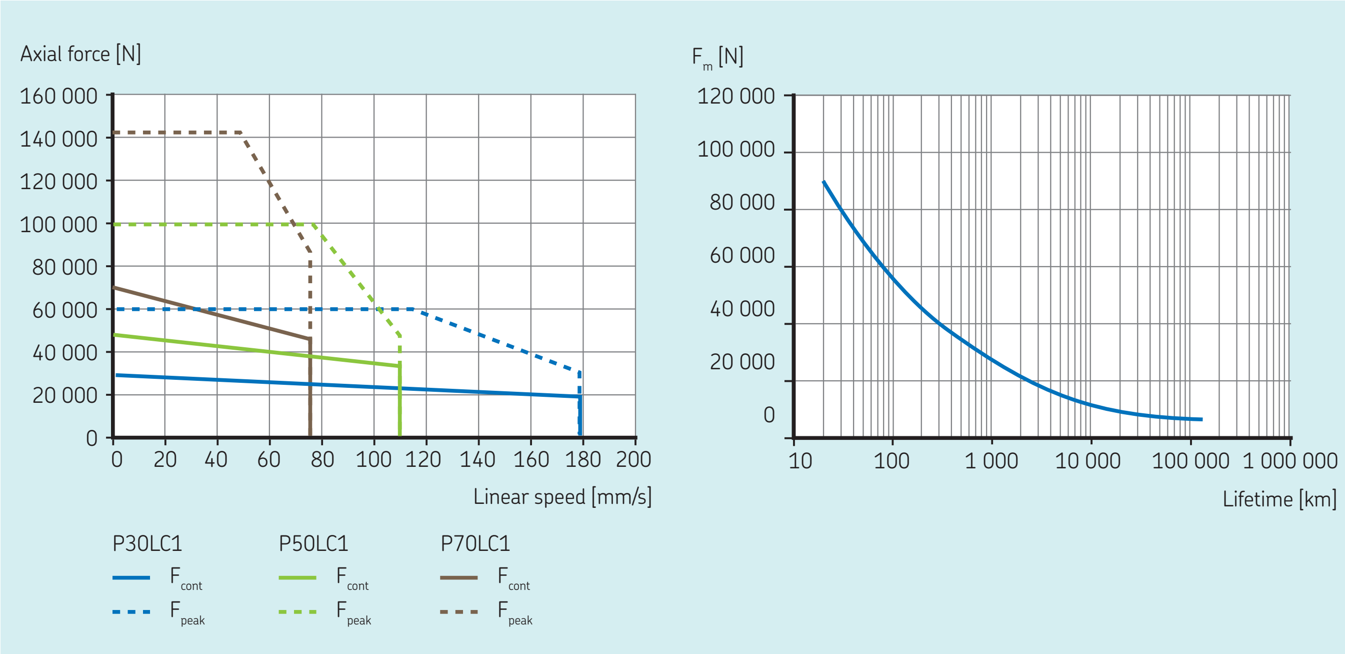
Designation	Symbol	Unit	Servo motor and parallel adapter P30 LC1	 P50 LC1	 P70 LC1
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	28,9	48,1	67,4
Continuous force @ max. speed	F_c	kN	19,7	32,9	46
Peak force @ zero speed	F_{p0}	kN	60,6	100,9	141,3
Peak force @ max. speed	F_p	kN	27,9	46,5	65,1
Dynamic load capacity	C	kN	153	153	153
Holding force (motorbrake option)	F_{Hold}	kN	51	84	118
Max. linear speed	v_{max}	mm/s	179	107	77
Max. acceleration	a_{max}	m/s^2	3	1,5	0,5
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	39	39	39
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G5	G5	G5
Stroke 1)	s	mm	100...900	100...900	100...900
Internal overstroke each side	s_0	mm	5	5	5
Backlash 2)	$s_{backlash}$	mm	0	0	0
Gear reduction	i		3	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	75,55	93,74	213,66
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,20	0,07	0,04
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	83,2	86,3	97,6
Δ weight per 100 mm stroke	Δm	kg	4,3	4,3	4,3
Weight of optional brake	m_{brake}	kg	1,9	1,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,5	0,5	0,5
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	16,5	16,5	16,5
Peak current	I_{peak}	A	39,6	39,6	39,6
Nominal power	P	kW	4,73	4,73	4,73
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection 3)	IP	–	54	54	54

1) By 100 mm steps
2) Backlash elimination up to stroke 500 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

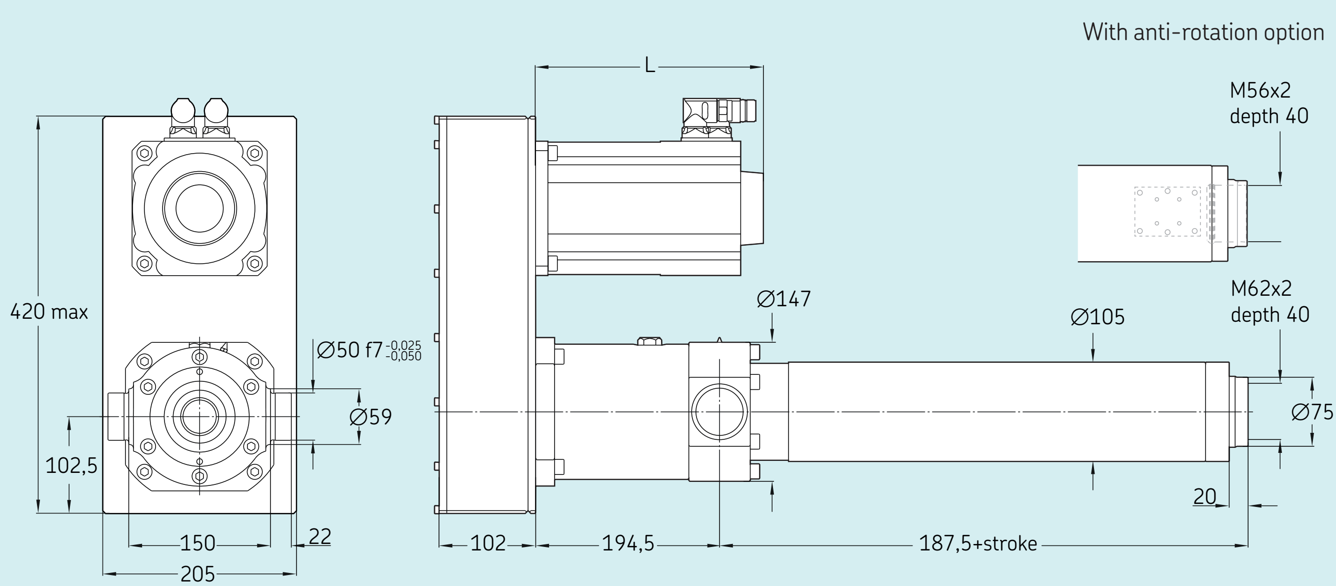
Ordering key

See page 306

Performance diagrams



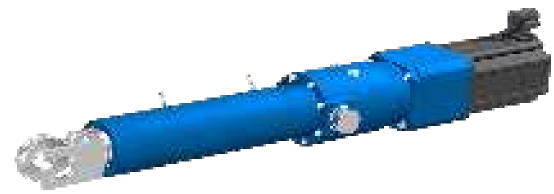
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
–	mm		
P30LC1	455	28	50
P50LC1	455	28	50
P70LC1	483	28	50

SRSA-S-3915

Electric cylinder
servo motor, inline configuration



Technical data

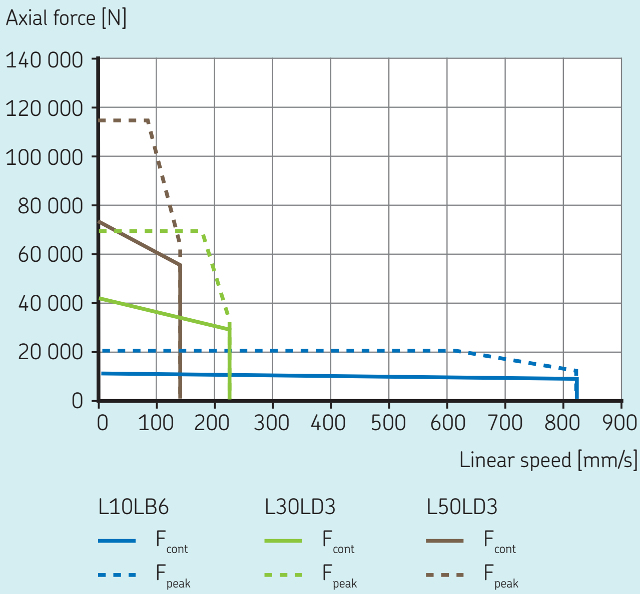
Designation	Symbol	Unit	Servo motor and inline adapter L10 LB6	L30 LD3	L50 LD3
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	12	42,6	71
Continuous force @ max. speed	F_c	kN	7,1	32,3	53,8
Peak force @ zero speed	F_{p0}	kN	20,1	68,7	114,6
Peak force @ max. speed	F_p	kN	9,1	38,2	63,6
Dynamic load capacity	C	kN	168	168	168
Holding force (motorbrake option)	F_{Hold}	kN	10	32	54
Max. linear speed	v_{max}	mm/s	807	219	131
Max. acceleration	a_{max}	m/s^2	21,4	7,7	6,8
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	39	39	39
Screw lead	p_{screw}	mm	15	15	15
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...900	100...900	100...900
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		1	3	5
Inertia @ 0 mm stroke	J	10^{-4} kgm²	64,88	72,65	49,30
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm²	1,80	0,20	0,07
Inertia of optional brake	J_{brake}	10^{-4} kgm²	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	70,2	101,9	101,9
Δ weight per 100 mm stroke	Δm	kg	4,3	4,3	4,3
Weight of optional brake	m_{brake}	kg	1,9	1,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,5	0,5	0,5
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	23,5	28,3	28,3
Peak current	I_{peak}	A	47	56	56
Nominal power	P	kW	7,09	9,07	9,07
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

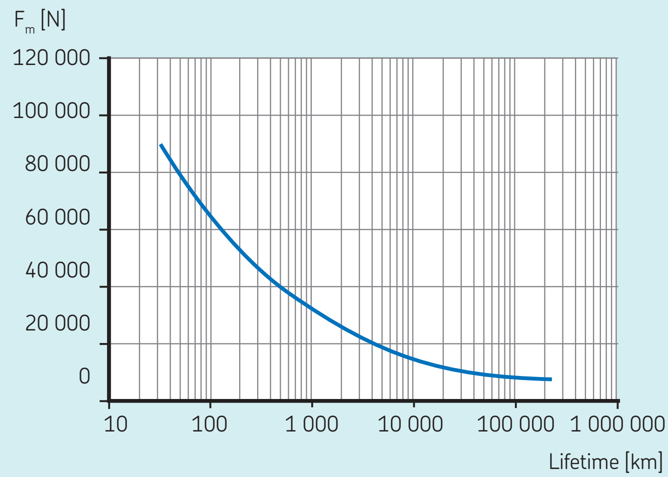
[1] By 100 mm steps
[2] Backlash elimination up to stroke 500 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

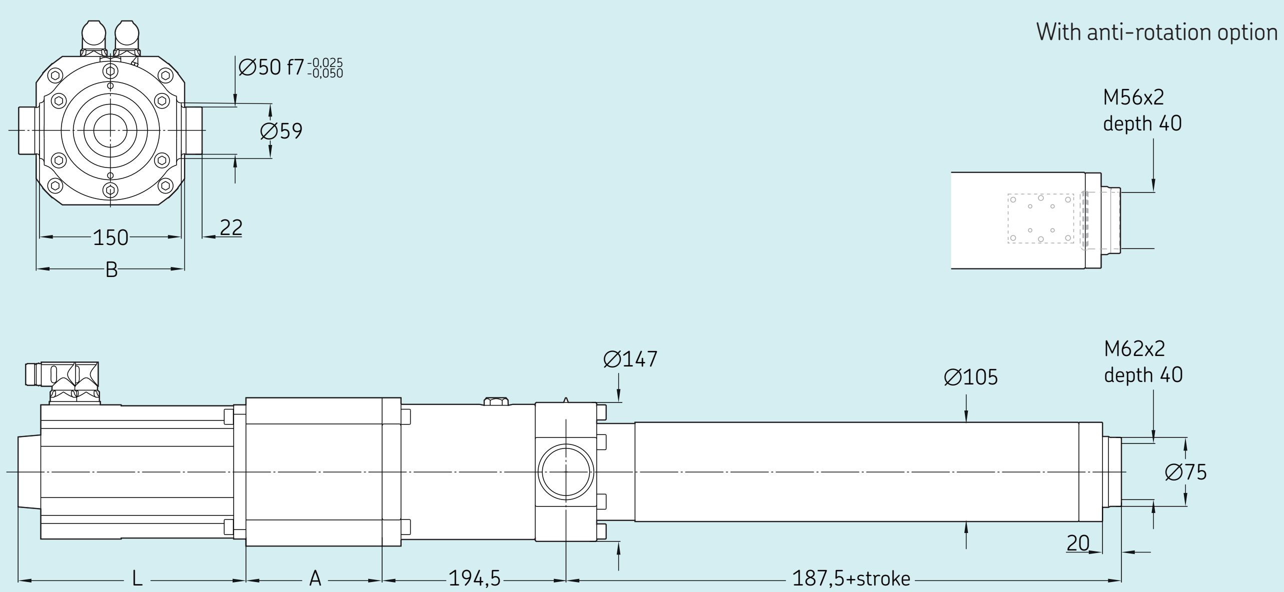
See page 306

Performance diagrams





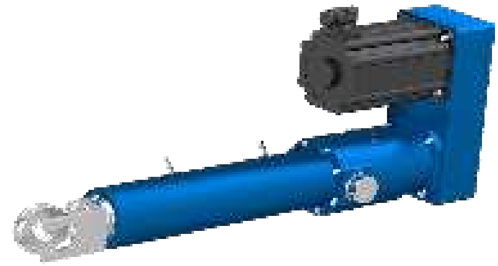
Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
–	mm				
L10LB6	144	321	185	28	50
L30LD3	216	584	185	28	50
L50LD3	216	584	185	28	50

SRSA-S-3915

Electric cylinder
servo motor, parallel configuration



Technical data

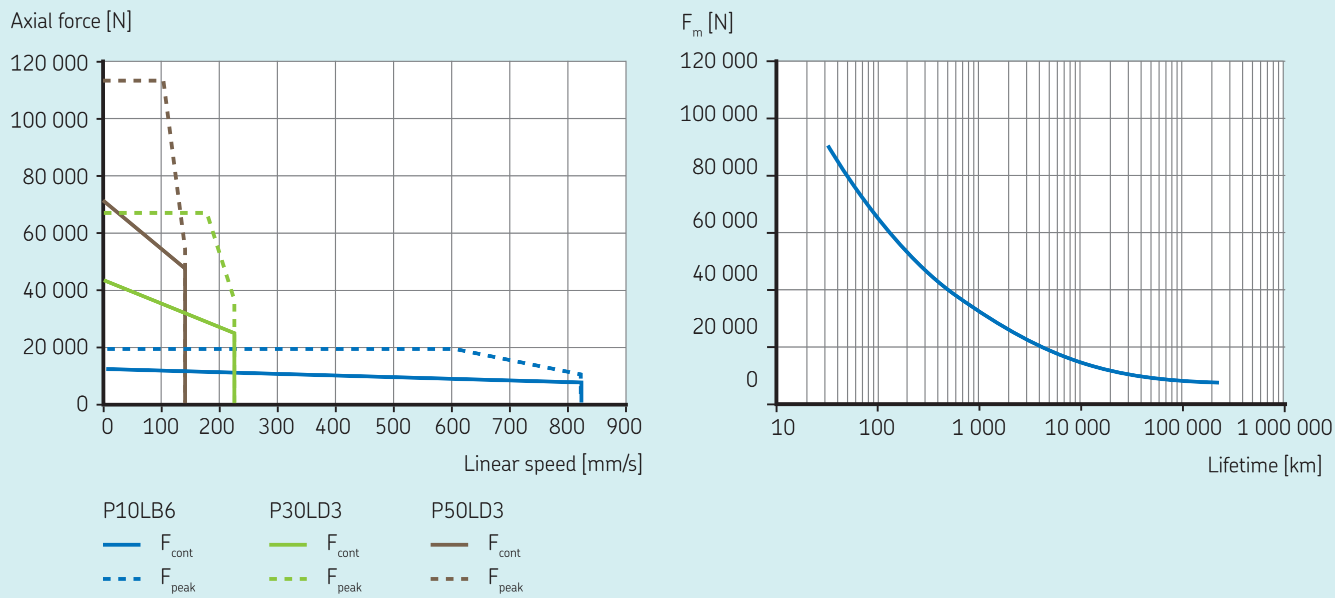
Designation	Symbol	Unit	Servo motor and parallel adapter P10 LB6	P30 LD3	P50 LD3
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	11,7	41,3	68,9
Continuous force @ max. speed	F_c	kN	6,9	31,3	52,2
Peak force @ zero speed	F_{p0}	kN	19,5	66,7	111,1
Peak force @ max. speed	F_p	kN	8,8	37	61,7
Dynamic load capacity	C	kN	168	168	168
Holding force (motorbrake option)	F_{Hold}	kN	11	33	56
Max. linear speed	v_{max}	mm/s	807	219	131
Max. acceleration	a_{max}	m/s^2	10,9	4,3	1,4
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	39	39	39
Screw lead	p_{screw}	mm	15	15	15
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...900	100...900	100...900
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		1	3	5
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	64,88	72,65	49,30
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,80	0,20	0,07
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	70,2	101,9	101,9
Δ weight per 100 mm stroke	Δm	kg	4,3	4,3	4,3
Weight of optional brake	m_{brake}	kg	1,9	1,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,5	0,5	0,5
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	23,5	28,3	28,3
Peak current	I_{peak}	A	47	56	56
Nominal power	P	kW	7,09	9,07	9,07
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

1) By 100 mm steps
2) Backlash elimination up to stroke 500 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

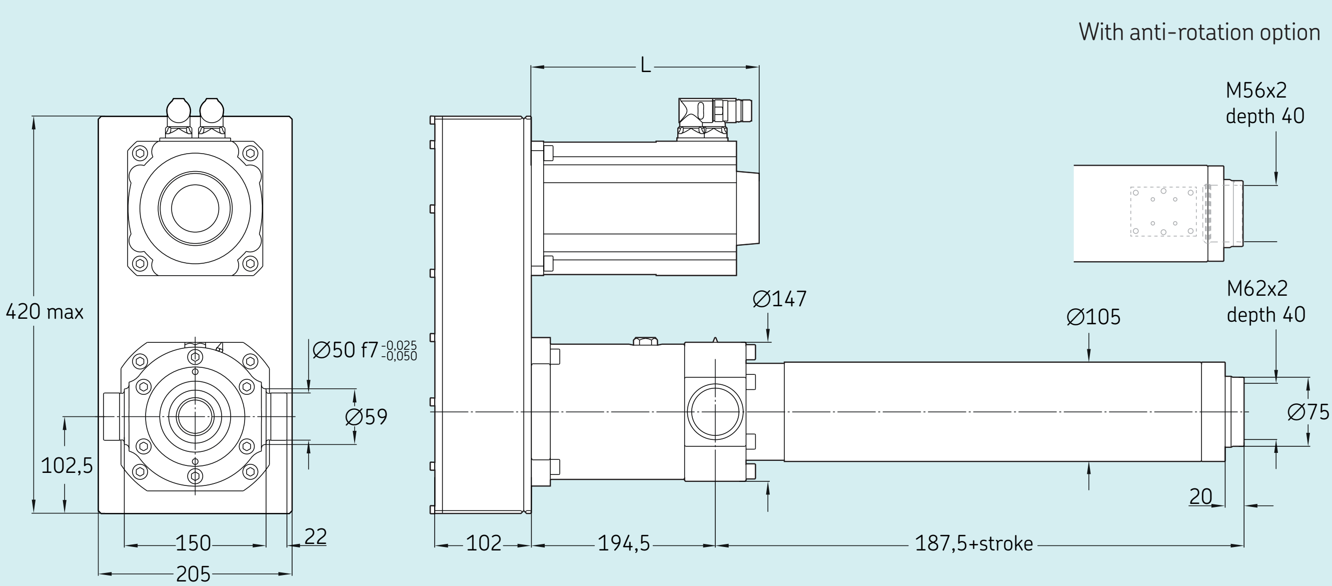
Ordering key

See page 306

Performance diagrams

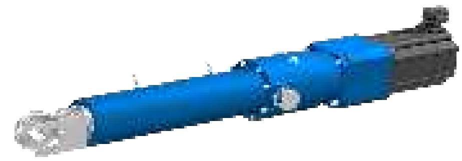


Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LB6	321	28	50
P30LD3	584	28	50
P50LD3	584	28	50

SRSA-S-4805



Electric cylinder
servo motor, inline configuration

Technical data

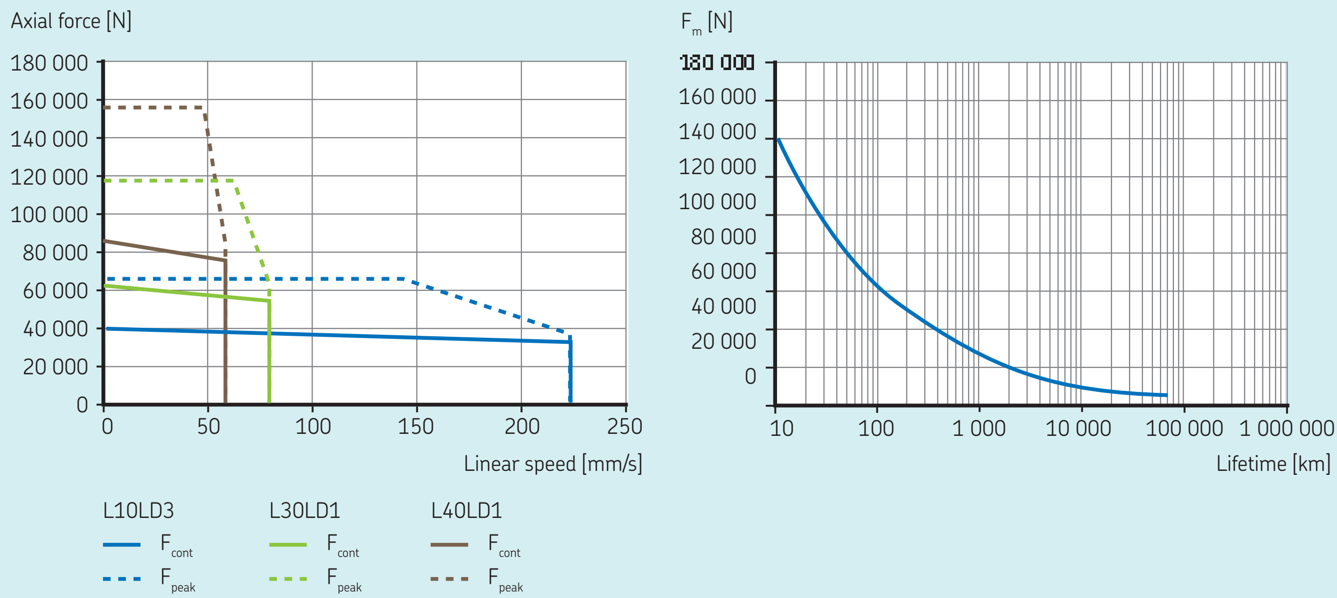
Designation	Symbol	Unit	Servo motor and inline adapter L10 LD3	L30 LD1	L40 LD1
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	40	61,2	81,6
Continuous force @ max. speed	F_c	kN	30,3	54,8	73,1
Peak force @ zero speed	F_{p0}	kN	64,5	117,6	156,8
Peak force @ max. speed	F_p	kN	35,8	63,4	84,5
Dynamic load capacity	C	kN	198	198	198
Holding force (motorbrake option)	F_{Hold}	kN	36	113	150
Max. linear speed	v_{max}	mm/s	219	77	58
Max. acceleration	a_{max}	m/s^2	3,5	3,5	3,5
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48
Screw lead	p_{screw}	mm	5	5	5
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		1	3	4
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	154,58	32,50	24,98
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	4,12	0,46	0,26
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	107,3	109,1	109,1
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7
Weight of optional brake	m_{brake}	kg	1,9	1,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	28,3	16,5	16,5
Peak current	I_{peak}	A	56	39,6	39,6
Nominal power	P	kW	9,07	5,96	5,96
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

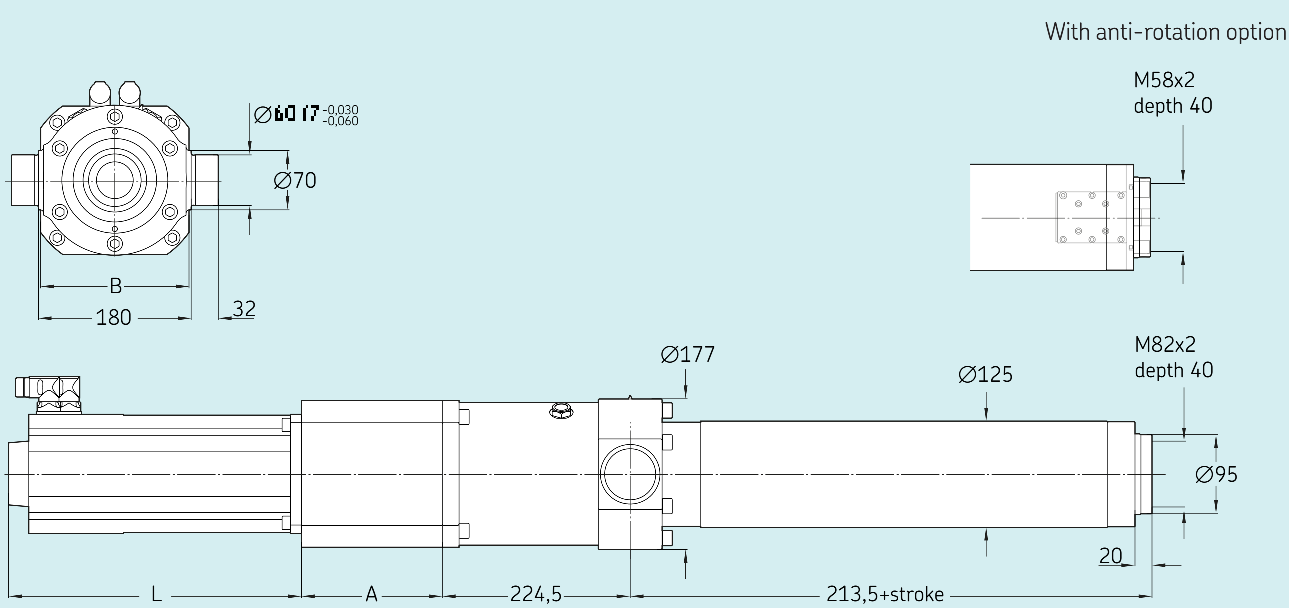
Ordering key

See page 306

Performance diagrams



Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LD3	168	409	192	28	50
L30LD1	206	476	192	28	50
L40LD1	206	476	192	28	50

SRSA-S-4805

Electric cylinder
servo motor, parallel configuration

Technical data

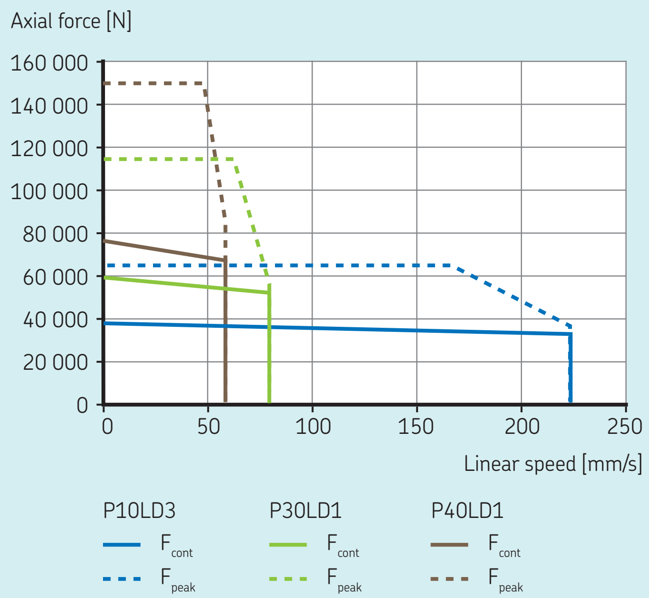
Designation	Symbol	Unit	Servo motor and parallel adapter P10 LD3	P30 LD1	P40 LD1
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	38,8	59,4	79,2
Continuous force @ max. speed	F_c	kN	29,4	53,2	70,9
Peak force @ zero speed	F_{p0}	kN	62,6	114,1	152,1
Peak force @ max. speed	F_p	kN	34,8	61,5	81,9
Dynamic load capacity	C	kN	198	198	198
Holding force (motorbrake option)	F_{Hold}	kN	38	116	155
Max. linear speed	v_{max}	mm/s	219	77	58
Max. acceleration	a_{max}	m/s^2	3,4	1,5	0,9
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48
Screw lead	p_{screw}	mm	5	5	5
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		1	3	4
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	161,88	79,22	98,33
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	4,12	0,46	0,26
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	112,9	111,5	114,6
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7
Weight of optional brake	m_{brake}	kg	1,9	1,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	28,3	16,5	16,5
Peak current	I_{peak}	A	56	39,6	39,6
Nominal power	P	kW	9,07	5,96	5,96
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

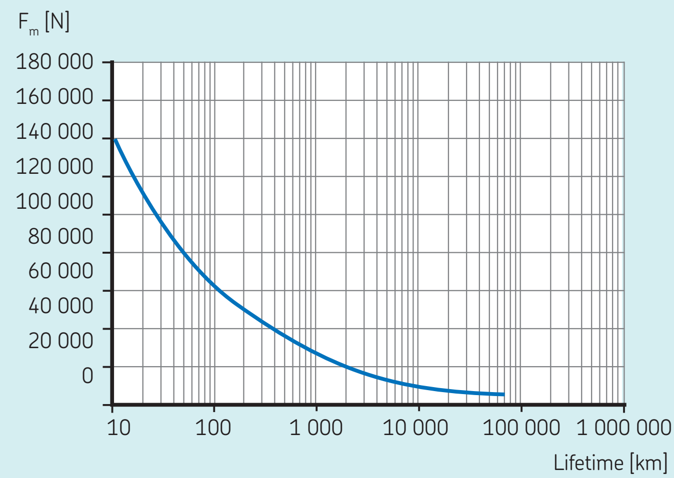
[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

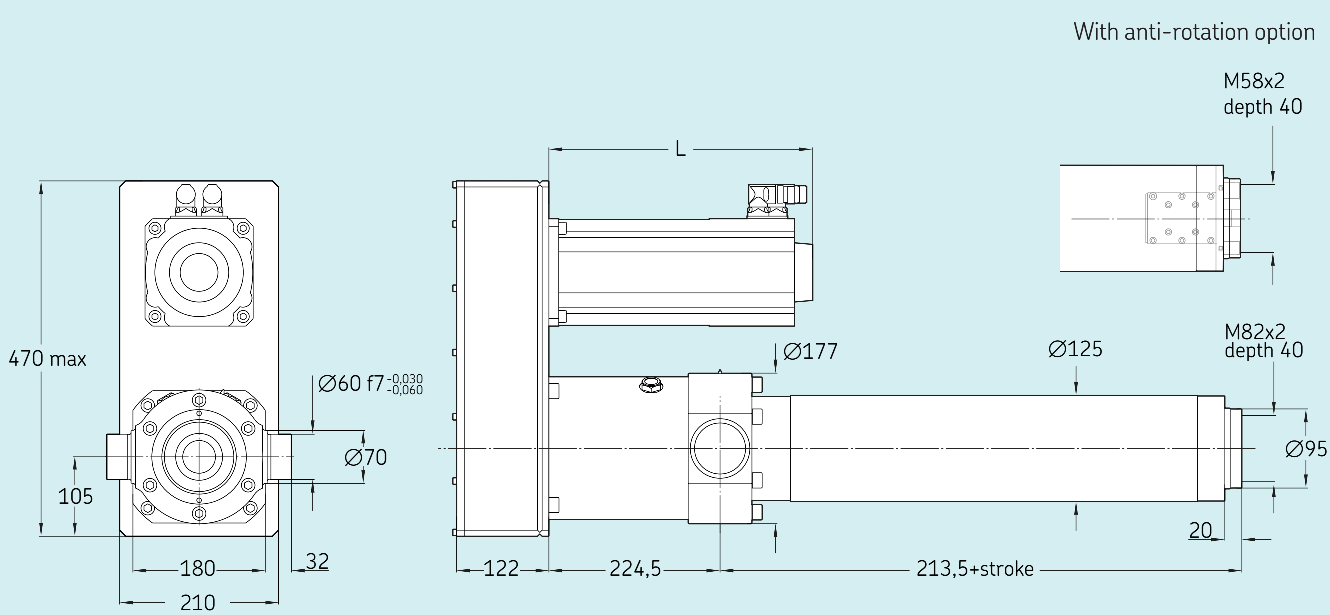
See page 306

Performance diagrams



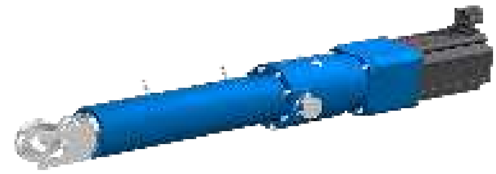


Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LD3	409	28	50
P30LD1	476	28	50
P40LD1	476	28	50

SRSA-S-4810



Electric cylinder
servo motor, inline configuration

Technical data

Designation	Symbol	Unit	Servo motor and inline adapter L30 LD2	 L40 LD2	 L50 LD2
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	49,5	66	82,5
Continuous force @ max. speed	F_c	kN	36,6	48,8	61
Peak force @ zero speed	F_{p0}	kN	87	116	145
Peak force @ max. speed	F_p	kN	48,4	64,5	80,6
Dynamic load capacity	C	kN	232	232	232
Holding force (motorbrake option)	F_{Hold}	kN	50	67	84
Max. linear speed	v_{max}	mm/s	167	125	100
Max. acceleration	a_{max}	m/s^2	7,6	7	4,1
Duty cycle	D	%	100%	100%	100%
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		3	4	5
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	41,70	34,18	46,45
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,46	0,26	0,16
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	113,6	113,6	126,6
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7
Weight of optional brake	m_{brake}	kg	1,9	1,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	26,7	26,7	26,7
Peak current	I_{peak}	A	56	56	56
Nominal power	P	kW	8,01	8,01	8,01
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

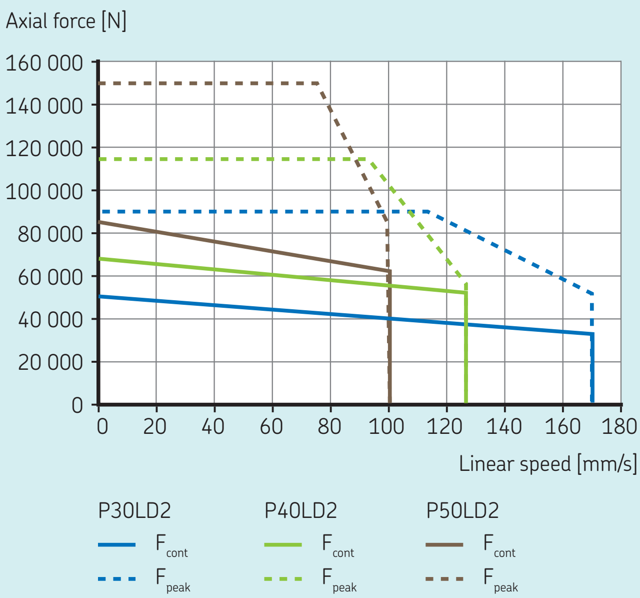
[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

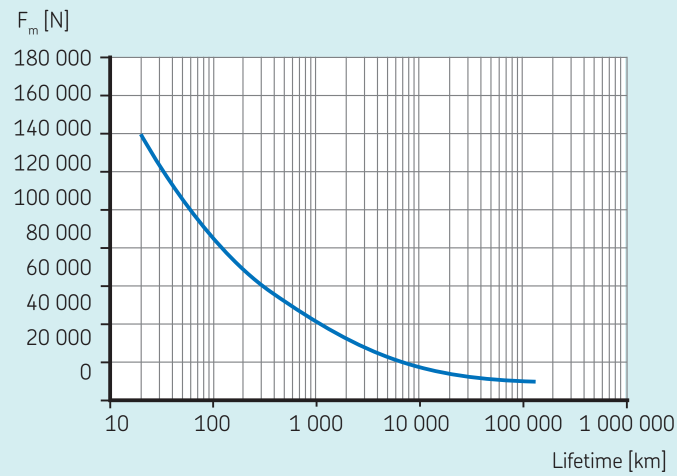
Ordering key

See page 306

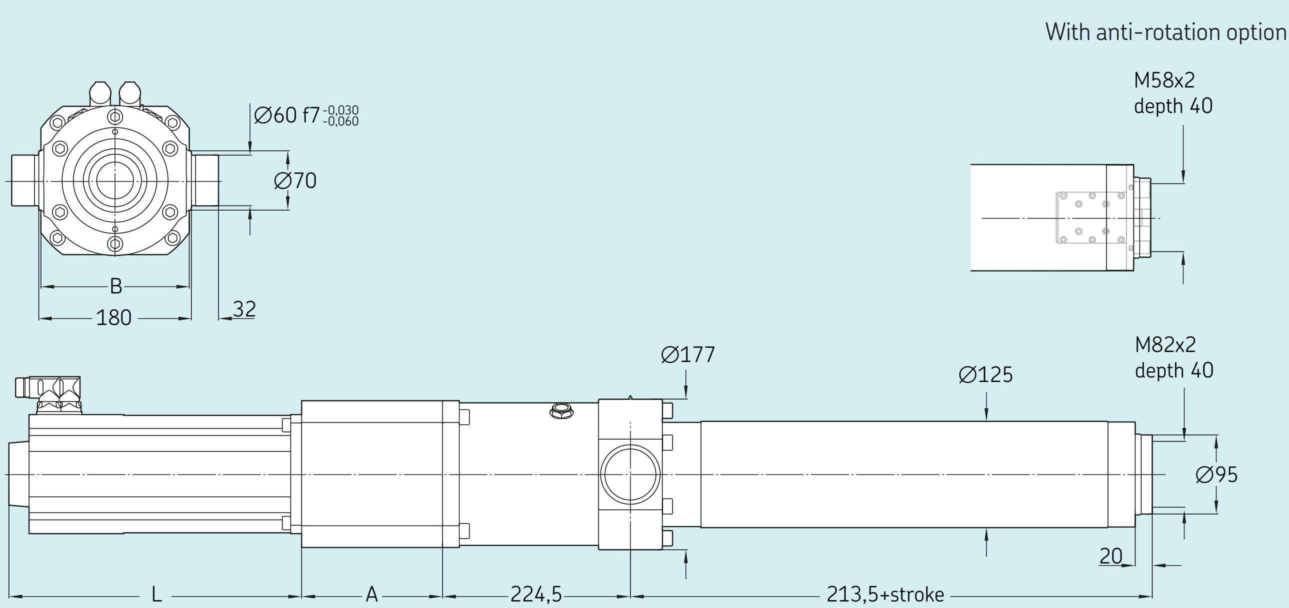
SKF

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L30LD2	206	516	192	28	50
L40LD2	206	516	192	28	50
L50LD2	239	544	192	28	50

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Electric cylinder
servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	Servo motor and parallel adapter P30 LD2	P40 LD2	P50 LD2
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	48	64,1	80,1
Continuous force @ max. speed	F_c	kN	35,5	47,3	59,2
Peak force @ zero speed	F_{p0}	kN	84,4	112,5	140,6
Peak force @ max. speed	F_p	kN	46,9	62,6	78,2
Dynamic load capacity	C	kN	232	232	232
Holding force (motorbrake option)	F_{Hold}	kN	52	69	86
Max. linear speed	v_{max}	mm/s	167	125	100
Max. acceleration	a_{max}	m/s^2	2,8	2,2	1,4
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		3	4	5
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	115,41	107,53	137,82
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,46	0,26	0,16
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	3,20	3,20
Weight @ 0 mm stroke	m	kg	119,1	119,1	126,3
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7
Weight of optional brake	m_{brake}	kg	1,9	1,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	26,7	26,7	26,7
Peak current	I_{peak}	A	56	56	56
Nominal power	P	kW	8,01	8,01	8,01
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

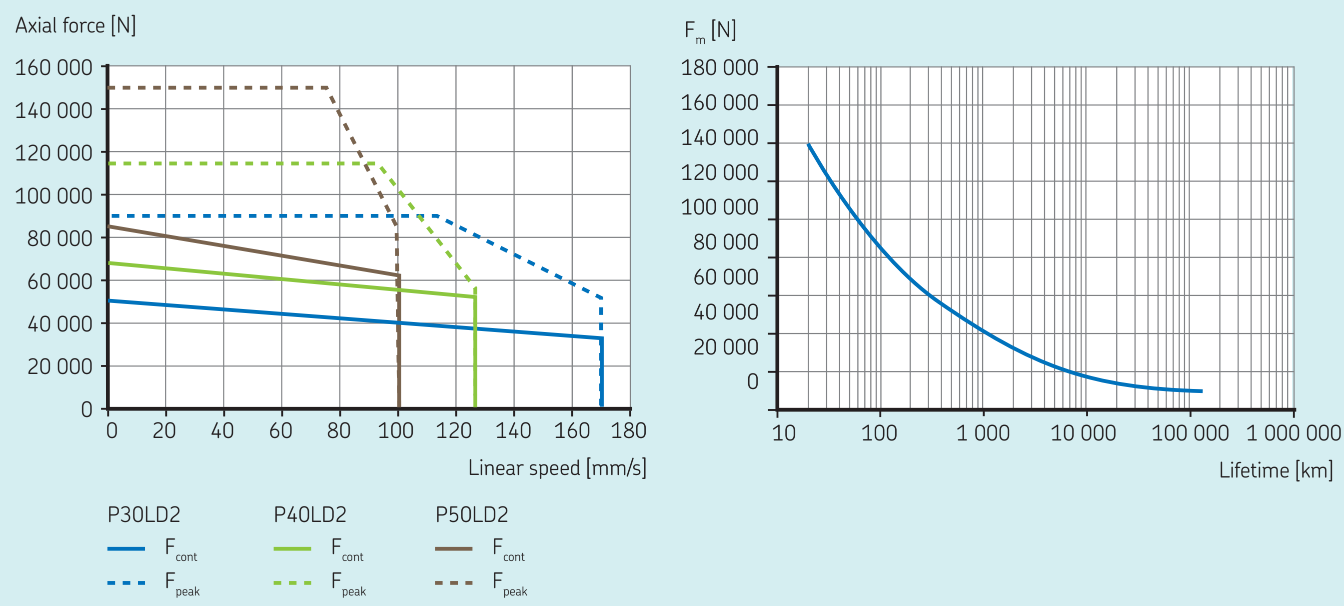
[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

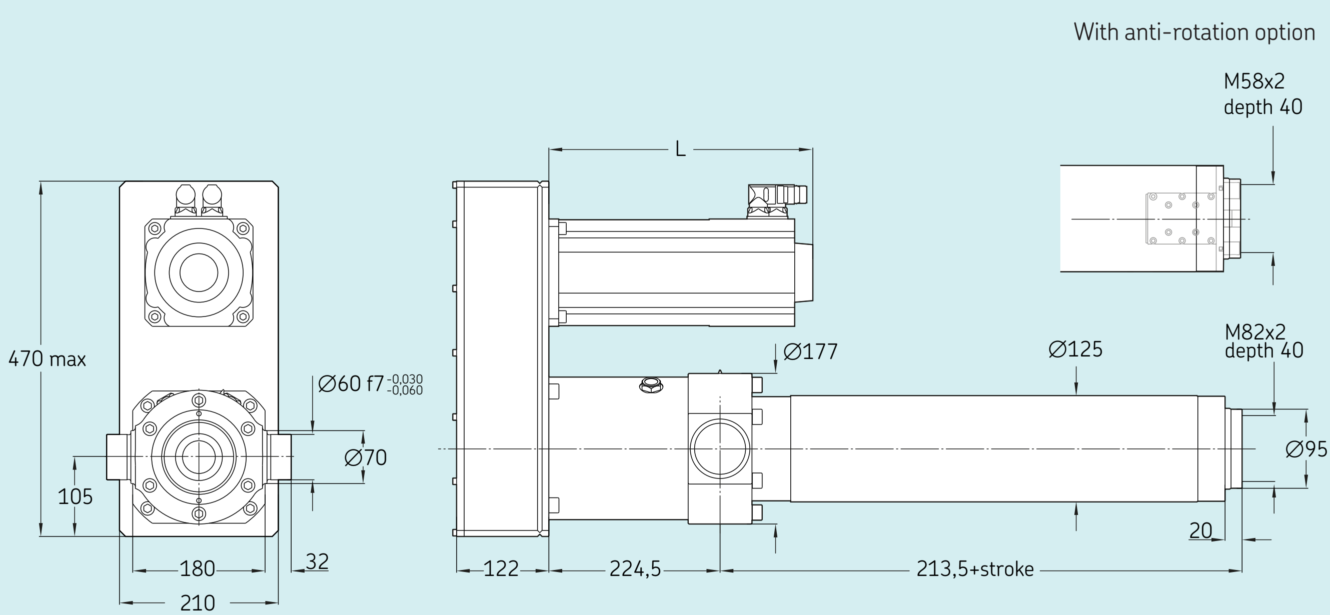
See page 306

SKF

Performance diagrams



Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P30LD2	516	28	50
P40LD2	516	28	50
P50LD2	544	28	50

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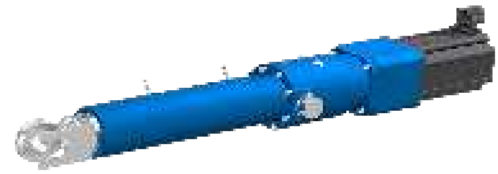


Electric cylinder
servo motor, inline configuration

Technical data

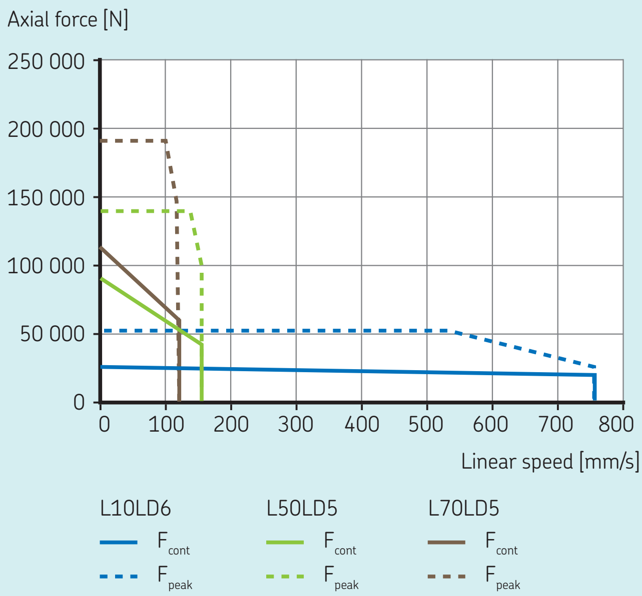
Designation	Symbol	Unit	Servo motor and inline adapter L10 LD6	 L50 LD5	 L70 LD5
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	28,9	83,2	116,5
Continuous force @ max. speed	F_c	kN	17,8	47,3	66,3
Peak force @ zero speed	F_{p0}	kN	51,8	137,8	192,9
Peak force @ max. speed	F_p	kN	29,3	100,4	140,5
Dynamic load capacity	C	kN	258	258	258
Holding force (motorbrake option)	F_{Hold}	kN	18	91	127
Max. linear speed	v_{max}	mm/s	713	150	107
Max. acceleration	a_{max}	m/s^2	13	3,1	2,4
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48
Screw lead	p_{screw}	mm	15	15	15
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i		1	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	279,80	129,05	120,06
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	4,12	0,16	0,08
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	128,8	144	144
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	30,5	30,5
Peak current	I_{peak}	A	94	56	56
Nominal power	P	kW	15,82	9,11	9,11
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

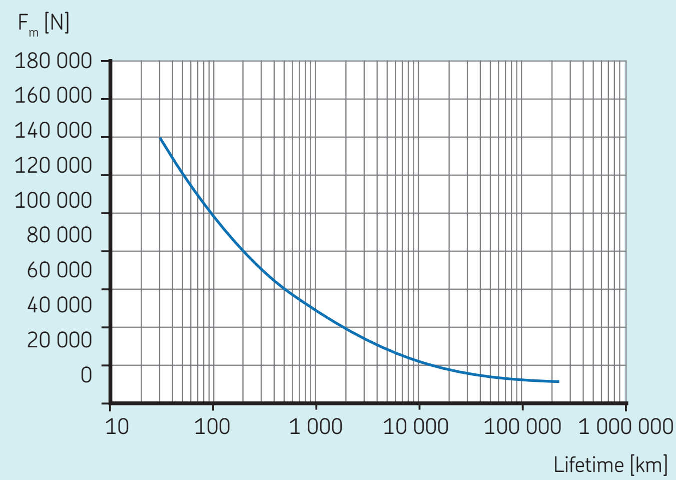
1) By 100 mm steps
2) Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

Ordering key

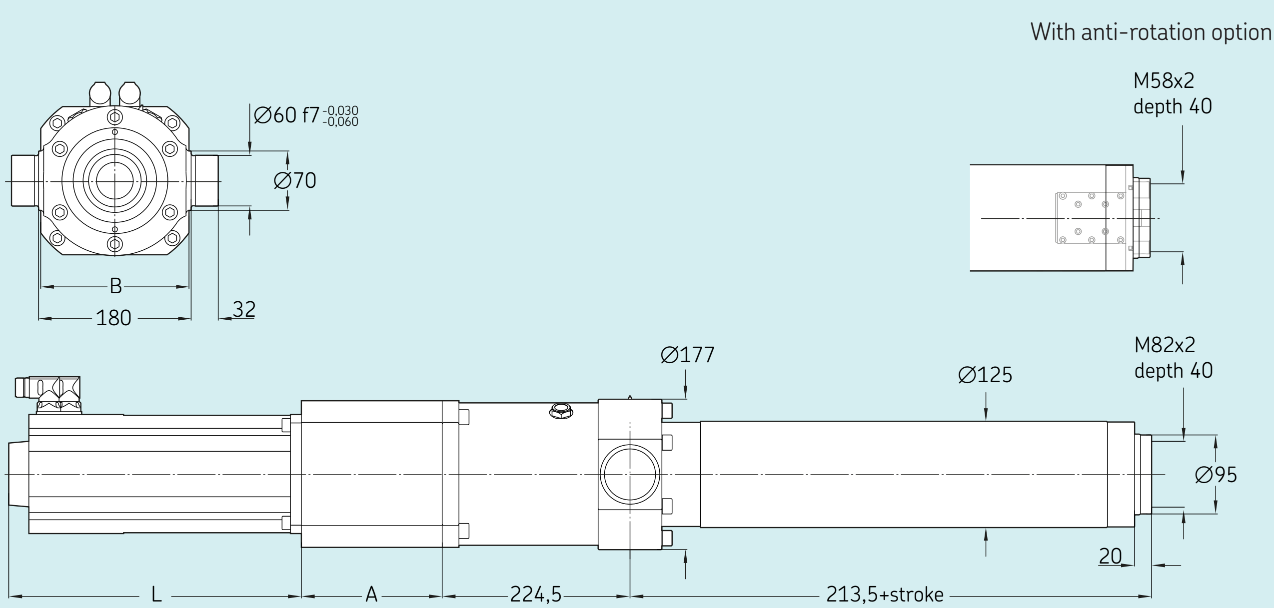
See page 306

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LD6	178	427	192	44	49
L50LD5	239	435	192	44	49
L70LD5	239	435	192	44	49

SRSA-S-4815

Electric cylinder
servo motor, parallel configuration

Technical data

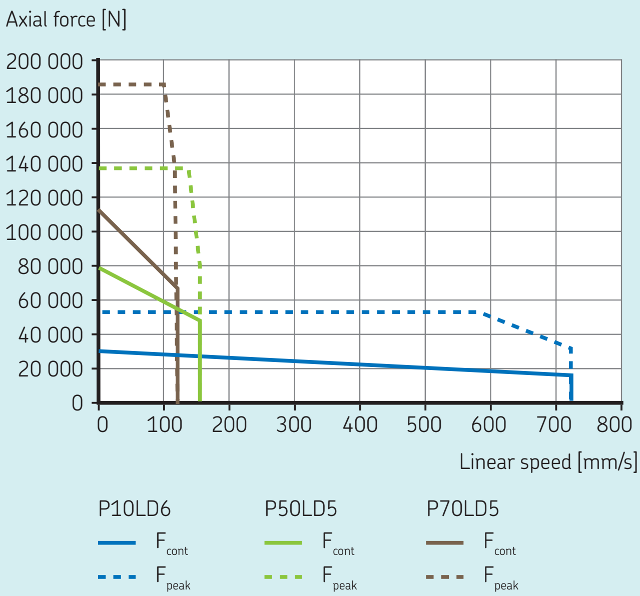
Designation	Symbol	Unit	Servo motor and parallel adapter P10 LD6	P50 LD5	P70 LD5
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	28,1	80,7	113
Continuous force @ max. speed	F_c	kN	17,3	45,9	64,3
Peak force @ zero speed	F_{p0}	kN	50,3	133,6	187,1
Peak force @ max. speed	F_p	kN	28,4	97,3	136,3
Dynamic load capacity	C	kN	258	258	258
Holding force (motorbrake option)	F_{Hold}	kN	18	94	131
Max. linear speed	v_{max}	mm/s	713	150	107
Max. acceleration	a_{max}	m/s^2	10,1	0,9	0,6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48
Screw lead	p_{screw}	mm	15	15	15
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	1	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	360,05	458,17	448,18
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	4,12	0,16	0,08
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	134,6	141,9	139,7
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	30,5	30,5
Peak current	I_{peak}	A	94	56	56
Nominal power	P	kW	15,82	9,11	9,11
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

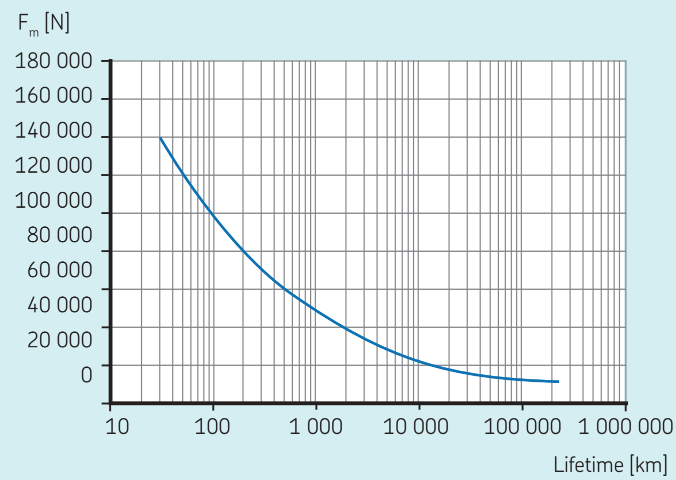
[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

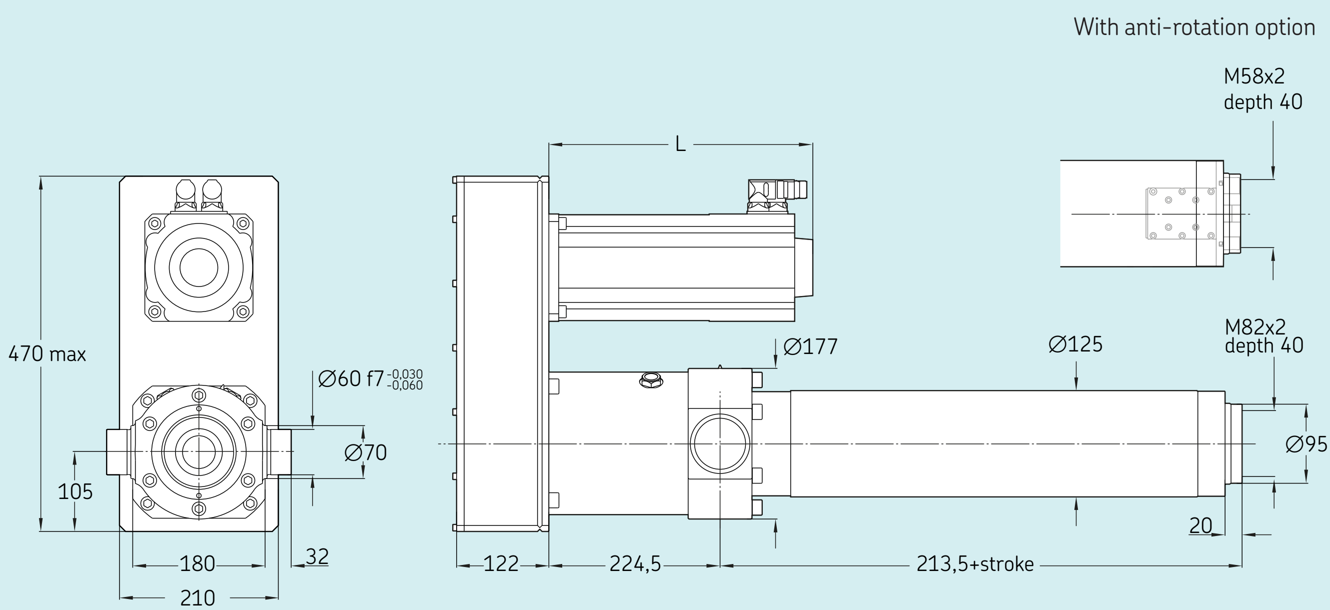
See page 306

Performance diagrams





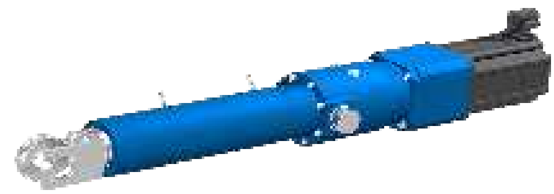
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LD6	427	44	49
P50LD5	435	44	49
P70LD5	435	44	49

SRSA-S-4820

Electric cylinder
servo motor, inline configuration



Technical data

Designation	Symbol	Unit	Servo motor and inline adapter L10 LD6	L50 LD7	L70 LD7
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	21,7	78,3	109,7
Continuous force @ max. speed	F_c	kN	13,4	39,2	54,8
Peak force @ zero speed	F_{p0}	kN	38,9	185,4	259,6
Peak force @ max. speed	F_p	kN	22	83,8	117,4
Dynamic load capacity	C	kN	261	261	261
Holding force (motorbrake option)	F_{Hold}	kN	13	68	95
Max. linear speed	v_{max}	mm/s	950	200	143
Max. acceleration	a_{max}	m/s^2	17,3	4,5	3,6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48
Screw lead	p_{screw}	mm	20	20	20
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	1	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	279,80	214,25	191,98
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	4,12	0,16	0,08
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	128,5	168,2	168,2
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	34,9	34,9
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	10,05	10,05
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

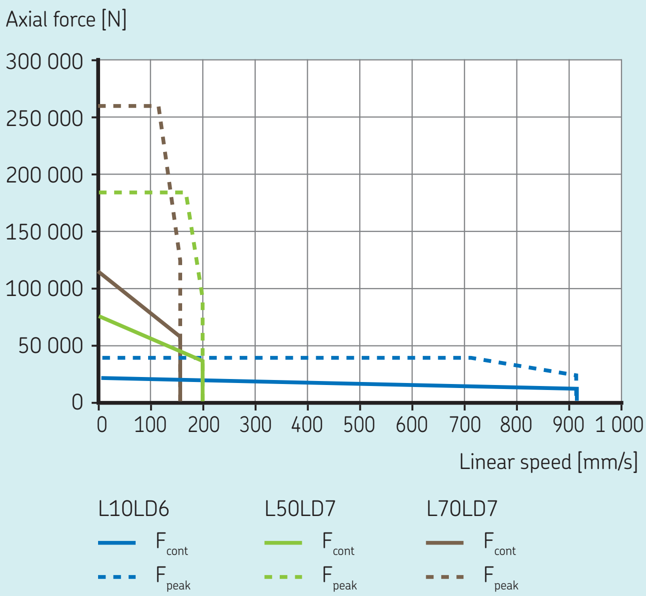
[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

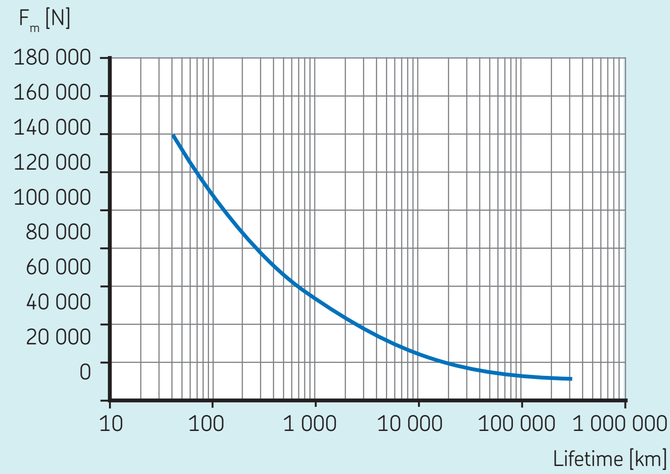
Ordering key

See page 306

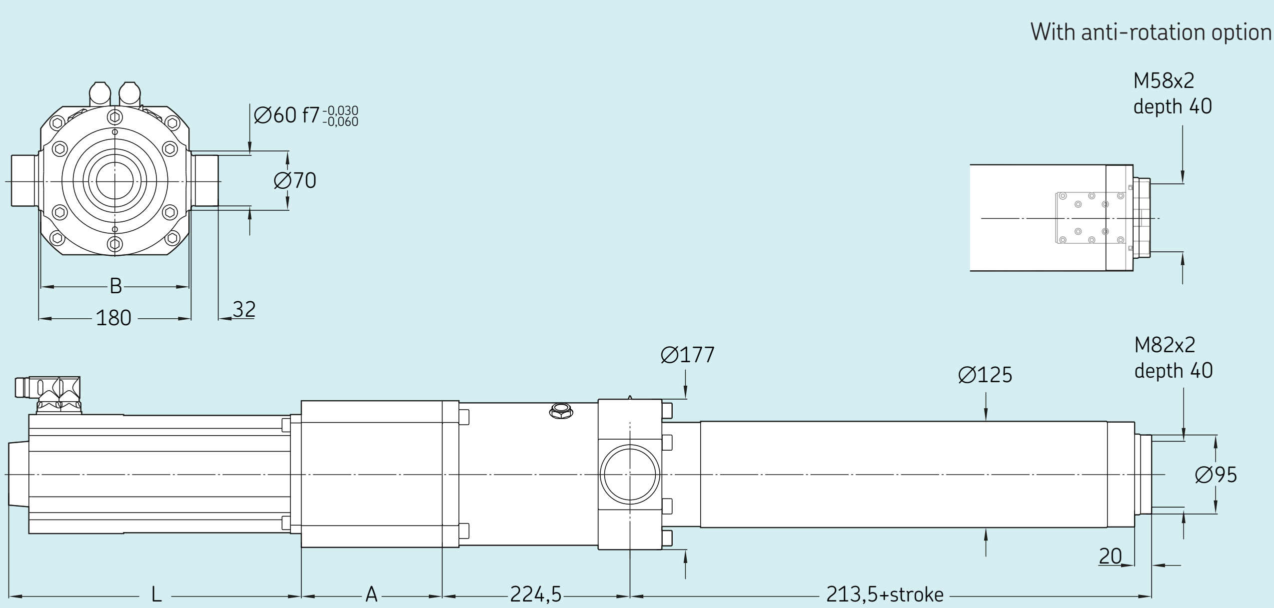
SKF

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LD6	178	427	192	44	49
L50LD7	247	529	192	44	49
L70LD7	247	529	192	44	49

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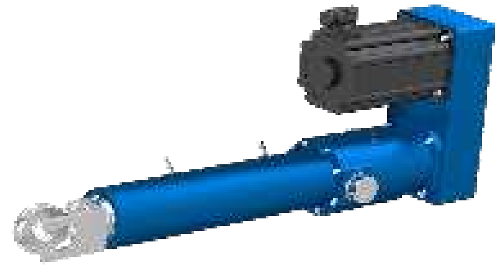


Electric cylinder
servo motor, parallel configuration

Technical data

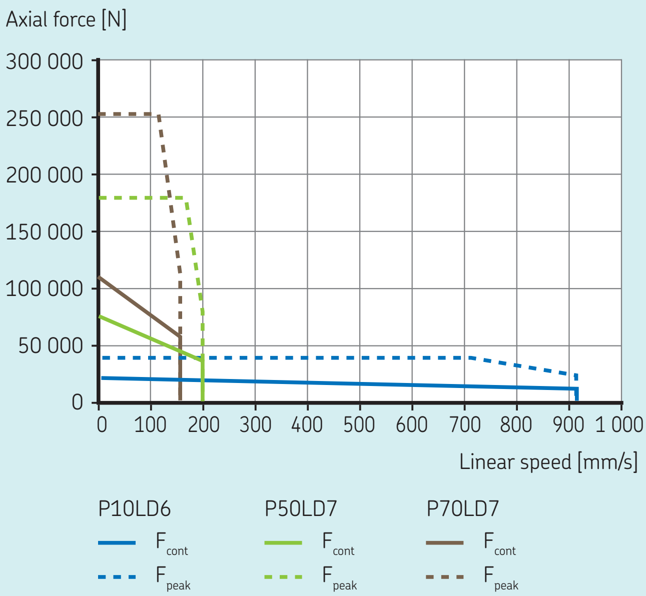
Designation	Symbol	Unit	Servo motor and parallel adapter P10 LD6	P50 LD7	P70 LD7
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	21,1	76	106,4
Continuous force @ max. speed	F_c	kN	13	38	53,2
Peak force @ zero speed	F_{p0}	kN	37,7	179,9	251,8
Peak force @ max. speed	F_p	kN	21,3	81,3	113,8
Dynamic load capacity	C	kN	261	261	261
Holding force (motorbrake option)	F_{Hold}	kN	14	70	98
Max. linear speed	v_{max}	mm/s	950	200	143
Max. acceleration	a_{max}	m/s^2	13,5	1,3	1
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	48	48	48
Screw lead	p_{screw}	mm	20	20	20
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 200	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5	5
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	1	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	360,05	728,22	711,85
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	4,12	0,16	0,08
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	134,6	174,6	174,6
Δ weight per 100 mm stroke	Δm	kg	5,7	5,7	5,7
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	3,6	3,6	3,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,7	0,7	0,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	34,9	34,9
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	10,05	10,05
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

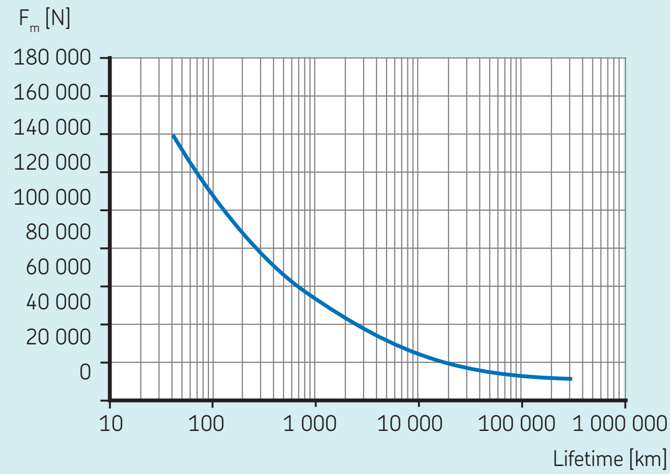
[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

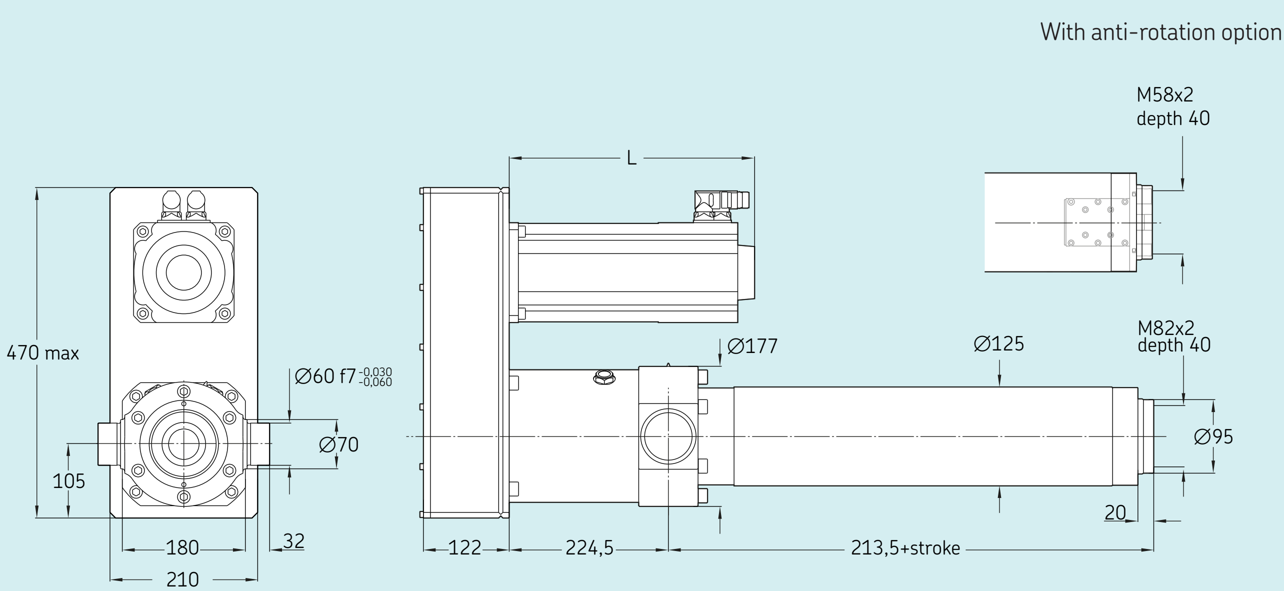
See page 306

Performance diagrams





Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LD6	427	44	49
P50LD7	529	44	49
P70LD7	529	44	49

C

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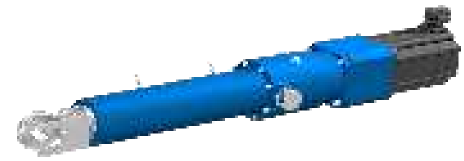


Electric cylinder
servo motor, inline configuration

Technical data

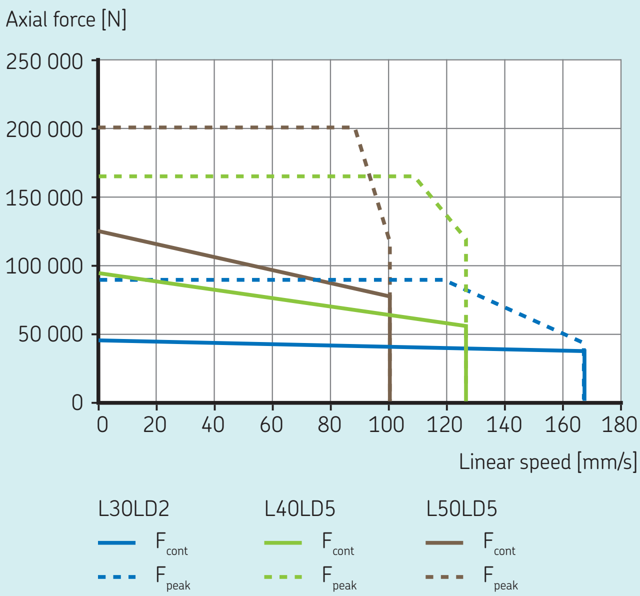
Designation	Symbol	Unit	Servo motor and inline adapter L30 LD2	 L40 LD5	 L50 LD5
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	49	96,5	120,6
Continuous force @ max. speed	F_c	kN	36,2	54,9	68,6
Peak force @ zero speed	F_{p0}	kN	86	159,8	199,7
Peak force @ max. speed	F_p	kN	47,8	116,4	145,5
Dynamic load capacity	C	kN	339	339	339
Holding force (motorbrake option)	F_{Hold}	kN	52	116	144
Max. linear speed	v_{max}	mm/s	167	125	100
Max. acceleration	a_{max}	m/s^2	5,2	2,3	2
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	60	60	60
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 300	100...1 300	100...1 300
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	3	4	5
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	60,21	148,50	134,01
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,12	0,63	0,40
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	12,40	12,40
Weight @ 0 mm stroke	m	kg	153,5	165,1	165,1
Δ weight per 100 mm stroke	Δm	kg	8,9	8,9	8,9
Weight of optional brake	m_{brake}	kg	1,9	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	5,2	5,2	5,2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,8	0,8	0,8
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	26,7	30,5	30,5
Peak current	I_{peak}	A	56	56	56
Nominal power	P	kW	8,01	9,11	9,11
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

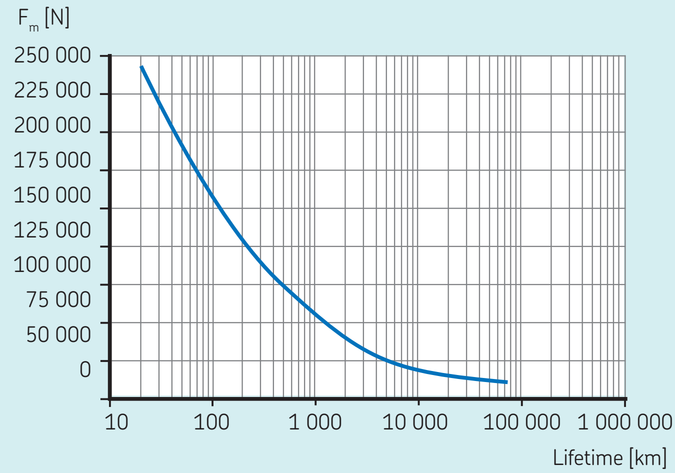
[1] By 100 mm steps
[2] Backlash elimination up to stroke 800 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

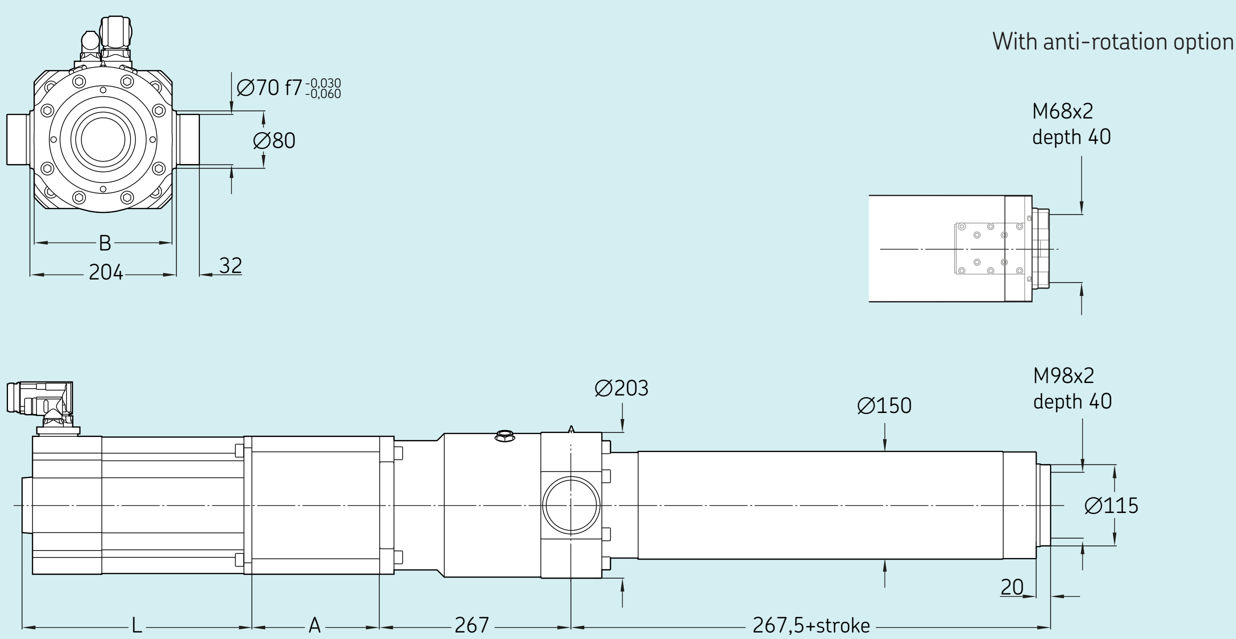
See page 306

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
–	mm				
L30LD2	209	516	192	28	50
L40LD5	240	435	192	44	49
L50LD5	240	435	192	44	49

SRSA-S-6010

Electric cylinder
servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	Servo motor and parallel adapter P30 LD2	P40 LD5	P50 LD5
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	47,5	93,6	117
Continuous force @ max. speed	F_c	kN	35,1	53,2	66,5
Peak force @ zero speed	F_{p0}	kN	83,4	155	193,7
Peak force @ max. speed	F_p	kN	46,4	112,9	141,1
Dynamic load capacity	C	kN	339	339	339
Holding force (motorbrake option)	F_{Hold}	kN	53	119	149
Max. linear speed	v_{max}	mm/s	167	125	100
Max. acceleration	a_{max}	m/s^2	2,5	0,7	0,6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	60	60	60
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G5	G5	G5
Stroke 1)	s	mm	100...1 300	100...1 300	100...1 300
Internal overstroke each side	s_0	mm	10	10	10
Backlash 2)	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	3	4	5
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	129,16	476,09	463,12
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,12	0,63	0,40
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	12,40	12,40
Weight @ 0 mm stroke	m	kg	150,4	173,3	173,3
Δ weight per 100 mm stroke	Δm	kg	8,9	8,9	8,9
Weight of optional brake	m_{brake}	kg	1,9	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	5,2	5,2	5,2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,8	0,8	0,8
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	26,7	30,5	30,5
Peak current	I_{peak}	A	56	56	56
Nominal power	P	kW	8,01	9,11	9,11
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection 3)	IP	–	54	54	54

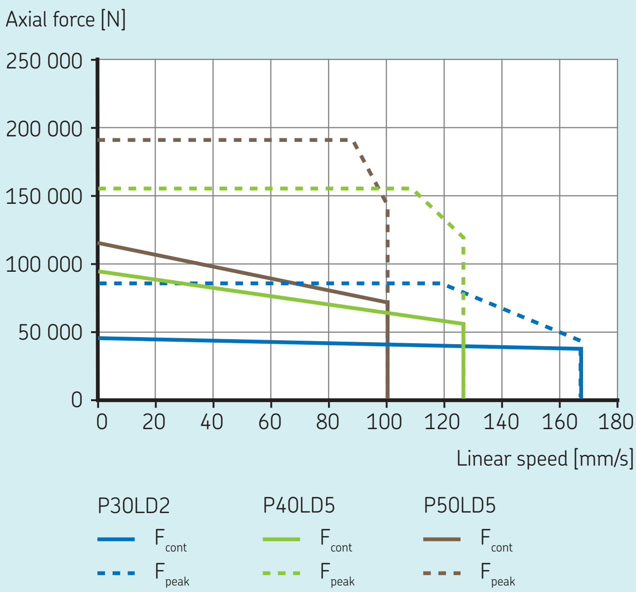
1) By 100 mm steps
2) Backlash elimination up to stroke 800 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

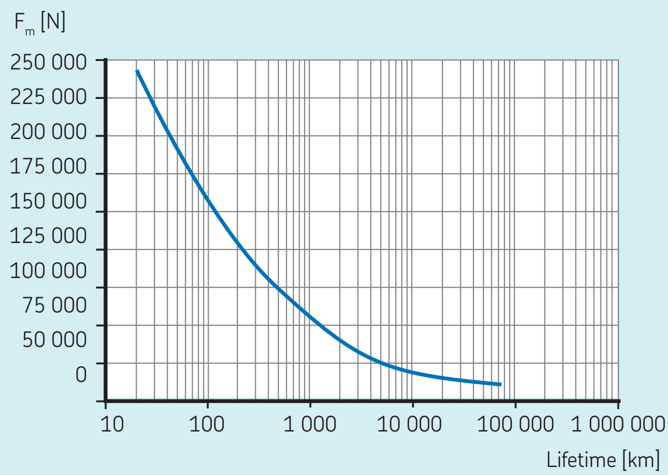
Ordering key

See page 306

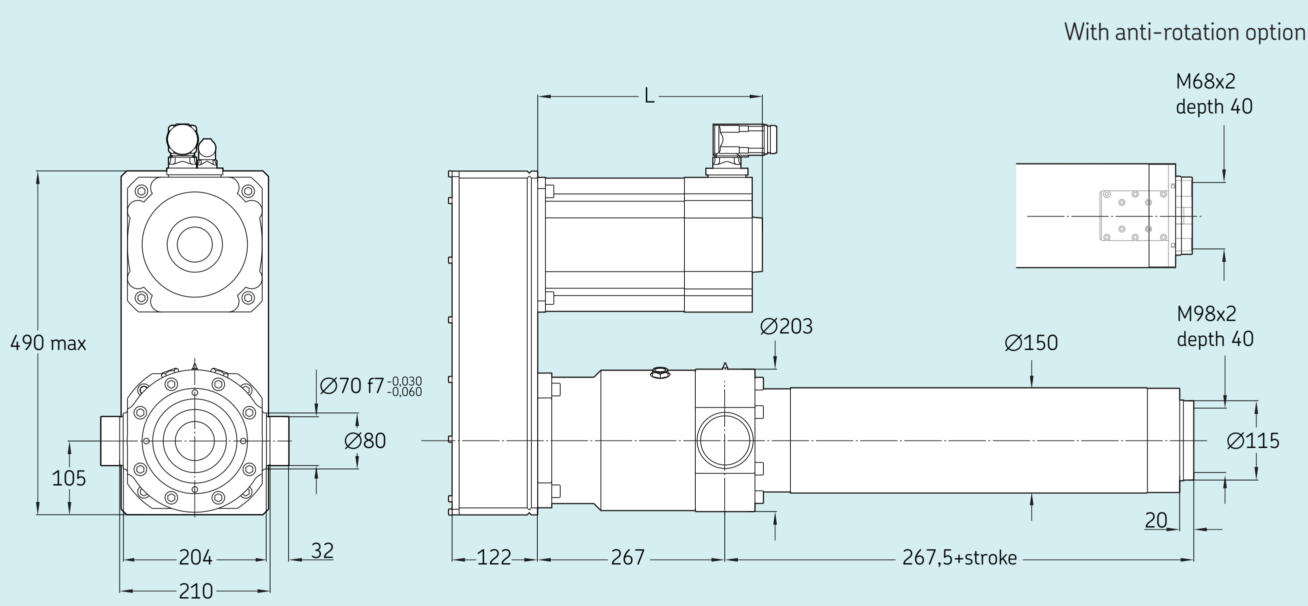
SKF

Performance diagrams





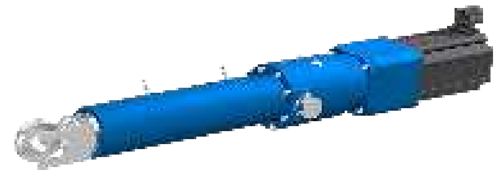
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
–	mm		
P30LD2	516	28	50
P40LD5	435	44	49
P50LD5	435	44	49

SRSA-S-6015

Electric cylinder
servo motor, inline configuration



Technical data

Designation	Symbol	Unit	Servo motor and inline adapter L30 LD6	L50 LD7	L70 LD7
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	83,3	103,3	144,6
Continuous force @ max. speed	F_c	kN	51,3	51,6	72,3
Peak force @ zero speed	F_{p0}	kN	149,2	244,4	342,2
Peak force @ max. speed	F_p	kN	84,2	110,5	154,7
Dynamic load capacity	C	kN	373	373	373
Holding force (motorbrake option)	F_{Hold}	kN	55	92	129
Max. linear speed	v_{max}	mm/s	238	150	107
Max. acceleration	a_{max}	m/s²	5,2	3,3	2,7
Duty cycle	D	%	100%	100%	100%
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	60	60	60
Screw lead	p_{screw}	mm	15	15	15
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 300	100...1 300	100...1 300
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	3	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm²	236,18	219,20	194,51
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm²	1,12	0,40	0,21
Inertia of optional brake	J_{brake}	10^{-4} kgm²	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	181,1	197,2	197,2
Δ weight per 100 mm stroke	Δm	kg	8,9	8,9	8,9
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	5,2	5,2	5,2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,8	0,8	0,8
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	34,9	34,9
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	10,05	10,05
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

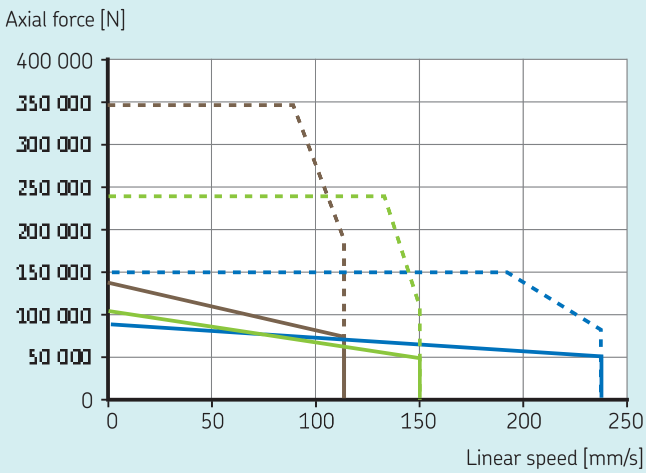
1) By 100 mm steps
2) Backlash elimination up to stroke 800 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

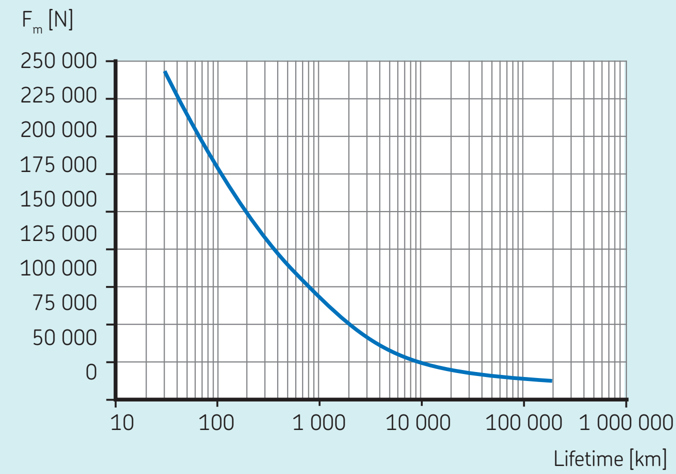
Ordering key

See page 306

SKF

Performance diagrams



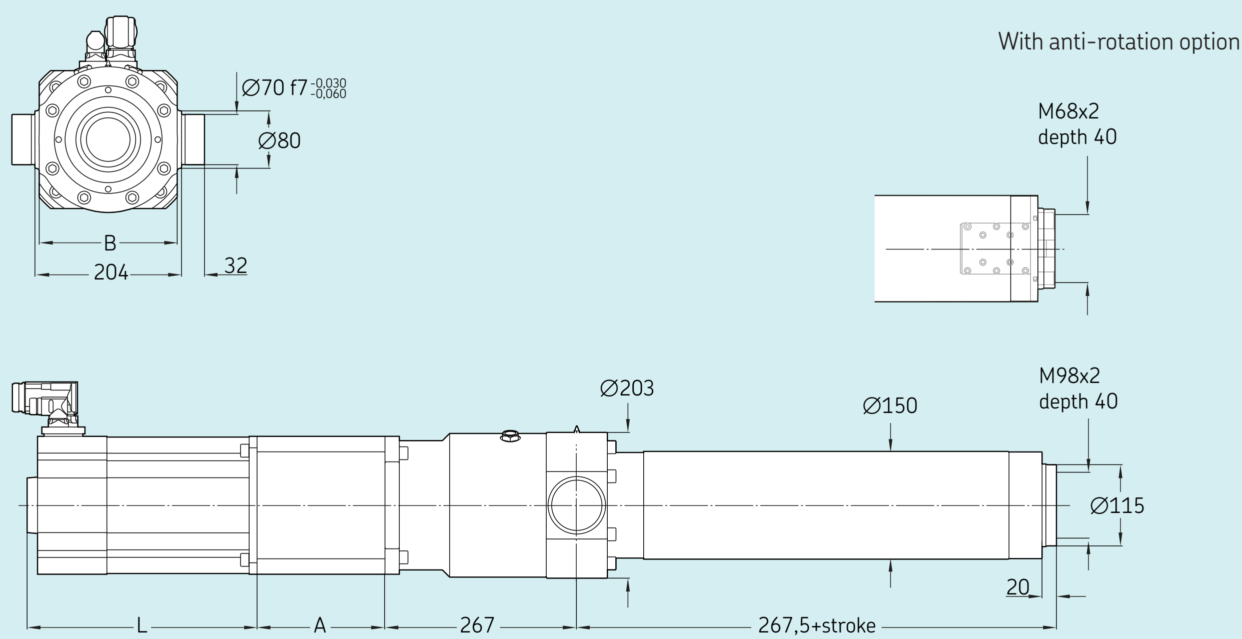


L30LD6
F_{cont}
F_{peak}

L50LD7
F_{cont}
F_{peak}

L70LD7
F_{cont}
F_{peak}

Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L30LD6	240	602	192	44	49
L50LD7	248	529	192	44	49
L70LD7	248	529	192	44	49

C

SRSA-S-6015

Electric cylinder
servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	Servo motor and parallel adapter P30 LD6	 P50 LD7	 P70 LD7
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	80,8	100,2	140,2
Continuous force @ max. speed	F_c	kN	49,8	50,1	70,1
Peak force @ zero speed	F_{p0}	kN	144,7	237,1	331,9
Peak force @ max. speed	F_p	kN	81,7	107,2	150,1
Dynamic load capacity	C	kN	373	373	373
Holding force (motorbrake option)	F_{Hold}	kN	57	95	133
Max. linear speed	v_{max}	mm/s	238	150	107
Max. acceleration	a_{max}	m/s^2	2,2	1	0,7
Duty cycle	D	%	100%	100%	100%
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	60	60	60
Screw lead	p_{screw}	mm	15	15	15
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 300	100...1 300	100...1 300
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	3	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	557,95	733,18	714,38
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,12	0,40	0,21
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	187	206	206
Δ weight per 100 mm stroke	Δm	kg	8,9	8,9	8,9
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	5,2	5,2	5,2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,8	0,8	0,8
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	34,9	34,9
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	10,05	10,05
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

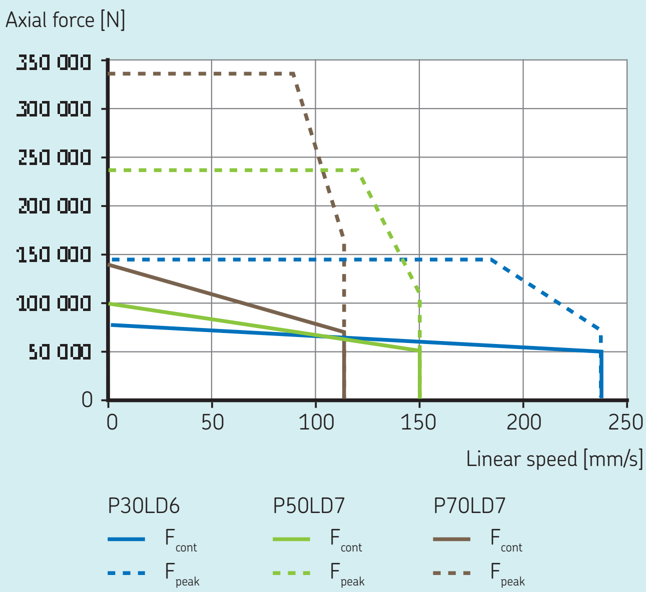
[1] By 100 mm steps
[2] Backlash elimination up to stroke 800 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

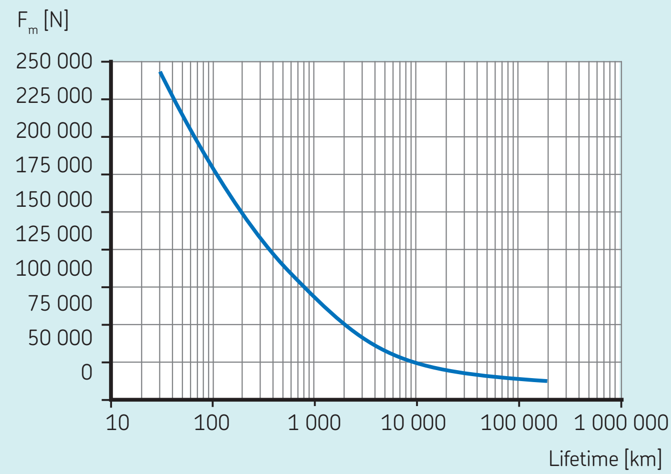
Ordering key

See page 306

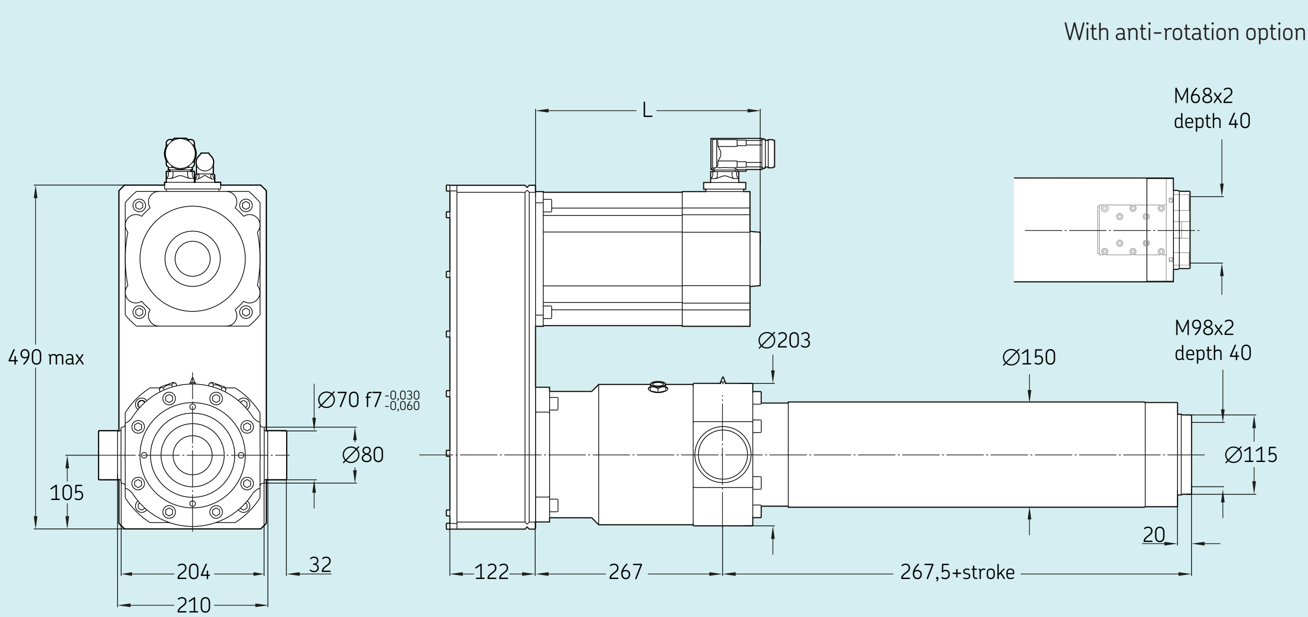
SKF

Performance diagrams





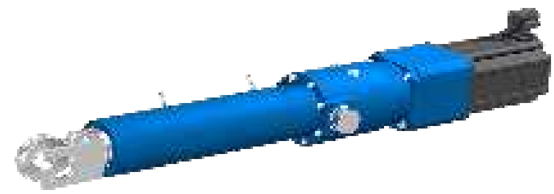
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P30LD6	602	44	49
P50LD7	529	44	49
P70LD7	529	44	49

SRSA-S-6020

Electric cylinder
servo motor, inline configuration



Technical data

Designation	Symbol	Unit	Servo motor and Inline adapter L10 LD6	 L70 LD7	 L100 LD7
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	21,7	109,7	156,7
Continuous force @ max. speed	F_c	kN	13,4	54,8	78,3
Peak force @ zero speed	F_{p0}	kN	38,9	259,6	370,8
Peak force @ max. speed	F_p	kN	22	117,4	167,7
Dynamic load capacity	C	kN	395	395	395
Holding force (motorbrake option)	F_{Hold}	kN	13	95	136
Max. linear speed	v_{max}	mm/s	889	143	100
Max. acceleration	a_{max}	m/s^2	11,9	3,5	2,2
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	60	60	60
Screw lead	p_{screw}	mm	20	20	20
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 300	100...1 300	100...1 300
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	1	7	10
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	403,60	194,51	219,94
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	10,05	0,21	0,10
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	152,4	197,2	223,1
Δ weight per 100 mm stroke	Δm	kg	8,9	8,9	8,9
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	5,2	5,2	5,2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,8	0,8	0,8
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	34,9	34,9
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	10,05	10,05
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

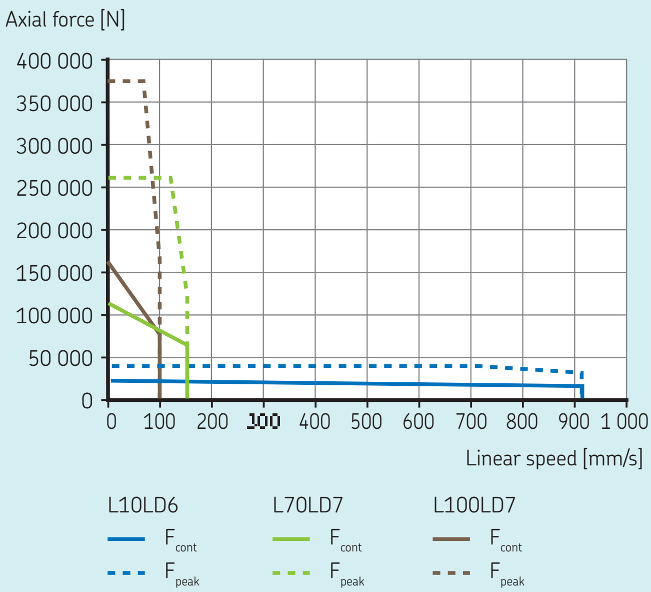
[1] By 100 mm steps
[2] Backlash elimination up to stroke 800 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

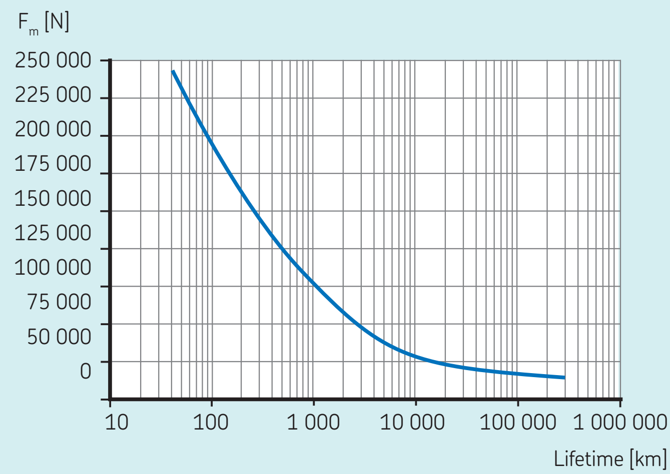
Ordering key

See page 306

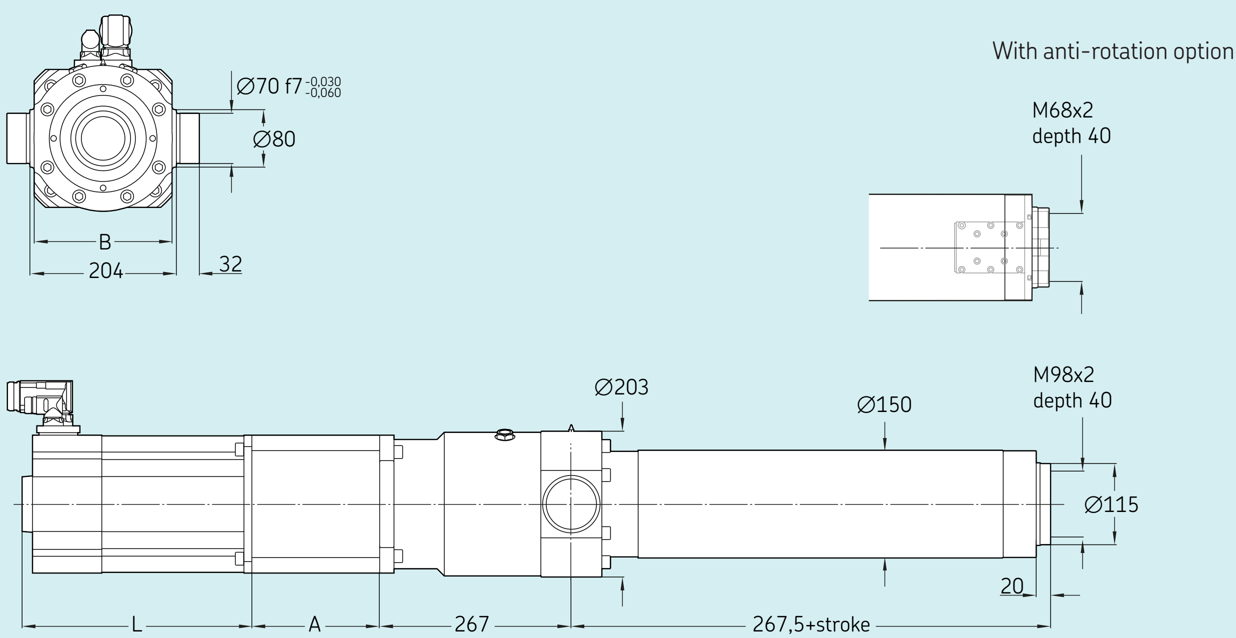
SKF

Performance diagrams





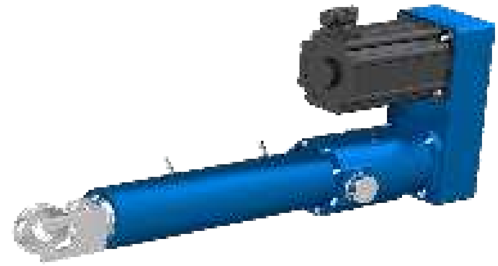
Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LD6	179	427	192	44	49
L70LD7	248	529	192	44	49
L100LD7	276	599	225	44	49

SRSA-S-6020

Electric cylinder
servo motor, parallel configuration



Technical data

Designation	Symbol	Unit	Servo motor and parallel adapter P10 LD6	P70 LD7	P100 LD7
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	21,1	106,4	152
Continuous force @ max. speed	F_c	kN	13	53,2	76
Peak force @ zero speed	F_{p0}	kN	37,7	251,8	359,7
Peak force @ max. speed	F_p	kN	21,3	113,8	162,6
Dynamic load capacity	C	kN	395	395	395
Holding force (motorbrake option)	F_{Hold}	kN	14	98	140
Max. linear speed	v_{max}	mm/s	889	143	100
Max. acceleration	a_{max}	m/s^2	10,5	1	0,4
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	60	60	60
Screw lead	p_{screw}	mm	20	20	20
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 300	100...1 300	100...1 300
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	1	7	10
Inertia @ 0 mm stroke	J	10^{-4} kgm²	458,52	714,38	1166,76
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm²	10,05	0,21	0,10
Inertia of optional brake	J_{brake}	10^{-4} kgm²	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	163,1	206	240
Δ weight per 100 mm stroke	Δm	kg	8,9	8,9	8,9
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	5,2	5,2	5,2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,8	0,8	0,8
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	34,9	34,9
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	10,05	10,05
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

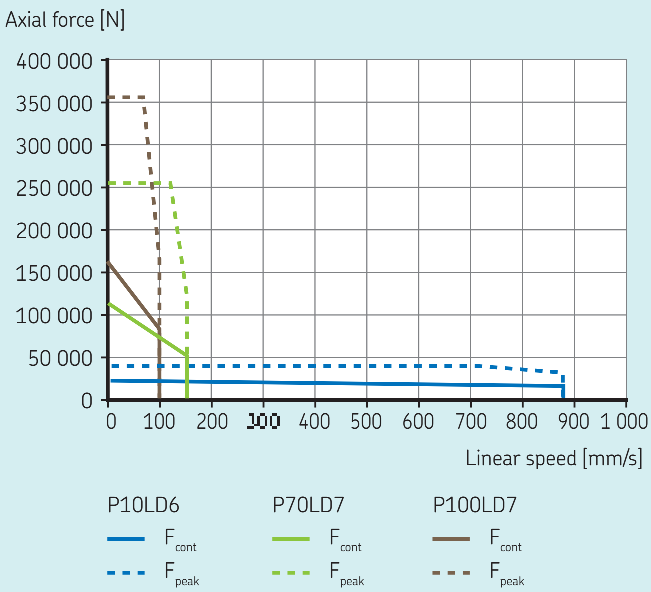
[1] By 100 mm steps
[2] Backlash elimination up to stroke 800 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

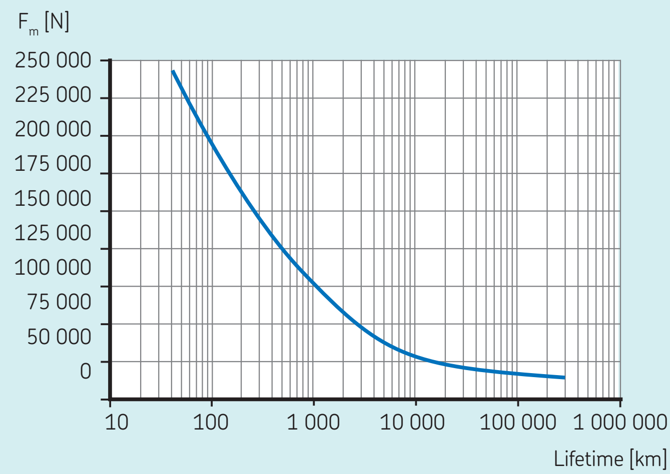
Ordering key

See page 306

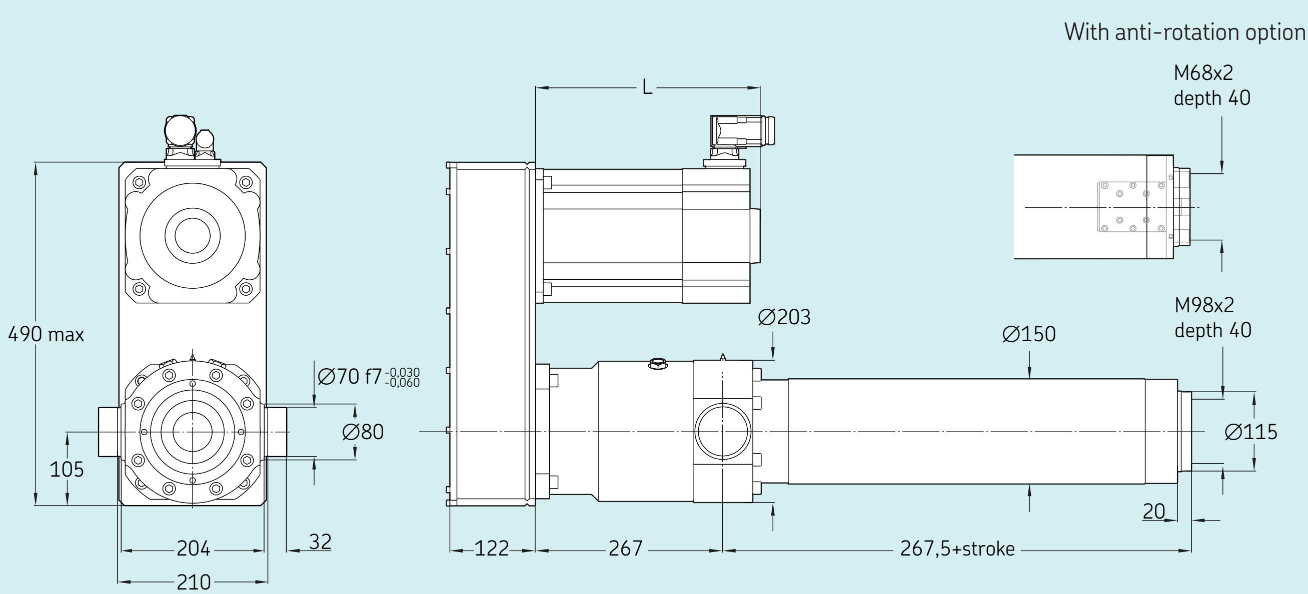
SKF

Performance diagrams





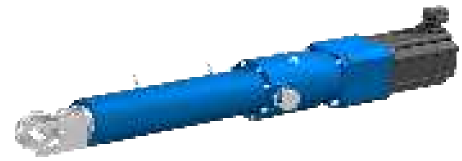
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LD6	427	44	49
P70LD7	529	44	49
P100LD7	599	44	49

SRSA-S-7510

Electric cylinder
servo motor, inline configuration



Technical data

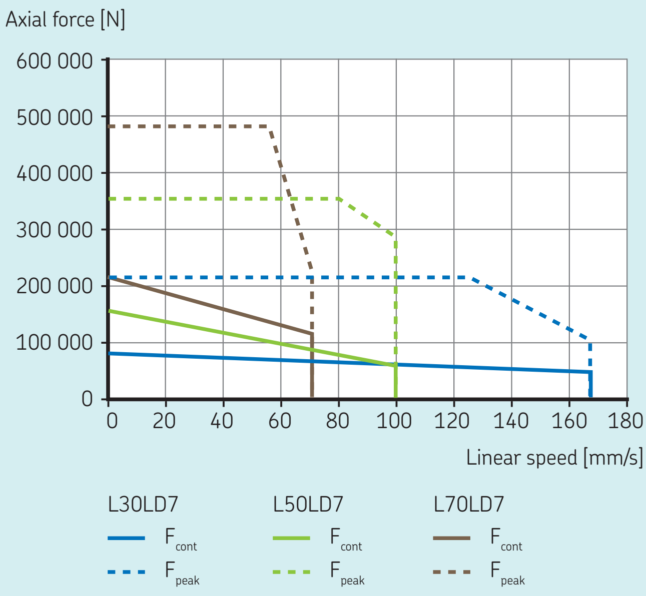
Designation	Symbol	Unit	Servo motor and inline adapter L30 LD7	L50 LD7	L70 LD7
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	88,7	147,9	207
Continuous force @ max. speed	F_c	kN	44,4	73,9	103,5
Peak force @ zero speed	F_{p0}	kN	210	350	490
Peak force @ max. speed	F_p	kN	94,9	158,2	221,5
Dynamic load capacity	C	kN	505	505	505
Holding force (motorbrake option)	F_{Hold}	kN	90	150	210
Max. linear speed	v_{max}	mm/s	167	100	71
Max. acceleration	a_{max}	m/s^2	2,8	2	1,7
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	75	75	75
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 500	100...1 500	100...1 500
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	3	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	285,71	237,03	263,61
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	2,73	0,98	0,50
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	271,8	292,1	292,1
Δ weight per 100 mm stroke	Δm	kg	11,3	11,3	11,3
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	7,5	7,5	7,5
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	2,7	2,7	2,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	34,9	34,9	34,9
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	10,05	10,05	10,05
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

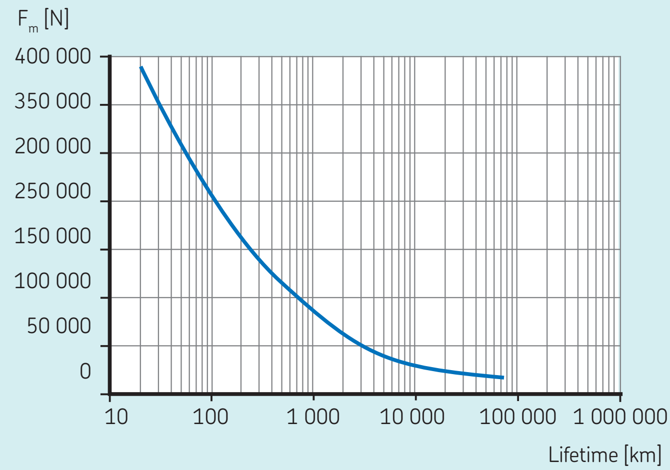
1) By 100 mm steps
2) Backlash elimination up to stroke 1 000 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

Ordering key

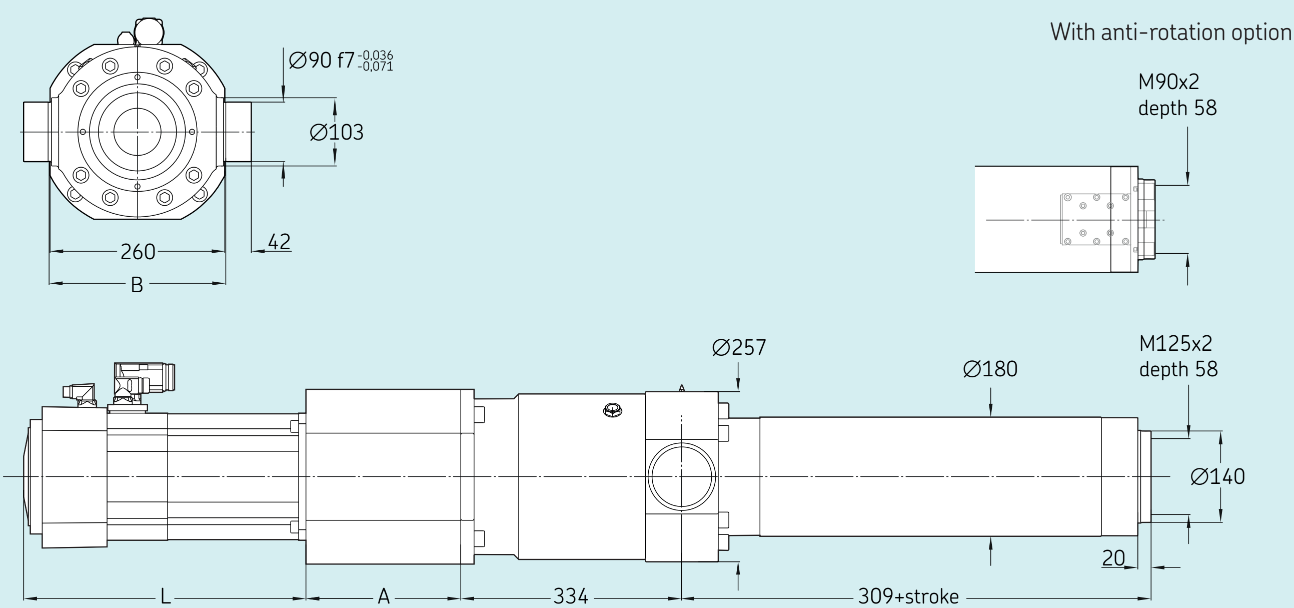
See page 306

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L30LD7	239	495	264	44	49
L50LD7	247	529	264	44	49
L70LD7	247	529	264	44	49

C

SRSA-S-7510

Electric cylinder
servo motor, parallel configuration

Technical data

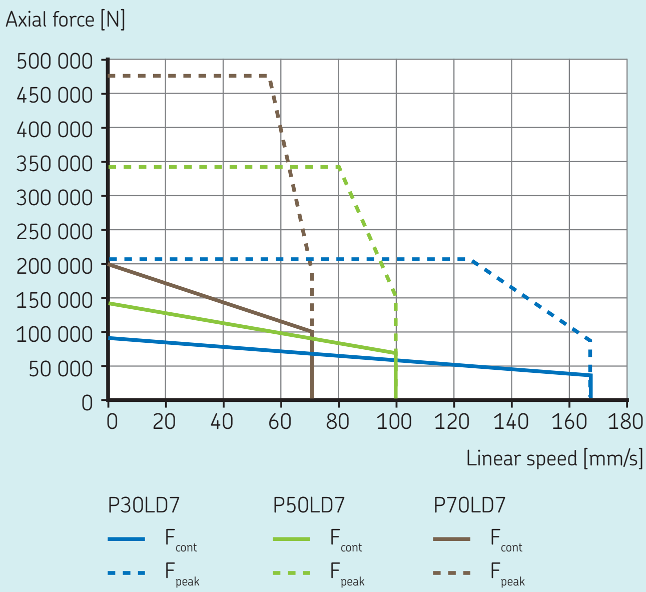
Designation	Symbol	Unit	Servo motor and parallel adapter P30 LD7	 P50 LD7	 P70 LD7
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	86,1	143,4	200,8
Continuous force @ max. speed	F_c	kN	43	71,7	100,4
Peak force @ zero speed	F_{p0}	kN	203,7	339,5	475,3
Peak force @ max. speed	F_p	kN	92,1	153,5	214,9
Dynamic load capacity	C	kN	505	505	505
Holding force (motorbrake option)	F_{Hold}	kN	93	154	216
Max. linear speed	v_{max}	mm/s	167	100	71
Max. acceleration	a_{max}	m/s^2	1,3	0,6	0,5
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	75	75	75
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 500	100...1 500	100...1 500
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	3	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	607,59	751,04	723,50
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	2,73	0,98	0,50
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	278,6	303,5	303,5
Δ weight per 100 mm stroke	Δm	kg	11,3	11,3	11,3
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	7,5	7,5	7,5
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	2,7	2,7	2,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	34,9	34,9	34,9
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	10,05	10,05	10,05
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

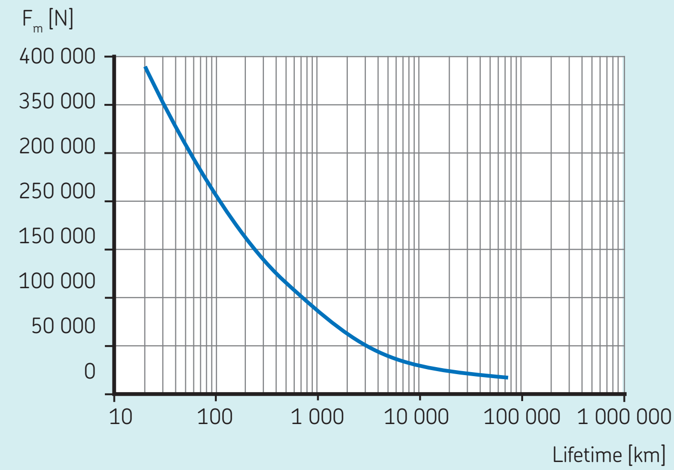
[1] By 100 mm steps
[2] Backlash elimination up to stroke 1 000 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

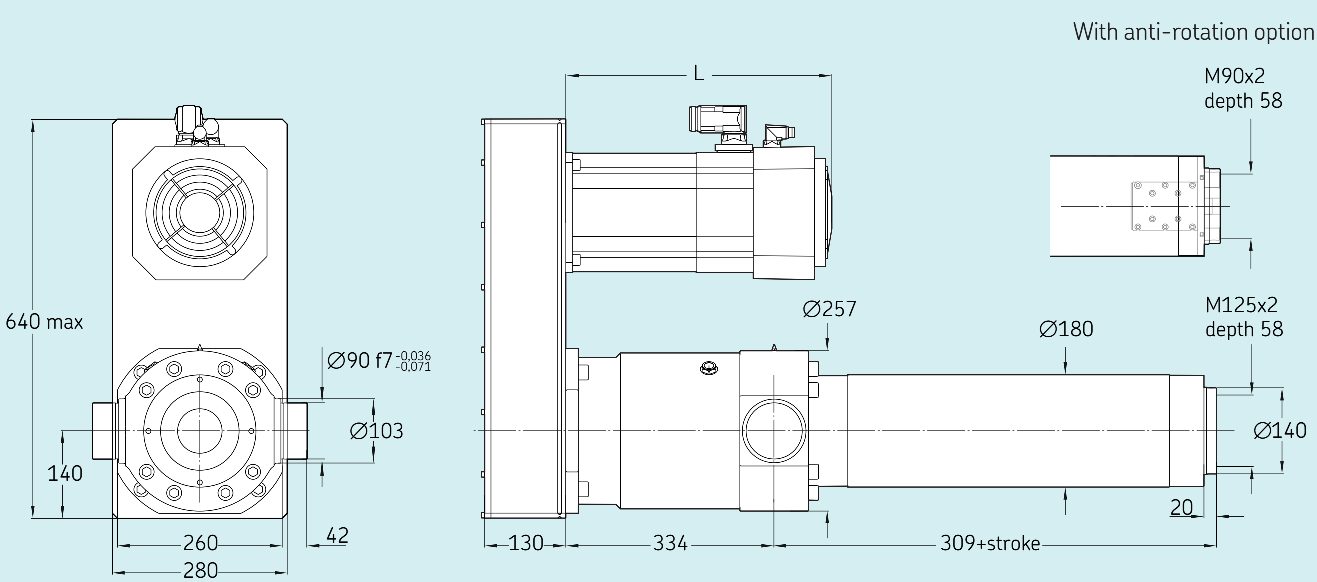
See page 306

Performance diagrams



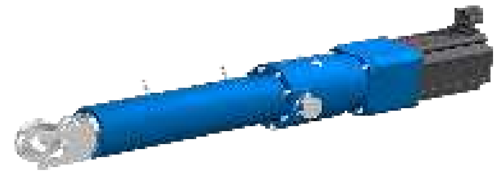


Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P30LD7	495	44	49
P50LD7	529	44	49
P70LD7	529	44	49

SRSA-S-7515



Electric cylinder
servo motor, inline configuration

Technical data

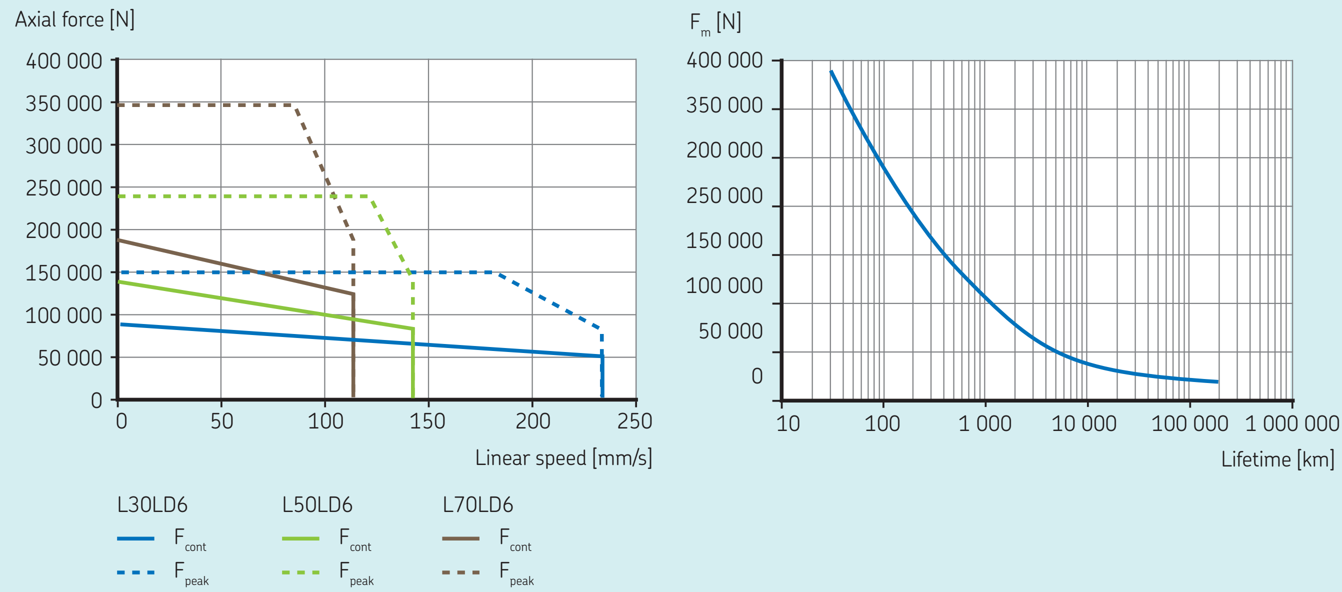
Designation	Symbol	Unit	Servo motor and inline adapter L30 LD6	 L50 LD6	 L70 LD6
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	82,3	137,2	192,1
Continuous force @ max. speed	F_c	kN	50,7	84,5	118,4
Peak force @ zero speed	F_{p0}	kN	147,5	245,8	344,1
Peak force @ max. speed	F_p	kN	83,3	138,8	194,3
Dynamic load capacity	C	kN	561	561	561
Holding force (motorbrake option)	F_{Hold}	kN	56	94	132
Max. linear speed	v_{max}	mm/s	238	143	102
Max. acceleration	a_{max}	m/s^2	4,3	3,1	2,6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	75	75	75
Screw lead	p_{screw}	mm	15	15	15
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 500	100...1 500	100...1 500
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	3	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	285,71	237,03	203,61
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	2,73	0,98	0,50
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	277,8	298,1	298,1
Δ weight per 100 mm stroke	Δm	kg	11,3	11,3	11,3
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	7,5	7,5	7,5
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	2,7	2,7	2,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	44,7	44,7
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	15,82	15,82
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

[1] By 100 mm steps
[2] Backlash elimination up to stroke 1 000 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

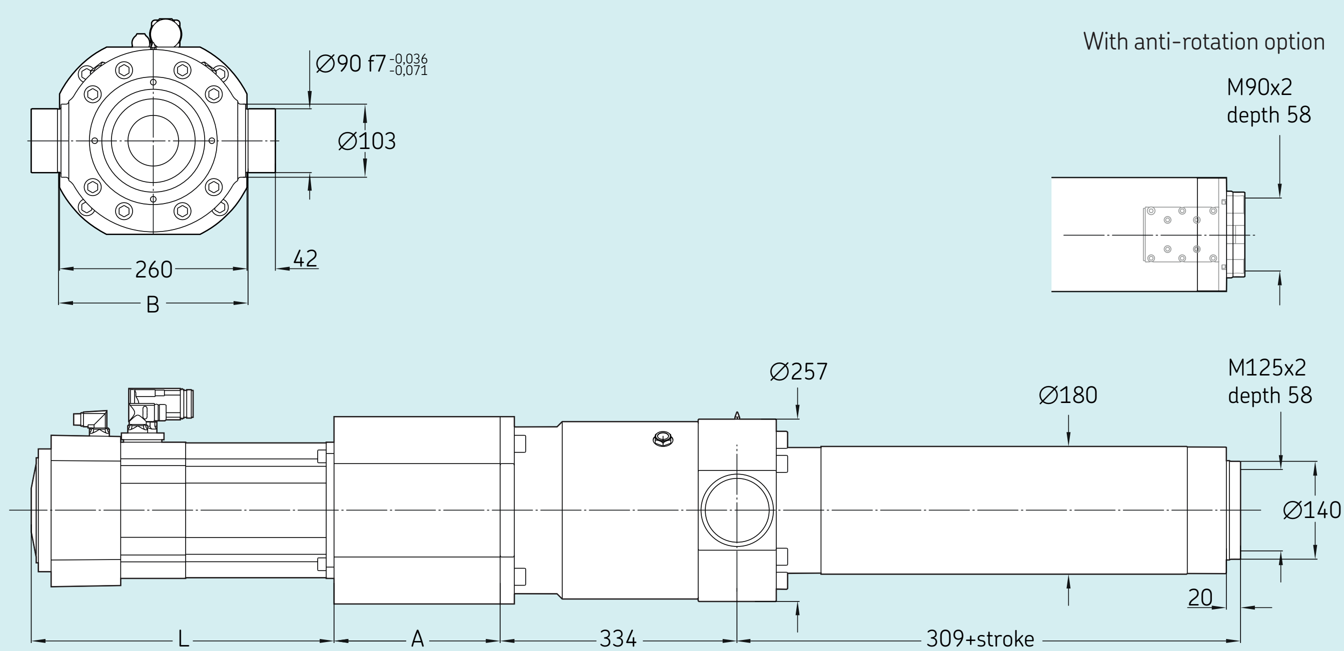
Ordering key

See page 306

Performance diagrams



Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L30LD6	239	602	264	44	49
L50LD6	247	636	264	44	49
L70LD6	247	636	264	44	49

SRSA-S-7515

Electric cylinder
servo motor, parallel configuration

Technical data

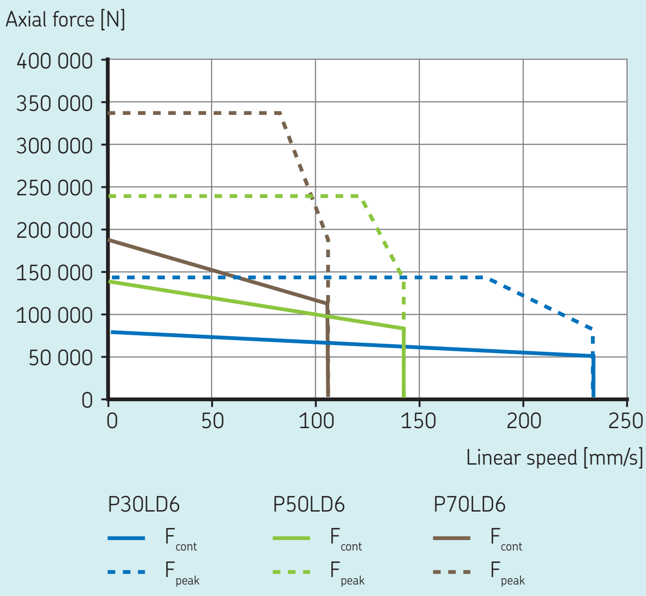
Designation	Symbol	Unit	Servo motor and parallel adapter P30 LD6	P50 LD6	P70 LD6
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	79,8	133,1	186,3
Continuous force @ max. speed	F_c	kN	49,2	82	114,8
Peak force @ zero speed	F_{p0}	kN	143,1	238,4	333,8
Peak force @ max. speed	F_p	kN	80,8	134,6	188,5
Dynamic load capacity	C	kN	561	561	561
Holding force (motorbrake option)	F_{Hold}	kN	58	97	136
Max. linear speed	v_{max}	mm/s	238	143	102
Max. acceleration	a_{max}	m/s^2	2	1	0,7
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	75	75	75
Screw lead	p_{screw}	mm	15	15	15
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 500	100...1 500	100...1 500
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	3	5	7
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	607,59	751,04	723,50
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	2,73	0,98	0,50
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	284,6	309,5	309,5
Δ weight per 100 mm stroke	Δm	kg	11,3	11,3	11,3
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	7,5	7,5	7,5
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	2,7	2,7	2,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	44,7	44,7
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	15,82	15,82
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

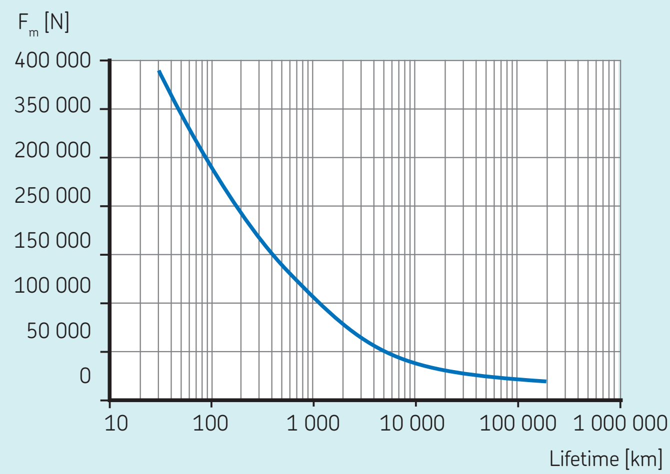
[1] By 100 mm steps
[2] Backlash elimination up to stroke 1 000 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

See page 306

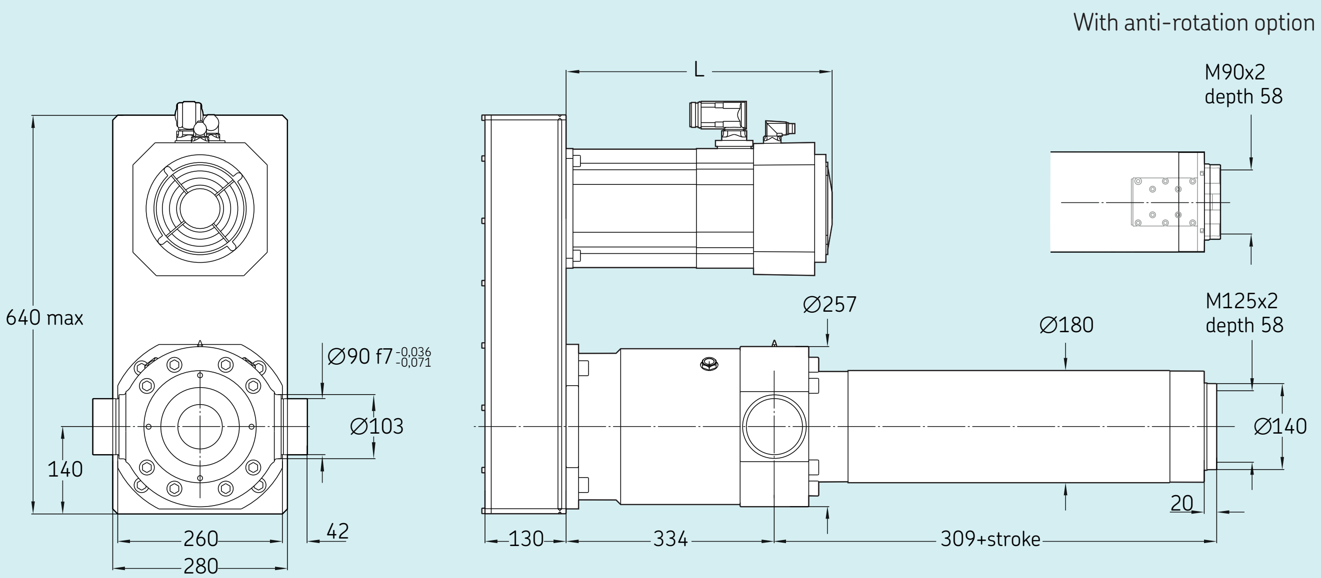
Performance diagrams





C

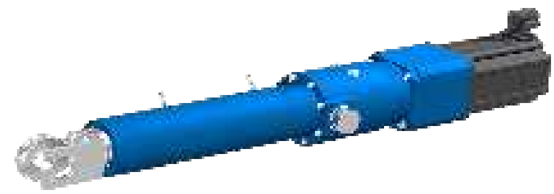
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
–	mm		
P30LD6	602	44	49
P50LD6	636	44	49
P70LD6	636	44	49

SRSA-S-7520

Electric cylinder
servo motor, inline configuration



Technical data

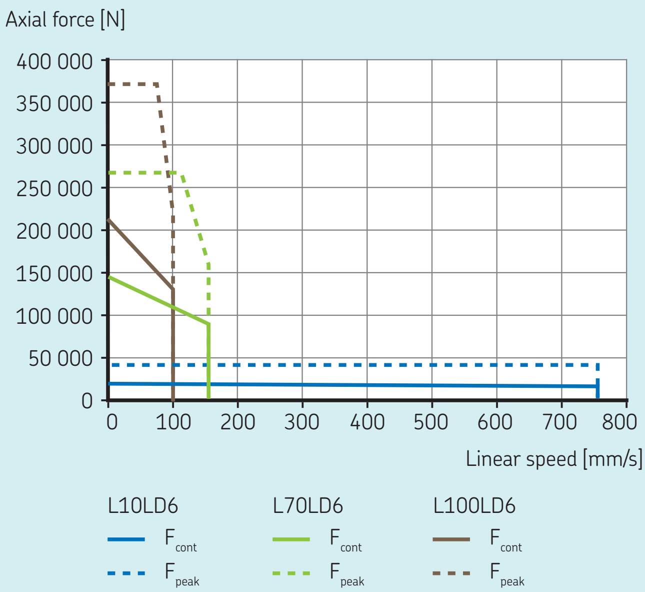
Designation	Symbol	Unit	Servo motor and inline adapter L10 LD6	L70 LD6	L100 LD6
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	21,5	145,7	208,1
Continuous force @ max. speed	F_c	kN	13,2	89,8	128,3
Peak force @ zero speed	F_{p0}	kN	38,4	261,1	373
Peak force @ max. speed	F_p	kN	21,7	147,4	210,6
Dynamic load capacity	C	kN	572	572	572
Holding force (motorbrake option)	F_{Hold}	kN	13	96	138
Max. linear speed	v_{max}	mm/s	711	136	95
Max. acceleration	a_{max}	m/s^2	5,6	3,4	2,2
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	75	75	75
Screw lead	p_{screw}	mm	20	20	20
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 500	100...1 500	100...1 500
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	1	7	10
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	849,72	203,61	224,40
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	21,60	0,44	0,22
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	242,5	298,1	326,1
Δ weight per 100 mm stroke	Δm	kg	11,3	11,3	11,3
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	7,5	7,5	7,5
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	2,7	2,7	2,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	44,7	44,7
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	15,82	15,82
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

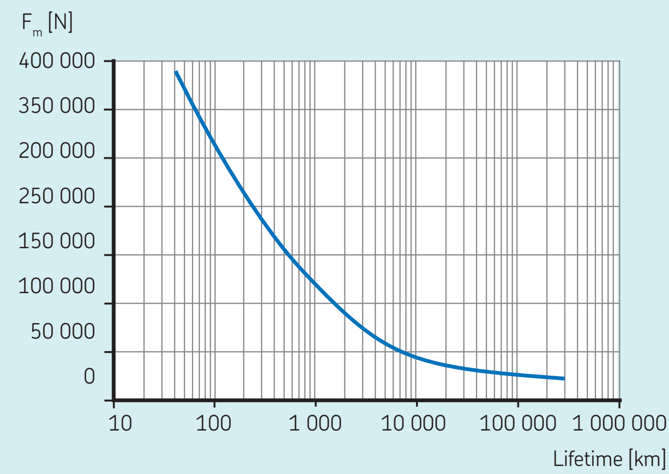
1) By 100 mm steps
2) Backlash elimination up to stroke 1 000 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

Ordering key

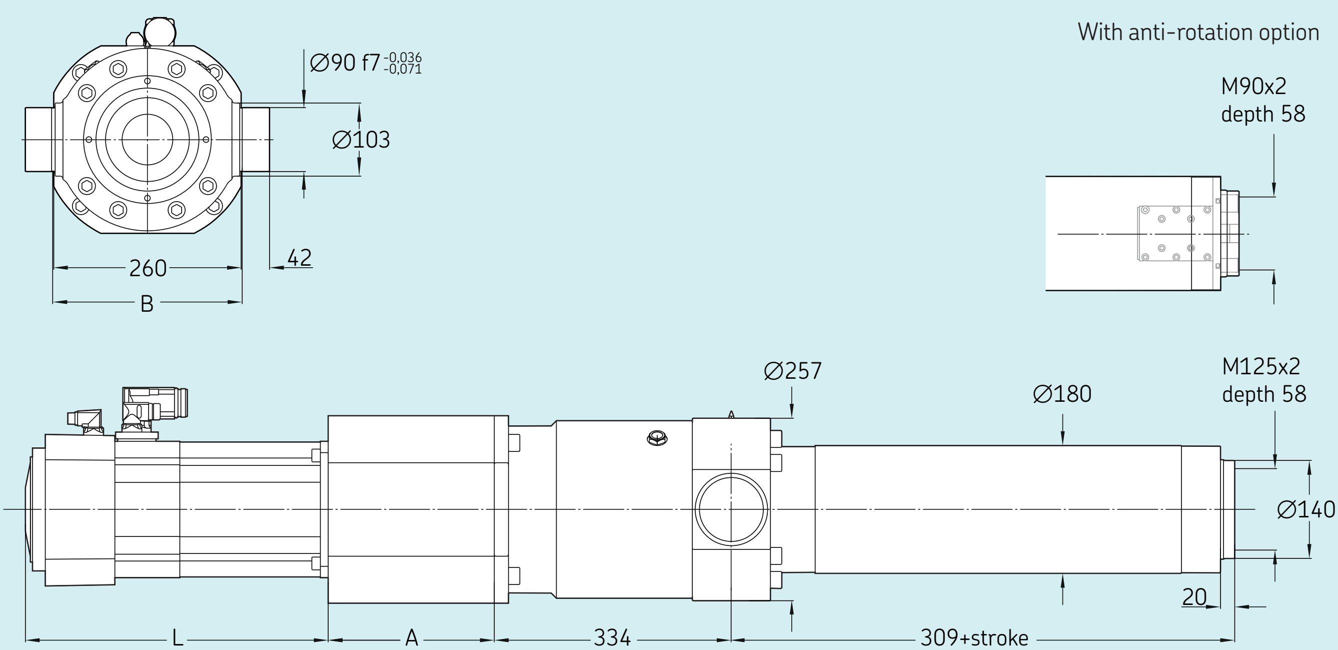
See page 306

Performance diagrams





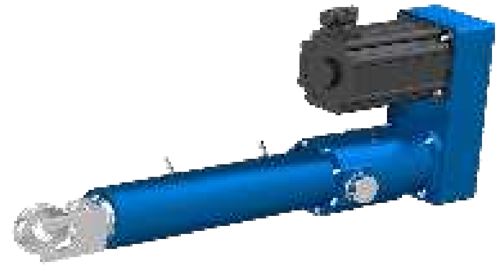
Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LD6	178	427	264	44	49
L70LD6	247	636	264	44	49
L100LD6	275	706	264	44	49

SRSA-S-7520

Electric cylinder
servo motor, parallel configuration



Technical data

Designation	Symbol	Unit	Servo motor and parallel adapter P10 LD6	P70 LD6	P100 LD6
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	20,8	141,3	201,9
Continuous force @ max. speed	F_c	kN	12,8	87,1	124,4
Peak force @ zero speed	F_{p0}	kN	37,3	253,2	361,8
Peak force @ max. speed	F_p	kN	21,1	143	204,2
Dynamic load capacity	C	kN	572	572	572
Holding force (motorbrake option)	F_{Hold}	kN	14	99	142
Max. linear speed	v_{max}	mm/s	711	136	95
Max. acceleration	a_{max}	m/s^2	4,6	1	0,4
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Roller screw	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	75	75	75
Screw lead	p_{screw}	mm	20	20	20
Lead accuracy	–	–	G5	G5	G5
Stroke [1]	s	mm	100...1 500	100...1 500	100...1 500
Internal overstroke each side	s_0	mm	10	10	10
Backlash [2]	$s_{backlash}$	mm	0	0	0
Gear reduction	i	–	1	7	10
Inertia @ 0 mm stroke	J	10^{-4} kgm²	1039,76	723,50	1171,22
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm²	21,60	0,44	0,22
Inertia of optional brake	J_{brake}	10^{-4} kgm²	12,40	12,40	12,40
Weight @ 0 mm stroke	m	kg	264,2	309,5	343,5
Δ weight per 100 mm stroke	Δm	kg	11,3	11,3	11,3
Weight of optional brake	m_{brake}	kg	3,1	3,1	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	7,5	7,5	7,5
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	2,7	2,7	2,7
Electrical Data					
Motor type	–	–	Servo	Servo	Servo
Nominal voltage	U	V AC	400	400	400
Nominal current	I	A	44,7	44,7	44,7
Peak current	I_{peak}	A	94	94	94
Nominal power	P	kW	15,82	15,82	15,82
Environment and Standards					
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40
Degree of protection [3]	IP	–	54	54	54

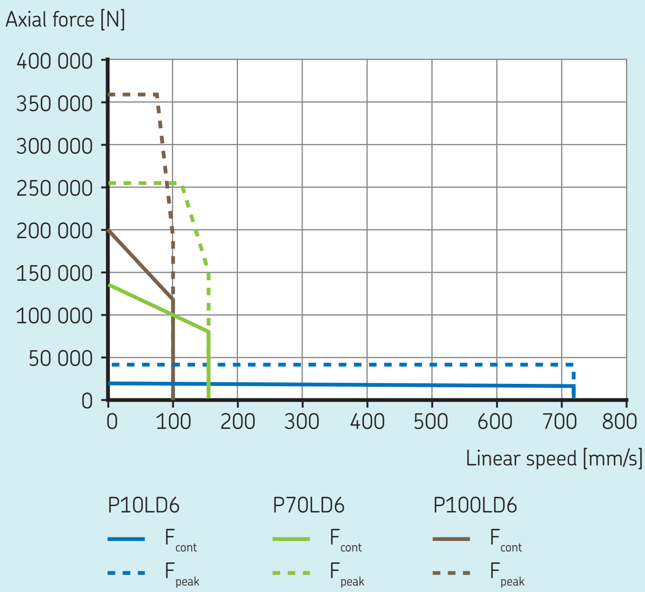
[1] By 100 mm steps
[2] Backlash elimination up to stroke 1 000 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

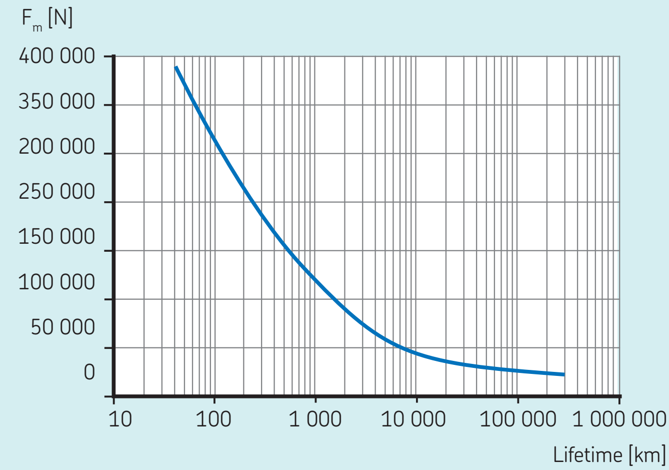
Ordering key

See page 306

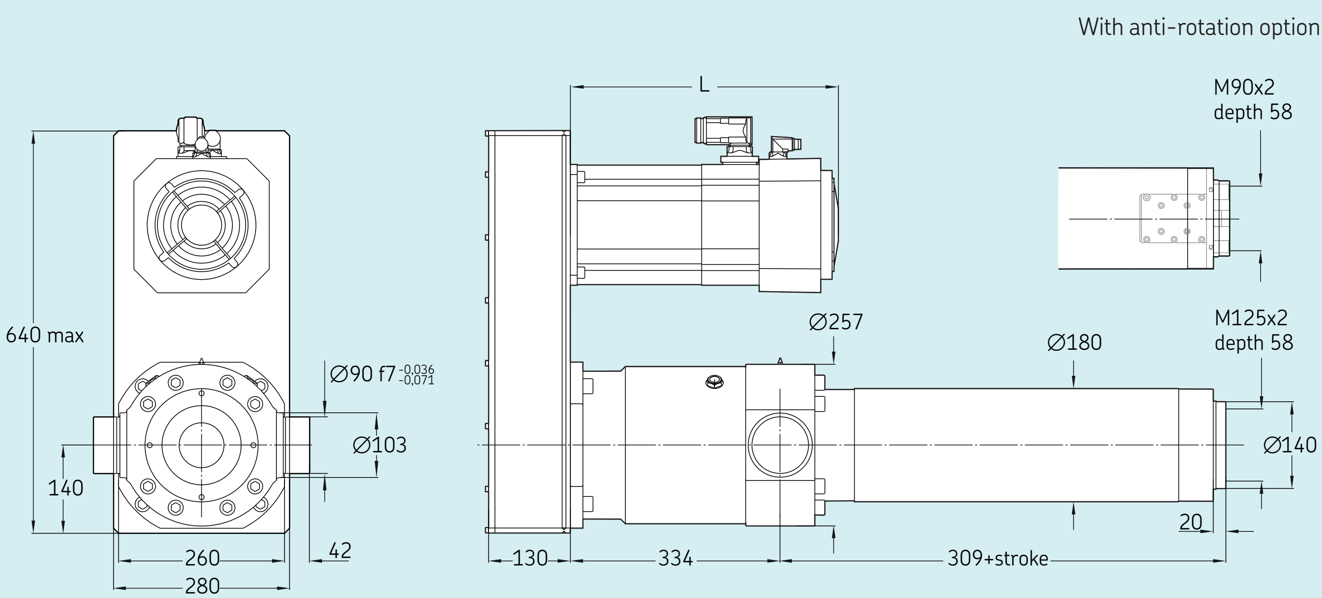
SKF

Performance diagrams





Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LD6	427	44	49
P70LD6	636	44	49
P100LD6	706	44	49

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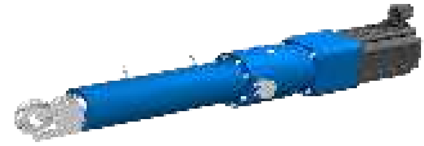


Electric cylinder
servo motor, inline configuration

Technical data

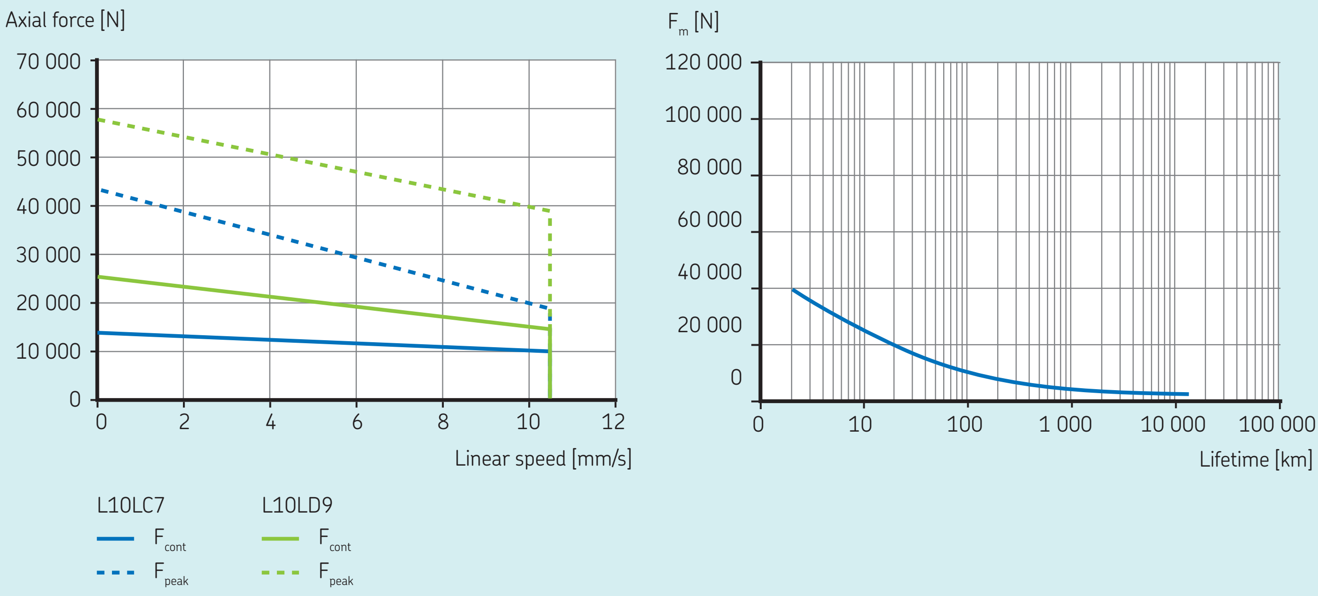
Designation	Symbol	Unit	Servo motor and inline adapter L10 LC7	 L10 LD9
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	13,8	24,7
Continuous force @ max. speed	F_c	kN	10,2	14,8
Peak force @ zero speed	F_{p0}	kN	42,8	57,8
Peak force @ max. speed	F_p	kN	18,7	38,8
Dynamic load capacity	C	kN	64	64
Holding force (motorbrake option)	F_{Hold}	kN	64	64
Max. linear speed	v_{max}	mm/s	10,4	10,4
Max. acceleration	a_{max}	m/s^2	0,6	0,6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	32	32
Screw lead	p_{screw}	mm	1	1
Lead accuracy	–	–	G5	G5
Stroke [1]	s	mm	100...600	100...600
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0	0
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	8,88	10,18
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,31	0,31
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07
Weight @ 0 mm stroke	m	kg	19,1	21,8
Δ weight per 100 mm stroke	Δm	kg	2,4	2,4
Weight of optional brake	m_{brake}	kg	0,8	0,8
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	2,6	2,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,3	0,3
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	3	6,2
Peak current	I_{peak}	A	12,8	16,8
Nominal power	P	kW	1,220	1,910
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [2]	IP	–	54	54

1) By 100 mm steps
2) With anti-rotation option IP44

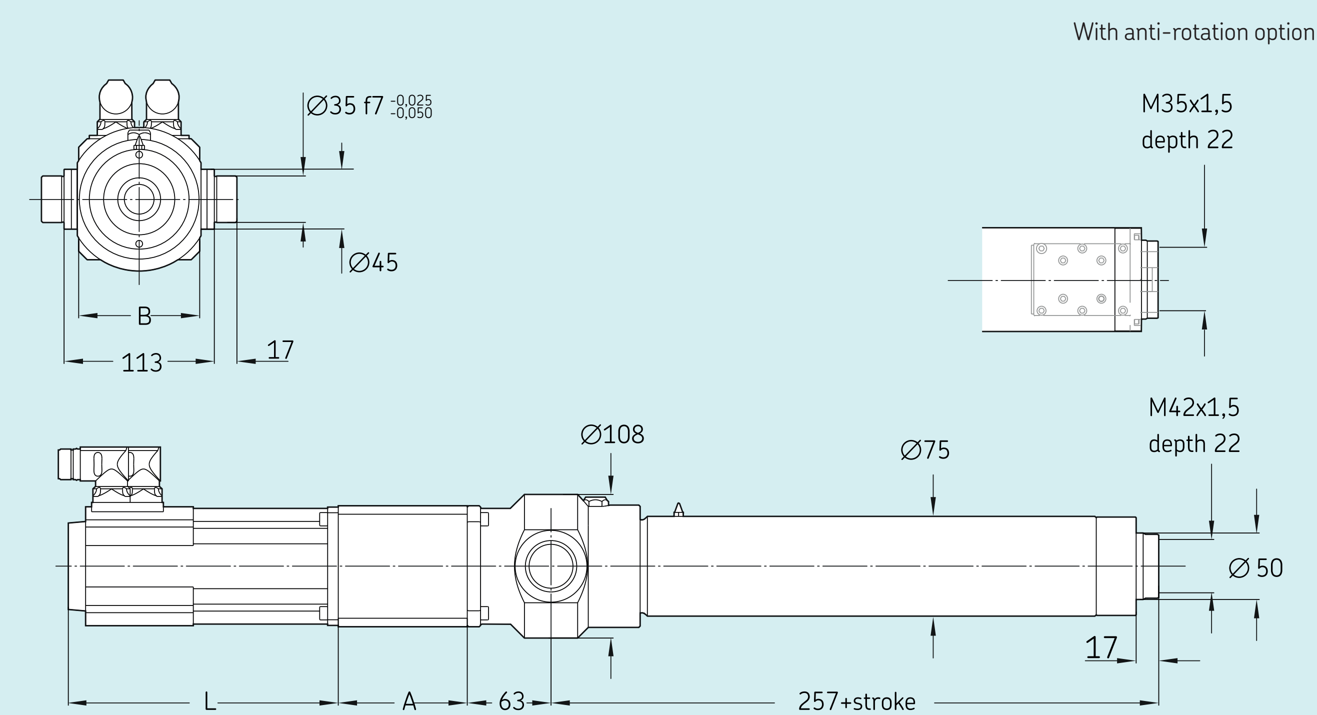
Ordering key

See page 306

Performance diagrams



Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LC7	97	203	91	20	51
L10LD9	97	263	91	20	51

SVSA-S-3201

Electric cylinder
servo motor, parallel configuration

Technical data

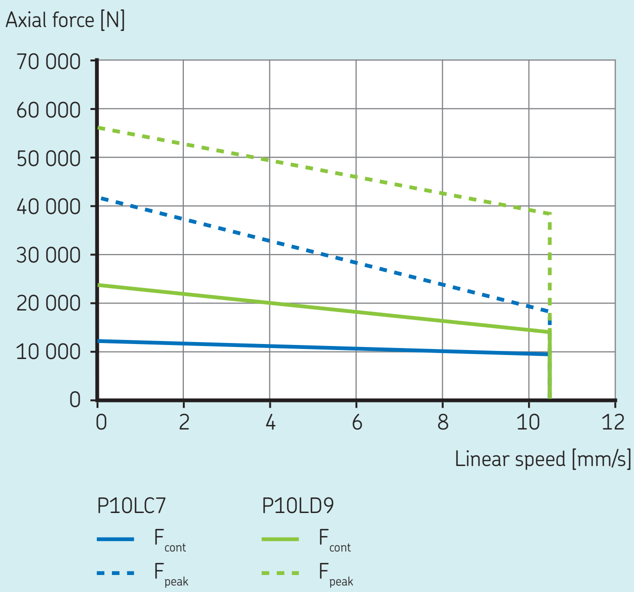
Designation	Symbol	Unit	Servo motor and parallel adapter P10 LC7	 P10 LD9
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	13,4	23,9
Continuous force @ max. speed	F_c	kN	9,9	14,4
Peak force @ zero speed	F_{p0}	kN	41,5	56,1
Peak force @ max. speed	F_p	kN	18,2	37,6
Dynamic load capacity	C	kN	64	64
Holding force (motorbrake option)	F_{Hold}	kN	64	64
Max. linear speed	v_{max}	mm/s	10,4	10,4
Max. acceleration	a_{max}	m/s^2	0,6	0,6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	32	32
Screw lead	p_{screw}	mm	1	1
Lead accuracy	–	–	G5	G5
Stroke 1)	s	mm	100…600	100…600
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0	0
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	7,70	9
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,31	0,31
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07
Weight @ 0 mm stroke	m	kg	24	26,7
Δ weight per 100 mm stroke	Δm	kg	2,4	2,4
Weight of optional brake	m_{brake}	kg	0,8	0,8
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	2,6	2,6
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,3	0,3
Electrical Data				
Motor type	–	–		
Nominal voltage	U	V AC	Servo	Servo
Nominal current	I	A	400	400
Peak current	I_{peak}	A	3	6,2
Nominal power	P	kW	12,8	16,8
			1,220	1,910
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0…+40	0…+40
Degree of protection 2)	IP	–	54	54

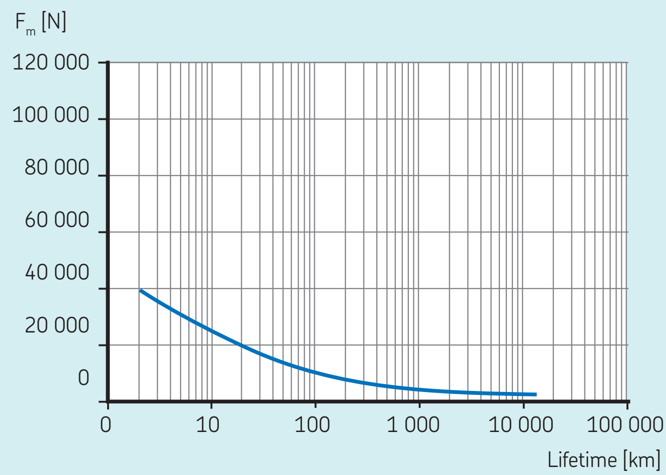
1) By 100 mm steps
2) With anti-rotation option IP44

Ordering key

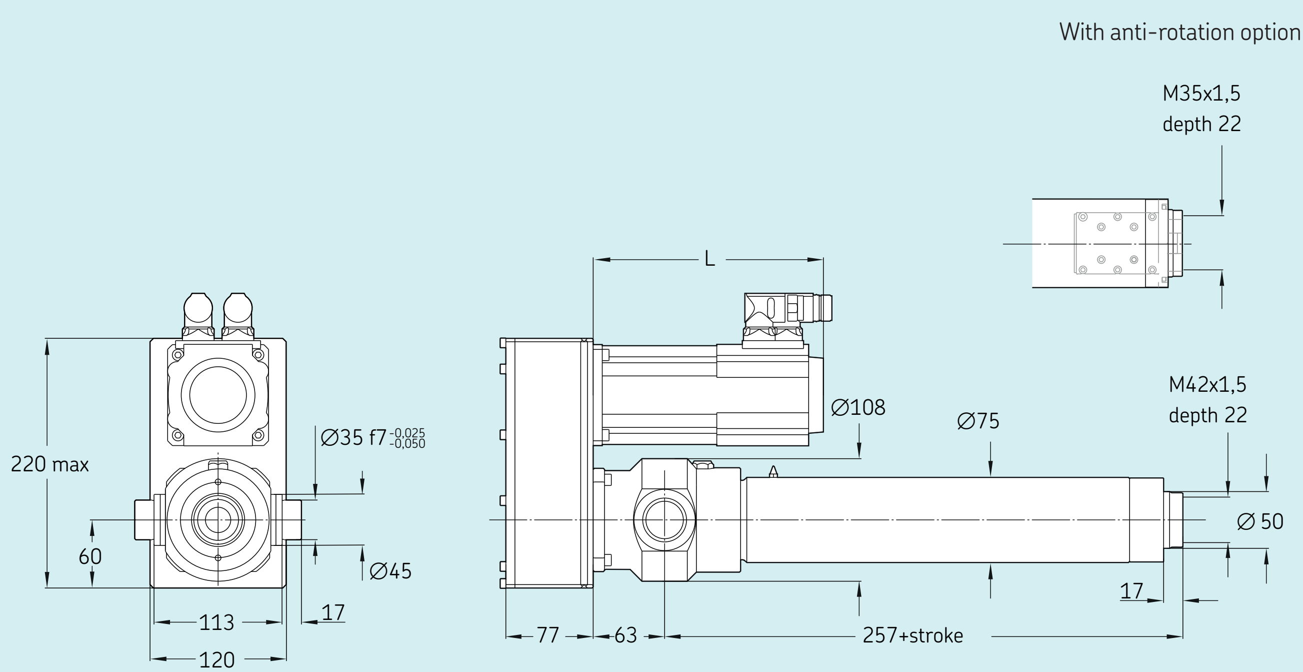
See page 306

Performance diagrams





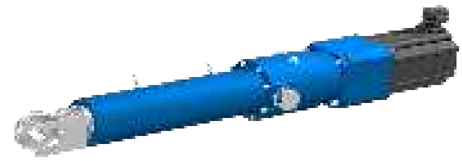
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
–	mm		
P10LC7	203	20	51
P10LD9	263	20	51

SVSA-S-4001

Electric cylinder
servo motor, inline configuration



Technical data

Designation	Symbol	Unit	Servo motor and inline adapter L10 LA1	L10 LA3
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	19,2	34,3
Continuous force @ max. speed	F_c	kN	16,5	30,1
Peak force @ zero speed	F_{p0}	kN	54,1	79,1
Peak force @ max. speed	F_p	kN	18,3	43,6
Dynamic load capacity	C	kN	79	79
Holding force (motorbrake option)	F_{Hold}	kN	79,0	79,0
Max. linear speed	v_{max}	mm/s	8,3	8,3
Max. acceleration	a_{max}	m/s^2	0,6	0,6
Duty cycle	D	%	100%	100%
Mechanical Data				
Screw type	–	–	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	40	40
Screw lead	p_{screw}	mm	1	1
Lead accuracy	–	–	G5	G5
Stroke [1]	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	5	5
Backlash [2]	$s_{backlash}$	mm	0	0
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	19,95	23,25
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,64	0,64
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07
Weight @ 0 mm stroke	m	kg	30,1	33,2
Δ weight per 100 mm stroke	Δm	kg	3,2	3,2
Weight of optional brake	m_{brake}	kg	0,9	0,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,2	0,2
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	2,7	4,1
Peak current	I_{peak}	A	10	12
Nominal power	P	kW	1,120	1,570
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [3]	IP	–	54	54

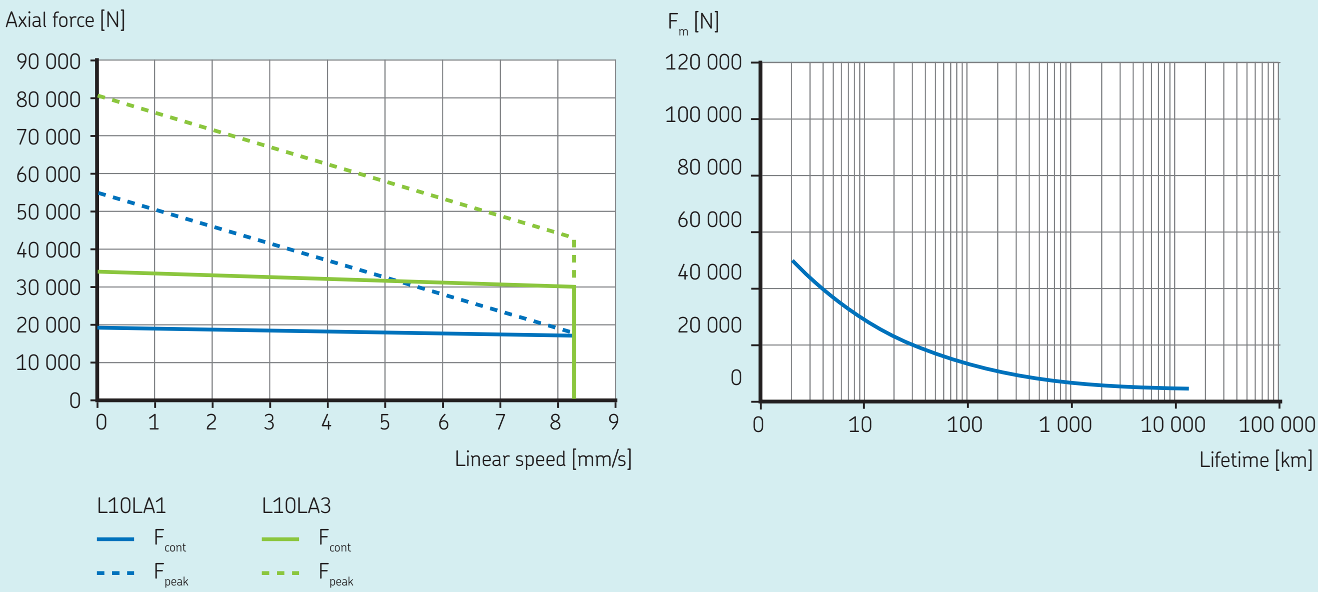
1) By 100 mm steps
2) Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

Ordering key

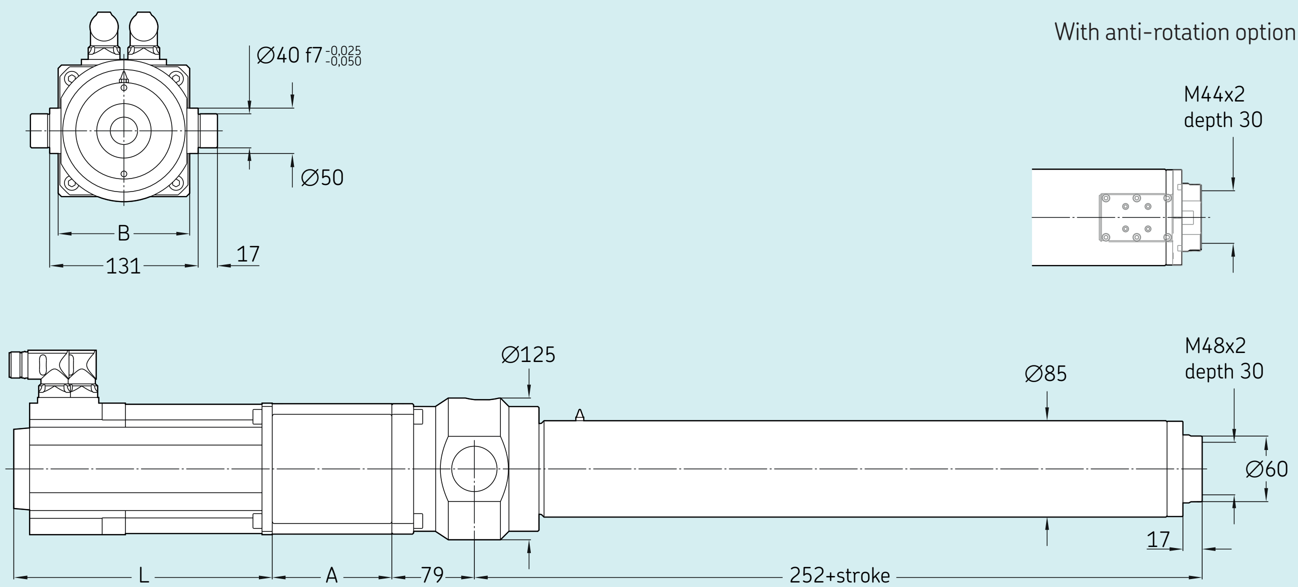
See page 306

SKF

Performance diagrams



Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LA1	111	188	116	20	49
L10LA3	111	228	116	20	49

SVSA-S-4001

Electric cylinder
servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	Servo motor and parallel adapter P10 LA1	P10 LA3
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	19,2	34,3
Continuous force @ max. speed	F_c	kN	16,5	30,1
Peak force @ zero speed	F_{p0}	kN	54,1	79,1
Peak force @ max. speed	F_p	kN	18,3	43,6
Dynamic load capacity	C	kN	79	79
Holding force (motorbrake option)	F_{Hold}	kN	79	79
Max. linear speed	v_{max}	mm/s	8,3	8,3
Max. acceleration	a_{max}	m/s^2	0,6	0,6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	40	40
Screw lead	p_{screw}	mm	1	1
Lead accuracy	–	–	G5	G5
Stroke [1]	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	5	5
Backlash [2]	$s_{backlash}$	mm	0	0
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	19,95	23,25
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,64	0,64
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	1,07
Weight @ 0 mm stroke	m	kg	30,1	33,2
Δ weight per 100 mm stroke	Δm	kg	3,2	3,2
Weight of optional brake	m_{brake}	kg	0,9	0,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,2	0,2
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	2,7	4,1
Peak current	I_{peak}	A	10	12
Nominal power	P	kW	1,120	1,570
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [3]	IP	–	54	54

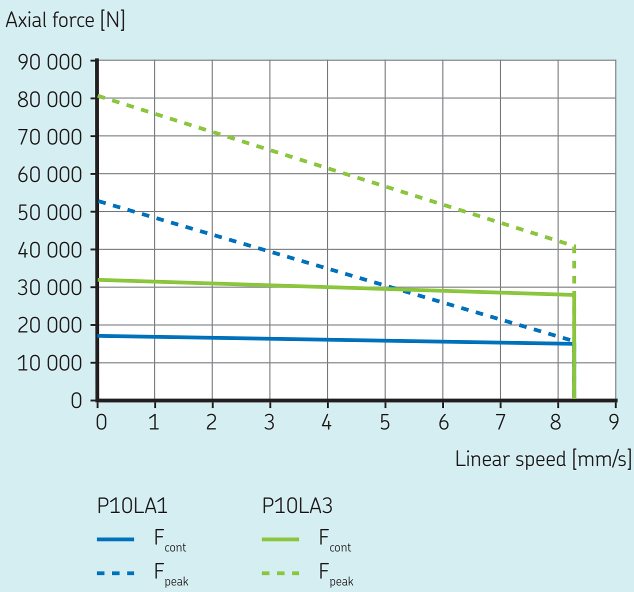
[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

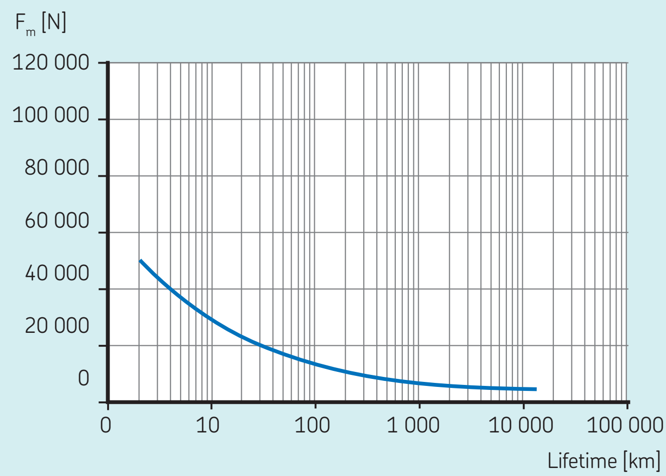
Ordering key

See page 306

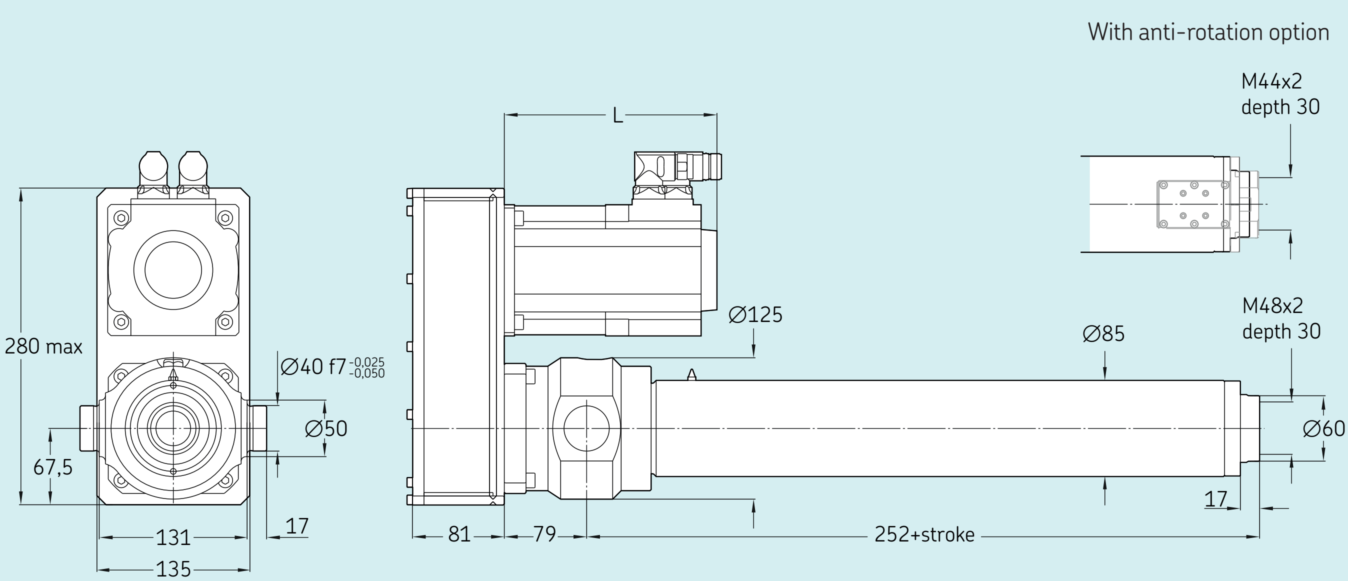
SKF

Performance diagrams





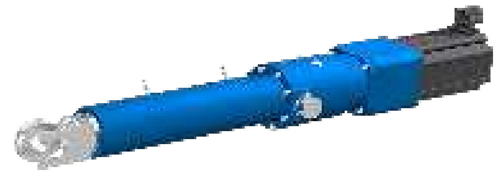
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LA1	188	20	49
P10LA3	228	20	49

SVSA-S-5001

Electric cylinder
servo motor, inline configuration



Technical data

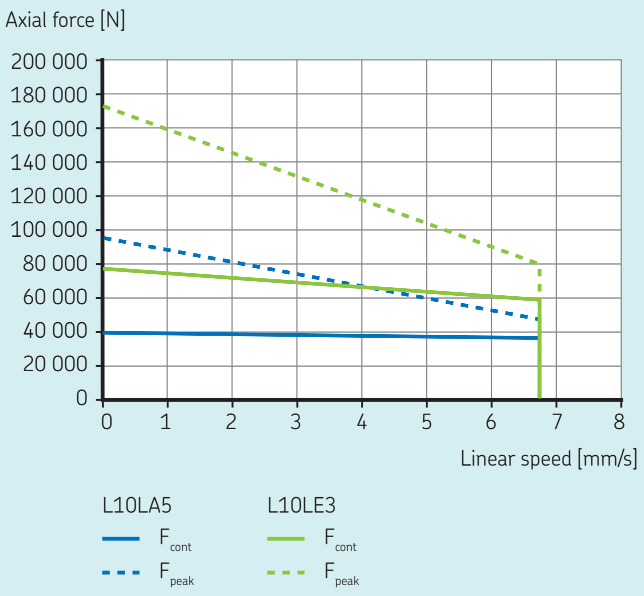
Designation	Symbol	Unit	Servo motor and inline adapter L10 LA5	 L10 LE3
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	40	74,6
Continuous force @ max. speed	F_c	kN	36	61,3
Peak force @ zero speed	F_{p0}	kN	93	174,2
Peak force @ max. speed	F_p	kN	45,3	79,2
Dynamic load capacity	C	kN	174	174
Holding force (motorbrake option)	F_{Hold}	kN	174	174
Max. linear speed	v_{max}	mm/s	6,7	6,7
Max. acceleration	a_{max}	m/s^2	0,6	0,6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	50	50
Screw lead	p_{screw}	mm	1	1
Lead accuracy	–	–	G5	G5
Stroke [1]	s	mm	100...900	100...900
Internal overstroke each side	s_0	mm	5	5
Backlash [2]	$s_{backlash}$	mm	0	0
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	40,82	72,22
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,80	1,80
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	3,20
Weight @ 0 mm stroke	m	kg	62,4	73,1
Δ weight per 100 mm stroke	Δm	kg	4,8	4,8
Weight of optional brake	m_{brake}	kg	0,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,4	0,4
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	6,2	12
Peak current	I_{peak}	A	26,8	31,2
Nominal power	P	kW	2,760	3,610
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [3]	IP	–	54	54

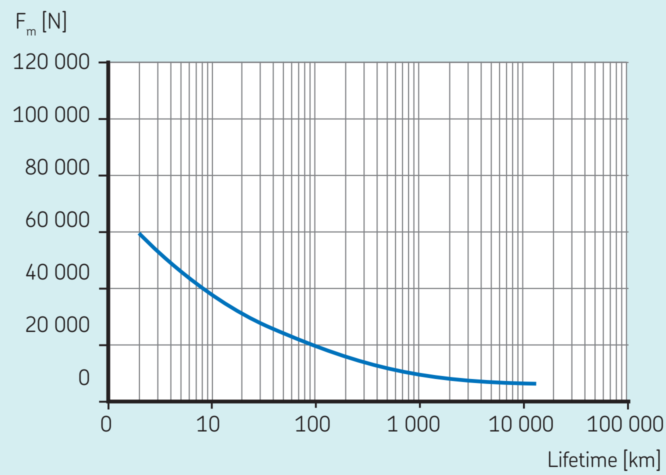
[1] By 100 mm steps
[2] Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
[3] With anti-rotation option IP44

Ordering key

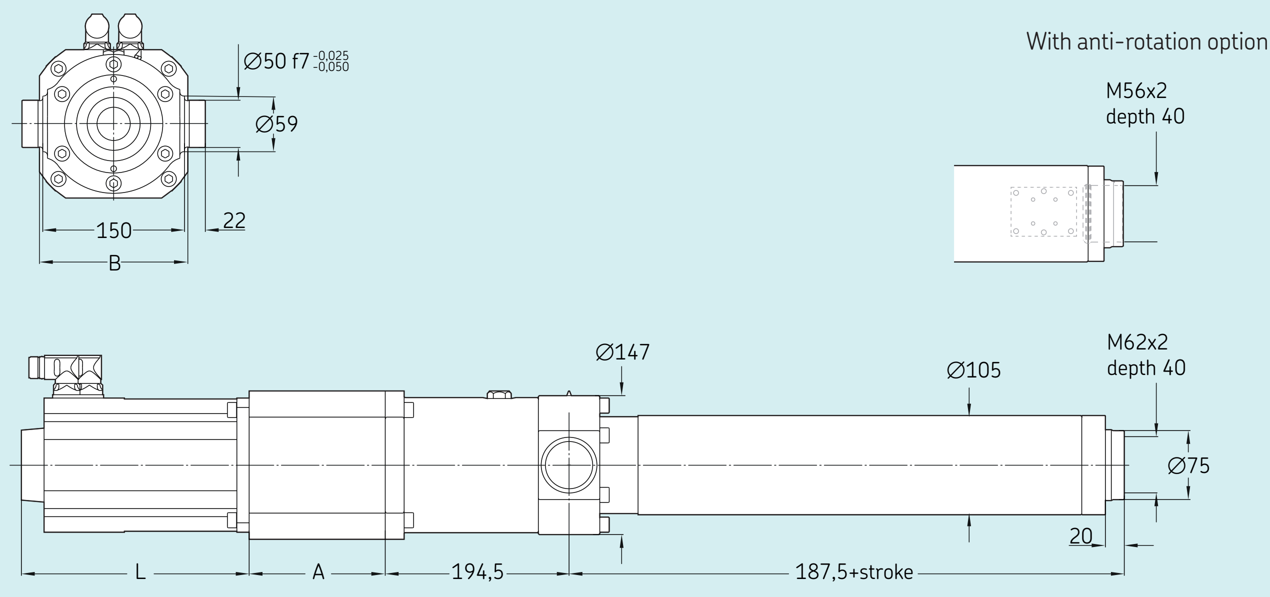
See page 306

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
–	mm				
L10LA5	134	268	185	20	49
L10LE3	148	281	135	28	50

SVSA-S-5001

Electric cylinder
servo motor, parallel configuration

Technical data

Designation	Symbol	Unit	Servo motor and parallel adapter P10 LA5	P10 LE3
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	40	74,6
Continuous force @ max. speed	F_c	kN	36	61,3
Peak force @ zero speed	F_{p0}	kN	93	174,2
Peak force @ max. speed	F_p	kN	45,3	79,2
Dynamic load capacity	C	kN	174	174
Holding force (motorbrake option)	F_{Hold}	kN	174	174
Max. linear speed	v_{max}	mm/s	6,7	6,7
Max. acceleration	a_{max}	m/s^2	0,6	0,6
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	50	50
Screw lead	p_{screw}	mm	1	1
Lead accuracy	–	–	G5	G5
Stroke [1]	s	mm	100...900	100...900
Internal overstroke each side	s_0	mm	5	5
Backlash [2]	$s_{backlash}$	mm	0	0
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	40,82	72,22
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,80	1,80
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	3,20
Weight @ 0 mm stroke	m	kg	62,4	73,1
Δ weight per 100 mm stroke	Δm	kg	4,8	4,8
Weight of optional brake	m_{brake}	kg	0,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,3	-0,3
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	0,4	0,4
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	6,2	12
Peak current	I_{peak}	A	26,8	31,2
Nominal power	P	kW	2,760	3,610
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [3]	IP	–	54	54

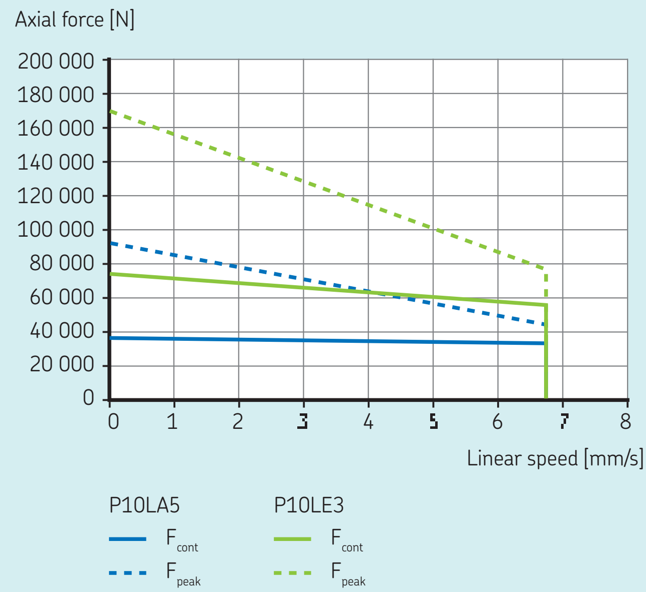
1) By 100 mm steps
2) Backlash elimination up to stroke 600 mm. For longer strokes $s_{backlash}$ = 0,02 mm
3) With anti-rotation option IP44

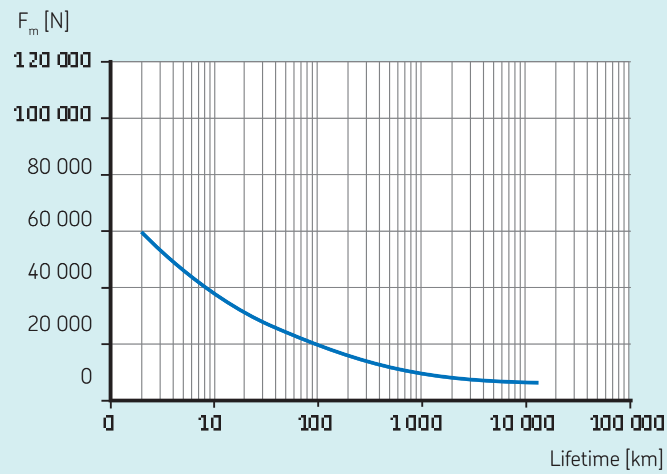
Ordering key

See page 306

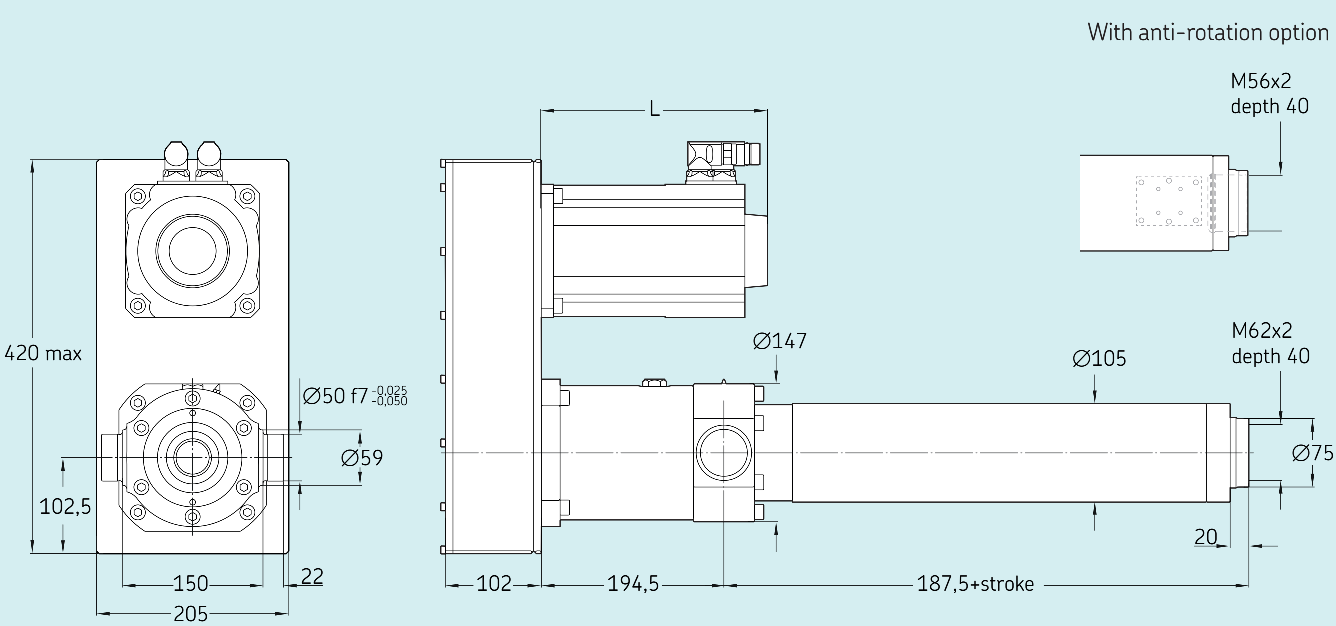
SKF

Performance diagrams





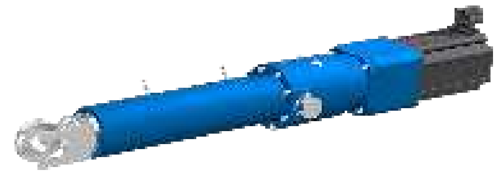
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LA5	268	20	49
P10LE3	281	28	50

SLSA-S-2525

Electric cylinder
servo motor, inline configuration



Technical data

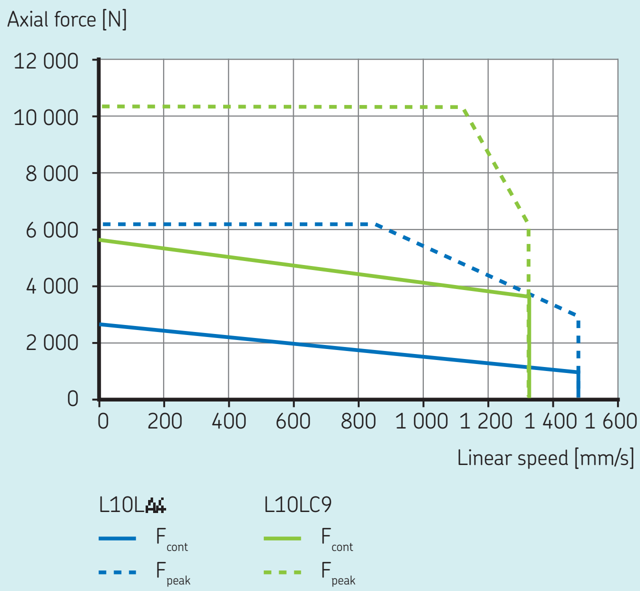
Designation	Symbol	Unit	Servo motor and inline adapter L10 LA4	L10 LC9
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	2,4	5,8
Continuous force @ max. speed	F_c	kN	1,6	3,6
Peak force @ zero speed	F_{p0}	kN	6,1	10,6
Peak force @ max. speed	F_p	kN	2,8	6,3
Dynamic load capacity	C	kN	22	22
Holding force (motorbrake option)	F_{Hold}	kN	3	6
Max. linear speed	v_{max}	mm/s	1 469	1 344
Max. acceleration	a_{max}	m/s^2	15,9	15,9
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	25	25
Screw lead	p_{screw}	mm	25	25
Lead accuracy	–	–	G9	G9
Stroke [1]	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0,08	0,08
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	23,29	39,35
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,21	0,21
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	3,20
Weight @ 0 mm stroke	m	kg	30,7	45,8
Δ weight per 100 mm stroke	Δm	kg	2,6	2,6
Weight of optional brake	m_{brake}	kg	0,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,4	-0,4
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	-0,1	-0,1
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	8,2	23,5
Peak current	I_{peak}	A	24	47
Nominal power	P	kW	2,77	5,81
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [2]	IP	–	54	54

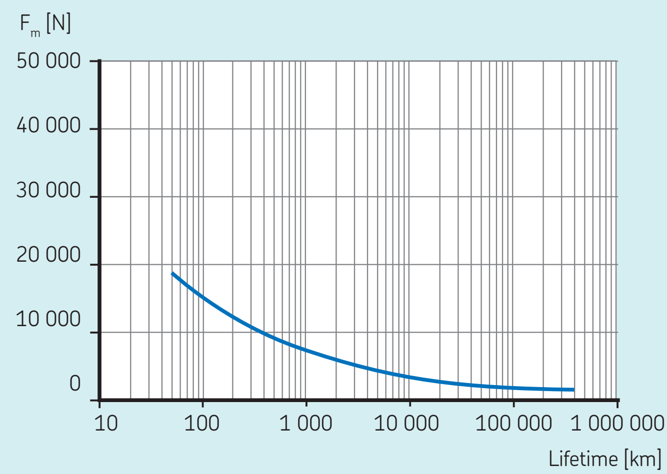
[1] By 100 mm steps
[2] With anti-rotation option IP44

Ordering key

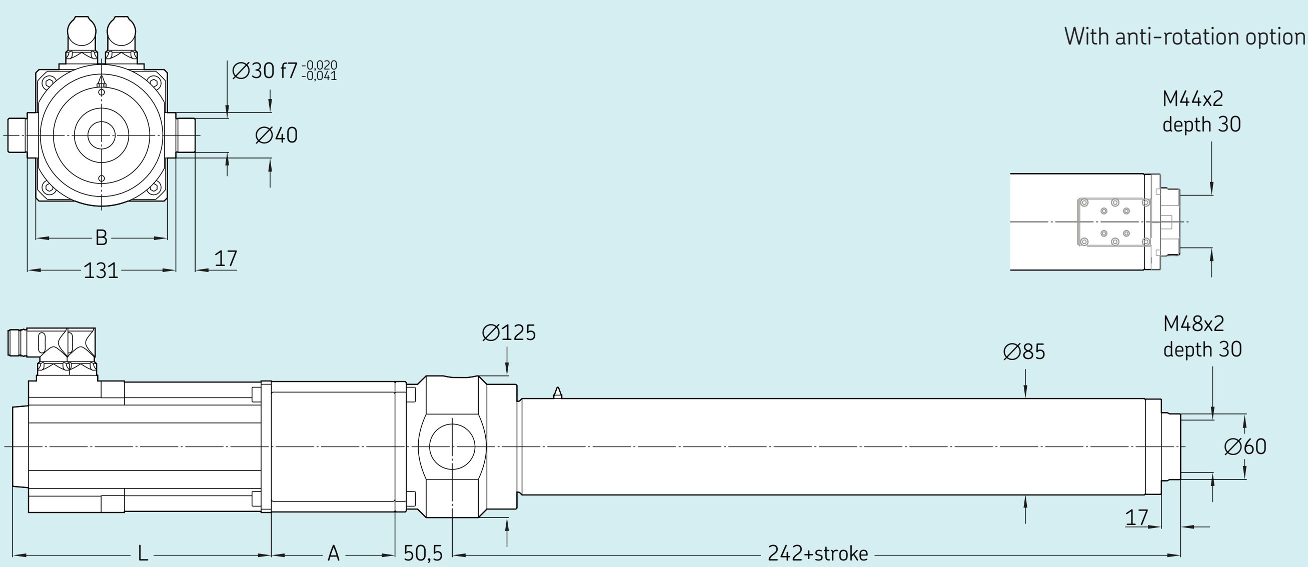
See page 306

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LA4	109	228	116	20	49
L10LC9	119	281	143	28	50

SLSA-S-2525

Electric cylinder
servo motor, parallel configuration

Technical data

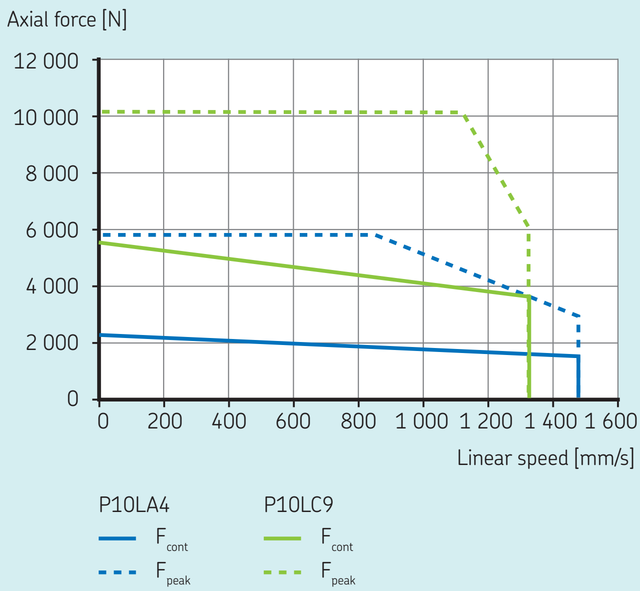
Designation	Symbol	Unit	Servo motor and parallel adapter P10 LA4	P10 LC9
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	2,3	5,6
Continuous force @ max. speed	F_c	kN	1,5	3,5
Peak force @ zero speed	F_{p0}	kN	5,9	10,2
Peak force @ max. speed	F_p	kN	2,8	6,1
Dynamic load capacity	C	kN	22	22
Holding force (motorbrake option)	F_{Hold}	kN	3	6
Max. linear speed	v_{max}	mm/s	1 469	1 344
Max. acceleration	a_{max}	m/s^2	15,9	15,9
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	25	25
Screw lead	p_{screw}	mm	25	25
Lead accuracy	–	–	G9	G9
Stroke [1]	s	mm	100...800	100...800
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0,08	0,08
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	46,76	62,86
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	0,21	0,21
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	1,07	3,20
Weight @ 0 mm stroke	m	kg	37,2	47,8
Δ weight per 100 mm stroke	Δm	kg	2,6	2,6
Weight of optional brake	m_{brake}	kg	0,9	1,9
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-0,4	-0,4
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	-0,1	-0,1
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	8,2	23,5
Peak current	I_{peak}	A	24	47
Nominal power	P	kW	2,77	5,81
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [2]	IP	–	54	54

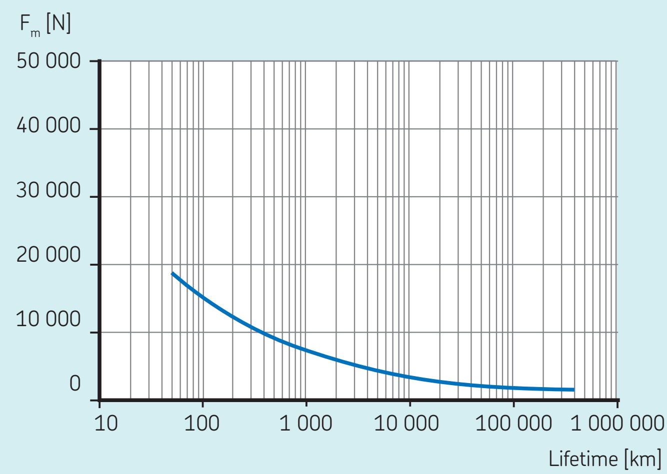
[1] By 100 mm steps
[2] With anti-rotation option IP44

Ordering key

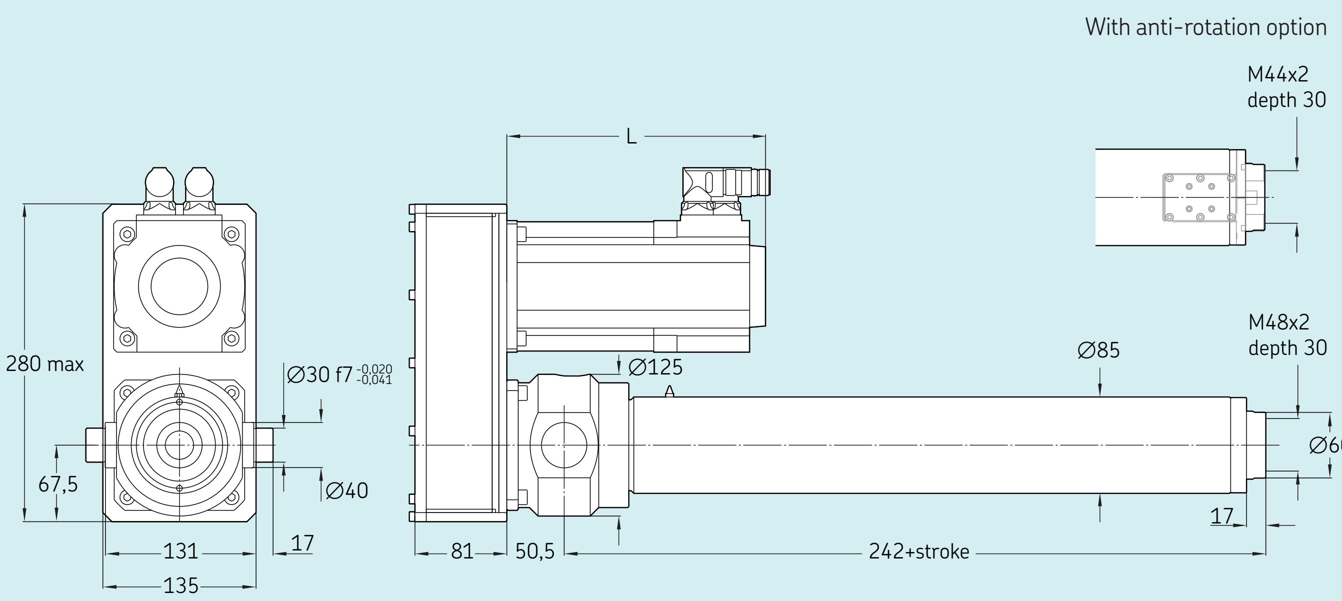
See page 306

Performance diagrams





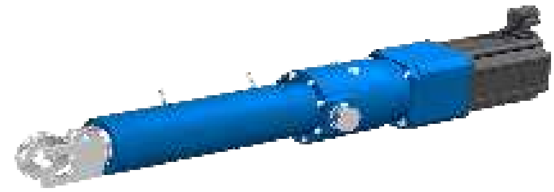
Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
–	mm		
P10LA4	228	20	49
P10LC9	281	28	50

SLSA-S-4040

Electric cylinder
servo motor, inline configuration



Technical data

Designation	Symbol	Unit	Servo motor and inline adapter L10 LD3	 L10 LD6
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	5,7	11,3
Continuous force @ max. speed	F_c	kN	4,3	7
Peak force @ zero speed	F_{p0}	kN	9,2	20,3
Peak force @ max. speed	F_p	kN	5,1	11,5
Dynamic load capacity	C	kN	52	52
Holding force (motorbrake option)	F_{Hold}	kN	4	6
Max. linear speed	v_{max}	mm/s	1 500	1 500
Max. acceleration	a_{max}	m/s^2	25,5	25,5
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	40	40
Screw lead	p_{screw}	mm	40	40
Lead accuracy	–	–	G9	G9
Stroke [1]	s	mm	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0,1	0,1
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	116,82	242,04
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,33	1,33
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	12,40
Weight @ 0 mm stroke	m	kg	96,1	118,2
Δ weight per 100 mm stroke	Δm	kg	7	7
Weight of optional brake	m_{brake}	kg	1,9	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-2	-2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	-1,3	-1,3
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	28,3	44,7
Peak current	I_{peak}	A	56	94
Nominal power	P	kW	9,07	15,82
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [2]	IP	–	54	54

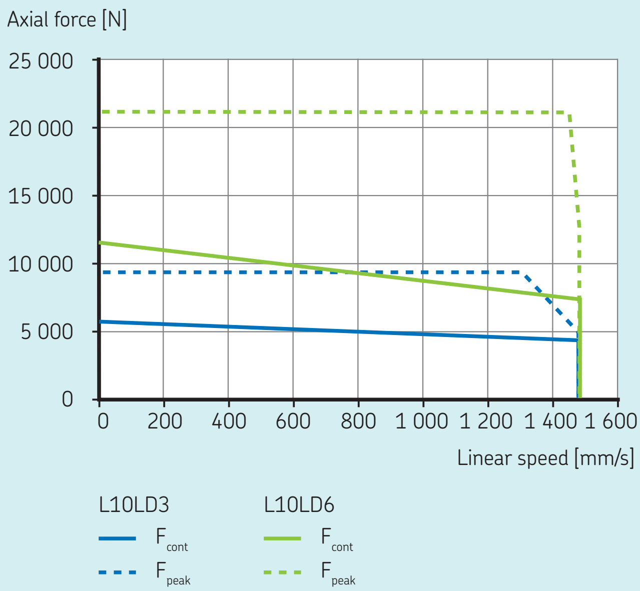
[1] By 100 mm steps
[2] With anti-rotation option IP44

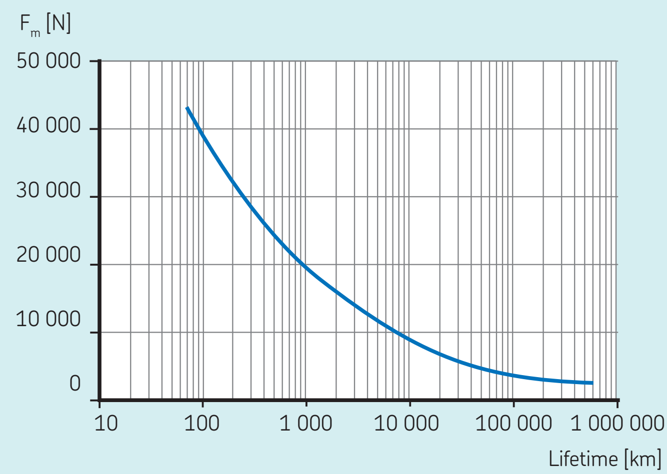
Ordering key

See page 306

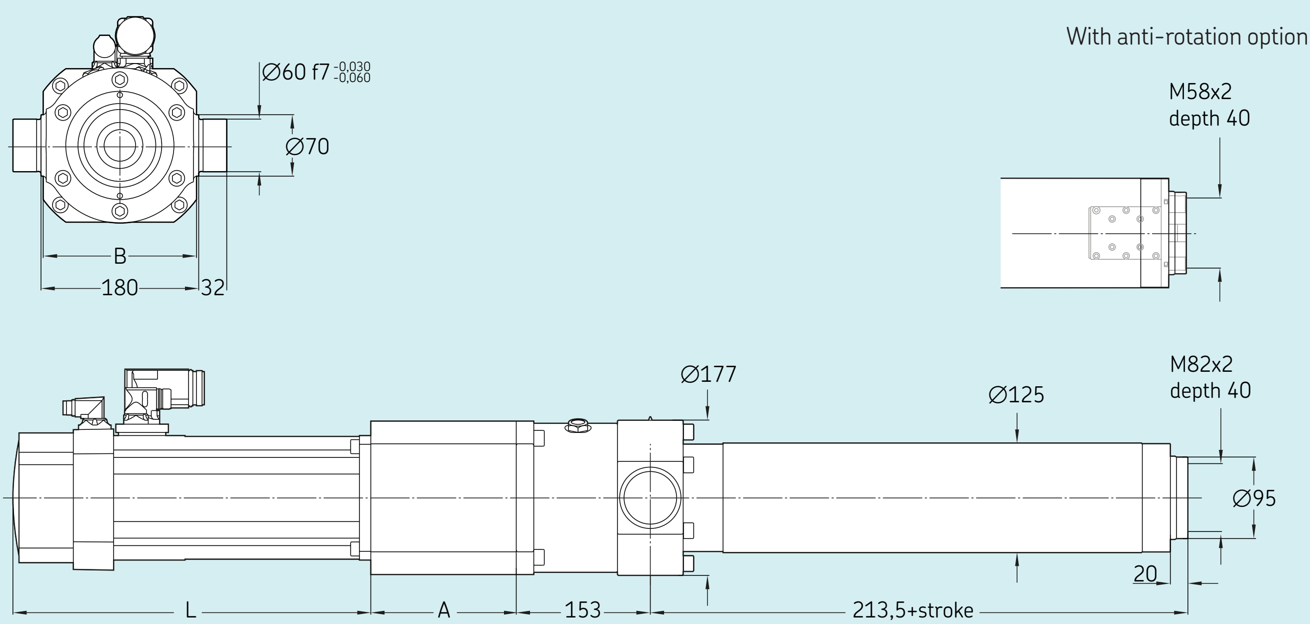
SKF

Performance diagrams





Dimensional drawing



Reference	A	L	B	Added length for brake option	Added length for encoder option
	mm				
L10LD3	166	409	192	28	50
L10LD6	176	427	192	44	49

C

SLSA-S-4040

Electric cylinder
servo motor, parallel configuration

Technical data

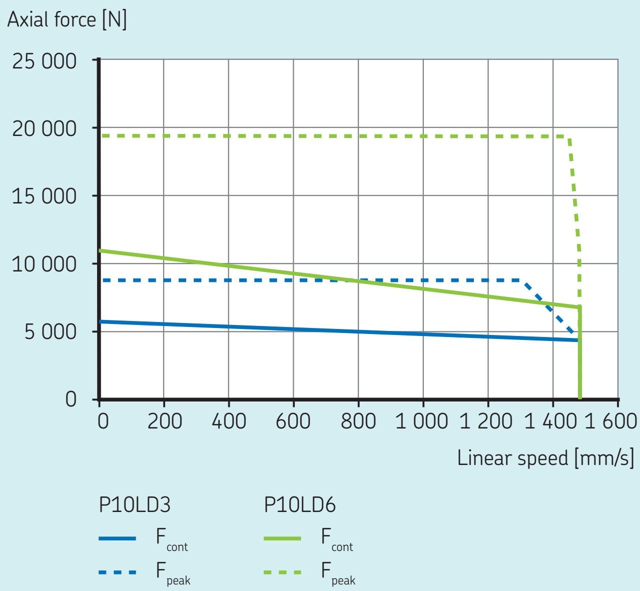
Designation	Symbol	Unit	Servo motor and parallel adapter P10 LD3	 P10 LD6
Performance Data				
Continuous force @ zero speed	F_{c0}	kN	5,6	11
Continuous force @ max. speed	F_c	kN	4,2	6,8
Peak force @ zero speed	F_{p0}	kN	9	19,7
Peak force @ max. speed	F_p	kN	5	11,1
Dynamic load capacity	C	kN	52	52
Holding force (motorbrake option)	F_{Hold}	kN	4	6
Max. linear speed	v_{max}	mm/s	1 500	1 500
Max. acceleration	a_{max}	m/s^2	25,5	25,5
Duty cycle	D	%	100	100
Mechanical Data				
Screw type	–	–	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	40	40
Screw lead	p_{screw}	mm	40	40
Lead accuracy	–	–	G9	G9
Stroke [1]	s	mm	100...1 200	100...1 200
Internal overstroke each side	s_0	mm	5	5
Backlash	$s_{backlash}$	mm	0,1	0,1
Gear reduction	i	–	1	1
Inertia @ 0 mm stroke	J	10^{-4} kgm^2	161,88	266,27
Δ Inertia per 100 mm stroke	ΔJ	10^{-4} kgm^2	1,33	1,33
Inertia of optional brake	J_{brake}	10^{-4} kgm^2	3,20	12,40
Weight @ 0 mm stroke	m	kg	109,3	127,2
Δ weight per 100 mm	Δm	kg	7	7
Weight of optional brake	m_{brake}	kg	1,9	3,1
Weight of anti-rotation @ 0 mm stroke	m_{arot0}	kg	-2	-2
Δ Weight of anti-rot. per 100 mm stroke	Δm_{arot}	kg	-1,3	-1,3
Electrical Data				
Motor type	–	–	Servo	Servo
Nominal voltage	U	V AC	400	400
Nominal current	I	A	28,3	44,7
Peak current	I_{peak}	A	56	94
Nominal power	P	kW	9,07	15,82
Environment and Standards				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection [2]	IP	–	54	54

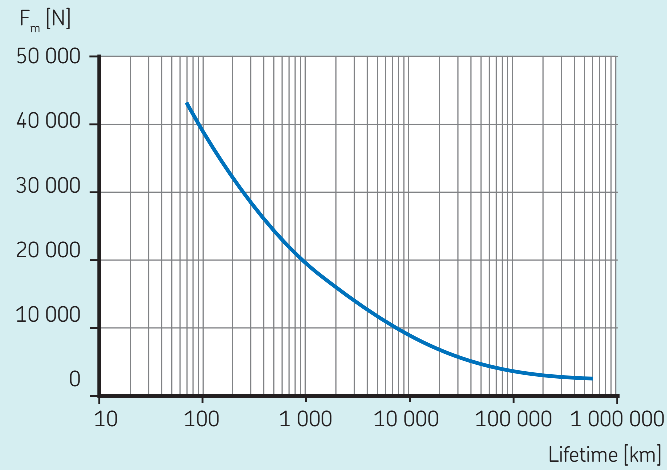
[1] By 100 mm steps
[2] With anti-rotation option IP44

Ordering key

See page 306

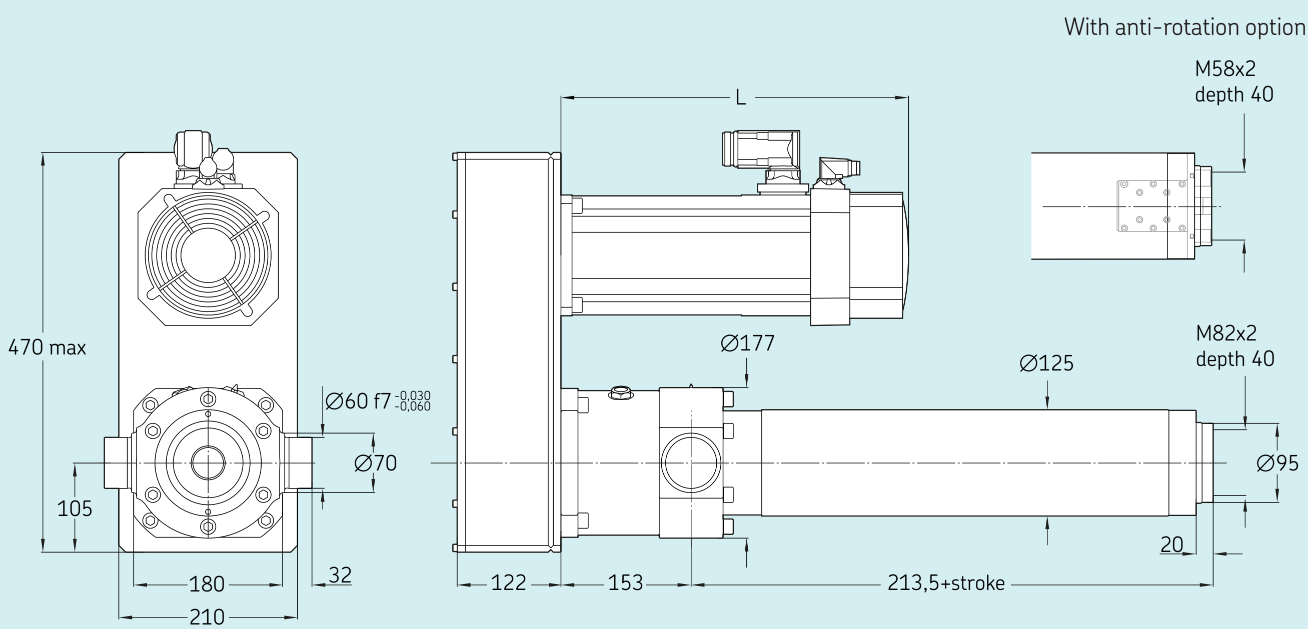
Performance diagrams





C

Dimensional drawing



Reference	L	Added length for brake option	Added length for encoder option
	mm		
P10LD3	409	28	50
P10LD6	427	44	49

Ordering key

Actuator with servo motor

S R S A - S - 4 8 1 0 - 0 2 0 0 - T R A F - L 0 1 0 L A 2 1 B Y A 1

Type
R Planetary roller screw
V Recirculating roller screw
L Long lead ball screw

Servomotor

Screw diameter

Screw lead

Stroke

Rear attachment
T Trunnions
Z Special
N No attachment

Front attachment
R Rod end
F Rod end with fork
Z Non standard
N No attachment (female thread)

Anti-rotation
A Anti-rotation
N No anti-rotation

Limit switches
F 2 limit switches and 1 home switch
S 2 limit switches only
M 1 limit switch and 1 home switch
L 1 limit switch only
H 1 home switch only
N No switch

SRSA - S - 4810 - 0200 - TRAF - L010LA21BYA1

Interface and gear ratio
see page 2017

Motor
see page 217

Feedback

1	Resolver
2	Absolute encoder Hiperface
3	Absolute encoder Endat

EM brake

B	Brake 24 V DC
N	No brake

Motor drive

Y	Drive included
N	No drive

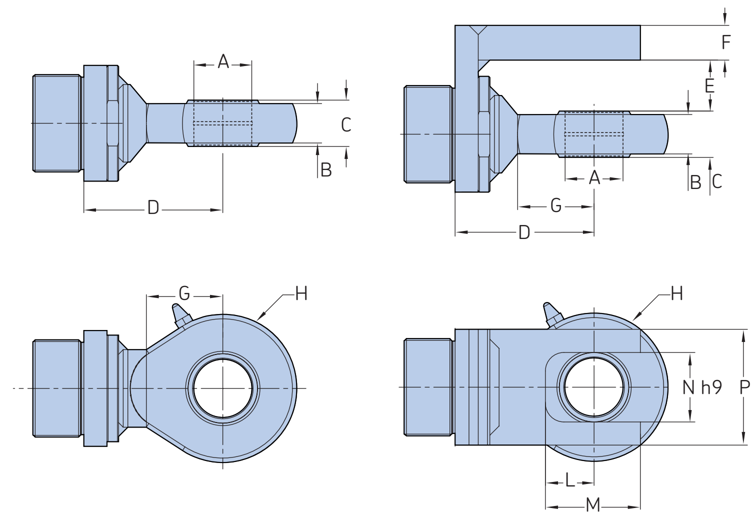
Drive fieldbus

A	CanOpen
B	DeviceNet
C	EtherCAT
D	Ethernet
E	Powerlink MN/CN
F	Powerlink CN
G	Profibus
H	Profinet
N	No fieldbus

Power and signal cables

1	5m
2	10m
3	15m
4	20m
N	No cable

Front attachment



Type	F_{max}	A [1]	B	C	D	E	F	G	H	L	M	N	P
–	kN	mm											
SVSA-x-32xx	25	∅ 25	17	$20^{0}_{-0,12}$	60	22	15	33	∅ 64	21	41	30	50
SVSA-x-40xx/SLSA-x-25xx	33	∅ 30	19	$22^{0}_{-0,12}$	71	24	15	37,5	∅ 73	23	45	35	60
SRSA-x-39xx/SVSA-x-50xx	46	∅ 40	23	$28^{0}_{-0,12}$	89	30	15	48	∅ 92	29	58	45	75
SRSA-x-48xx/SLSA-x-40xx	77	∅ 50	30	$35^{0}_{-0,12}$	110	38	15	59	∅ 112	36	71	55	95
SRSA-x-60xx	117	∅ 60	38	$44^{0}_{-0,15}$	122	46	15	72,5	∅ 135	43	83	65	115
SRSA-x-75xx	192	∅ 80	47	$55^{0}_{-0,15}$	98	50	15	168	∅ 180	50	95	85	140

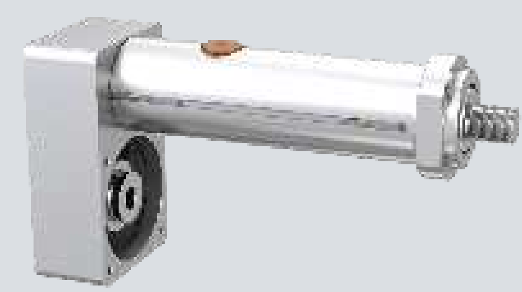
[1] Rod-end inner diameter A tolerance: m6.
Tolerance of axis which will be inserted in rod-end has to be in accordance with recommendations given in SKF spherical plain bearings and rod-end catalogue - publication PUB BU/P1 06116/1 EN.

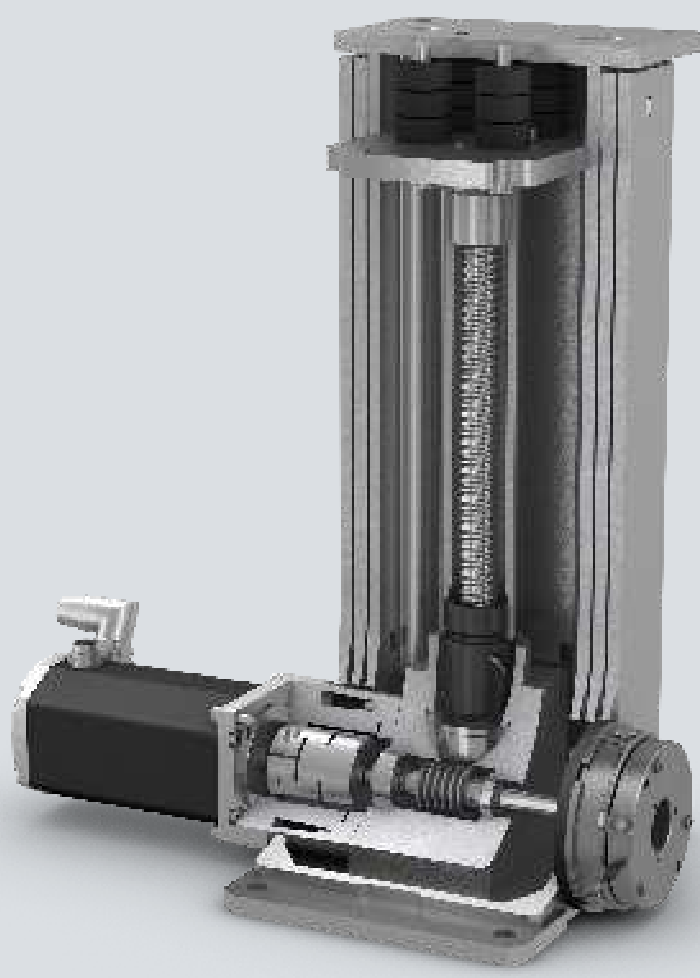
C

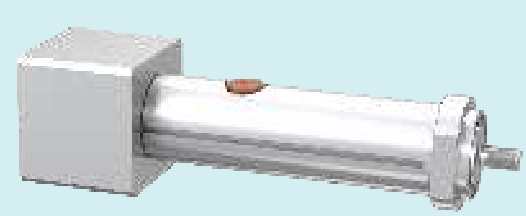
UP TO
65 %
WEIGHT SAVING

Customized solutions

UP TO
100 mm/s
HIGH SPEED
PILLARS







Servo pillar CPSM

D

Features

- High dynamic servo or brushless DC motor for high speed up to 100 mm/s
- High performance ball screw for high load capacity up to 5 kN
- Extruded alumium proiles for a very robust design
- Manually adjusted gliders for very high stiff-ness and high excentric loads
- Encoder system of the motor and high quality gearbox enable high positioning accuracy and high repeatability (0,1 mm)

Benefits

- High nominal power of the motor allows for high duty cycle of the pillar
- Customized motor adapter for highest flexibil-ity (max. motor diameter 90 mm)
- Customized top and bottom plate to fit most of the applications
- Customized aluminum profile colour (ano-dized) to fit application design needs
- Optional brake to release the motor when it’s in position and to increase the duty cycle
- Preloaded bearing arrangement also for ceil-ing mount applications (only available without damping system)

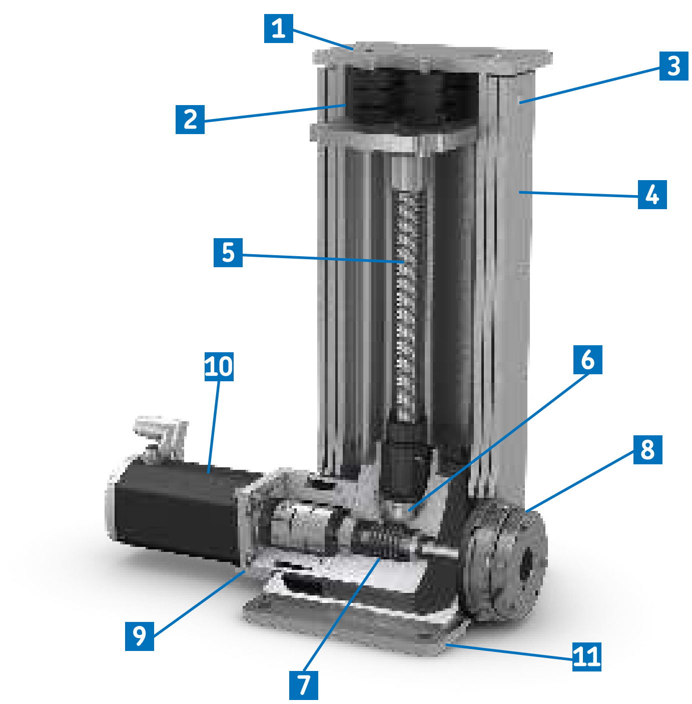
Product description

Telescopic pillars CPSM are the ideal solution to combine strong guiding functions with linear movements.

The robust, manually adjusted and virtually backlash-free aluminum extrusions are able to carry high excentric loads in push and pull directions.

To provide enough power to lift and lower heavy weights with high speed, the pillars are equipped with brushless DC or servo motors. Of course, SKF also supports the usage of preferred motors with a customizable motor interface.

Optional brakes and damping elements are key features that allow an effective usage in heavy duty industrial applications.



- **1** Customized top plate
- **2** Optional damping system
- **3** Backlash-free long lasting guiding pads
- **4** 2 or 3 section extruded aluminum guiding tubes
- **5** High eficiency ball screw
- **6** Preloaded bearing arrangement
- **7** Low friction worm gear reduction
- **8** Optional electromechanical brake
- **9** Standard or customized motor interface
- **10** Motor (Brushless DC or servo AC)
- **11** Customized bottom plate

CPSM

Servo pillar

Technical data

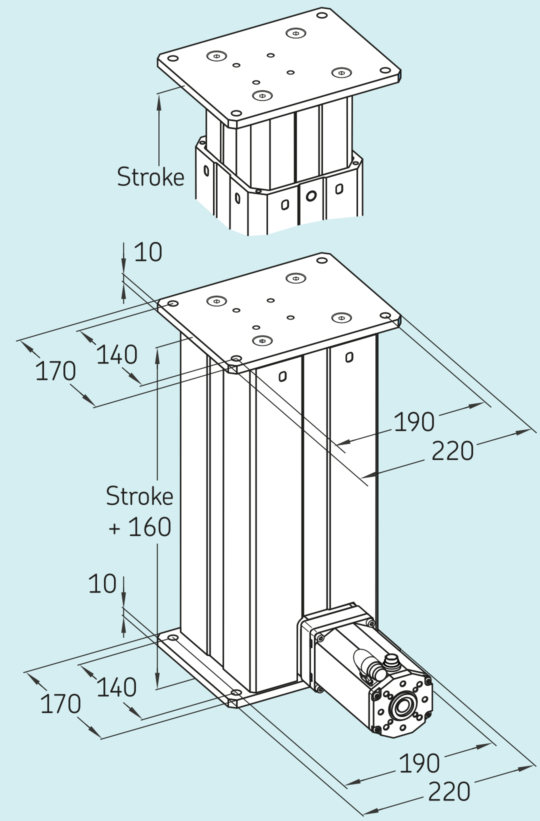
Designation	Symbol	Unit	w/o motor	BG75	1FK7034
Performance Data					
Continuous force @ zero speed	F_{c0}	kN	5	4,013	5,000
Continuous force @ max. speed	F_c	kN	5	4,013	4,013
Peak force @ zero speed	F_{p0}	kN	5	5	5
Peak force @ max. speed	F_p	kN	5	5	5
Dynamic load capacity	C	kN	21	21	21
Holding force (motorbrake option)	$F_{Hold-MB}$	kN	N/A	5	5
Holding force (external brake option)	$F_{Hold-EB}$	kN	5	5	5
Max. linear speed	v_{max}	mm/s	–	62	100
Max. acceleration	a_{max}	m/s^2	6	6	6
Duty cycle	D	%	100	100	100
Mechanical Data					
Screw type	–	–	Ball screw	Ball screw	Ball screw
Screw diameter	d_{screw}	mm	20	20	20
Screw lead	p_{screw}	mm	10	10	10
Lead accuracy	–	–	G7	G7	G7
Stroke [1)]	s	mm	100...700	100...700	100...700
Internal overstroke each side	s_0	mm	1	1	1
Backlash	$s_{backlash}$	mm	0,07	0,07	0,07
Gear reduction	i	–	10	10	10
Efficiency	η	%	58	52	51
Electrical Data					
Motor type	–	–	N/A	Brushless DC	Servo
Nominal voltage	U	V DC	N/A	40	N/A
Nominal current	I	A	N/A	12,7	1,3
Peak current	I_{peak}	A	N/A	10,8	1,9
Nominal power	P	kW	N/A	0,45	0,6
Environment					
Ambient temperature	$T_{ambient}$	°C	0...+50	0...+50	0...+50
Max. humidity	φ	%	95	95	95

[1)] By 100 mm steps
For more information about the motors, please refer to the High performance actuator catalogue on skf.com, section CASM 32 – 63

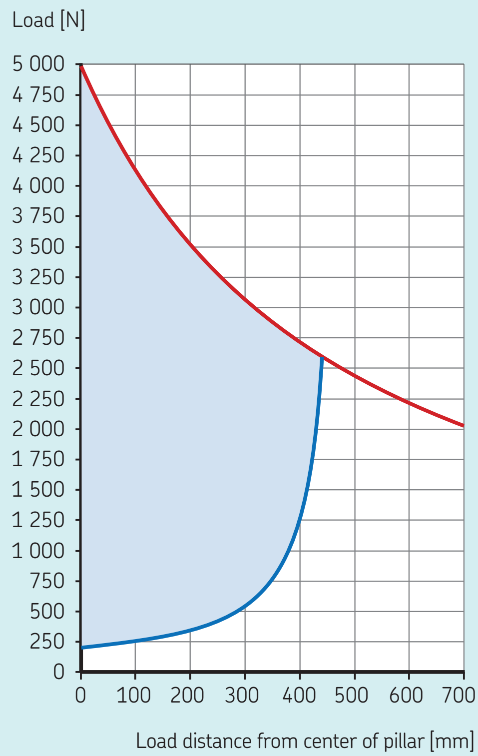
Ordering key

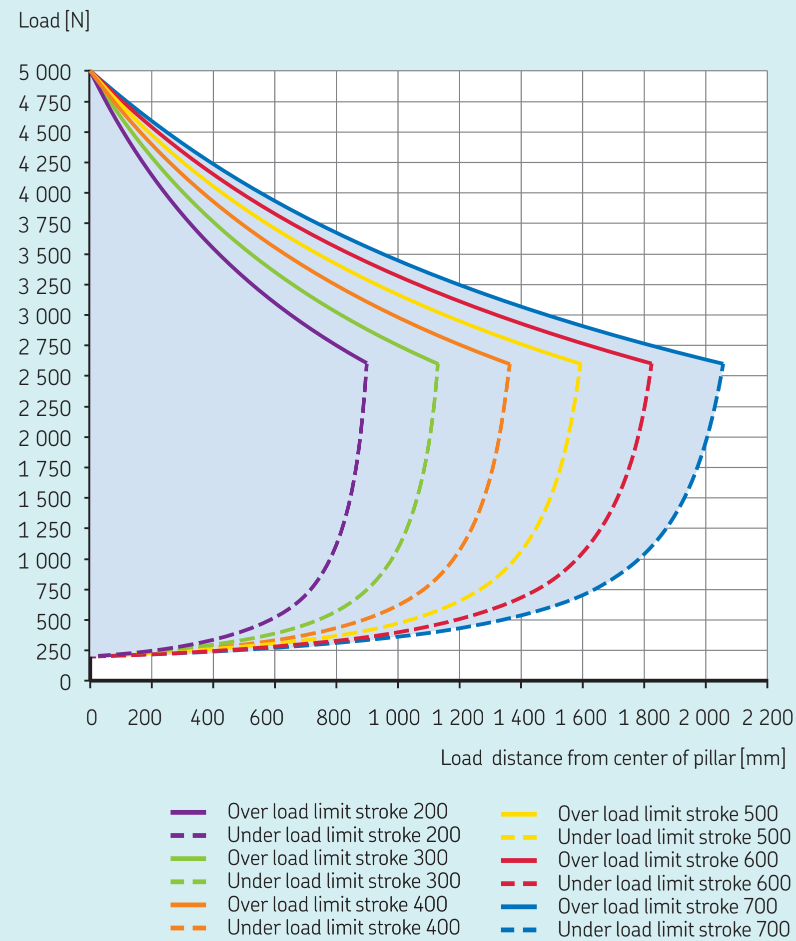
See page 317

Dimensional drawing

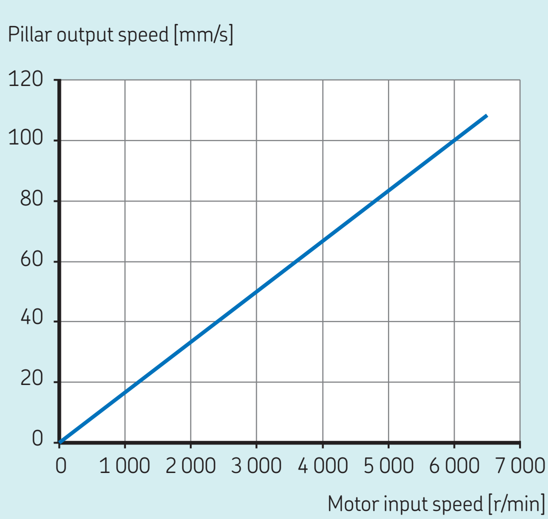


Performance diagrams





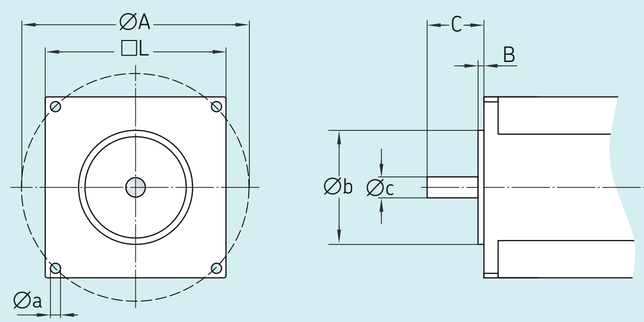
Performance diagram



D

Adapter for third-party motors

In order to attach your preferred motor to the pillar, SKF offers tailor-made solutions within the specifications below. For motor specifications which are not covered by those below, please contact SKF.



Description	Symbol	Unit	Min.	Max.
Motor housing	□L	mm	60	95
Motor centering	Øb	mm	4/	95
Centering height	B	mm	1	5
Fixing diameter	ØA	mm	52	103
Shaft diameter	Øc	mm	11	19
Shaft lenght	C	mm	15	48

Ordering key

Linear units

CPSM10 - BN - 10 - D0300 - 000 - AM - 000

Type

Tube size
10 L-Size tube [1)]

Screw type
BN Ball screw 20×10
- - Other, on request

Worm gear
10 Worm gear ratio 1:10
- - Other, on request

Tube set
A 2-section
D 3-section

Stroke
100 mm
200 mm
300 mm
400 mm
500 mm
600 mm
700 mm
- - Other, on request

Dampening element
0 Without dampening element (retracted length = stroke + 160 mm)
W With dampening element (retracted length = stroke + 212 mm)

External brake
00 Without electromechanical brake
24 With electromechanical holding brake 24VDC
- - Customized brake on request

Motor and Adapter
AA Motor, adapter separately delivered
AM Motor, adapter mounted

1) 3- sections: ☐ 163 mm / 2-sections: ☐ 146 m

Servo actuator SEMC

Features

- High performance roller screw for high speed (up to 600 mm/s) and acceleration (up to 9,5 m/s^2) requests
- High dynamic servomotor for high speed and acceleration requests
- Optional anti-rotation device
- Adjustable external proximity switches
- Optional lubricant for food grease compatibility
- Optional fail safe brake, absolute encoder on servomotor
- Recirculation roller screw with low lead (up to 1 mm) available on demand

Benefits

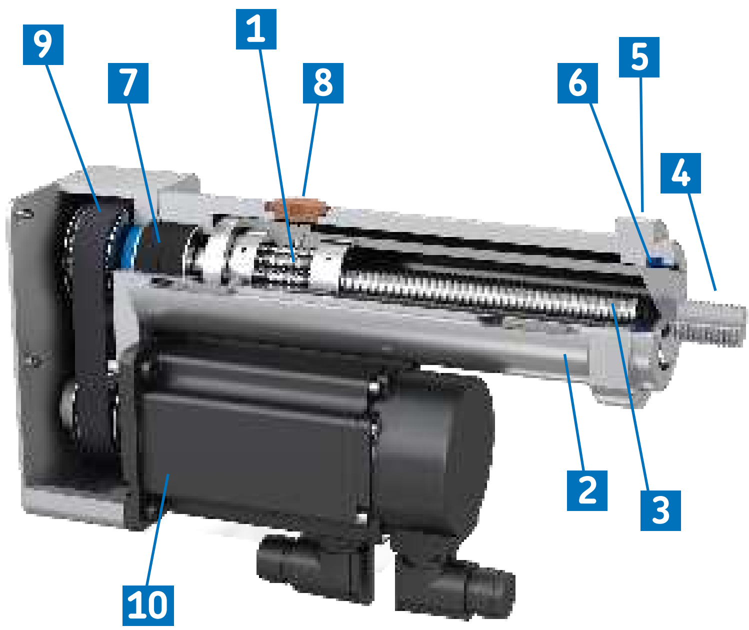
- Long lifetime, thanks to roller screw technology
- Aluminium body to save kg and limit total weight of the actuator
- Customized motor adapter for highest flexibility (max motor section 90 mm)
- Compact solution with high power density

Product description

In addition to standard electrical cylinder product range, SKF offers an extensive customization program that is able to fulfill specific application needs. This is important for SKF recognition as a knowledge engineering company and solution provider.

The SEMC actuator is one of the customized solutions designed by SKF. The application requirements consisted of a dimensionally compact and lightweight actuator with a long lifetime, high speed and high acceleration.

The SKF solution is based on a BRC15x5 or 8 roller screw, with a full aluminium body, resulting in a very compact solution weighing less than 7 kg including the motor, but robust thanks to the roller screw technology used inside.



1 High quality SKF planetary roller screw with backlash elimination
2 Aluminium body
3 Steel push rod
4 Male thread on push rod (customization upon request)
5 Front mount
6 Scraper on the front to keep out contaminants
7 High quality SKF bearings
8 Plug for direct grease access on roller screw nut body
9 Pulleys/belt transmission (ratio 1:1)
10 Servomotor

D

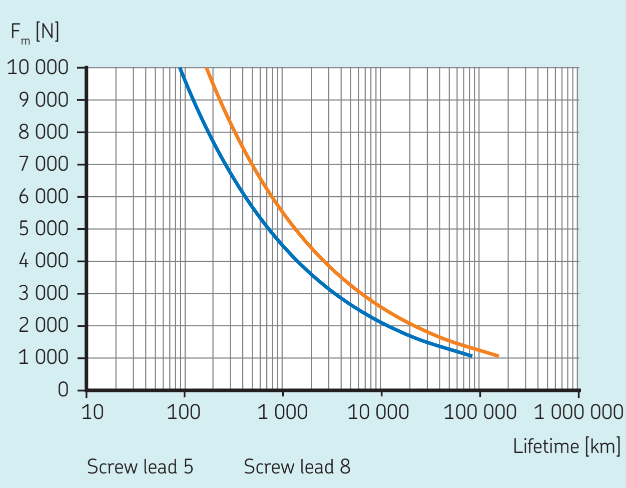
SEMC

Linear unit

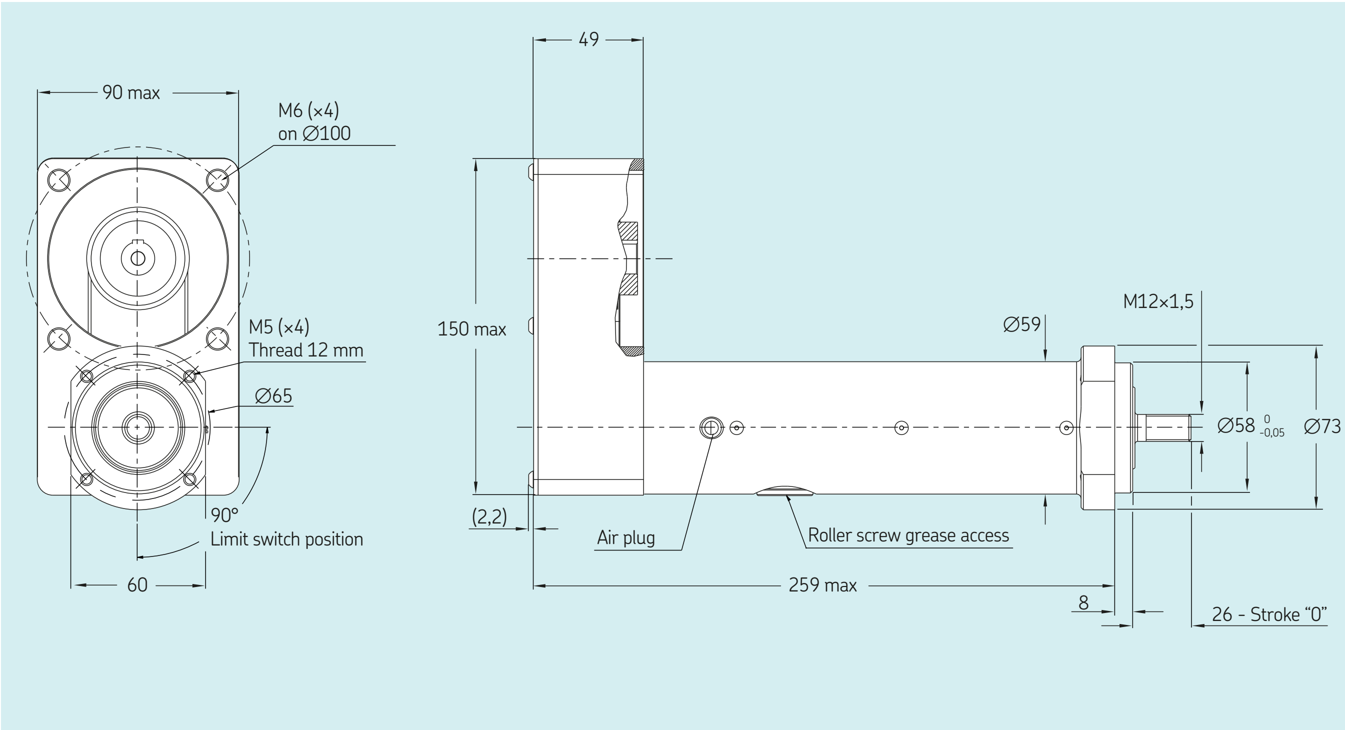
Technical data

Designation	Symbol	Unit	SEMC1505 w/o motor P10 interface	L10 interface	SEMC1508 w/o motor P10 interface	L10 interface
Performance data						
Max. dynamic axial force	F_{max}	kN	7,4	10	4,5	6,2
Max. static axial force	F_{0max}	kN	7,4	10	4,5	6,2
Dynamic load capacity	C	kN	26	26	27,4	27,4
Maximum torque to reach F_{max}	M_{max}	Nm	7,5	10	7,5	10
Max. linear speed	V_{max}	mm/s	375	375	600	600
Max. rotational speed	n_{max}	1/min	4 500	4 500	4 500	4 500
Max. acceleration	a_{max}	m/s^2	6	6	9,5	9,5
Duty cycle	D_{unit}	%	100	100	100	100
Mechanical Data						
Screw type	-	-	Roller screw		Roller screw	
Screw diameter	d_{screw}	mm	15	15	15	15
Screw lead	p_{screw}	mm	5	5	8	8
Lead accuracy	-	-	G5	G5	G5	G5
Stroke	s	mm	up to 125	up to 125	up to 125	up to 125
Internal overstroke each side	s_0	mm	2	2	2	2
Backlash	$s_{backlash}$	mm	0	0	0	0
Efficiency	η_{lu}	%	78	80	77	79
Gear reduction	i	-	1	1	1	1
Weight @ 0 mm stroke	m_{lu}	kg	3,7	3,7	3,7	3,7
Δ Weight per 50 mm stroke	Δm	kg	0,4	0,4	0,4	0,4
Environment						
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40	0...+40	0...+40
Degree of protection	IP	-	54S	54S	54S	54S

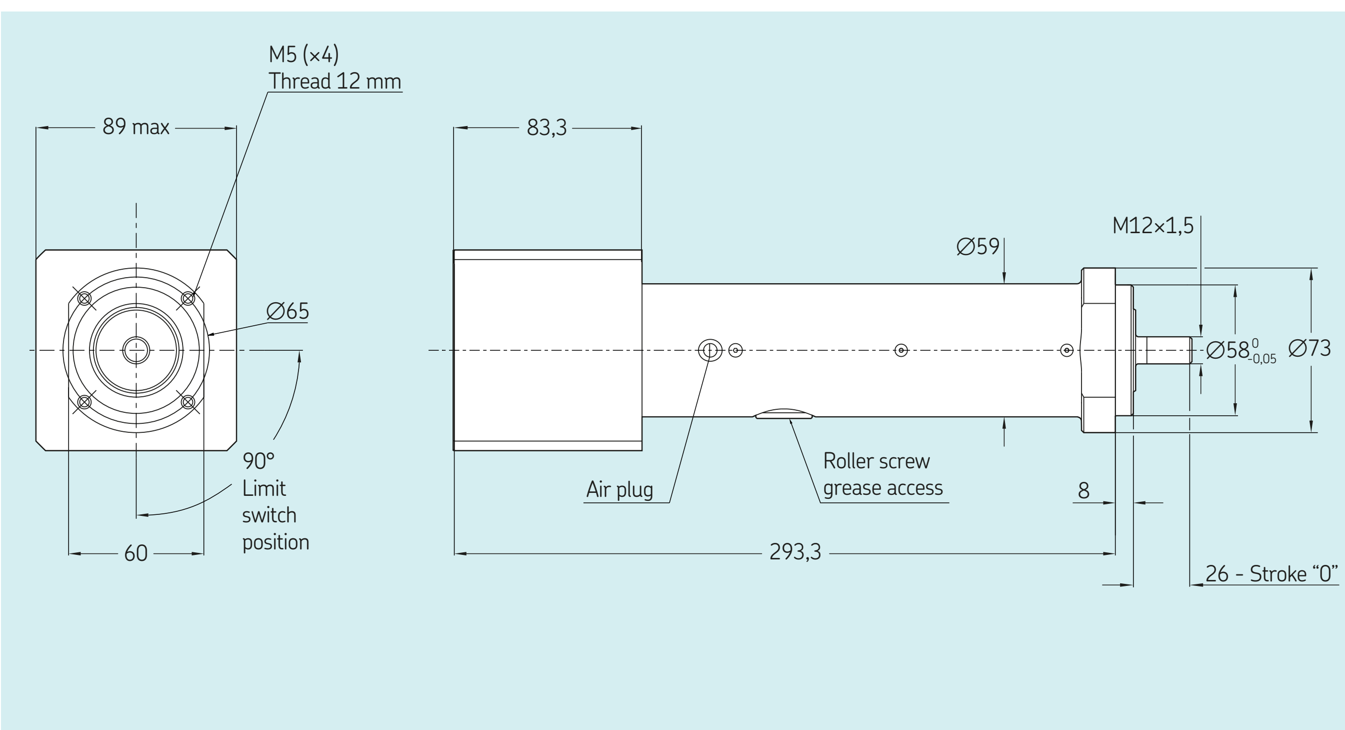
Lifetime diagram



Dimensional drawing parallel configuration



Dimensional drawing inline configuration



Ordering key

See page 326

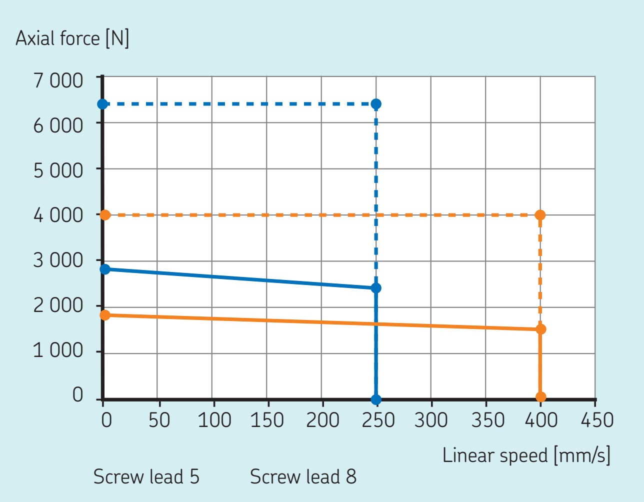
SEMC

Servomotor, inline configuration

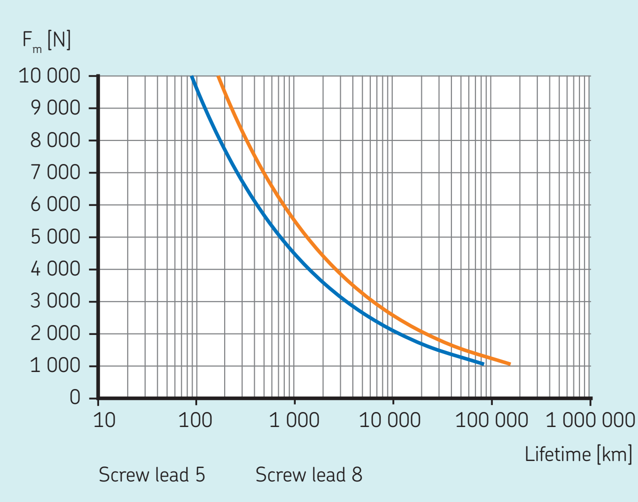
Technical data

Designation	Symbol	Unit	SEMC1505 Lenze MCM	SEMC1508 Lenze MCM
Performance data				
Continuous force @ zero speed	F_{c0}	kN	2,9	1,8
Continuous force @ max speed	F_c	kN	2,4	1,5
Peak force @ zero speed	F_{p0}	kN	6,5	4,0
Peak force @ max speed	F_p	kN	6,5	4,0
Dynamic load capacity	C	kN	26	27,4
Holding force (motorbrake option)	F_{hold}	kN	4,1	2,6
Max. linear speed	v_{max}	mm/s	250	400
Max. acceleration	a_{max}	m/s^2	6	9,5
Duty cycle	D_{unit}	%	100	100
Mechanical Data				
Screw type	-	-	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	15	15
Screw lead	p_{screw}	mm	5	8
Lead accuracy	-	-	G5	G5
Stroke	s	mm	up to 125	up to 125
Internal overstroke each side	s_0	mm	2	2
Backlash	$s_{backlash}$	mm	0	0
Gear reduction	i	-	1	1
Weight @ 0 mm stroke	m_{lu}	kg	6,5	6,5
Δ Weight per 50 mm stroke	Δm	kg	0,4	0,4
Environment				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection	IP	-	54S	54S

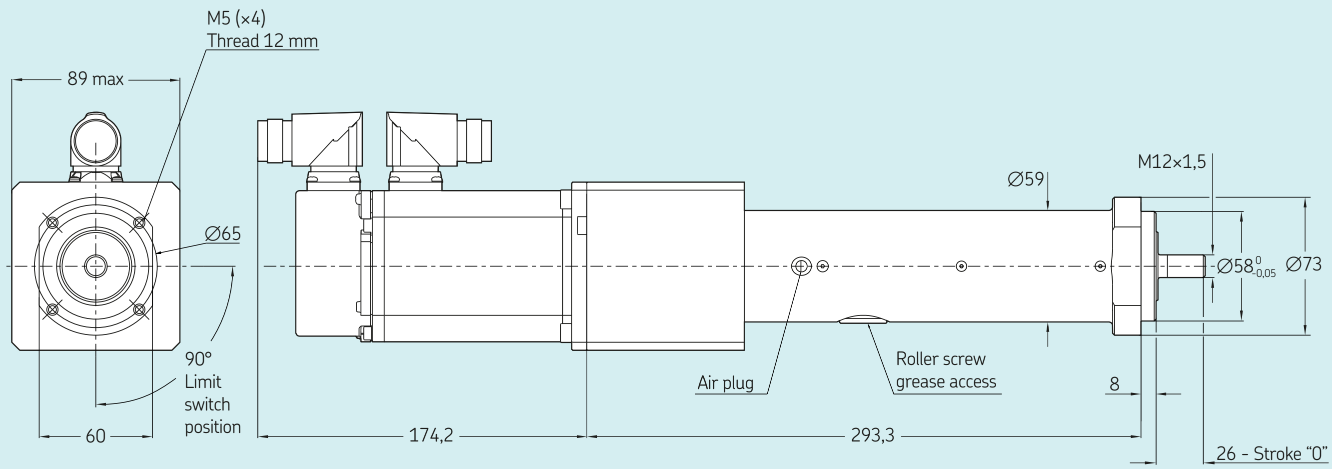
Performance diagram



Lifetime diagram



Dimensional drawing



Comments :

- Drawing valid for a stroke of 125 mm (the maximum stroke on SEMC)
- For brake option, add 36 mm on the servomotor length
- For brake option, add 0,5 kg
- No additional length for absolute encoder on the servomotor
- Motor plugs/connectors are orientable

Ordering key

See page 326

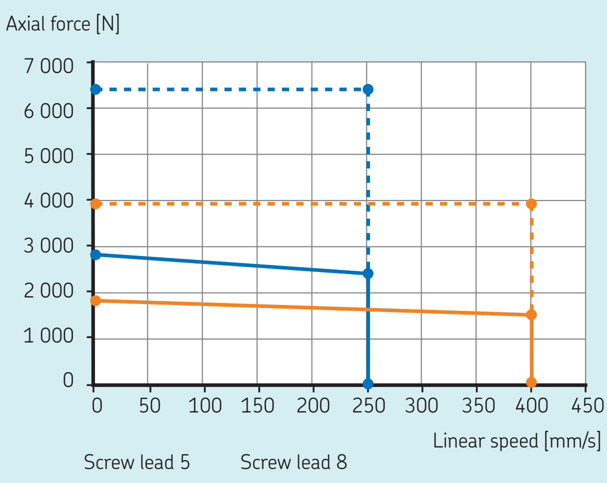
SEMC

Servomotor, parallel configuration

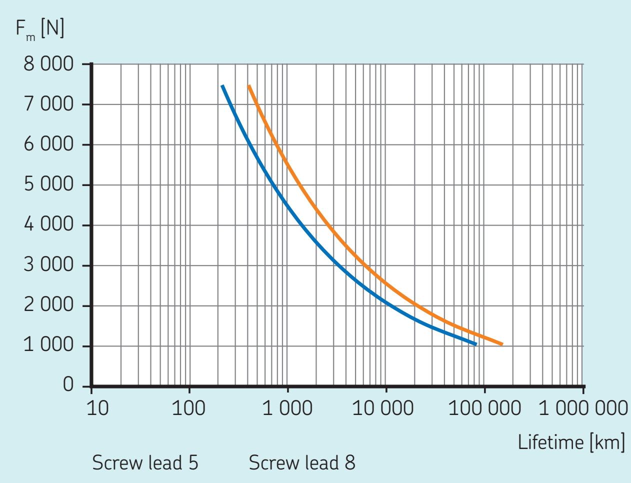
Technical data

Designation	Symbol	Unit	SEMC1505 Lenze MCM	SEMC1508 Lenze MCM
Performance data				
Continuous force @ zero speed	F_{c0}	kN	2,8	1,8
Continuous force @ max speed	F_c	kN	2,4	1,5
Peak force @ zero speed	F_{p0}	kN	6,4	3,9
Peak force @ max speed	F_p	kN	6,4	3,9
Dynamic load capacity	C	kN	26	27,4
Holding force (motorbrake option)	F_{hold}	kN	4,2	2,7
Max. linear speed	v_{max}	mm/s	250	400
Max. acceleration	a_{max}	m/s^2	6	9,5
Duty cycle	D_{unit}	%	100	100
Mechanical Data				
Screw type	-	-	Roller screw	Roller screw
Screw diameter	d_{screw}	mm	15	15
Screw lead	p_{screw}	mm	5	8
Lead accuracy	-	-	G5	G5
Stroke	s	mm	up to 125	up to 125
Internal overstroke each side	s_0	mm	2	2
Backlash	$s_{backlash}$	mm	0	0
Gear reduction	i	-	1	1
Weight @ 0 mm stroke	m_{lu}	kg	6,5	6,5
Δ Weight per 50 mm stroke	Δm	kg	0,4	0,4
Environment				
Ambient temperature	$T_{ambient}$	°C	0...+40	0...+40
Degree of protection	IP	-	54S	54S

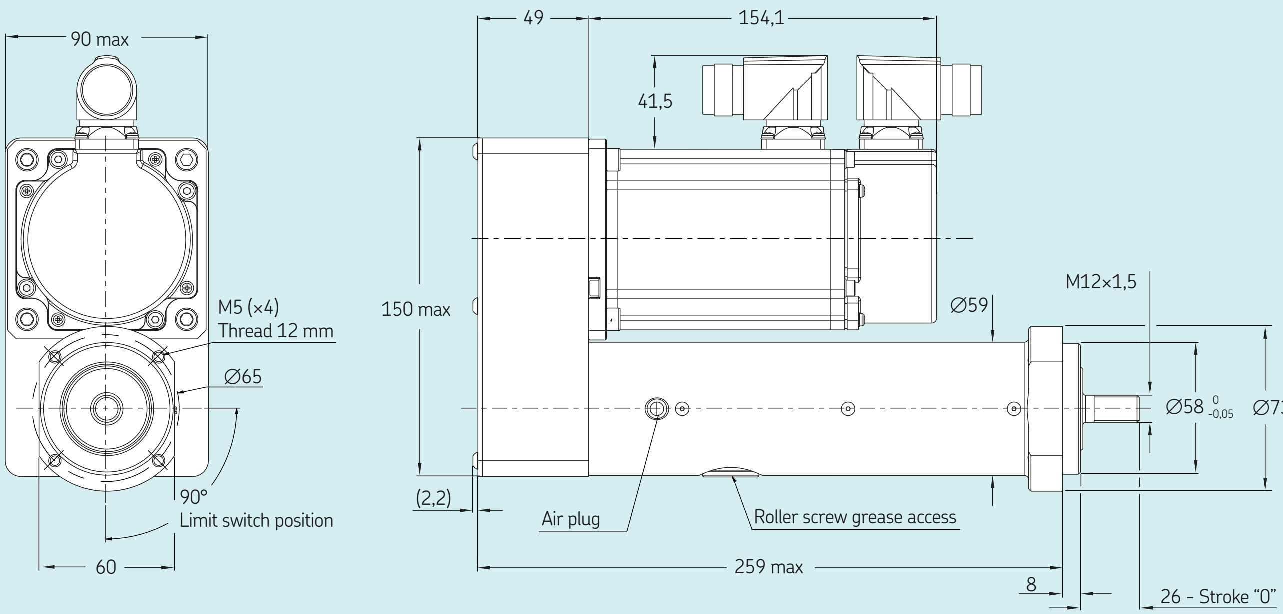
Performance diagram



Lifetime diagram



Dimensional drawing



Comments :

- Drawing valid for a stroke of 125 mm (the maximum stroke on SEMC)
- For brake option, add 36 mm on the servomotor length
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Ordering key

See page 326

Ordering key

Linear units

S E M C - S - 1 5 0 8 - 1 2 5 - F M A F - P 1 0 Z Z Z 1 B Y A 1

Type

Design
U Linear unit only
S Servo motor

Screw diameter

Screw lead
05 5 mm
08 8 mm

Stroke (mm)

Rear attachement
F Front plate
Z Custom

Front attachement
M Male thread
N No attachement (female thread)
Z Custom

Anti-rotation
A Anti-rotation
N No anti-rotation

Limit switches [1)]
F 2 limit switches and 1 home switch
S 2 limit switches only
M 1 limit switch and 1 home switch
L 1 limit switch only
H Home switch only
N No switch

1) The limit switches configuration can be limited by the stroke length

SEMC - S - 1508 - 125 - FMAF - P10ZZZ1BYA1

Linear unit interface

L	Inline interface
P	Parallel interface

Interface and gear ratio

10	ratio 1:1

Motor/drive combination code

ZZZ	On request

Feedback

1	Resolver
2	Absolute encoder Hiperface

EM brake

B	Brake 24 VDC
N	No brake

Motor drive

Y	Drive included
N	No drive

Drive fieldbus

A	CanOpen
B	Devicenet
C	Ethercat
D	Ethernet
E	Powerlink MN/CN
F	Powerlink CN
G	Profibus
H	Profinet
N	No fieldbus

Power and signal cables

1	5m
2	10m
3	15m
4	20m
N	No cable

D

Glossary

A

Absolute movement	A move referenced from a fixed absolute zero position
Acceleration	The change in velocity as a function of time, going from a lower speed to a higher speed
Accuracy	An absolute measurement defining the difference between expected and actual position
Actuator	An actuator is a device that is responsible for moving or controlling a mechanism or system also known as cylinder, electromechanical cylinder or linear actuator
Ambient temperature	The temperature of the cooling medium, usually air, immediately surrounding the actuator or another device
Angular contact ball bearing	Angular contact ball bearings have raceways in the inner and outer rings that are displaced relative to each other in the direction of the bearing axis. This means that they are designed to accommodate combined loads, i.e. simultaneously acting radial and axial loads.
Anodized	Protective treatment for aluminium that involves subjecting the metal to electrolytic action in a chemical bath, to create a protective film of aluminium oxide with a very smooth finish
Axial load	Load where the force is acting along the axis of actuator (bearing) in any direction

B

Backlash	The amount of play between a set of moveable parts when changing the direction of travel. Typically seen in drive trains, ball/ lead screws and bearings
Ball bearing	A support device which allows a smooth low friction motion between two surfaces loaded against each other with balls as rolling elements
Ball screw	A screw assembly which uses a ball nut which contains one or more circuits of recirculating steel balls which roll between the nut and the screw
Bearing	A support device which allows a smooth low friction motion between two surfaces loaded against each other
Brushless DC motor	Synchronous motor type that are powered by a DC electric supply through an inverter that produce an AC signal to drive the motor
Bushing	A cylindrical sleeve inserted into a machine part to reduce friction between moving parts

C

Configurator (product)	Name given to the software that uses the configuration string to build-up a specific actuator from an existing list of components and options
Continuous torque	Is the torque that the motor is able to provide continuously with no limitation in time
Current	The flow of charge through a conductor
Cycle	A complete motion of an actuator from the start position via intermediate positions and back to the start position
Cycle time	Time for one complete motion cycle, from the start of the cycle until the start of the next cycle
Cylinder	A mechanical device which produces a linear force to achieve a reciprocating linear motion. There three common types: pneumatic, hydraulic and electromechanical (or electric). The first two use the power of compressed media (gas or liquid) while the latter uses a mechanical device (screw) to transform the rotational input movement of a motor into a linear one.

D

Deceleration — The change in velocity as a function of time going from a higher speed to a lower speed

Duty cycle — The ratio of motor on time and total cycle time within a given cycle of operation

Dynamic load rating — Constant that is used to calculate the service life of a screw drive. The value for the dynamic load rating represents the load under which 90% of a sufficient large number of identical screw drives can achieve a service life of one million revolutions

E

Efficiency — Ratio of output power versus input power

Electric cylinder — A self-contained system which converts rotary motion (from a motor) to linear motion

Electromechanical cylinder — A self-contained system which converts rotary motion (from a motor) to linear motion

Electrode — The part of a resistance welding gun that facilitates the high voltage current path to the parts being welded

Equivalent dynamic axial load — Load of constant magnitude over a full motion cycle which has the same influence on the linear unit's service life as the actual fluctuating load

F

Foot mount — Mounting plates, attached to front and end of a cylinder, to mount the cylinder in parallel to a flat surface

Force — The action of one body on another which tends to change the state of motion of that body. Typically described in terms of magnitude, direction and point of application

Friction — The resistance to motion of two surfaces that are in direct contact

G

Gear ratio — This relates to the transmission and conversion of movements, linear and rotary speeds, forces and torques in a geared mechanism. The gear ratio (also known as reduction ratio) is the ratio between the input and output variable, e.g. the ratio of input speed to output speed

H

Hall effect sensor — A magnetically controlled transistor switch controlling DC power. It has no moving parts and theoretically unlimited contact life.

Holding force — Maximum external force that can be applied to a stopped actuator, without causing any linear movement. It is usually given by the holding torque of an electromechanical brake applied on the motor

Humidity (relative) — A ratio that indicates the amount of water vapor in the air. It is usually expressed as a percentage. At any temperature, it is the amount of water vapor in the air, divided by the amount that would be present at saturation

I

Inertia — Property of an object that resists a change in motion. It is dependent on the mass and shape of the object. The greater an object's mass, the greater its inertia and the more force is necessary to accelerate and decelerate it

K

Keyway — An axially-located groove in the length of a shaft along which a key may be located

L

Lead — Describes the axial distance a nut is moving on a screw at one full rotation of either the screw or the nut

Lead screw — A screw which uses a threaded screw design (e.g. with trapezoidal shaped thread) with sliding surfaces between the screw and nut

Lifetime — Service life in km that 90% of a sufficiently large group of apparently identical cylinders can be expected to reach or exceed.

Limit switch — A switch that is actuated by some part of motion of a machine or equipment to alter the electrical circuit associated with it

Linear speed — The linear speed is the change in position as a function of time.
Max. linear speed — Maximum linear speed, a linear unit or a cylinder can reach without damaging the mechanical system. Limiting factors can be the recirculating system of the balls or rollers, or the heat dissipation when using lead screws, or others. If the motor of the cylinder could turn faster, it needs to be limited

Load — A mass or weight of an application acting on the in axial direction on the push tube

E

M

Mass The quantity of matter that an object contains

Moment Rotational forces applied to a linear axis typically expressed as yaw pitch and roll

Motion profile A method of describing a move operation in terms of time position and velocity Typically velocity is character-ized as a function of time or distance which results in a triangular or trapezoidal profile

Motor A device which converts electrical energy into mechanical energy

O

O-ring A ring of synthetic rubber with a circular cross-section used as a gasket or seal

Overheating The heat in a system is mostly dissipated into the surrounding air Dissipation can be accelerated by various forms of ventilation In case the dissipation level is lower than the heat generation overheating takes place

P

Peak force The peak force is the maximum force an actuator can push or pull for a short time (peak) without being mechanically damaged or overheating

Peak torque The peak force is the maximum torque a motor can provide for pull for a short time (peak) without being mechanically damaged or overheating

PLC (programmable logic controller) An industrial digital computer that is used to control machines and processes by continuously monitoring analog and digital inputs and making decisions based on customer programs

Positioning accuracy Is the maximum deviation between the actual position and the target position, as defined in VDI/DGQ 3441 norms

Power How much work is done in a specific amount of time

Proximity sensor A device for sensing a position of an actuator or application. Proximity sensors supply either a sourcing or sink-ing signal to a device such as a programmable logic controller

R

Radial load Load where the force is acting perpendicular to the axis of the actuator

Repeatability The ability of a positioning system to return to an exact location during operation (from the same direction with the same load and speed)

Resolver A feedback device consisting of a stator and rotor that provides position and velocity information to the drive for motor commutation

RMS The root mean square is the square root of a mean square value

Rod cylinder A cylinder using a rod attached to its piston to transmit force

Roller screw A screw assembly which uses a roller nut which contains guided steel rollers which are rotating around their own axis and around the screw (planetary rollers)

S

Screw assembly Device which converts rotary motion into linear motion

Service life The nominal life is expressed by the number of revolutions (or number of operating hours at constant rotary speed) that will be attained or exceeded by 90% of a sufficiently large number of identical screw drives before the firsts signs of material fatigue become evident

Servomotor A motor which is used in closed loop systems where feedback is used to control motor velocity, position or torque

Spur gear Is a gear or a system of gearing having radial teeth parallel to the axle

Static axial force Maximum axial force which can be applied on a linear unit only if it is not moving

Stiffness Is the rigidity of an object, representing its resistance to deformation from an applied force

Stroke length The linear distance that the push tube of a cylinder can extend or retract

T

Thermal load	The thermal load describes the force which the actuator can permanently move without overheating. The thermal load is calculated by a formula in respect of changing load conditions over different time phases of a full motion cycle.
Torque	A measure of angular force which produces rotational motion.

U

Units (metric)	A decimal system of weights and measures based on the kilogram and meter.

V

Volt	Difference in electrical potential between two points.

W

Watt	A unit of power or a rate of doing work. The power dissipated by a one-ohm resistor with one ampere of current is one watt.
Weight	Force of gravity acting on a body. Determined by multiplying the mass of the object by the acceleration due to gravity.

E

Symbols description

A			
a	m/s^2	**Acceleration**	The change in velocity as a function of time, going from a lower speed to a higher speed
a_{max}	m/s^2	**Max. acceleration**	The maximum allowed change in velocity as a function of time from a lower speed to a higher speed. Exceeding this value can cause damages.
C			
C	kN	**Dynamic load capacity**	Constant that is used to calculate the service life of a ball or roller screw. The value for the dynamic load rating represents the load under which 90% of a sufficient large number of identical screws can achieve a service life of one million revolutions
D			
D	%	**Duty cycle of the cylinder**	The ratio of active time at full load and total cycle time within a given cycle of operation
D_{unit}	%	**Duty cycle of the linear unit**	The ratio of active time and total cycle time within a given cycle of operation
d_{screw}	mm	**Screw diameter**	Describes the outer diameter of the screw shaft
E			
η	%	**Efficiency**	Ratio of output power versus input power
η_{lu}	%	**Efficiency of the linear unit**	Ratio of output power versus input power of the linear unit.
F			
F	N	**Force (cylinder) or load (application)**	The action of one body on another which tends to change the state of motion of that body. Typically described in terms of magnitude, direction and point of application. The force is related to the capability of the cylinder while the load is related to the mass or weight of an application acting on the axial direction on the push tube.
F_{Amax}	N	**Maximum dynamic axial load of the application**	Maximum axial push or pull load which is needed to fulfill the specifications of the application.
F_c	N	**Continuous force at max speed**	The continuous force at max speed describes the force the cylinder can permanently move at maximum allowed linear speed, without overheating.
F_{c0}	N	**Continuous force at zero speed**	The continuous force at zero speed describes the force the cylinder can permanently hold without overheating and without using a brake.
F_{cont}		**Continuous force curve**	A curve that represents the continuous force an actuator can permanently move at maximum allowed linear speed, without overheating.
F_{Hold}	kN	**Holding force of the brake**	Describes the maximum axial load the engaged brake (optional motor brake) can hold if the motor is disabled. This value must not exceed the maximum axial force of the cylinder
F_m	N	**Equivalent dynamic axial load**	Load of constant magnitude over a full motion cycle which has the same influence on the linear unit's service life as the actual fluctuating load
F_{max}	N	**Maximum dynamic axial force**	The maximum dynamic axial force describes the maximum force an electric cylinder can deliver during movements without damaging parts. The acceleration/ deceleration of masses need to be considered.
F_{maxL10}	N	**Maximum dynamic axial force**	Maximum dynamic axial force usable to apply the theoretical lifetime calculation (L10)
F_{max0}	N	**Max. static axial force**	Maximum axial force which can be applied on a linear unit only if it is not moving.
F_p	N	**Peak force**	The peak force describes the maximum force the cylinder can push or pull for a short time, without being mechanically destroyed or by overheating. The length of the peak is depending on the temperature of the system when the peak is initiated.
F_{p0}	N	**Peak force at zero speed**	The peak force at zero speed is the maximum force the cylinder can hold for a short time without using a brake.

F_{peak}		**Peak force curve**	A curve that represents the continuous force an actuator can push or pull for a short time without being mechanically destroyed or by overheating. The length of the peak is depending on the temperature of the system when the peak is initiated
I			
i	#	**Gear reduction**	Describes the factor between the number of revolutions of the input of the gear divided by the number of revolutions of the output of the gear. A gear reduction 2 means that the output of the gear (linear unit side) is turning with half speed compared to the input of the gear (motor side). Using a gear reduction enables for using smaller motors with less torque to bring higher force but with lower speed
I	A	**Nominal Current**	Is the nominal current consumption of the motor
I_{peak}	A	**Peak current**	Is the maximum current consumption of the motor for a short period of time.
IP		**Degree of protection**	International protection (also ingress protection) describes the protection of a product with two digits. The first digit describes the protection against dust, the second against water. The higher the value the better the protection.
J			
J	10^{-4} kgm^2	**Inertia**	Property of an object that resists a change in motion. It is dependent on the mass and shape of the object. The greater an object's mass, the greater its inertia and the more force is necessary to accelerate and decelerate. As an electric cylinder is available in different lengths, the inertia is typically given for stroke 0, followed by an inertia indication ΔJ for each additional 100 mm.
J_{brake}	10^{-4} kgm^2	**Inertia of the brake**	Property of an object that resists a change in motion. It is dependent on the mass and shape of the object. The greater an object's mass, the greater its inertia and the more force is necessary to accelerate and decelerate. As the brake is typically an option, this value has to be added to the Inertia of the electric cylinder.
J_{lu}	10^{-4} kgm^2	**Inertia of the linear unit**	Property of an object that resists a change in motion. It is dependent on the mass and shape of the object. The greater an object's mass, the greater its inertia and the more force is necessary to accelerate and decelerate. As the linear unit is available in different lengths, the inertia is typically given for stroke 0, followed by an inertia indication ΔJ for each additional 100 mm.
L			
$L_{10\ dist}$	km	**Lifetime distance**	Service life in km that 90% of a sufficiently large group of apparently identical cylinders can be expected to reach or exceed.
M			
m	kg	**Weight**	Force of gravity acting on a body. Determined by multiplying the mass of the object by the acceleration due to gravity
Δm	kg	**Weight difference**	As electric cylinders are available in different lengths, the weight is typically given for stroke 0, followed by a weight indication Δm for each additional 100 mm.
m_{arot0}	kg	**Weight of the anti-rotation device**	The weight of the optional anti-rotation device has to be added to the weight of the cylinder.
m_{brake}	kg	**Weight of the brake**	The weight of the optional brake has to be added to the weight of the cylinder
m_{lu}	kg	**Weight of the linear unit**	As the linear unit is available in different lengths, the weight is typically given for stroke 0, followed by a weight indication Δm for each additional 100 mm.
M	Nm	**Torque**	A measure of angular force applied to a linear axis to produce rotational motion
M_{Ac}	Nm	**Required continuous torque**	A measure of continuous angular force (torque) a motor has to deliver without overheating
M_{Amax}	Nm	**Required maximum torque of the motor**	Maximum angular force (torque) of a motor which is required that the cylinder is able to push or pull the maximum load of the application
M_{max}	Nm	**Maximum torque**	The maximum torque is the upper limitation of the torque. Exceeding this value can cause damages of related parts.
N			
n_{cycles}	#	**Number of cycles**	The number of motion cycles a cylinder has to have without damage during the expected life of the application
n_{max}	1/min	**Max. rotational speed**	Describes the maximum allowed number of full rotations of an axis. Exceeding this value can cause damages.
P			
P	W	**Nominal Power**	Nominal power of the motor, given by multiplying the nominal voltage and the nominal current
p_{screw}	mm	**Screw lead**	Describes the axial distance a nut is moving on a screw at one full rotation of either the screw or the nut

E

R			
R	Ω	**Resistance**	The opposition to the flow of charge through a conductor
S			
s	mm	**Stroke**	The linear distance that the push tube of a cylinder can extend or retract
s_0	mm	**Internal over stroke**	Additional stroke which is not part of the specified stroke length of the cylinder. It is used to prevent the screw nut touching the mechanical end stops when moving over the full specified stroke.
$s_{backlash}$	mm	**Backlash**	Axial play that the cylinder push tube has without turning the screw. It's equivalent with the mechanical axial play of the inner parts of the cylinder.
s_{cycle}	m	**Distance travelled per motion cycle**	Travelled distance of a push tube for a full motion cycle, from the start to the next start in both directions.
s_{max}	mm	**Maximum stroke**	The maximum stroke describes the mechanical limitation which a cylinder can extend or retract. Limiting factors are side loads (buckling), speed (wobbling of the screw inside), limitations in the manufacturing process and others
T			
t	s	**Time**	Time in seconds which is needed for a certain activity.
t_{cycle}	s	**Cycle time**	Time for one complete motion cycle, from the start of the cycle until the start of the next cycle
t_L	h	**Required lifetime in hours**	The lifetime of a cylinder in hours which is required to serve an application without damage during the expected life of the application.
T	Nm	**Torque**	A measure of angular force applied to a linear axis to produce rotational motion
$T_{ambient}$	°C	**Ambient temperature**	Temperature of the environment around the object
U			
U	V	**Nominal voltage**	Is the supply voltage required by the electric motor
V			
v	m/s	**Linear speed**	The linear speed is the change in position as a function of time.
v_{max}	mm/s	**Max. linear speed**	Maximum linear speed, a linear unit or a cylinder can reach without damaging the mechanical system. Limiting factors can be the recirculating system of the balls or rollers, or the heat dissipation when using lead screws, or others. If the motor of the cylinder could turn faster, it needs to be limited
v_{min}	mm/s	**Min. linear speed**	Minimum linear speed of a LEMC-A cylinder equipped with asynchronous motors that can be adjusted through the integrated frequency inverter

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