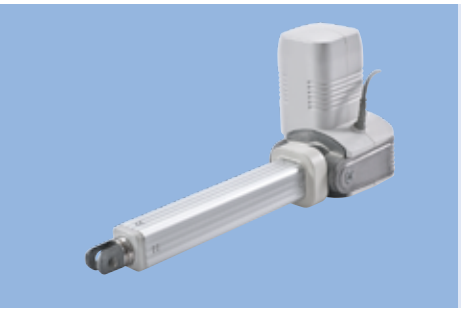
Actuation System
Standard range

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The SKF brand now stands for more than ever before, and means more to you as a valued customer.

While SKF maintains its leadership as the hallmark of quality bearings throughout the world, new dimensions in technical advances, product support and services have evolved SKF into a truly solutions-oriented supplier, creating greater value for customers.

These solutions encompass ways to bring greater productivity to customers, not only with breakthrough application-specific products, but also through leading-edge design simulation tools and consultancy services, plant asset efficiency maintenance programmes, and the industry's most advanced supply management techniques.

The SKF brand still stands for the very best in rolling bearings, but it now stands for much more.

SKF – the knowledge engineering company

Foreword

This publication provides information on all the standard SKF Actuation System products with clear tables to help the customer select and order the correct product.

Structure of the catalogue

The catalogue is divided into six main chapters, marked with numbered blue tabs in the right margin:

- Chapter 1 provides technical and application recommendations.
- Chapter 2 describes the different telescopic pillars.
- Chapter 3 presents the linear actuator series.
- Chapter 4 and 5 contain information about control units and accessories.
- Chapter 6 is an overview about other SKF Actuation System products.

About the data in this catalogue

All data in this catalogue relate to SKF's state-of-the-art technology and production capabilities as of 2009. The data may differ from that presented in earlier catalogues because of redesign, technological developments, or revised methods of calculation. SKF reserves the right to make continuing improvements to SKF products regarding materials, design and manufacturing methods, as well as changes necessitated by technological developments.

How to use this catalogue

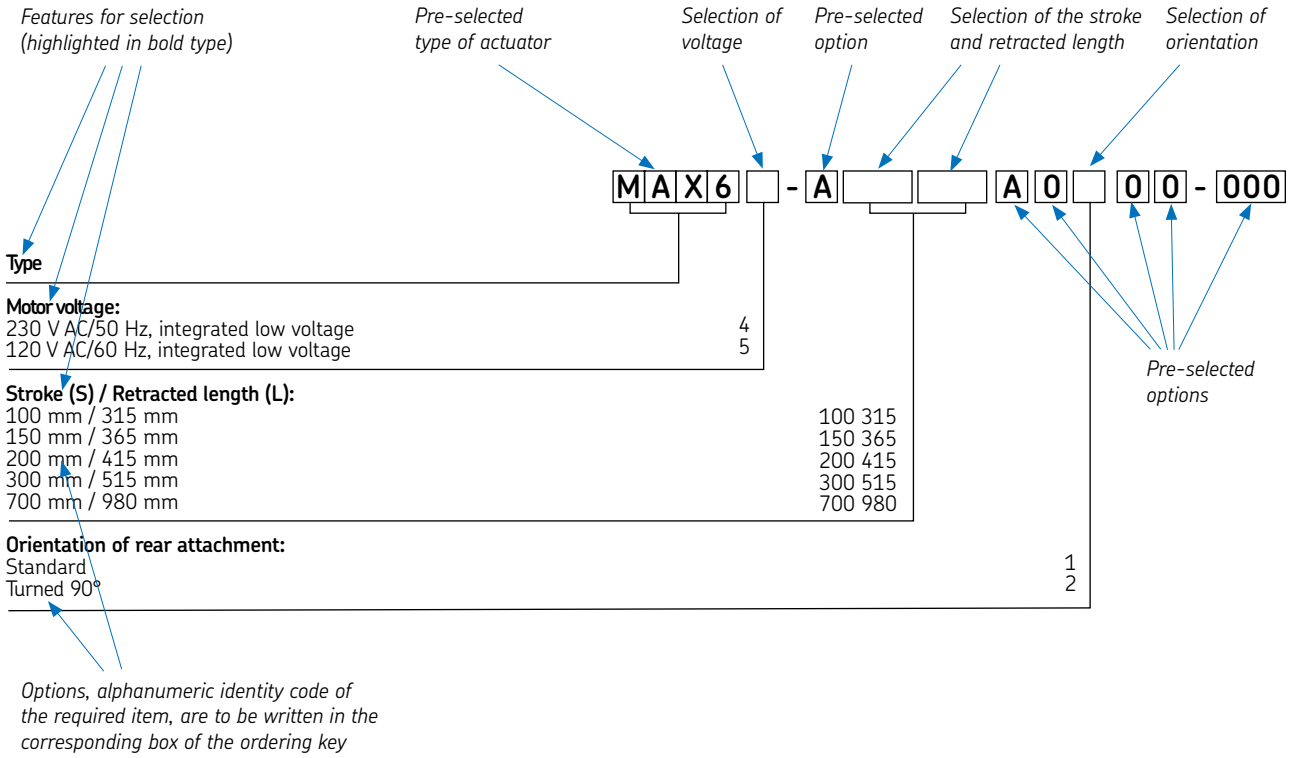
Each product is introduced by providing information such as technical data, dimensional drawings or connecting diagrams, in order to make it easy to select the correct product.

At the end of each section of product information, an ordering key is shown. To determine the product code to be used on the order, do the following: after identifying the type of product required by examining the relevant pages containing the main data, it is necessary to prepare the order code. This may consist of pre-set options, ordering key boxes already filled in (for example: type, color, etc.) and options that can be selected from several items, empty boxes (for example: voltage, stroke length, etc.) In the ordering key, the options are set out under the associated subjects, with the indication of the code or the information to be entered (with the measurement restrictions contained in the associated tables). The sequence of the ordering key is defined by the thin guiding lines that select the corresponding box. The individual ordering key may contain indications or special notes.

For the CAT series, the selection of the item's dynamic load/speed and motor option should be made by use of an additional table with several options located above the ordering key.

An example is given on the next page to show how to prepare the order code for a MAX linear actuator.

NOTE: See the Actuator Range general catalogue and product specific catalogues at www.actuators.skf.com for more complete information and descriptions of the various products briefly described in this catalogue.



Example

MAX6 4 - A 100 315 A 0 1 0 0 - 000

Example of an ordering key that has been filled in

SKF – the knowledge engineering company

From the company that invented the self-aligning ball bearing more than 100 years ago, SKF has evolved into a knowledge engineering company that is able to draw on five technology platforms to create unique solutions for its customers. These platforms include bearings, bearing units and seals, of course, but extend to other areas including: lubricants and lubrication systems, critical for long bearing life in many applications; mechatronics that combine mechanical and electronics knowledge into systems for more effective linear motion and sensorized solutions; and a full range of services, from design and logistics support to conditioning monitoring and reliability systems.

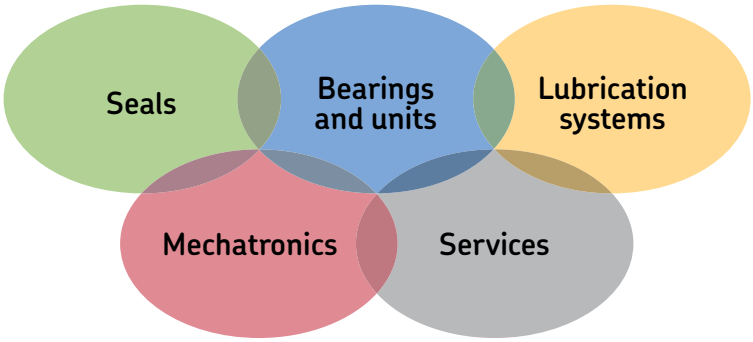
Though the scope has broadened, SKF continues to maintain the world's leadership in the design, manufacture and marketing of rolling bearings, as well as complementary products such as radial seals. SKF also holds an increasingly important position in the market for linear motion products, high precision aerospace bearings, machine tool spindles and plant maintenance services.

The SKF Group is globally certified to ISO 14001, the international standard for environmental management, as well as OHSAS 18001, the health and safety management standard. Individual divisions have been approved for quality certification in accordance with ISO 9001 and other customer specific requirements.

With over 100 manufacturing sites worldwide and sales companies in 70 countries, SKF is a truly international corporation. In addition, our distributors and dealers in some 15 000 locations around the world, an e-business marketplace and a global distribution system put SKF close to customers for the supply of both products and services. In essence, SKF solutions are available wherever and whenever customers need them. Overall, the SKF brand and the corporation are stronger than ever. As the knowledge engineering company, we stand ready to serve you with world-class product competencies, intellectual resources, and the vision to help you succeed.

Evolving by-wire technology
SKF has a unique expertise in fast-growing by-wire technology, from fly-by-wire, to drive-by-wire, to work-by-wire. SKF pioneered practical fly-by-wire technology and is a close working partner with all aerospace industry leaders. As an example, virtually all aircraft of the Airbus design use SKF by-wire systems for cockpit flight control.

SKF is also a leader in automotive by-wire technology, and has partnered with automotive engineers to develop two concept cars, which employ SKF mechatronics for steering and braking. Further by-wire development has led SKF to produce an all-electric forklift truck, which uses mechatronics rather than hydraulics for all controls.



Principles of actuator and pillar selection and application

1

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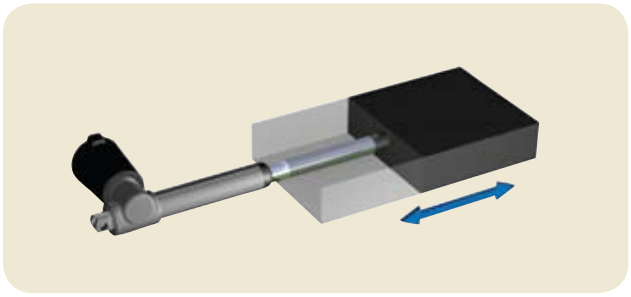
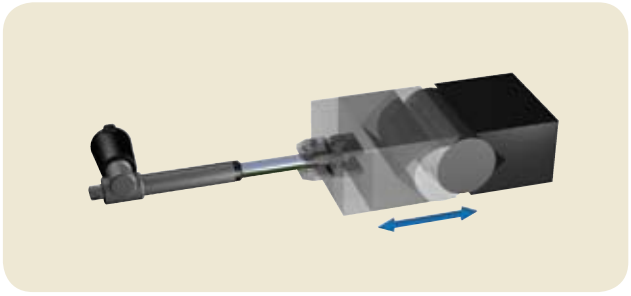
Electro-mechanical linear actuators

Electro-mechanical linear actuators enable precise, controlled, and repeatable push/pull movement in linear drive applications (see illustrations below).

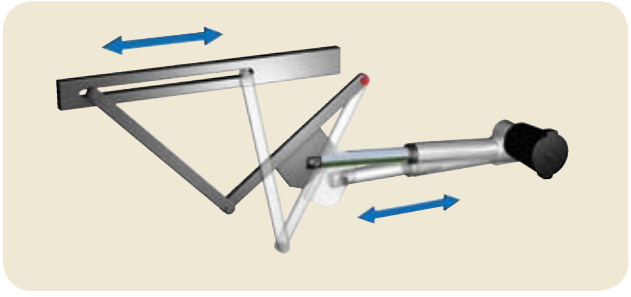
Linear actuators serve as efficient, virtually maintenance-free, and environmentally friendly alternatives to hydraulic or pneumatic types.



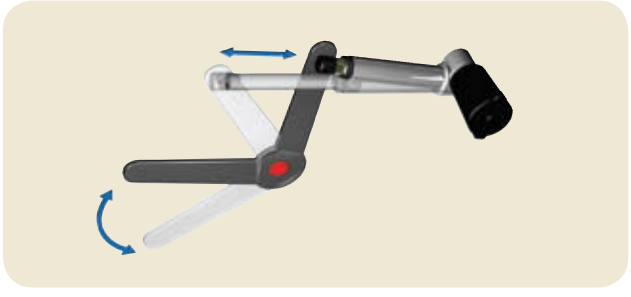
Pushing/pulling



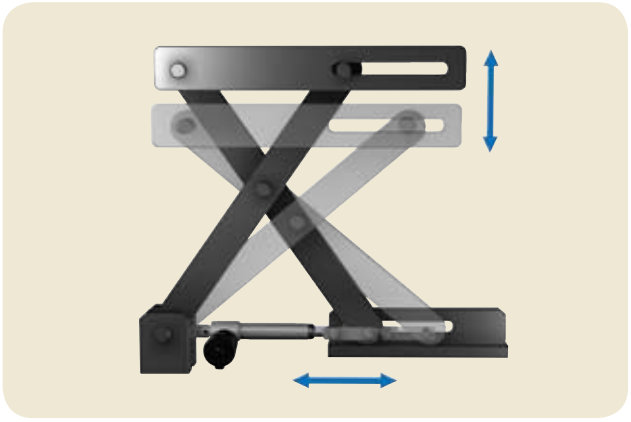
Clamping/gripping



Opening/closing



Tilting

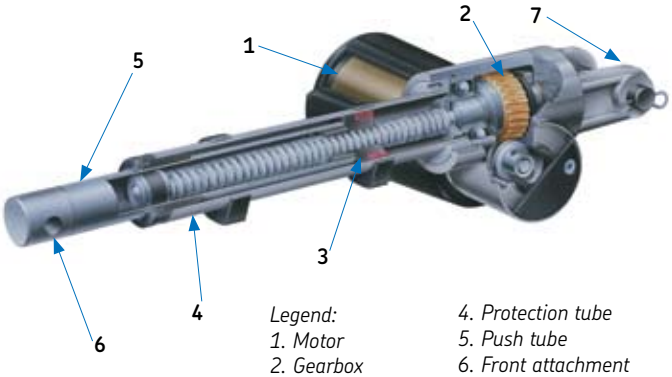


Raising/lowering

Standard versions can handle loads as great as 12 kN, deliver speeds up to 174 mm/s, and travel as far as 1 500 mm. They can be self-contained in aluminum, zinc, or polymer housings and ready-to-mount for easy plug-in operation.

Actuators with 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.

Screw-type linear actuators powered by an electric AC or DC motor basically consist of a **lead screw** (threaded shaft/spindle) with **drive nut** and **push tube**. In 90 % of the cases, a gearbox between the motor and the screw is also present.



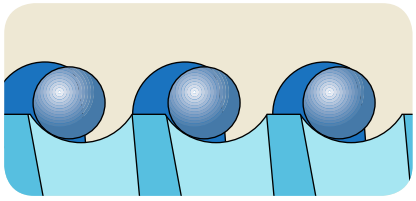
Legend:
1. Motor
2. Gearbox
3. Screw and nut
4. Protection tube
5. Push tube
6. Front attachment
7. Rear attachment

When power is supplied, the motor rotates the lead screw, which causes the drive nut to travel and extend the push tube. Reversing the motor rotation retracts the push tube.

Ball screw vs. acme screw

Traditional types of lead screws include **ball screws** and **acme screws**, whose specification will be influenced by an actuator's configuration and load requirements.

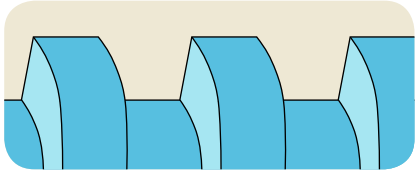
Ball screws: These all-steel screw units integrate a screw shaft, nut, ball bearings, and a ball recirculating system to convert rotary motion into smooth, accurate, and reversible linear motion (or torque to thrust). The row of spherical rolling elements is self-contained in a closed system between the nut and screw for a design exhibiting extremely low friction coefficients. The low frictional resistance minimizes wear, improves efficiency, and reduces operating temperature for longer service life.



Ball screw

Ball screws can handle extreme loads, achieve high duty cycles, operate over a wide temperature range, and deliver the precision necessary to equip actuators performing over long periods at high speeds and requiring high acceleration and deceleration capabilities. Brakes usually will be specified for ball screw actuators to prevent backdrive.

Acme screws: These screws transmit torque into linear motion through direct sliding friction similar to a conventional nut-and-bolt combination. A typical assembly consists of a steel screw, plastic or brass nut, and bearing support.



Acme screw

The acme screw design delivers a high friction coefficient ideally suited for "self-locking" applications where an actuator must be prevented from "moving backwards" under the weight of a load. This eliminates any need for a locking mechanism or brake to keep the actuator in position when at rest.

Acme screw actuators accommodate high static and dynamic loads, withstand excessive vibration, operate quietly, and represent cost-effective solutions.

Performance considerations

Beyond the basic fundamentals of actuator operation, applications may require feedback on position and/or direction, limits on motion or travel in a particular direction, or protection against dynamic overload. Enabling technologies have been developed for these purposes.

Limit switch: Its purpose is to limit actuator motion or travel in a particular direction. When activated, the switch opens or closes an electrical contact. When the contact is closed, current will flow through the switch; when the contact is open, no current will flow through the switch. These devices prevent actuators from running into the ends and may allow for the adjustment of stroke length.

Hall sensors: These rotary or linear sensing devices determine the relative position of an actuator. Two sensors detect the changing magnetic field created by a rotating magnet and then relay corresponding output pulses to a control unit to provide the position feedback.

Friction clutch: This component will protect the actuator from mechanical damage when it reaches either of its end positions or when the maximum dynamic load is momentarily exceeded. A friction clutch consists of a series of steel plates engaging a hub and a series of friction rings engaging a housing. Pressure is exerted on the plates and rings by an adjuster acting through a spring and pressure plate. The friction clutch is not intended for use as a load limiter, but only for protection of the actuator and end-use equipment in the event of dynamic overload.

Ball detent clutch: A ball detent type clutch transmits force through hardened balls which rest in detents on the shaft and are held in place with springs. An overtorque / load condition pushes the balls out of their detents, thereby decoupling the lead-screw from the motor.

Back-up nut: This prevents an actuator from collapsing if a drive nut failure occurs. The back-up nut is usually in metal, exhibits greater anti-shear strength than the drive nut, and only makes contact with the threads of the spindle when the threads of the drive nut fail. The back-up nut carries the load and may be able to lower the load (signaling need for repair).

Selection criteria

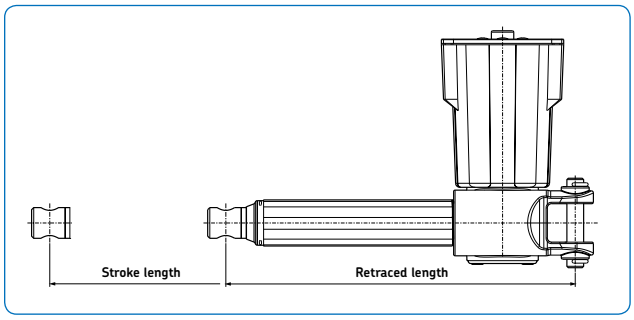
An actuator's performance will be influenced by a variety of factors intrinsic to an application. An understanding can help select the most suitable actuator design and solution. Relevant factors to evaluate include push/pull force, static and dynamic load capacity, speed, stroke and retracted length, duty cycle, and life calculation.

Force: Push force is the maximum extending force that an electric linear actuator can produce in Newtons (N) and pull force is the maximum retracting force. Some actuators do not produce equal push and pull forces, while others do not permit pull force.

Load capacity: Maximum static load refers to the weight or mass that an actuator can handle when standing still without causing permanent damage or causing the actuator to start "going backwards." (Subjecting an actuator to loads in excess of stated values can risk permanent deformation to some parts.) Maximum dynamic load represents the maximum total weight or mass that the actuator can move. The decisive factor for this value is the size of the motor and the type of gearing. (When an actuator is subject to loads exceeding the stated value, it will simply stop.) Some versions feature an integral mechanical safety device similar to a clutch to protect the motor and gears from damage.

Speed: This represents the rate of travel (when extending or retracting) and is usually measured in mm/s or in/s. Speed can vary under different loads, often depending on the motor. Actuators with DC motors demonstrate a speed variation inversely proportional to the load. Actuators with AC motors move at more consistent speed, which is only slightly affected by the load. Other factors impacting the speed will include the magnitude and/or frequency of the applied voltage, the ambient temperature, and how well an actuator is integrated into the end-use application.

Stroke and retracted length: The stroke describes the length (in millimeters or inches) that an electro-mechanical linear actuator will extend or retract. The retracted length is the shortest distance between the two fixed points on an actuator when the actuator is in its innermost position. The dimensions reflect a measurement from the center of the rear and front mounting holes.

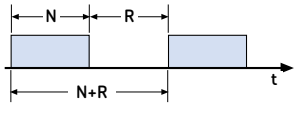


Duty cycle and duty factor: This defines the maximum period during actuator operation without interruption. The corollary duty factor expresses how long an actuator can handle non-stop operation before it overheats or is otherwise damaged. Many variables will affect the duty cycle, including running time, application, design, installation, and components. It is necessary to assess the type of task, its duration, frequency, and repetitiveness when evaluating expected duty cycle.

SKF linear actuators are designed for intermittent operation. Permitted load is related to the duty factor i.e. load must be reduced when the duty factor is increased. In the diagrams, maximum load is shown as a function of duty cycle. Duty factor is defined as amount of time running under load versus total cycle time. If the recommended duty factor is exceeded, the actuator may overheat and be damaged.

Permitted load for DC-actuators at a specific duty factor is expressed in percentage of maximum dynamic load capacity.

$$\text{Duty factor } \% = \frac{N}{N+R} \times 100$$



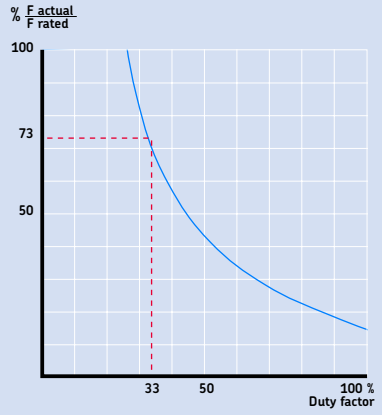
N = *running under load*
R = *rest period*
N+R = *total cycle time*

Example:
An actuator is running with the following cycle, 5 seconds running, 5 seconds rest, 5 seconds running, 15 seconds rest, and so on.

Calculate duty factor and maximum load for this working cycle.

$$\text{Duty factor} = \frac{5 + 5}{(5 + 5) + (5 + 15)} \times 100 = 33\ \%$$

The diagram below shows that permitted load (F_{act}/F_{rated}) is 73 % of maximum dynamic load at 33 % duty factor.



Max. dynamic load = 5 000 N
Permitted load = 0,73 x 5 000 = 3 650 N.

Life calculation: An actuator's life expectancy is a function of load, stroke length, and how often the overload clutch is operated.

The service life of a ball screw actuator normally will be determined by the L_{10} life of the ball screw. In most cases there is less wear on the worm gear and bearings than on the ball screw.

Under certain circumstances, the life of the motor is shorter than that of the ball screw, however the motor can be easily replaced. Generally, the life of DC-motors is reduced when load and number of starts/stops is increased.

To calculate the basic rating life L_{10} of ball screw, it is sufficient if the dynamic load and actual stroke is known. L_{10} is defined as the life that 90 % of a sufficiently large group of apparently identical ball screws can be expected to attain or exceed.

$$L_{10\,d\,s} = \frac{500\,000 \times p}{S} \times \left(\frac{C}{F_M}\right)^3$$

$L_{10\,d\,s}$ = *basic rating life in double strokes i.e. a stroke from one end position to the other and back again.*
p = *lead of the ball screw (mm).*
S = *actual stroke (mm).*
C = *ball screw basic dynamic load rating (N).*
F_M = *cubic mean load (N).*

In many cases, the magnitude of the load fluctuates. In order to calculate the equivalent screw load, it is first necessary to determine a constant mean load F_m which would have the same influence on the ball screw as the actually fluctuating load. A constant mean load can be obtained from the formula below.

$$F_M = \sqrt[3]{\frac{F_1^3 \times S_1 + F_2^3 \times S_2 + F_3^3 \times S_3 + \ldots.}{S_1 + S_2 + S_3 + \ldots.}}$$

$F_1, F_2, F_3 \ldots$ = *cubic load (N) during S_1, S_2 and S_3*
.... partial stroke.

Example:
An actuator with a stroke of 500 mm having a load of 2 800 N in one direction of movement and 2 100 N in the other. The entire stroke of the actuator is utilized.

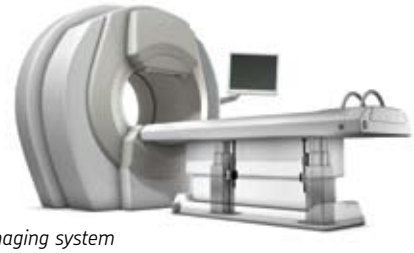
$$F_M = \sqrt[3]{\frac{2\,800^3 \times 500 + 2\,100^3 \times 500}{500 + 500}} = 2\,500\ \text{N}$$

Application checklist

Designing and specifying an electro-mechanical linear actuator begins by assessing as many application factors as possible to make the most appropriate and educated technology choices.

- *How much force and in what directions (push, pull, vertical, and/or horizontal) will the actuator need to move?*
- *How far and how fast will the actuator need to travel?*
- *How often will the actuator operate and how much time will elapse between operations?*
- *What is the desired lifetime for the application?*
- *How will the actuator be mounted and will front and/or back mounts require special configurations?*
- *Does the application suggest a need for safety mechanisms?*
- *Will environmental factors (temperature variations, moisture, or vibration) pose a challenge to operation?*
- *Is space limited?*
- *What are the power supply options?*
- *If a motor is used, what type (AC, DC, or special) and what voltage?*
- *Is feedback required for speed and/or position?*
- *Are revised specifications likely or anticipated in the future?*

Typical applications

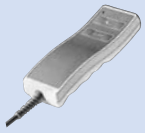
Off-highway	 *Hood lifter*	 *Highway mobile sign*
Food and beverage	 *Grill*	 *Tilting pan*
Medical	 *Imaging system*	 *Incubator*
Healthcare	 *Treadmill*	 *Massage table*
Solar tracking	 *Solar tracker*	
Industrial workstations	 *Adjustable workstation*	

Selection guide

Telescopic pillars	Type	Force	Speed	Stroke length	Motor	Page
		N	mm/s	mm	V	No.
	**TFG**	2 500	15 to 19	200 to 700	24 DC 120/230 AC	22

Linear actuators	Type	Force	Speed	Stroke length	Motor	Page
		N	mm/s	mm	V	No.
	**MAX 3**	3 000 to 8 000	5 to 18	100 to 700	24 DC	28
	MAX 6	6 000 to 8 000	6 to 8	100 to 700	120/230 AC	32
	**RU 22**	8 000 to 12 000	4 to 7	100 to 700	24 DC	36
	**CAT 33H**	1 200	36 to 174	100 to 400	12/24 DC	40
	CAT 32B	4 000	12 to 65	100 to 400	12/24 DC	44
	**IMD3**	240 to 1 000	6 to 30	50 to 300	12/24 DC	48
	**ID8A**	1 500 to 2 500	13 to 38	102 to 305	12/24 DC	52
	ID8B	3 500 to 4 500	13 to 36	102 to 305	12/24 DC	54
	**IA4A**	1 500 to 2 300	14 to 29	102 to 305	230 AC	56
	IA4B	4 500 to 6 000	13 to 29	102 to 305	230 AC	58

Control units	Type	Max. motor connections	Input	Output	Page
		n°	V	V/A	No.
	**BCU**	3	120/230 AC	24/7	62
	**CAED**	1	24 DC	24/9	64

Hand switches	Type	Operating power	Max. operating motors	Protection class	Page
		V DC/mA	n°	IP	No.
	**EHA 1**	12/50	1	67	68
	EHA 3	12/50	3	67	69
	**CAES31**	30/33	1	54	70

Telescopic pillars

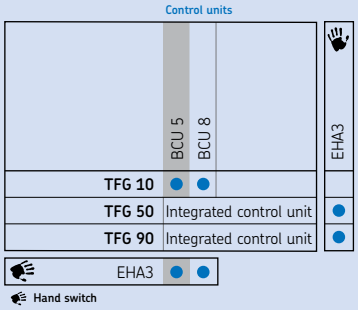
TFG series..... 22

TELEMAG TFG

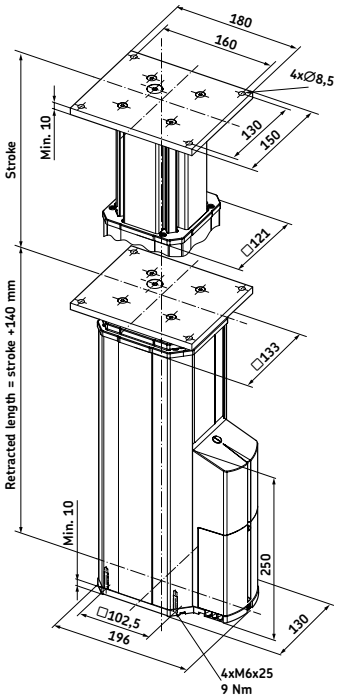
Benefits
- Push or pull force
- Compact design
- Fast movement
- Powerful
- Parallel drive

Standards
- EN/IEC 60601-1
- UL 60601-1

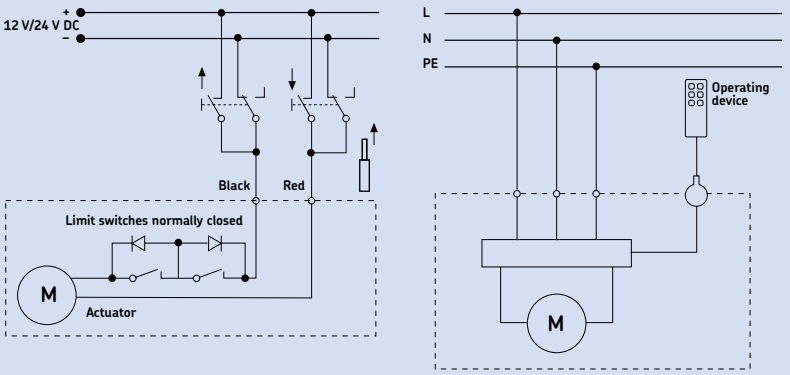
Suitable control units and accessories



Dimensional drawing



Connecting diagram TFG10 and TGF50/90



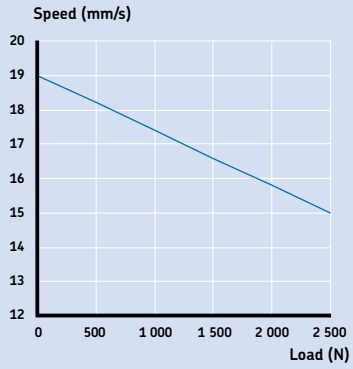
Technical data

	Unit	TFG10	TGF50	TFG90
Max. force* (push or pull)	N	2 500	2 500	2 500
Speed	mm/s	15 to 19	15 to 19	15 to 19
Stroke	mm	200 to 700	200 to 700	200 to 700
Retracted length (3 sections)	mm	S+140 (incl. plate)	S+140 (incl. plate)	S+140 (incl. plate)
Voltage input	V	24 DC	120 AC	230 AC
Current consumption	A	5	1,8	1
Duty cycle intermittent operation	min	1 min./9 min.	1 min./9 min.	1 min./9 min.
Duty cycle short-time operation	min	3	3	3
Ambient temperature	°C	+10 to +40	+10 to +40	+10 to +40
Protection class	IP	30	30	30
Isolation class	–	SELV	I	I
Weight	kg	8 to 19	8 to 19	8 to 19

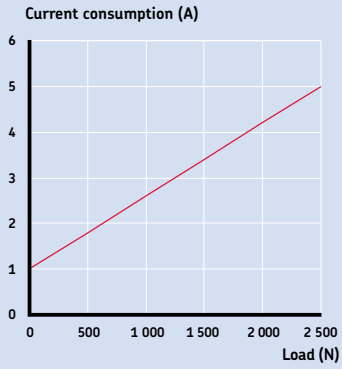
*See offset load diagram on next page

TELEMAG TFG

Performance diagrams

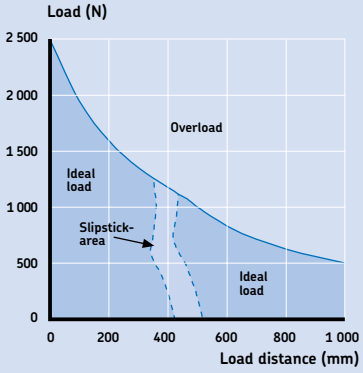


Speed-force diagram

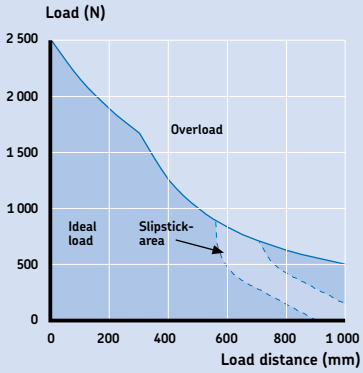


Current-force diagram

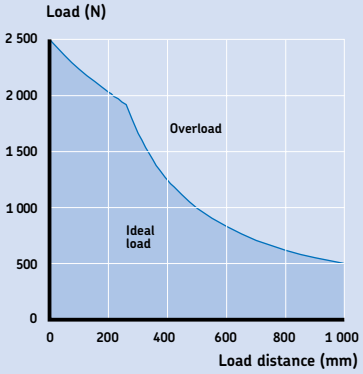
Offset diagrams



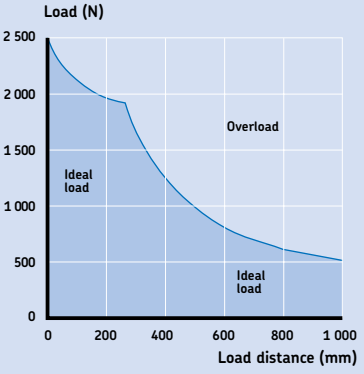
Offset load diagram - 200 mm stroke



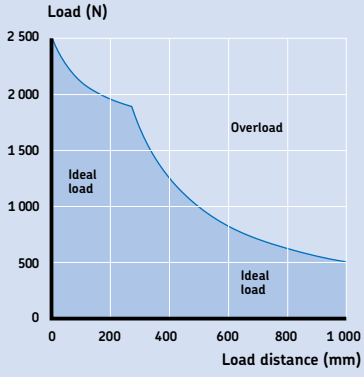
Offset load diagram - 300 mm stroke



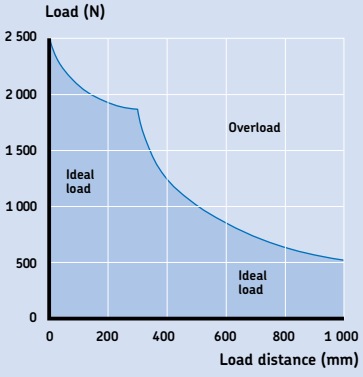
Offset load diagram - 400 mm stroke



Offset load diagram - 500 mm stroke



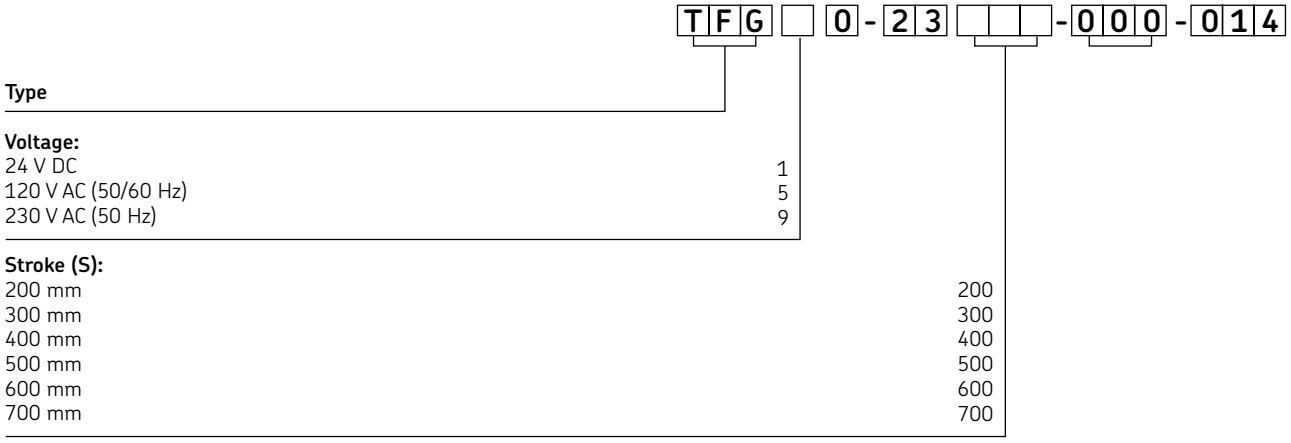
Offset load diagram - 600 mm stroke



Offset load diagram - 700 mm stroke

TELEMAG TFG

Ordering key



Accessories

	Designation	Order N°
Bottom mounting plate Bore 102,5x102,5 mm	SMT-264363	M/0124814
Screw for bottom mounting plate M6x30 (4 screws required)	ZBE-510709	M/0125560
Mains cable SEV plug 3 000 mm, black, 3x0,75 mm^2	ZKA-304345	M/0125331
Mains cable Schuko plug 3 000 mm, black, 3x0,75 mm^2	ZKA-304346-3000	M/0121729
Mains cable US plug 3 000 mm, black, 3x0,75 mm^2	ZKA-304347-3000	M/0121762
Mains cable British Standard plug 3 000 mm, black, 3x0,75 mm^2	ZKA-304355-3000	M/0121755

Notes

Linear actuators

Matrix series **28**

Runner series **36**

CAT series **40**

IMD3 series **48**

ID8 series **52**

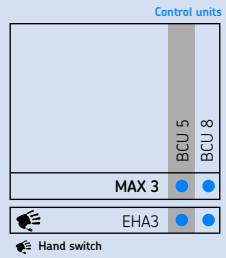
IA4 series **56**

MATRIX MAX3

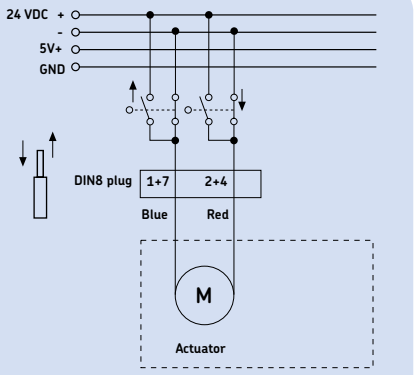
Benefits

- Long service life
- Silent operation
- Full system with control unit and hand switch
- Synchronization possible
- Compact and aesthetic
- Back-up nut in standard

Suitable control units and accessories

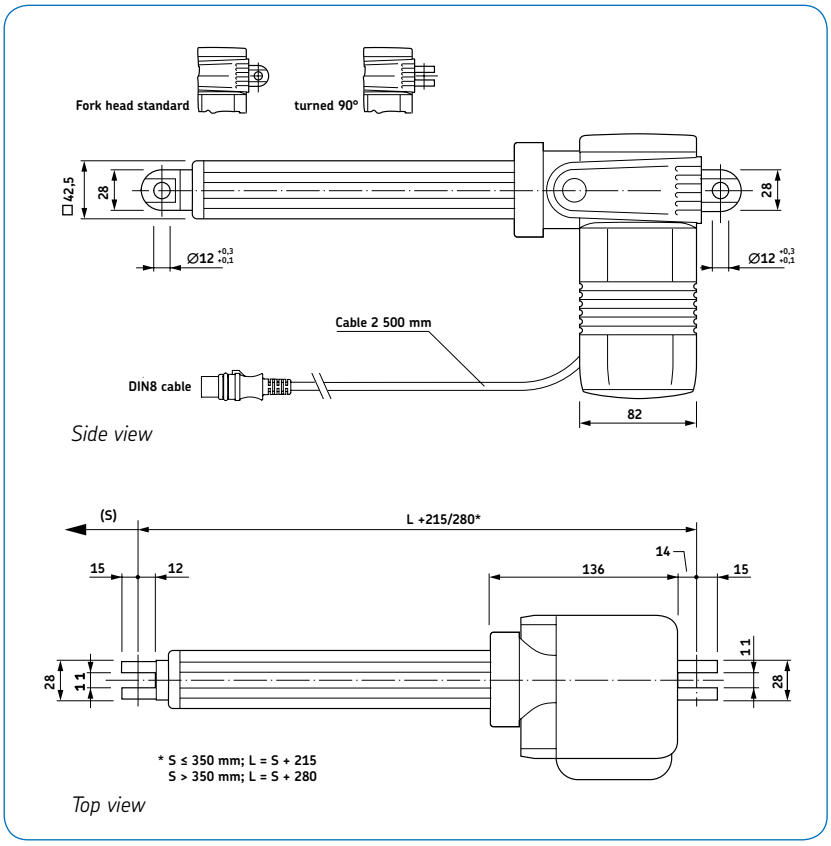


*Connecting diagram**



** Only valid for MAX 31*
MAX 30 must be operated by a BCU control unit.

Dimensional drawing



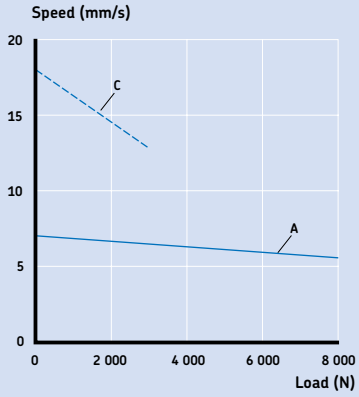
Technical data

	Unit	MAX3 A	MAX3 C
Push force (max)	N	8 000	3 000
Pull force (max)	N	6 000	3 000
Speed	mm/s	5 to 7	13 to 18
Stroke	mm	100 to 700	100 to 700
Retracted length	mm	S+215/280*	S+215/280*
Voltage	V DC	24	24
Current consumption	A	5,0	5,0
Duty cycle	%	10 (1 min./9 min.)	10 (1 min./9 min.)
Ambient temperature	°C	0 to +40	0 to +40
Protection class	IP	66S	66S
Weight (at 200 mm stroke)	kg	4,5	4,0
Color	–	Grey	Grey

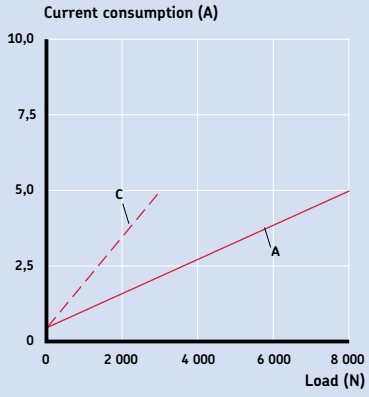
* S ≤ 350 mm; L = S + 215
S > 350 mm; L = S + 280

MATRIX MAX3

Performance diagrams

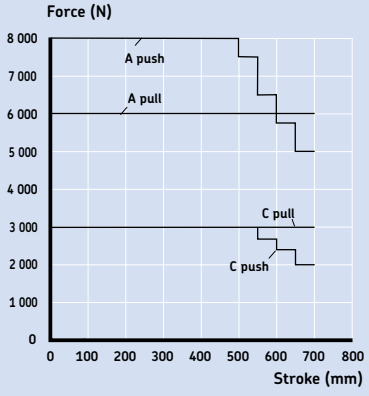


Speed-force diagram

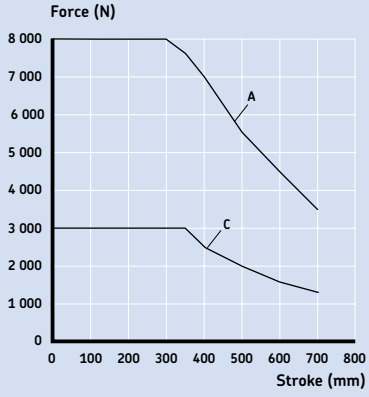


Current-force diagram

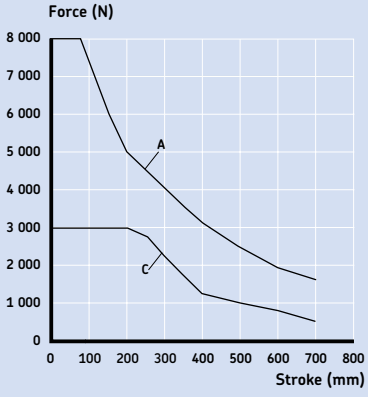
Safety factor load conditions



Push force reduction static
Safety factor S=1



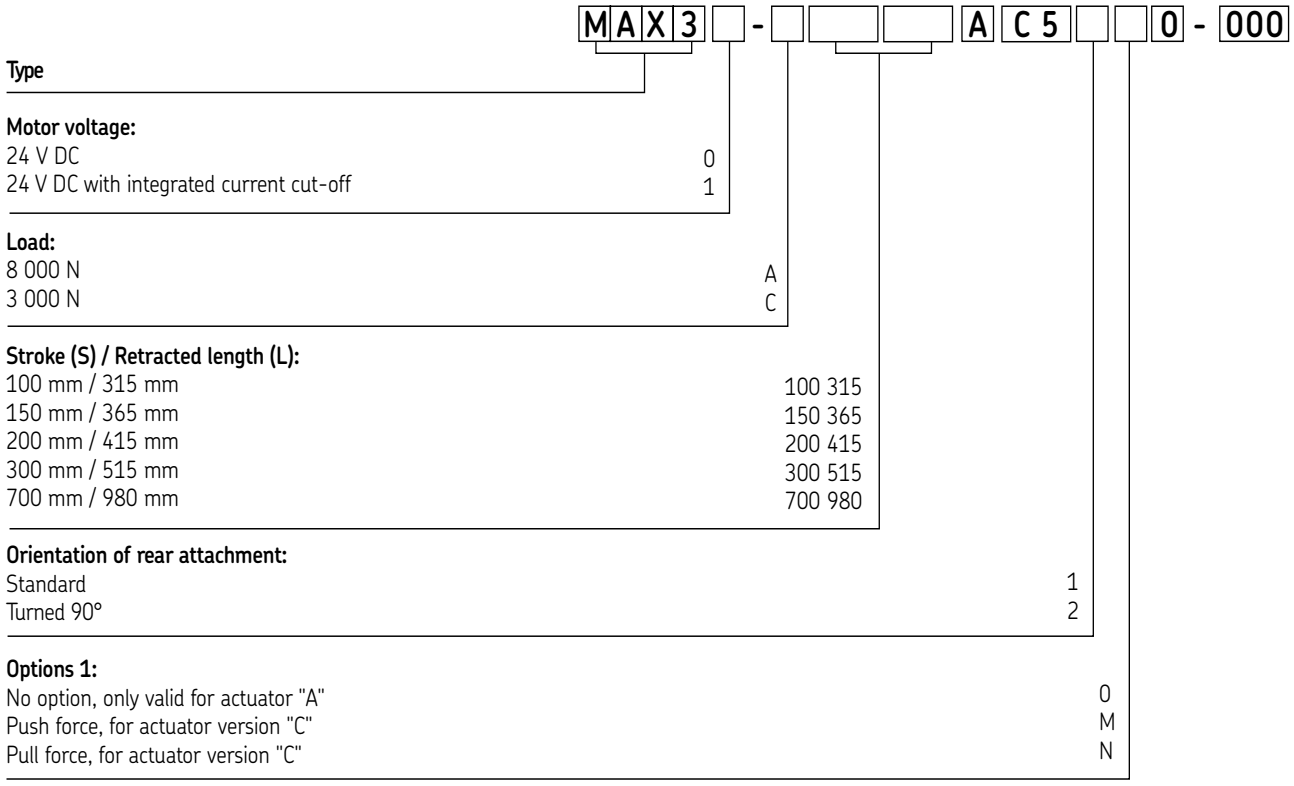
Push force reduction static
Safety factor S=2



Push force reduction static
Safety factor S=4 (EN60601)

MATRIX MAX3

Ordering key



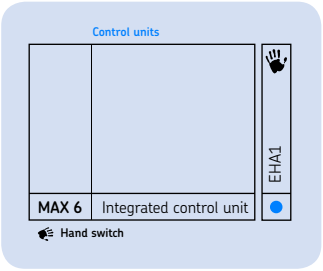
Notes

MATRIX MAX6

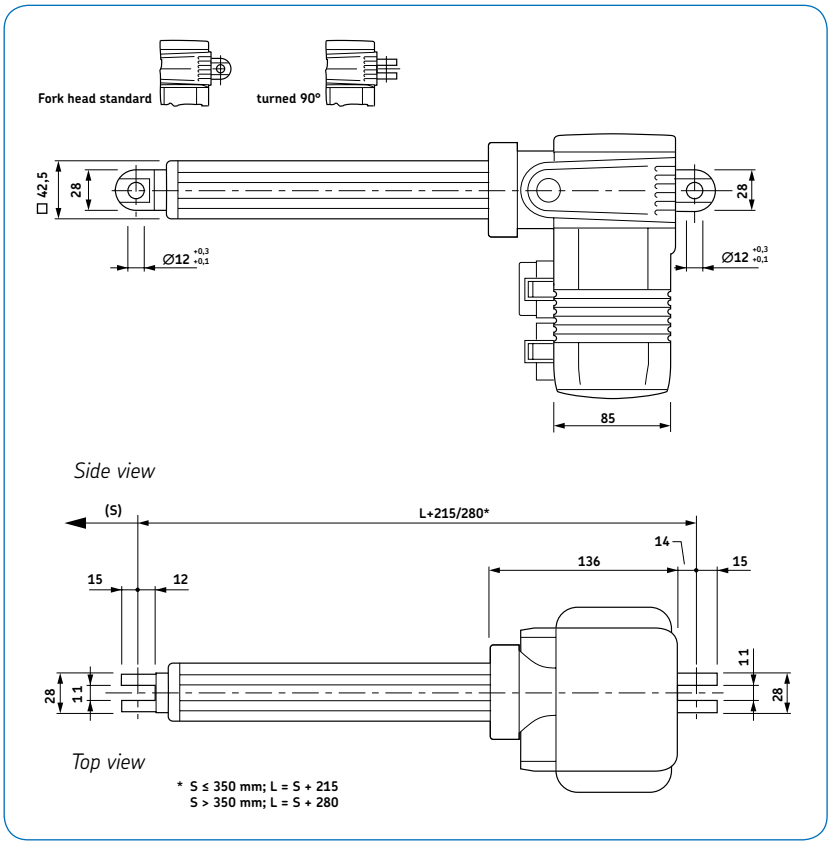
Benefits

- Long service life
- Silent operation
- Synchronization possible
- Compact and aesthetic
- Back-up nut in standard
- Integrated control unit

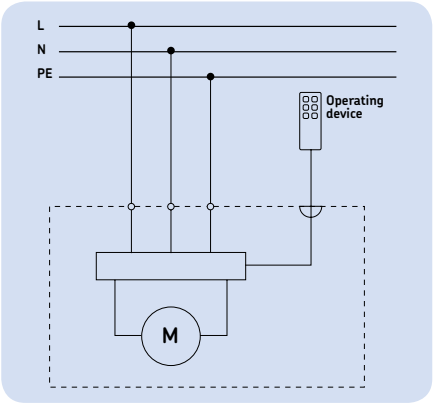
Suitable control units and accessories



Dimensional drawing



Connecting diagram



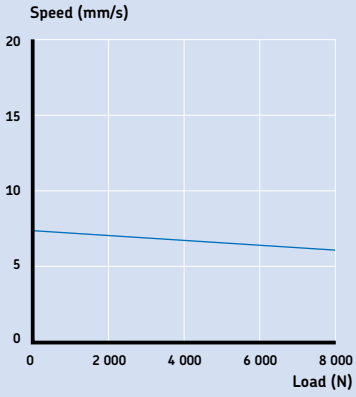
Technical data

	Unit	MAX6 A
Push force (max)	N	8 000
Pull force (max)	N	6 000
Speed	mm/s	6 to 8
Stroke	mm	100 to 700
Retracted length	mm	S+215/280*
Voltage	V AC	120/230
Current consumption	A	1,8
Duty cycle	%	10 (1 min./9 min.)
Ambient temperature	°C	0 to +40
Protection class	IP	66S
Weight (at 200 mm stroke)	kg	4,8
Color	–	Grey

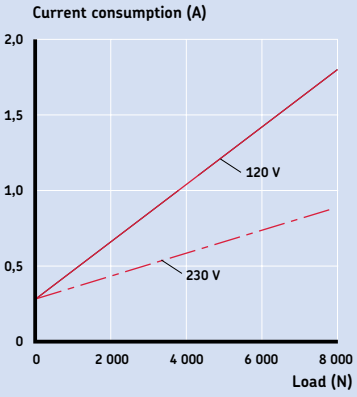
* S ≤ 350 mm; L = S + 215
S > 350 mm; L = S + 280

MAX6

Performance diagrams



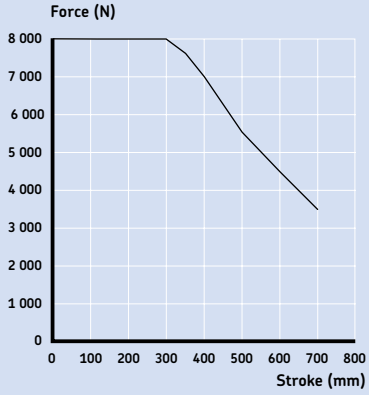
Speed-force diagram



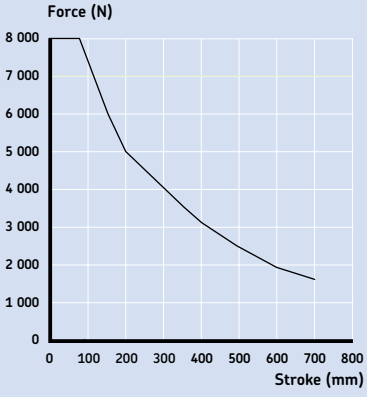
Current-force diagram

Safety factor load conditions

Push force reduction static
Safety factor S=1



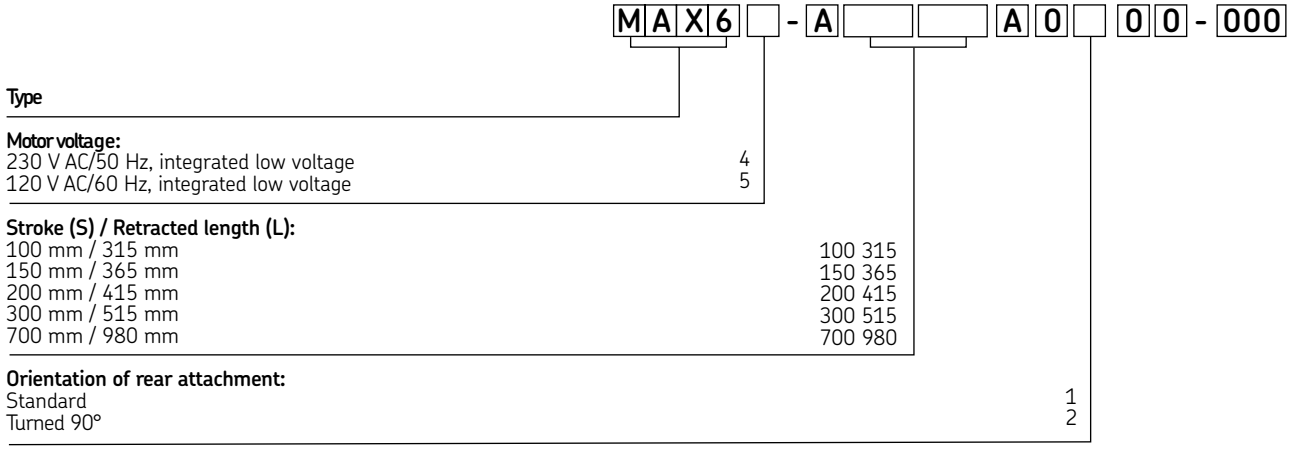
Push force reduction static
Safety factor S=2



Push force reduction static
Safety factor S=4 (EN60601)

MAX6

Ordering key



Accessories

Mains cable for MAX6	Plug	Country	Designation	Order N°
Straight cable 3,5 m	Schuko	DE	ZKA-140306-3500	M/0121723
Straight cable 3,5 m	SEV	CH	ZKA-140316-3500	M/0121737
Straight cable 3,5 m	UL	USA	ZKA-140355-3500	M/0121724
Straight cable 3,5 m	Hospital grade	USA	ZKA-140360-3500	M/0121732
Straight cable 3,5 m	British standard	UK	ZKA-140350-3500	M/0121743
Coiled cable 1,2 m / 2,2 m	Schuko	DE	ZKA-140342-1500	M/0121728
Coiled cable 1,2 m / 2,2 m	SEV	CH	ZKA-140378-1200	M/0121738
Straight polyurethane cable 3,5 m	SEV	CH	ZKA-140422-3500	M/0121739
Straight polyurethane cable 3,5 m	Schuko	DE	ZKA-140426-3500	M/0121740
Strain relief for mains cable			ZUB-952253	M/0102848
Tool for plugs (Jack/D-Sub/Mains)			ZWS-140375	M/0125322

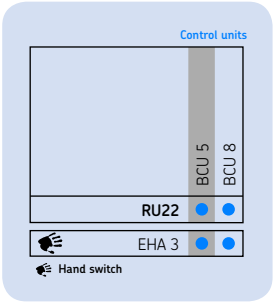
Notes

Runner

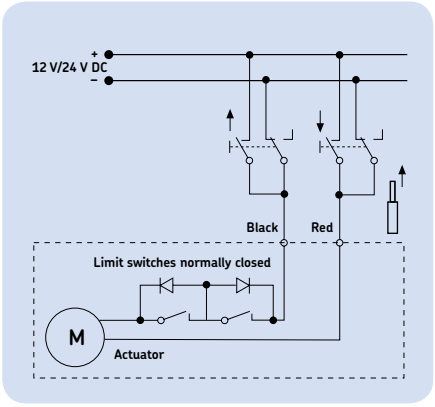
Benefits

- High push/pull force
- Compact design
- Silent operation
- Long service life
- Back-up nut in standard
- High security factor in static

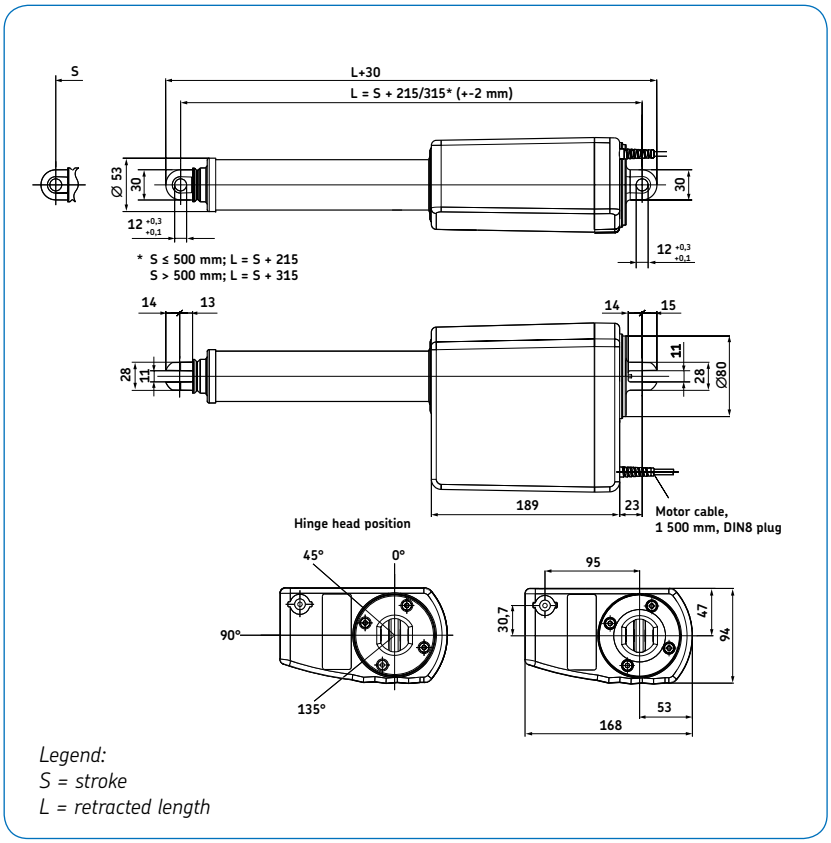
Suitable control units and accessories



Connecting diagram



Dimensional drawing



Legend:
S = stroke
L = retracted length

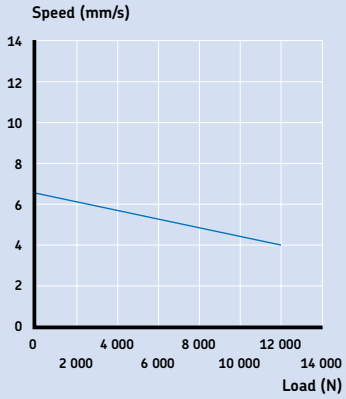
Technical data

	Unit	RU22
Push force (max)	N	12 000
Pull force (max)	N	8 000
Speed	mm/s	4 to 7
Stroke	mm	100 to 700
Retracted length	mm	S+215/315*
Voltage	V DC	24
Current consumption	A	7
Duty cycle	%	10 (1 min./9 min.)
Ambient temperature	°C	0 to +40
Protection class	IP	X6S
Weight (at 200 mm stroke)	kg	4,7
Color	–	Grey

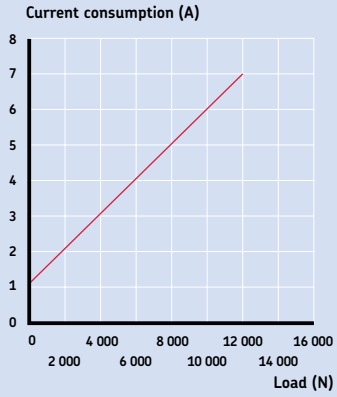
* S ≤ 500 mm; L = S + 215
S > 500 mm; L = S + 315

Runner

Performance diagrams

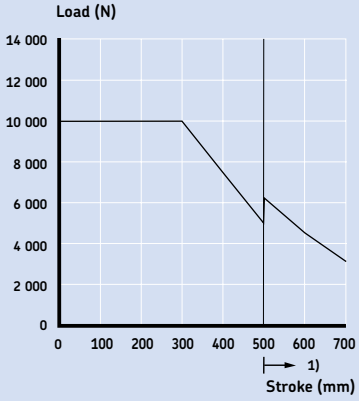


Speed-force diagram

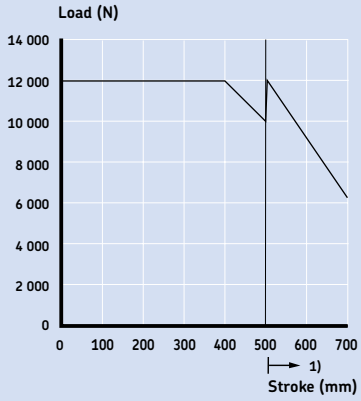


Current-force diagram

Safety factor load conditions



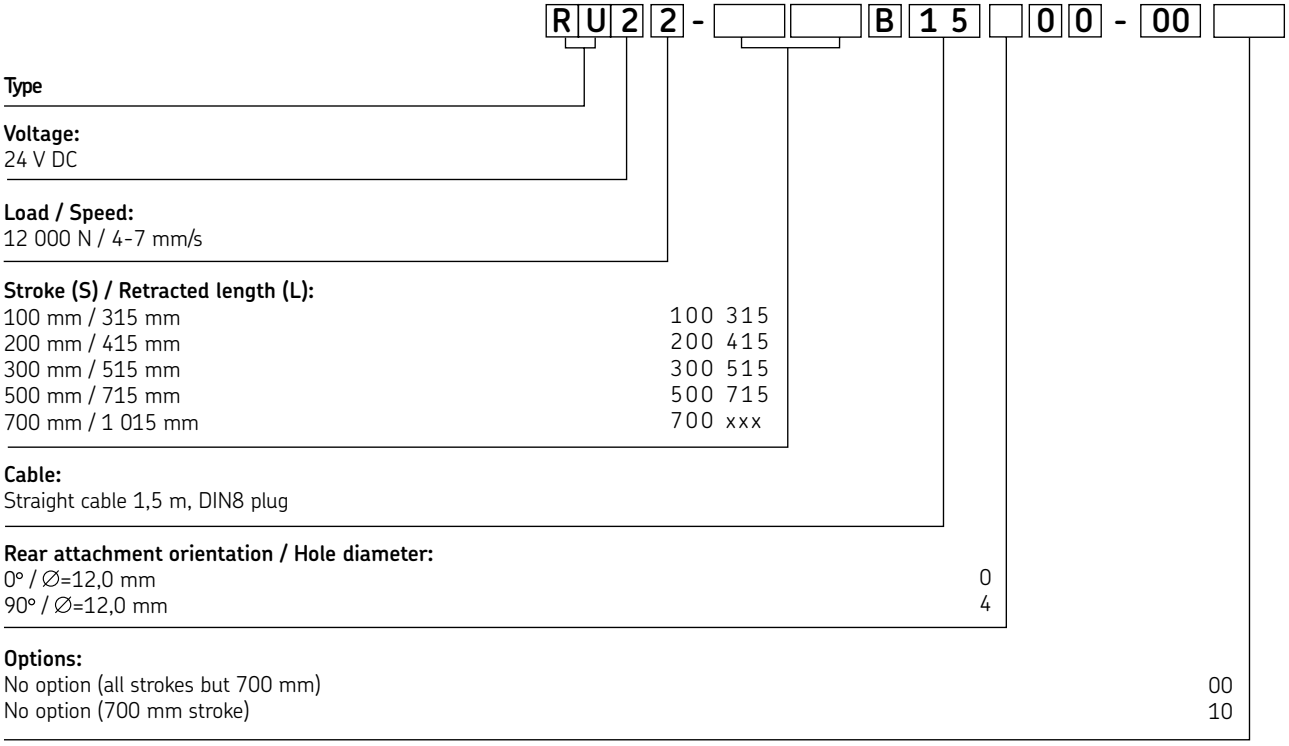
Push force limit, safety factor S=4 (EN 60601) [1]retracted length extension at stroke >500 mm



Push force limit, safety factor S=2 [1]retracted length extension at stroke >500 mm

Runner

Ordering key



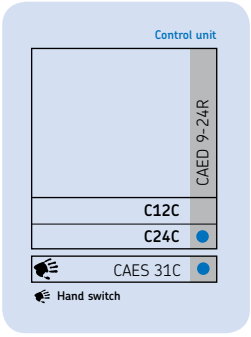
Notes

CAT 33H

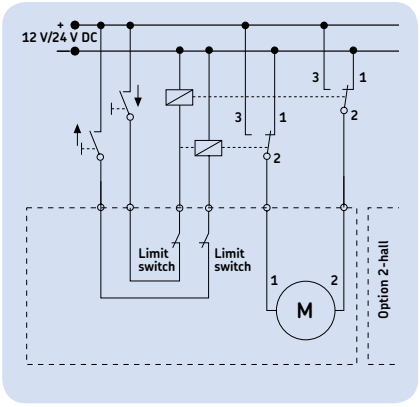
Benefits

- Small
- Robust
- Highly efficient
- Friction clutch

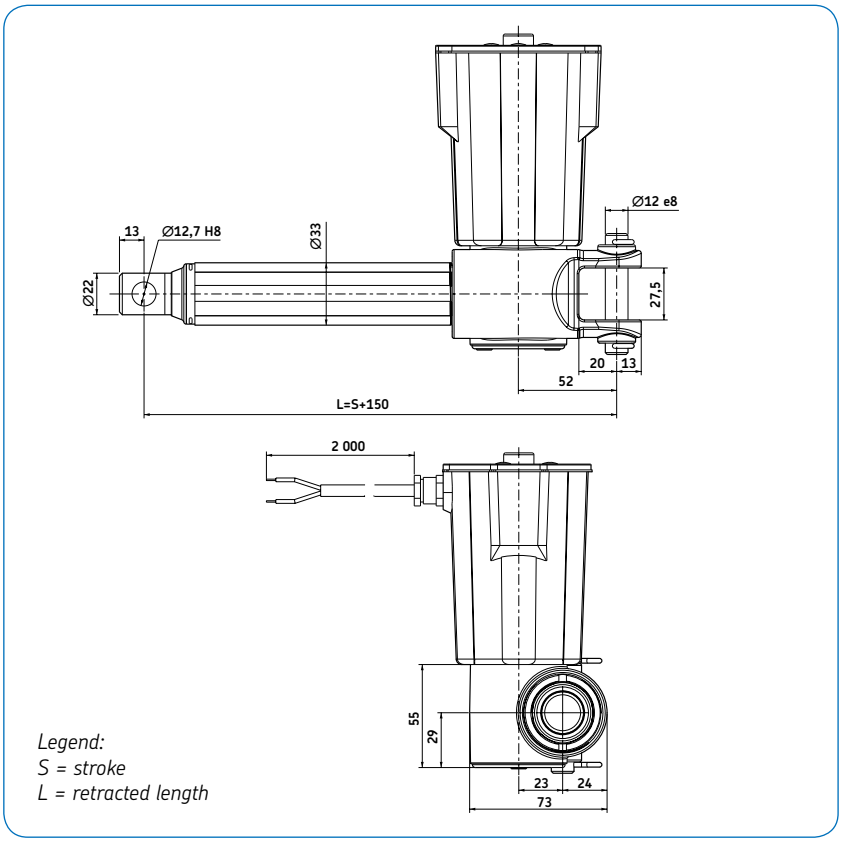
Suitable control units and accessories



Connecting diagram



Dimensional drawing



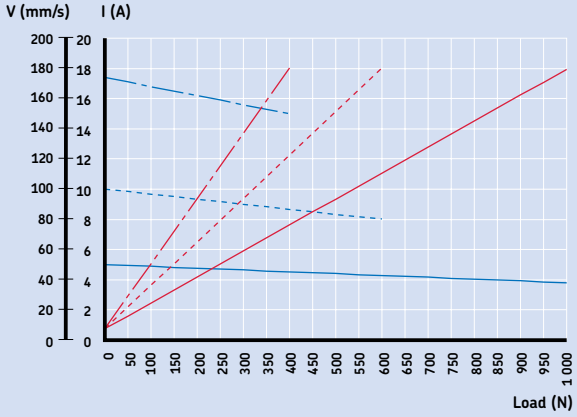
Legend:
S = stroke
L = retracted length

Technical data

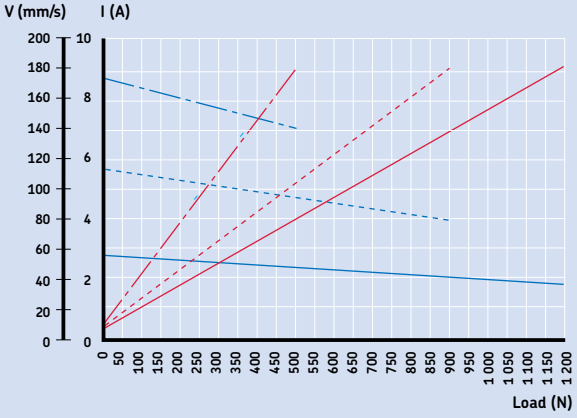
	Unit	CAT 33H
Push force (max)	N	1 200
Pull force (max)	N	1 200
Speed	mm/s	36 to 174
Stroke	mm	100 to 400
Retracted length	mm	S+150
Voltage	V DC	12/24
Current consumption (12 V DC)	A	18
(24 V DC)	A	9
Duty cycle	%	20
Ambient temperature	°C	-20 to +50
Protection class	IP	65
Weight (at 200 mm stroke)	kg	2,2
Color	–	–

CAT 33H

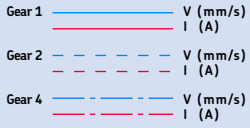
Performance diagrams



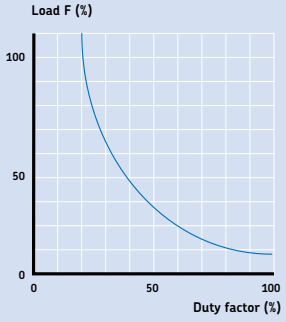
CATR 33H.../C12C



CATR 33H.../C24C



Duty factor



CAT 33H

Ordering key

Dynamic load (N) /Speed (mm/s)			Motor options	
1 000/50-38 1 200/56-36	600/100-80 900/113-79	400/174-150 500/174-140	12 VDC, IP65 24 VDC, IP65	C12C C24C
1	2	4		

CATR33HX[ ]X[ ]A1G1F/[ ]IT2

Type

Motor assembly:
Right

Stroke (S):
100 mm 100
200 mm 200
300 mm 300
400 mm 400

Rear attachment:
Fork ear ∅=12,0 mm

Front attachment:
Hole ∅=12,0 mm

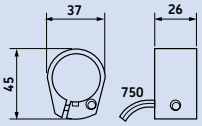
Option for CxxC motors:
Straight cable 2,0 m, no plug

Limit switches

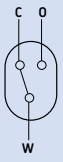
CAXC 33
- Two CAXC needed for inner and outer limit
- The switches reduce the effective stroke length by 20 mm

Product designation
CAXC 33

Dimensional drawing



Connecting diagram



Permissible break power: *3 W*
Max. break voltage: *200 V DC*
Max. break current: *200 mA (DC)*

W= Common
C = Normally closed
O = Normally opened

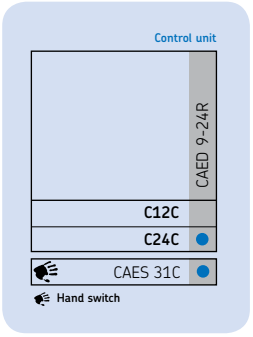
Notes

CAT 32B

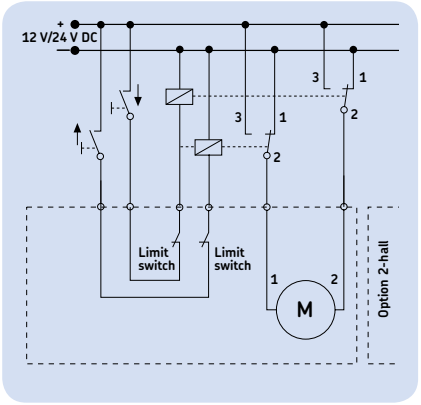
Benefits

- Small
- Robust
- Highly efficient
- Friction clutch

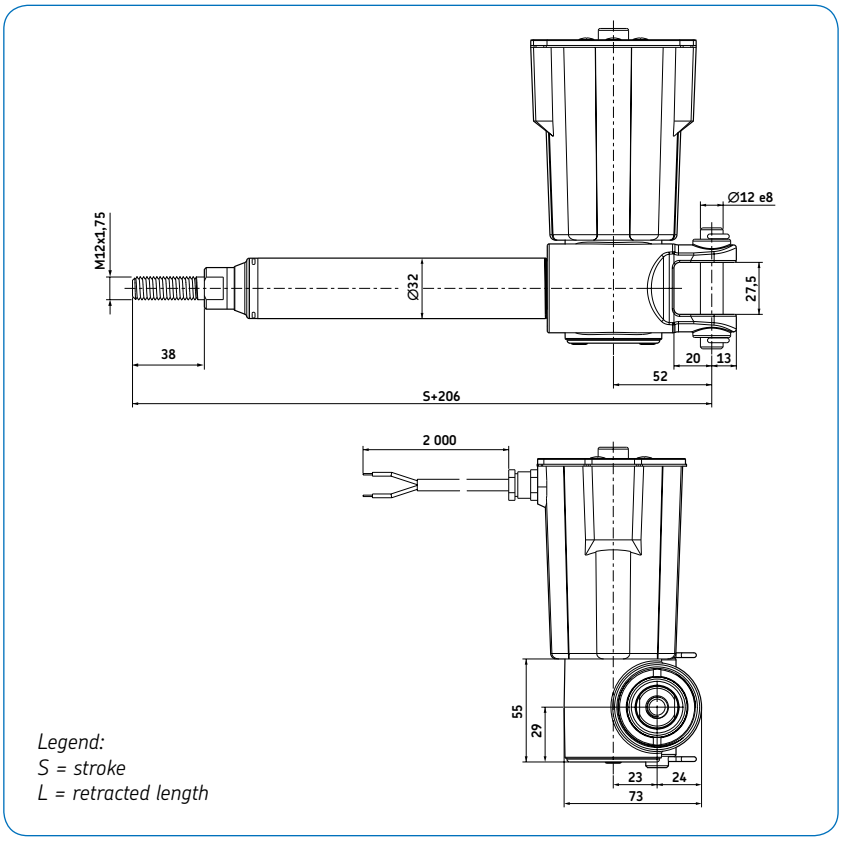
Suitable control units and accessories



Connecting diagram



Dimensional drawing



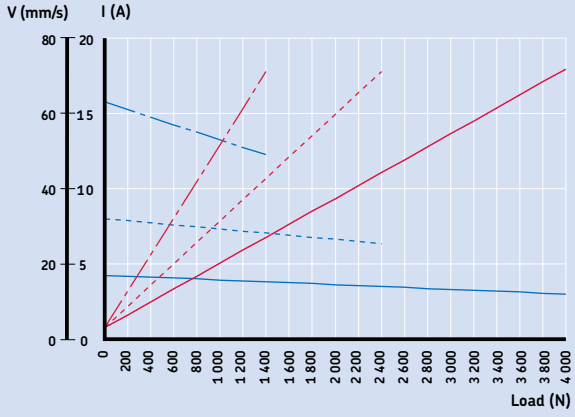
Legend:
S = stroke
L = retracted length

Technical data

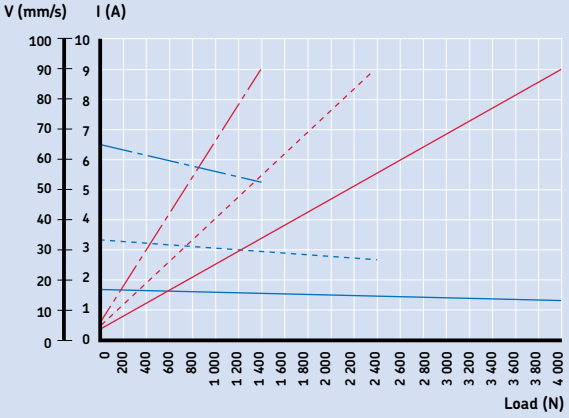
	Unit	CAT 32B
Push force (max)	N	4 000
Pull force (max)	N	4 000
Speed	mm/s	12 to 65
Stroke	mm	100 to 400
Retracted length	mm	S+206
Voltage	V DC	12/24
Current consumption (12 V DC)	A	18
(24 V DC)	A	9
Duty cycle	%	20
Ambient temperature	°C	-20 to +50
Protection class	IP	65
Weight (at 200 mm stroke)	kg	2,6
Color	–	–

CAT 32B

Performance diagrams

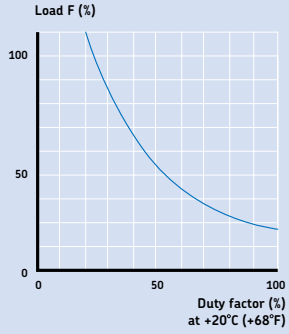


CATR 32B.../C12C



CATR 32B.../C24C

Duty factor



CAT 32B

Ordering key

Dynamic load (N)/Speed (mm/s)			Motor options	
4 000/17-12 4 000/17-13	2 500/32-25 2 500/33-26	1 500/63-48 1 500/65-52	12 VDC, IP65 24 VDC, IP65	C12C C24C
1	2	4		

C A T R 32B X [ ] X [ ] A1 G3 F / [ ] IT2

Type

Stroke (S):

100 mm	100
200 mm	200
300 mm	300
400 mm	400

Rear attachment:
Fork ear ∅=12,0 mm

Front attachment:
Male thread, M12

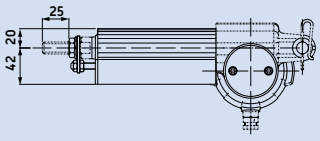
Option for CxxC motors:
Straight cable 2,0 m, no plug

Limit switches

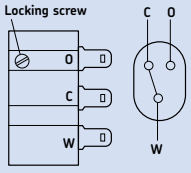
CAXB 32B

- To avoid running into mechanical end stop, the limit switches should be located approximately 10 mm from respective end stop

Dimensional drawing



Connecting diagram



Permissible break power: *3 W*
Max. break voltage: *200 V DC*
Max. break current: *200 mA (DC)*

W= Common
C = Normally closed
O = Normally opened

Ordering key

C A X B 3 2 B [ ] [ ] [ ]

Type

Actuator stroke

100 mm	100
200 mm	200
300 mm	300
400 mm	400

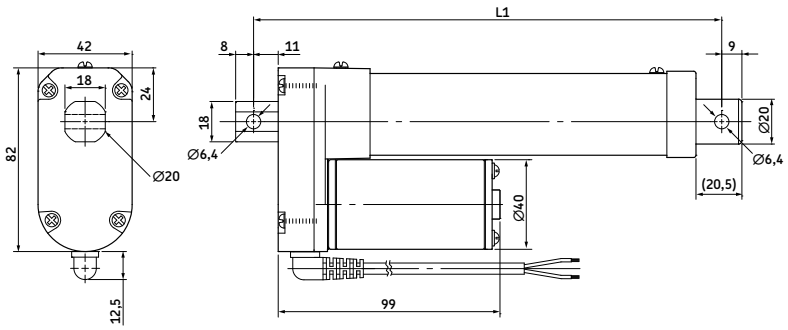
Notes

IMD3 series

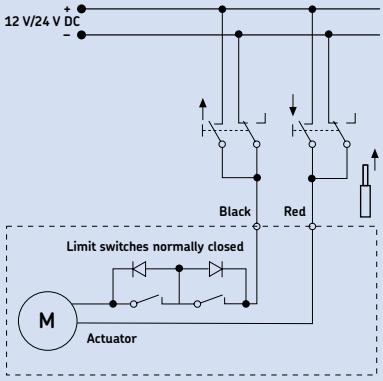
Features / Benefits

- ACME screw drive
- Extension tube (aluminium)
- Protection tube (aluminium)
- Zinc alloy gear housing
- Powder metal gears
- Self-locking
- Cable length 600 mm without connector

Dimensional drawing



Connecting diagram



Dimensions in mm* Stroke	50	100	150	200	300
Retracted length (L1)	158	209	260	311	413

*Tolerance: L1 = ± 2,0 mm

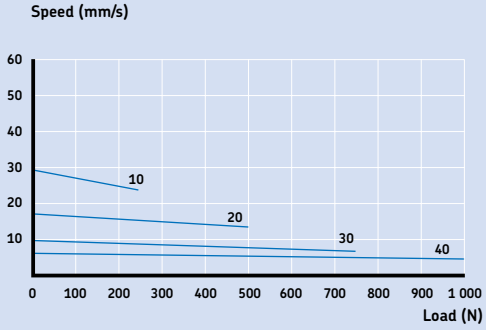
Technical data

		Unit	IMD3 10	IMD3 20	IMD3 30	IMD3 40
Push force (max)		N	240	500	750	1 000
Pull force (max)		N	240	500	750	1 000
Speed		mm/s	24 to 30	13 to 16	8 to 10	6 to 8
Stroke		mm	50	50 to 300	50	100
Retracted length		mm	–*	–*	–*	–*
Voltage		V DC	12/24	12/24	12/24	12/24
Current consumption	(12 V DC)	A	3,2	3,0	2,8	2,6
	(24 V DC)	A	2,0	1,8	1,8	1,6
Duty cycle		%	25	25	25	25
Ambient temperature		°C	-15 to +65	-15 to +65	-15 to +65	-15 to +65
Protection class		IP	65	65	65	65
Weight (at 300 mm stroke)		kg	1,5	1,5	1,5	1,5
Color		–	Silver	Silver	Silver	Silver

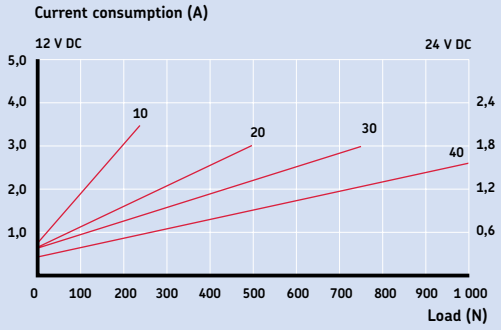
* see above table

IMD3

Performance diagrams



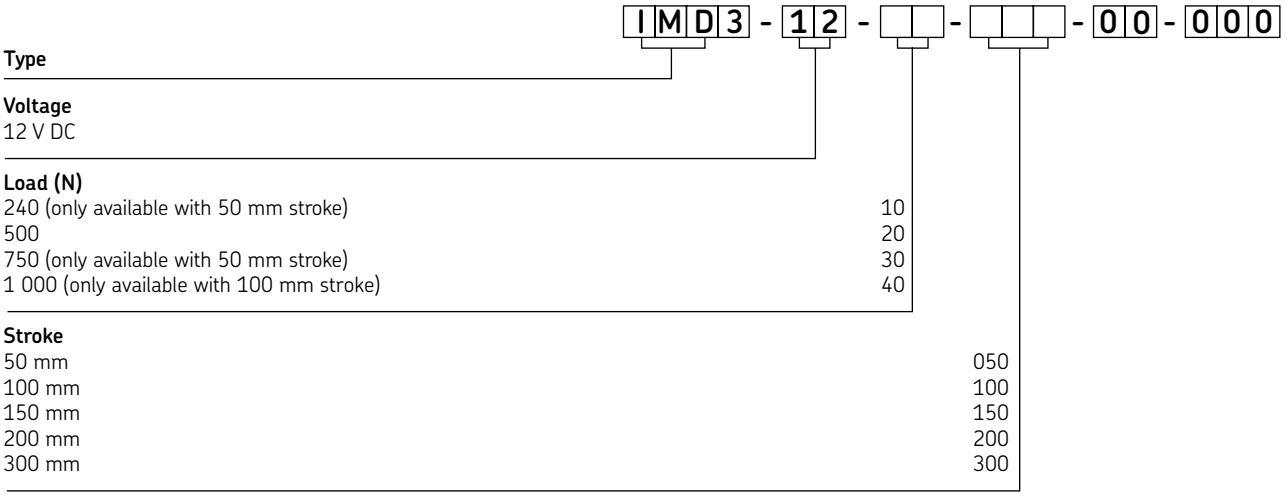
Speed-force diagram



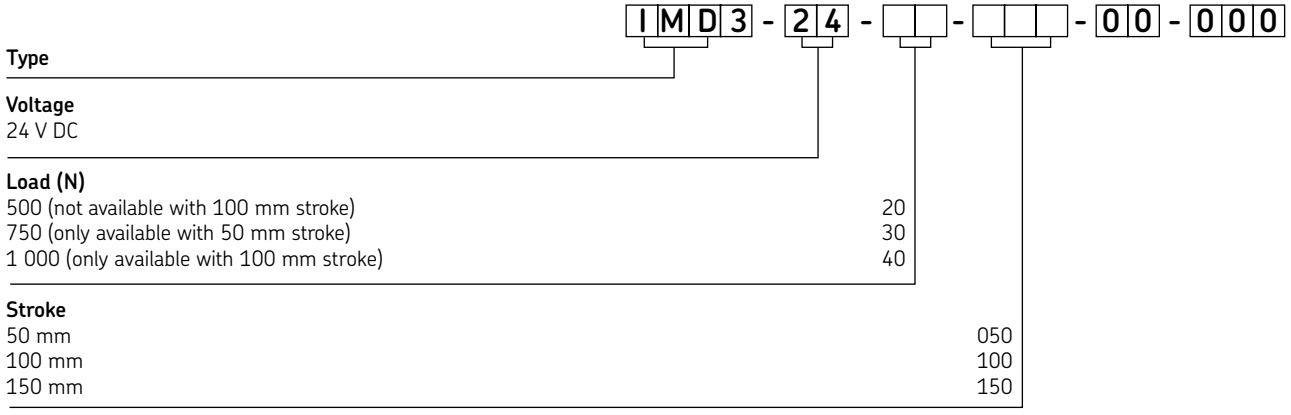
Current-force diagram

IMD3

Ordering key



Ordering key



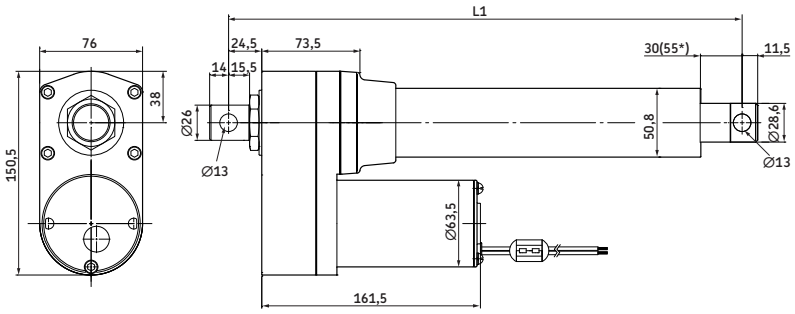
Notes

ID8A series

Features / Benefits

- ACME screw drive
- Extension tube (stainless steel)
- Protection tube (steel), powder coated
- Enhanced corrosion resistance
- Mechanical overload protection (clutch)
- Lubricated for service life
- Robust, designed for tough environment
- Self-locking
- Certified (CE: EN 55011)
- Cable length 130 mm without connector

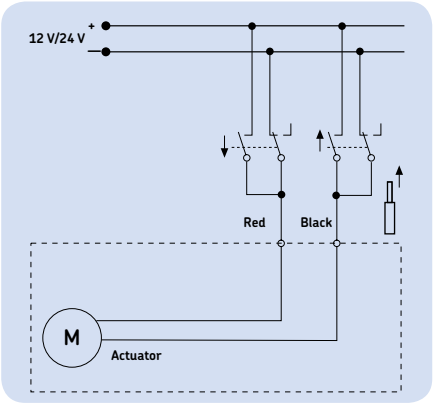
Dimensional drawing



Stroke (mm)	102	153	204	305
L1 (Retracted length in mm)*	262	313	364	465

* Tolerance; L1 = ± 3,8 mm

Connecting diagram



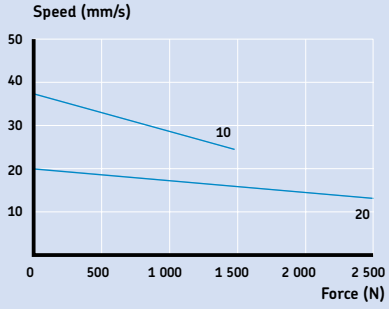
Technical data

		Unit	ID8A 10	ID8A 20
Push force (max)		N	1 500	2 500
Pull force (max)		N	1 500	2 500
Speed		mm/s	25 to 38	13 to 20
Stroke		mm	102 to 305	102 to 204
Retracted length		mm	–*	–*
Voltage		V DC	12/24	12/24
Current consumption	(12 V DC)	A	14,0	12,0
	(24 V DC)	A	7	6
Duty cycle		%	25	25
Ambient temperature		°C	-26 to +65	-26 to +65
Protection class		IP	65	65
Weight (at 305 mm stroke)		kg	5,5	5,5
Color		–	Black	Black

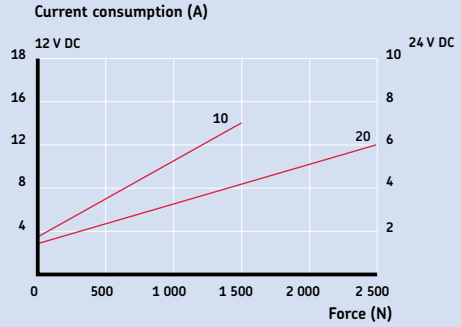
* see above table

ID8A

Performance diagrams



Speed-force diagram



Current-force diagram

Ordering key

ID8A - □□ - □□ - □□□ - 000 - C0 - 000

Type

Voltage
12 V DC 12
24 V DC 24

Load (N)
1 500 (only available with 102 and 305 mm stroke) 10
2 500 (not available with 305 mm stroke) 20

Stroke
102 mm 102
153 mm 153
204 mm 204
305 mm 305

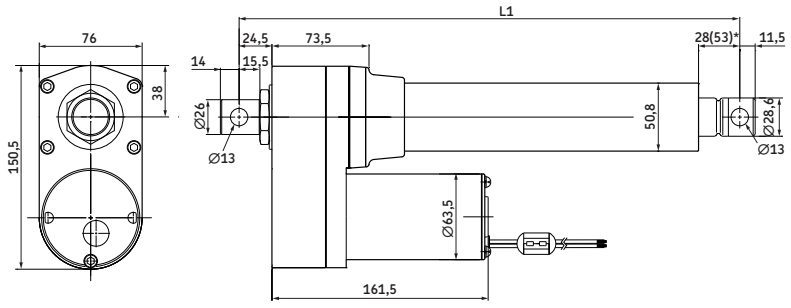
Orientation rear attachment
0° C0

ID8B series

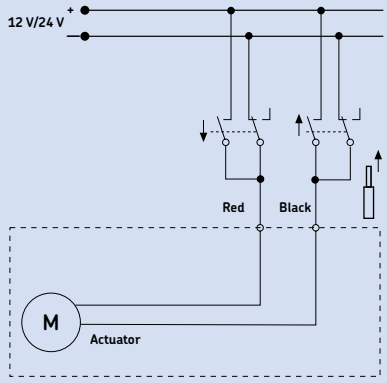
Features / Benefits

- High efficiency ball screw
- Extension tube (stainless steel)
- Protection tube (steel), powder coated
- Enhanced corrosion resistance
- Mechanical overload protection (clutch)
- Lubricated for service life
- Robust, designed for tough environment
- No back driving
- Certified (CE: EN 55011)
- Cable length 130 mm
  without connector

Dimensional drawing



Connecting diagram



Stroke (mm)	102	153	204	305
L1 (Retracted length in mm)*	317	368	419	521

* Tolerance; L1 = ± 3,8 mm

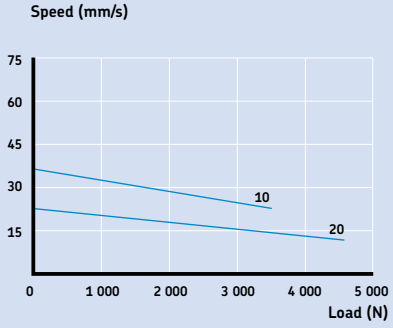
Technical data

	Unit	ID8B 10	ID8B 20
Push force (max)	N	3 500	4 500
Pull force (max)	N	3 500	4 500
Speed	mm/s	22 to 36	13 to 22
Stroke	mm	102-305	102-204
Retracted length	mm	–*	–*
Voltage	V DC	12/24	12/24
Current consumption (12 V DC)	A	17	13
(24 V DC)	A	8	7
Duty cycle	%	25	25
Ambient temperature	°C	-26 to +65	-26 to +65
Protection class	IP	65	65
Weight (at 305 mm stroke)	kg	6,5	6,5
Color	–	Black	Black

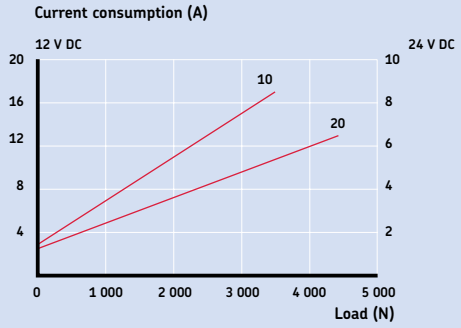
* see above table

ID8B

Performance diagrams



Speed-force diagram



Current-force diagram

Ordering key

I D 8 B - □□ - □□ - □□□ - 0 0 0 - C 0 - 0 0 0

Type

Voltage

12 V DC	12
24 V DC	24

Load (N)

3 500 (only available with 102 and 305 mm stroke)	10
4 500 (not available with 305 mm stroke)	20

Stroke

102 mm	102
153 mm	153
204 mm	204
305 mm	305

Orientation rear attachment

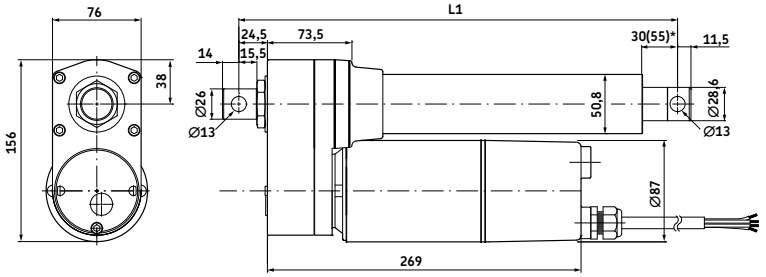
0°

IA4A series

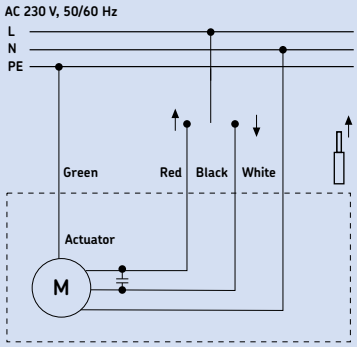
Features / Benefits

- ACME screw drive
- Extension tube (stainless steel)
- Protection tube (steel), powder coated
- Enhanced corrosion resistance
- Mechanical overload protection (clutch)
- Lubricated for service life
- Robust, designed for tough environment
- Self-locking
- Cable length 600 mm without connector

Dimensional drawing



Connecting diagram



Stroke (mm)	102	153	204	305
L1 (Retracted length in mm)*	380	415	415	465

* Tolerance; L1 = ± 3,8 mm

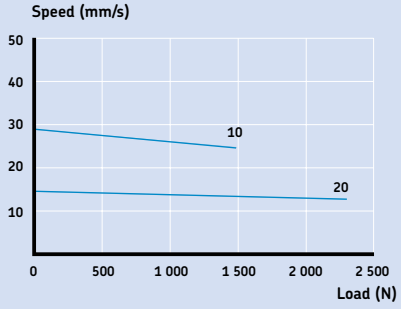
Technical data

	Unit	IA4A 10	IA4A 20
Push force (max)	N	1 500	2 300
Pull force (max)	N	1 500	2 300
Speed	mm/s	25 to 29	14 to 16
Stroke	mm	102 to 305	102 to 204
Retracted length	mm	–*	–*
Voltage	V AC	230	230
Current consumption (230 V AC)	A	1,3	1,1
Duty cycle	%	25	25
Ambient temperature	°C	-26 to +65	-26 to +65
Protection class	IP	65	65
Weight (at 305 mm stroke)	kg	9	9
Color	–	Black	Black

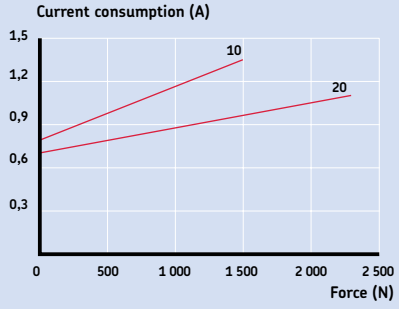
* see above table.
For outdoors application, please contact SKF.

IA4A

Performance diagrams



Speed-force diagram



Current-force diagram

Ordering key

IA4A-230-□□-□□□-00-C0-000

Type

Voltage
230 V AC

Load (N)

1 500 (only available with 102 and 305 mm stroke)	10
2 300 (not available with 305 mm stroke)	20

Stroke

102 mm	102
153 mm	153
204 mm	204
305 mm	305

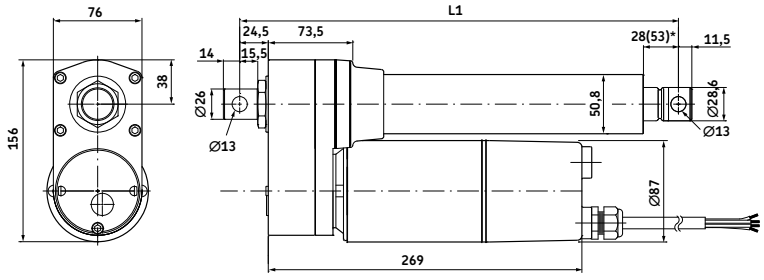
Orientation rear attachment
0°

IA4B series

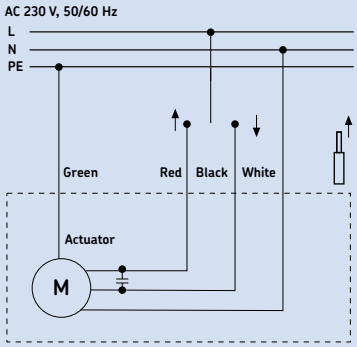
Features / Benefits

- High efficiency ball screw
- Motor with thermal protection
- No back driving
- Extension tube (stainless steel)
- Protection tube (steel), powder coated
- Enhanced corrosion resistance
- Mechanical overload protection (clutch)
- Lubricated for service life
- Robust, designed for tough environment
- No back driving
- Cable length 600 mm without connector

Dimensional drawing



Connecting diagram



Stroke (mm)	102	153	204	305
L1 (Retracted length in mm)*	380	419	419	521

* Tolerance; L1 = ± 3,8 mm

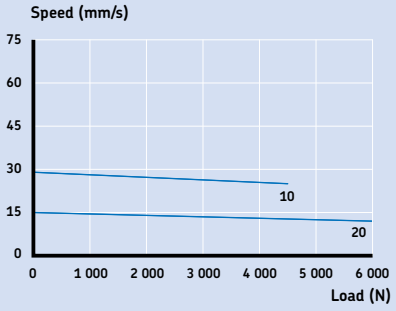
Technical data

	Unit	IA4B 10	IA4B 20
Push force (max)	N	4 500	6 000
Pull force (max)	N	4 500	6 000
Speed	mm/s	25 to 29	12 to 15
Stroke	mm	102 to 305	102 to 204
Retracted length	mm	–*	–*
Voltage	V AC	230	230
Current consumption (230 V AC)	A	1,3	1,1
Duty cycle	%	25	25
Ambient temperature	°C	-26 to +65	-26 to +65
Protection class	IP	65	65
Weight (at 305 mm stroke)	kg	9,5	9,5
Color	–	Black	Black

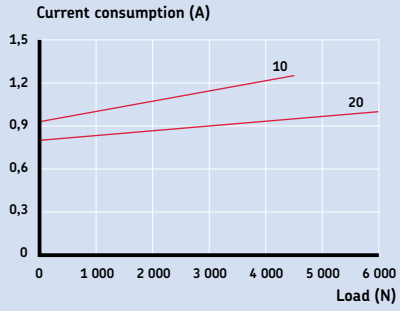
* see above table.
For outdoors application, please contact SKF.

IA4B

Performance diagrams



Speed-force diagram



Current-force diagram

Ordering key

IA4B-230-□□-□□□-00-C0-000

Type

Voltage
230 V AC

Load (N)

4 500 (only available with 102 and 305 mm stroke)	10
6 000 (not available with 305 mm stroke)	20

Stroke

102 mm	102
153 mm	153
204 mm	204
305 mm	305

Orientation rear attachment
0°

Control units

BCU series **62**

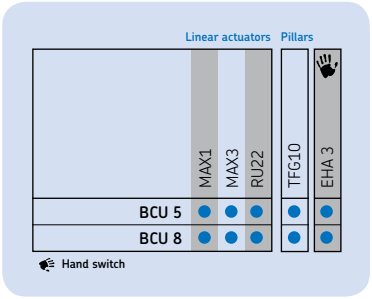
CAED series **64**

BCU

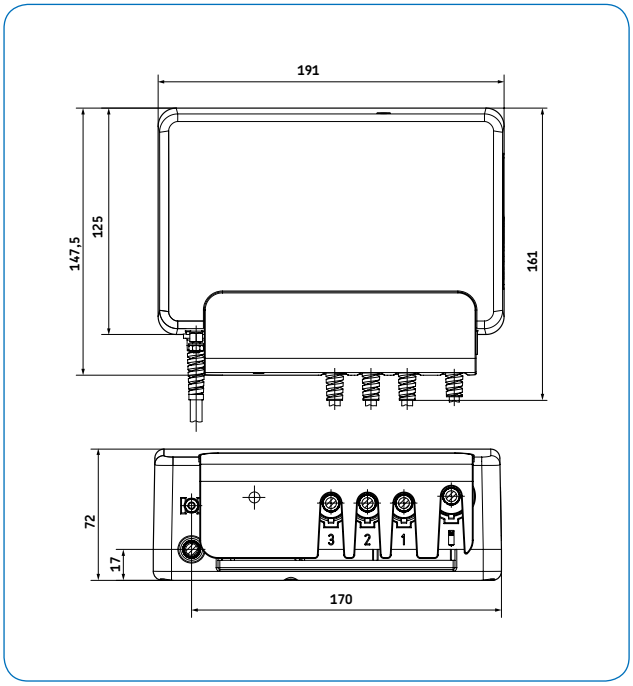
Benefits

- Compact 3-channel actuator control unit
- Single fault safe
- Overload and over-temperature protection
- Easy to clean
- Low standby current

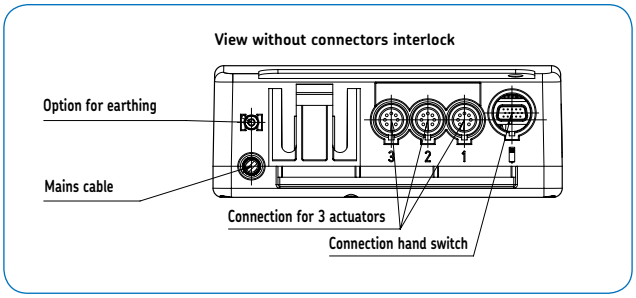
Suitable actuators and accessories



Dimensional drawing



Connecting diagram

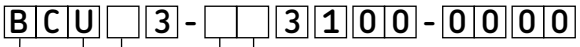


Technical data

	Unit	BCU 5	BCU 8
Motor ports (DIN8)	#	3	3
Operating device ports (HD15)	#	1	1
Single fault safety	yes/no	yes	yes
Encoder processing	yes/no	no	no
Input voltage	V AC	120	230
Frequency	Hz	60	50
Input current (max)	A	2,5	1,3
Standby power	W	–	–
Output voltage	V	24	24
Output current (max)	A	7	7
Duty cycle intermittent	min	1/9	1/9
Duty cycle short time	min	2	2
Ambient temperature	°C	0 to +40	0 to +40
Humidity	%	5 to 85	5 to 85
Degree of protection	IP	X4	X4
Protection class	–	I	II
Approvals	EN/UL	UL 60601-1 EN 60601.1-2	UL 60601-1 EN 60601.1-2
Weight	kg	2,3	2,3

BCU

Ordering key



Type

Voltage:

120 VAC 50/60 Hz (Class I)	5
230 VAC 50 Hz (Class II)	8

Mains power supply cable:

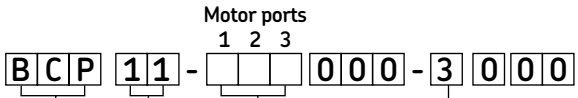
Class II, straight 3,5 m, 2-pole plug, EU (for voltage type 8)	2J
Class II, straight 3,5 m, 2-pole plug, UK (for voltage type 8)	2H
Class I, straight 3,5 m, 3-pole plug, Hospital grade (for voltage type 5)	2N

Ordering codes

BCU53-2N3100-0000
BCU83-2J3100-0000
BCU83-2H3100-0000

The BCU needs to be parameterized for the connected motors on ports 1 to 3.
When ordering a BCU, please indicate which BCP parameterization is needed.

Ordering key



BCU parameterization

Functionality:
All channels individual

Motors:

TFG	5,7 A	code E
MAX3	6,7 A	code M
RU 22	8,5 A	code R

Soft start/stop:
Medium, start 400 ms, stop 200 ms

Ordering codes

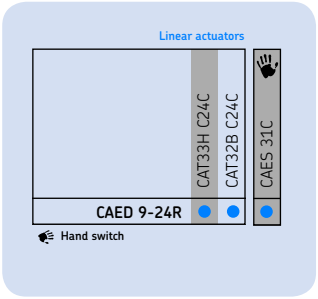
BCP11-EEE000-3000
BCP11-EEM000-3000
BCP11-RRR000-3000
BCP11-EMM000-3000
BCP11-MMM000-3000
BCP11-MME000-3000
BCP11-MEE000-3000

CAED

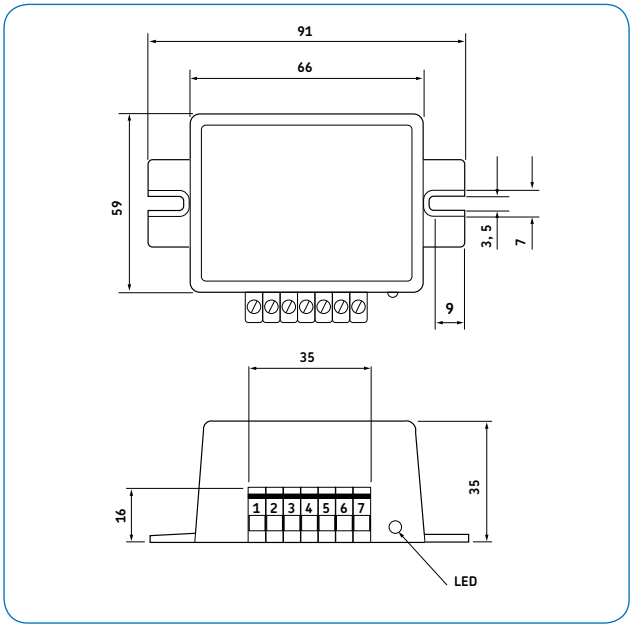
Benefits

- Supply voltage 24 V DC
- Output voltage 24 V DC
- Electronic overload protection, factory pre-set at 9 A
- LED indication for overload cut-off
- Easy installation, all connections made at front screw terminal

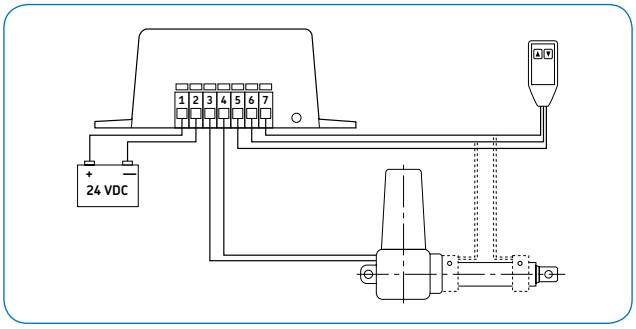
Suitable actuators and accessories



Dimensional drawing



Connecting diagram



Ordering code

CAED 9-24R

Technical data

	Unit	CAED 9-24R
Motor ports	#	1
Operating device ports	#	1
Battery ports	#	1
Limit switch ports	#	yes
Single fault safety	y/n	no
Encoder processing	y/n	no
Input voltage	V DC	24 (22-29)
Frequency	Hz	–
Input current (max)	A	10
Standby power	W	0,72
Output voltage	V DC	24
Output current (max)	A	9
Duty cycle intermittent	min on/off	10%
Duty cycle short time	min on	2
Ambient temperature	°C	0 to +50
Humidity	%	–
Protection class	IP	31
Approvals	EN/ UL	EN 60601-1-2, EN 50081-1, EN 50082-1
Dimensions	mm (w x h x d)	91 x 59 x 35
Weight	kg	–

Notes

Hand switches

EHA 1 ..... **68**

EHA 3 ..... **69**

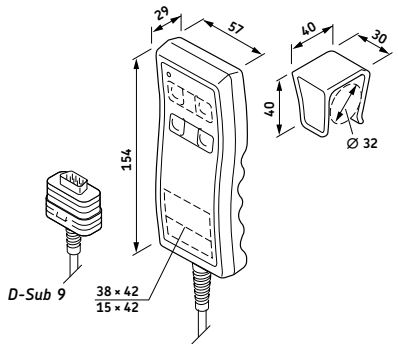
CAES 31C **70**

EHA 1

Benefits

- Robust ergonomic design
- Tactile buttons, clearly marked
- Easy mountable fastening hook
- D-Sub 9 connector
- For MAX6 linear actuator

Dimensional drawing



Technical data

Type	Operating power	Max. operating channels	Prot. class	Colour
	V DC/mA	n°	IP	
EHA 1	12/50	1	67	Grey

Ordering key

EHA1 1 - 2 1 B 10 N - 0 0 0

Type

Hook:
Hook supplied separately

Cable/Connecting plug:
Coiled 1,3 m / 2,5 m, D-Sub 9-pin plug

Symbols:
1 channel: Arrow up/down

Ordering code

EHA11-21B10N-000

Accessories

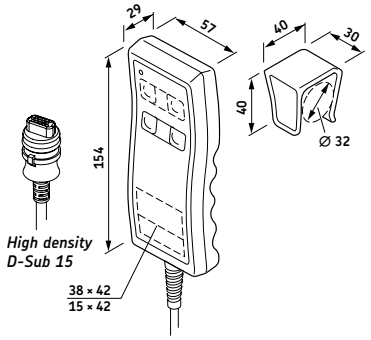
Item	Order number
Hook with sticker	ZHS-145361

EHA 3

Benefits

- Robust ergonomic design
- Tactile buttons, clearly marked
- Easy mountable fastening hook
- D-Sub 15 HD connector
- For BCU control unit and TFG pillar

Dimensional drawing



Technical data

Type	Operating power	Max. operating channels	Prot. class	Colour
	V DC/mA	n°	IP	
EHA 3	12/50	3	67	Grey

Cable: coiled 1,3-2,3 m Hook with sticker included

Ordering key

E H A 3 ☐ - 2 3 M ☐ ☐ N - 0 0 0

Type

Number of channels:

1 channel	1
2 channels	2
3 channels	3

Hook:
Hook supplied separately

Symbols:

1 channel: 2nd row from top	Arrow up/down	10
2 channels: 1st row from top	Arrow up/down	20
3 channels: 1st-3rd row from top	Arrow up/down	30

Ordering codes

EHA31-23M10N-000
EHA32-23M20N-000
EHA33-23M30N-000

Accessories

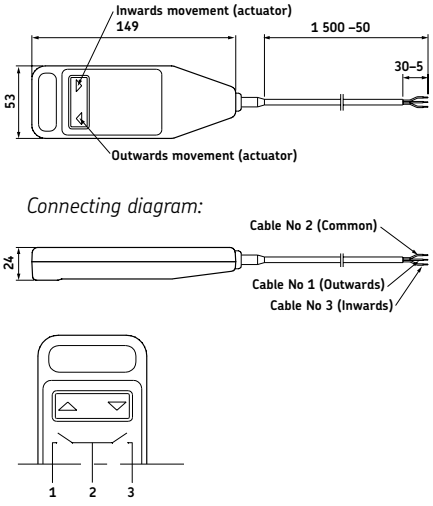
Item	Order number
Hook with sticker	ZHS-145361

CAES

Benefits

- Robust ergonomic design
- Membrane keyboard
- Clearly marked buttons
- For CAED control unit

Dimensional drawing



Technical data

Type	Operating power	Max. operating channels	Prot. class	Colour
	V DC/mA	n°	IP	
31C	30/33	1	54	Black

Technical data:

Pressure force on keys:	3,5N
Max. current:	200 mA
Max. voltage:	30 V DC
Housing material	PA6
Colour:	Black

Ordering code

CAES 31C

Notes

Our full product range

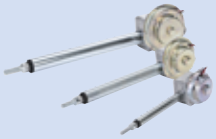
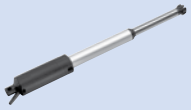
Our full product range

Telescopic pillars	Type	Max. force push	Max. force pull	Max. speed no load	Max. speed full load	Stroke (S)	Features
		N	N	mm/s	mm/s	mm	
TELEMAG	**TFG**	2 500	2 500	19	15	200 to 700	Plug & play
	TGC	1 000	1 000	11	9	200 to 700	Robust
	THC	1 800	1 800	15	12	200 to 700	Robust
	THG	2 000	0	15	12	200 to 700	Robust
	TLC	4 000	4 000	16	11	100 to 700	Robust
	TLG	4 000	0	33	25	200 to 700	Robust
	TLT	4 000	0	42	25	300 to 700	Compact
TMS	**MECH**	4 000	0	–	–	250 to 700	For eccentric loads
TELESMART	**TMD**	800	0	60	35	700	Slim & stylish
	TMA	1 000	0	55	35	500	Slim & stylish
	TXG	1 500	0	23	17	200 to 600	Plug & play

Linear actuators	Type	Max. force push	Max. force pull	Max. speed no load	Max. speed full load	Stroke (S)	Features
		N	N	mm/s	mm/s	mm	
CAT	**CAT 33H**	1 200	1 200	174	150	100 to 400	Flexible, modular
	CAT 33	3 000	3 000	48	38	100 to 400	Flexible, modular
	CAT 32B	4 000	4 000	67	50	50 to 700	Flexible, modular
	CAT 21B	600	600	10	5	50 to 300	Compact
CAP	**CAP 32**	3 500	3 500	60	40	50 to 700	High duty factor
	CAP 43A	3 000	3 000	48	35	100 to 400	Positioning
	CAP 43B	4 000	4 000	65	50	50 to 700	Positioning

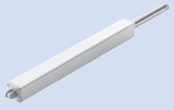
For more information, please see the Actuator Range general catalogue.

Our full product range

Linear actuators	Type	Max. force push	pull	Max. speed no load	full load	Stroke (S)	Features
		N	N	mm/s	mm/s	mm	
CAR 	CAR 22	1 500	1 500	30	20	50 to 300	High duty factor
	CAR 32	3 500	3 500	60	40	50 to 700	High duty factor
	CAR 40	6 000	6 000	60	40	100 to 700	High duty factor
	CARN 32	3 500	3 500	N/A	N/A	50 to 700	No motor
	CCBR 32	2 500	2 500	N/A	N/A	50 to 700	No motor
MAGFORCE 	WSP	2 600	2 600	50	50	100 to 700	Powerful
	ASM	4 000	4 000	50	50	100 to 700	Powerful
	DSP	4 500	4 500	40	40	100 to 700	Powerful
	SKG	15 000	15 000	55	55	100 to 700	Powerful
	SKD	15 000	15 000	25	25	100 to 700	Powerful
	STW	15 000	15 000	12	12	100 to 700	Powerful
	STG	15 000	15 000	14	14	100 to 700	Powerful
	STD	15 000	15 000	10	10	100 to 700	Powerful
	SKS/SKA	30 000	30 000	45	45	100 to 700	Powerful
	SLS	50 000	50 000	70	70	100 to 700	Powerful
ECOMAG 	ECO 20/40	2 000	0	13	9	50 to 300	Compact
	ECO 60/80	6 000	0	7	4	50 to 300	Compact
	ECO 30/50	2 000	2 000	13	9	50 to 300	Compact
	ECO 70/90	6 000	4 000	7	4	50 to 300	Compact
CALA 36 	CALA 36A	600	600	23	12	50 to 200	In-line
MATRIX 	MAX 1	4 000	4 000	18	13	50 to 700	Silent operation
	MAX 3	8 000	6 000	18	13	50 to 700	Silent operation
	MAX 6	8 000	6 000	18	15	50 to 700	Plug & play

For more information, please see the Actuator Range general catalogue.

Our full product range

Linear actuators	Type	Max. force push	Max. force pull	Max. speed no load	Max. speed full load	Stroke (S)	Features
		N	N	mm/s	mm/s	mm	
CARE 	**CARE 33H**	800	800	45	32	50 to 500	Silent operation
	CARE 33M	1 400	1 400	22	16	50 to 500	Silent operation
	CARE 33A	2 000	2 000	12	8	50 to 300	Silent operation
RUNNER 	**RU 20**	8 000	8 000	10	7	100 to 700	High push force
	RU 21	10 000	8 000	8	5	100 to 700	High push force
	RU 22	12 000	8 000	7	4	100 to 700	High push force
	RU 23	8 000	8 000	15	8	100 to 700	High push force
	RU 24	10 000	8 000	12	6	100 to 700	High push force
	RU 25	12 000	8 000	9	5	100 to 700	High push force
MAGDRIVE 	**MD 22/24**	6 000	200	15	8,5	50 to 700	Slim & silent
	MD 23/25	6 000	6 000	15	8,5	50 to 700	Slim & silent
	**FD-A1**	6 000	4 000	4,2	2,6	50 to 300	Silent operation
	FD-A2	3 000	2 000	8,2	6,2	50 to 300	Silent operation
	**IMD3-05**	120	120	57	45	50 to 300	Silent operation
	IMD3-10	240	240	30	24	50 to 300	Silent operation
	IMD3-20	500	500	16	13	50 to 300	Silent operation
	IMD3-30	750	750	10	8	50 to 300	Silent operation
	IMD3-40	1 000	1 000	8	6	50 to 300	Silent operation

For more information, please see the Actuator Range general catalogue.

Our full product range

Linear actuators	Type (series)	Max. force push	Max. force pull	Max. speed no load	Max. speed full load	Stroke (S) standard	Features
		N	N	mm/s	mm/s	mm	
	**ID8A-10**	1 500	1 500	38	25	102 to 610	Robust
	ID8A-20	2 500	2 500	20	13	102 to 610	Robust
	ID8B-05	2 500	2 500	65	45	102 to 610	Robust
	ID8B-10	3 500	3 500	36	22	102 to 610	Robust
	ID8B-20	4 500	4 500	22	13	102 to 610	Robust
	**IA4A-10**	1 500	1 500	29	25	102 to 610	Robust
	IA4A-20	2 300	2 300	16	14	102 to 610	Robust
	IA4B-05	2 300	2 300	57	46	102 to 610	Robust
	IA4B-10	4 500	4 500	29	25	102 to 610	Robust
	IA4B-20	6 000	6 000	22	13	102 to 610	Robust
	**SJ-255**	2 000	2 000	7,2	6,6	100 to 600	AC actuator
	SJ-256	2 500	2 500	6,0	5,5	100 to 600	AC actuator
	SJ-257	3 000	3 000	4,5	4,0	100 to 600	AC actuator
	SJ-355	3 000	3 000	7,2	6,6	100 to 600	AaC actuator
	SJ-356	3 500	3 500	6,0	5,5	100 to 600	AC actuator
	SJ-358	4 000	4 000	4,5	4,0	100 to 600	AC actuator
	SJ-455	4 000	4 000	7,2	6,6	100 to 600	AC actuator
	SJ-456	4 500	4 500	6,0	5,5	100 to 600	AC actuator
	SJ-458	5 000	5 000	4,5	4,0	100 to 600	AC actuator

Rotary actuators	Type	Max. torque	Max. speed	Size	Features
		Nm	rpm	mm	
CRAB 17	**CRAB 17**	70	8	125	Compact
	CRAB 17	105	20	125	Compact
					
CRAB 05	**CRAB 05**	100	3	86	Compact
					

For more information, please see the Actuator Range general catalogue.

Our full product range

Control units	Type	Control connections	Max. motor	Input	Output
			n°	V AC/DC	V/A
SCU	**SCU**	Encoder processing	6	22–40/120/230	24/18 or 30
VCU	**VCU**	Basic functions	5	120/230	24/7 or 18
BCU	**BCU**	Basic functions	3	230/120	24/7
SEM	**SEM 1**	Basic functions	4	230/120	24/5
CB200	**CB200S**	Basic functions	3	(100 to 240)*	24/3
MCU	**MCU 1**	Basic functions	2	24	24/6 or 9

* See type key for available voltage.

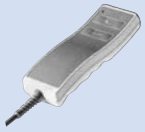
For more information, please see the Actuator Range general catalogue.

Our full product range

Control units	Type	Control connections	Max. motor	Input	Output
			n°	V AC/DC	V/A
LD 	**LD-014**	Synchronous	4	230/120	24/11
	LD-015	Synchronous	3	230/120	24/11
	LD-015	Synchronous	2	230/120	24/9
CAED ANR 	**5-24R -P 0**	Encoder processing	1	22 to 28	24/5
	9-24R -P 0	Encoder processing	1	22 to 28	24/9
CAED 	**3-24R**	Basic functions	1	24	24/3
	5-24R	Basic functions	1	24	24/5
	9-24R	Basic functions	1	24	24/9
CAEV 	**110/220**	Basic functions	1	230/120	400/200

For more information, please see the Actuator Range general catalogue.

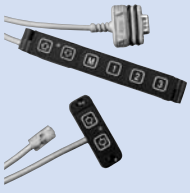
Our full product range

Hand switches	Type	Operating power	Max. operating motors	Prot. class	Colour
		V DC/mA	n°	IP	
EHA 	**EHA 1**	12/50	2	67	Grey
	EHA 3	12/50	5	67	Grey
EHE 	**EHE 1**	38/50	4	X7	Grey
PHC 	**PHC**	–	4	66	Grey
CAES 	**CAES 31B**	30/33	1	54	Black
	CAES 31C	30/33	1	54	Black
	**HS 112**	40/50	1	51	Black
	HS 124	40/50	2	51	Black
	HS 126	40/50	2	51	Black
	HS 138	40/50	3	51	Black

For more information, please see the Actuator Range general catalogue.

Our full product range

Foot switches	Type	Operating power	Max. operating motors	Prot. class	Colour
		V DC/mA	n°	IP	
ST 	ST	12/50	3	X5	Blue/anthracite
PFP 	PFP 1	–	1	21	Grey/anthracite

Desk switches	Type	Operating power	Max. operating motors	Prot. class	Colour
		V DC/mA	n°	IP	
ST 	ST	12/50	3	X0	Black
LD 	LD	5/50	2	32	Black

For more information, please see the Actuator Range general catalogue.

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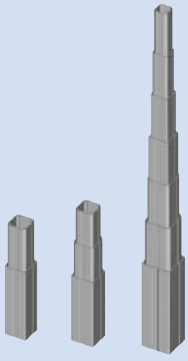
Our full product range

Desk switch (pneumatic)	Type	Max. operating motors	Air tube	Colour
		n°		
PAM	**PAM**	1	-	Anthracite

Guiding tubes	Type	Sections						Stroke
		2	3	4	5	6	7	mm
FRE	**FRE**	x	x	x*	x*	x*	x*	200 to 700



* on request only

For more information, please see the Actuator Range general catalogue.

Not able to find your type in this catalogue?

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

Company: ..... Name of representative: .....

Tel.: ..... Email: .....

Dimensions

*Type:	☐ Linear actuator		☐ Pillar	
*Stroke length:	..... mm			
*Retracted length:	..... mm			
*Attachment:	☐ Front	☐ Rear	☐ Other	☐ Plate (only for pillars)
Mounting:	☐ Vertical	☐ Horizontal	☐ Diagonal	

Performance

*Linear speed:	..... mm/s	at load ..... N		
*Dynamic load capacity:	Pull ..... N	Push ..... N		
*Static load capacity:	Pull ..... N	Push ..... N	at max. stroke: ..... mm	
*Eccentric load (only for pillars):	Load offset ..... mm			
*Influence of lateral (side) force:	☐ No	☐ Yes		
*Self-locking:	☐ None	☐ In & Out	☐ In	☐ Out
*Lifetime:	..... cycles (in double stroke)			
*Number of work cycles:	..... cycle/hour	..... hour/day	..... day/year	..... year
*Duty factor:	..... %	at load ..... N		

Motor type

*Motor voltage:	☐ 24V DC	☐ 230V AC/50Hz	☐ 120V AC/60Hz	
Mode of control:	☐ Mains	☐ 24V DC	☐ Pneumatic	
Overheating protection:	☐ Internal	☐ External	☐ No protection	☐ Self hold
Manual emergency operation:	☐ No	☐ Yes	☐ Quick-release	

Miscellaneous

*Feedback:	☐ None	☐ Limit switches	☐ Potentiometer	☐ Encoder
Cable feedthrough (pillars):	☐ None	☐ Mains	☐ Other:	
IP Protection:	IP			
*Ambient temperature:	Lowest ..... °C	Highest ..... °C		
*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		
Electrical protection class:	☐ I, grounded	☐ II, double isolation	☐ Safety low voltage	

Quantity needed: Prototype ..... pcs Pre-series ..... pcs Series ..... pcs

Other customer requirements that cannot be defined above:

* mandatory fields

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