

EWELLIX

A Schaeffler Company

Actuator range catalogue



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The heritage of innovation

Ewellix is a global innovator and manufacturer of linear motion and actuation solutions. Our state-of-the-art linear solutions are designed to increase machine performance, maximise uptime, reduce maintenance, improve safety and save energy. We engineer solutions for assembly automation, medical equipment, mobile machinery, distribution and a wide range of other industrial applications.

Technology leadership

We earned our reputation through decades of engineering excellence. Our journey began over 50 years ago as part of the SKF Group, a leading global technology provider. Our history provided us with the expertise to continuously develop new technologies and use them to create cutting edge products that offer our customers a competitive advantage.

In 2019, we became independent and changed our name to Ewellix. We are proud of our heritage. This gives us a unique foundation on which to build an agile business with engineering excellence and innovation as our core strengths.

Global presence and local support

With our global presence, we are uniquely positioned to deliver standard components and custom-engineered solutions, with full technical and applications support around the world. Our skilled engineers provide total life-cycle support, helping to optimise the design, operation and maintenance of equipment thus improving productivity and reliability while reducing costs. At Ewellix, we don't just provide products; we engineer integrated solutions that help customers realise their ambitions.



Schaeffler Group – We pioneer motion

Ewellix is since 2023 owned by the Schaeffler Group.

As a leading global supplier to the automotive and industrial sectors, the Schaeffler Group has been driving forward groundbreaking inventions and developments in the fields of motion and mobility for over 75 years.

With innovative technologies, products, and services for electric mobility, CO₂-efficient drives, Industry 4.0, digitalization, and renewable energies, the company is a reliable partner for making motion and mobility more efficient, intelligent, and sustainable.

Schaeffler manufactures high-precision components and systems for powertrain and chassis applications as well as rolling and plain bearing solutions for a large number of industrial applications.



Trusted engineering expertise

Our industry is in motion; pushing towards solutions that reduce environmental impact and leverage new technology. We provide technical and manufacturing expertise to overcome our customers' challenges.

Engineering for the future

We work in a **wide range of industries**, where our solutions provide key functionality for business critical applications.

For the **medical industry**, we provide precision components for use in core medical equipment.

Our unparalleled understanding of **assembly automation** systems is based on decades of research into advanced automation components and techniques.

Our deep knowledge of **mobile machinery** provides powerful and reliable electromechanical solutions for the harshest conditions. In an **industrial distribution** setting, we supply linear expertise to our partners, empowering them to serve customers with greater efficiency.

We offer excellence

We have a **unique understanding of linear equipment** and how it's integrated in customers' applications to provide the best performance and machine efficiency.

We assist our customers by creating equipment that runs faster, longer and that is safe and sustainable.

We provide a wide variety of **linear motion components** and **electromechanical actuators** for equipping any automation application, thus helping our customers **increase productivity, reduce their footprint, energy use and maintenance**.

Actuation systems



Ball and roller screws



Linear guides and systems





1

Introduction

- Cost effectiveness
- Controllability
- Stability

Core technologies

Actuation technology

Our extensive experience and knowledge of actuation systems allows us to satisfy the most demanding requirements using linear actuators, lifting columns 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**).

Lifting columns

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

Control units

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

Operating switches

Ewellix offers different operating switches to control the position of your equipment. The range includes:

- Hand switches
- Foot switches
- Desk switches

These switches can be used with control units to drive linear actuators and lifting columns or directly with the devices in AC powered versions.



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

Ewellix miniature ball screws are very compact and provide silent operations (↳ **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**).

Ground ball screws

Ewellix ground ball screws offer increased rigidity and precision.

Roller screws

Ewellix 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. 5



Fig. 6



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.



Fig. 8



Fig. 9

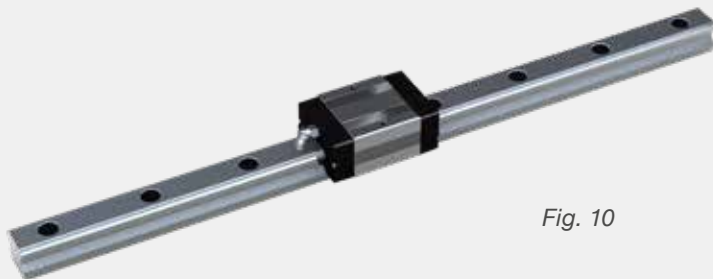


Fig. 10

Linear ball bearings

Cost-effective, simple and self-aligning, Ewellix 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**).

Precision rail guides

With a range of modular options, Ewellix 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**).

Profile rail guides

Featuring unlimited stroke through joint rails and excellent rigidity, capable of withstanding moment loads in all directions, Ewellix 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**).

The terms used in the catalog are listed in a **Glossary** on **page 303** and the **Symbols** are described from the **page 307**.

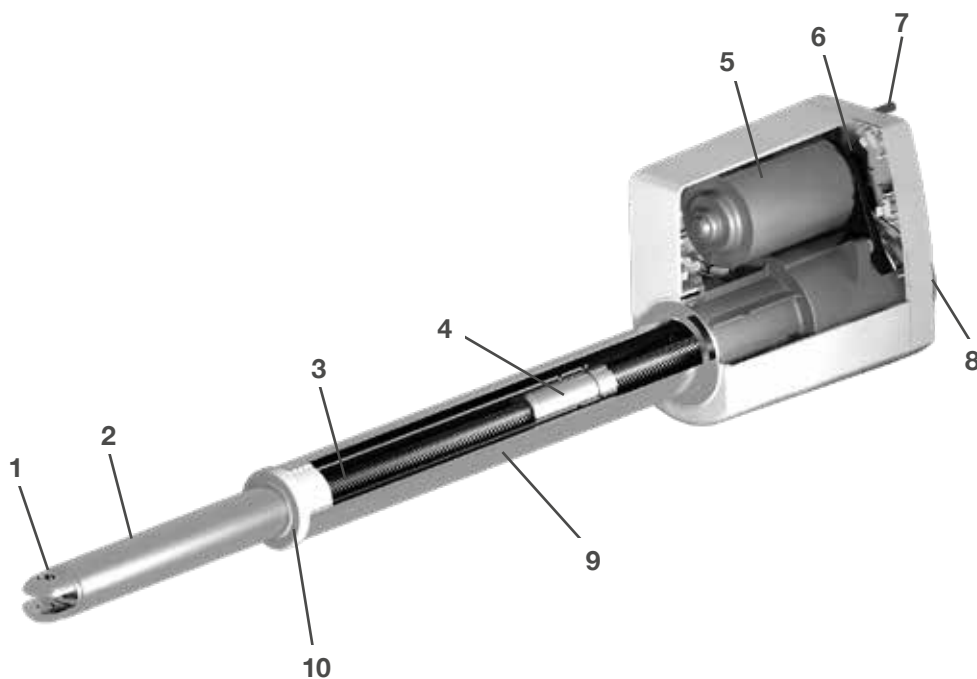
Product overview

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. Equipped with brushed DC motor or AC motor, the duty cycle is rated up to 20% or up to 40% if equipped with a AC motor.



1. Front attachment
2. Inner tube or Push tube
3. Screw
4. Nut
5. Electrical motor
6. Gearbox
7. Electrical cable
8. Rear attachment
9. Outer tube or protection tube
10. Sealing system

Lifting column

Lifting columns enable precise, controlled, and repeatable lifting movements of in linear drive applications including with those with torsion and off set loads.

Lifting columns with a modular design and open architecture offer opportunities to choose and integrate components like linear actuators or drive to achieve customized solutions within existing aluminum profiles. Application potential expands with the introduction of technologies for specific pur-

poses, such as hall sensors, limit switches but also Integrated Circuits for switch mode power supply and motor control. Equipped with brushes DC motor or AC motor, the duty cycle is rated up to 10%, which means when the load is the maximum.



1. Inner tube
2. Outer tube
3. Screw and nut
4. Cables through
5. Power supply
6. Electrical Motor
7. Gearbox
8. Control board
9. Cable connector



Lead screw

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, Ewellix 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

Precision rolled ball screws

Ewellix 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. Ewellix production meets G7 lead precision for screw shaft nominal diameter starting from 20 mm. On request, Ewellix 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.

Ewellix engineering tools

Web-based solutions

To simplify the product selection process, Ewellix offers a set of free Web tools that allow a quick and easy navigation into the complete linear motion offering.

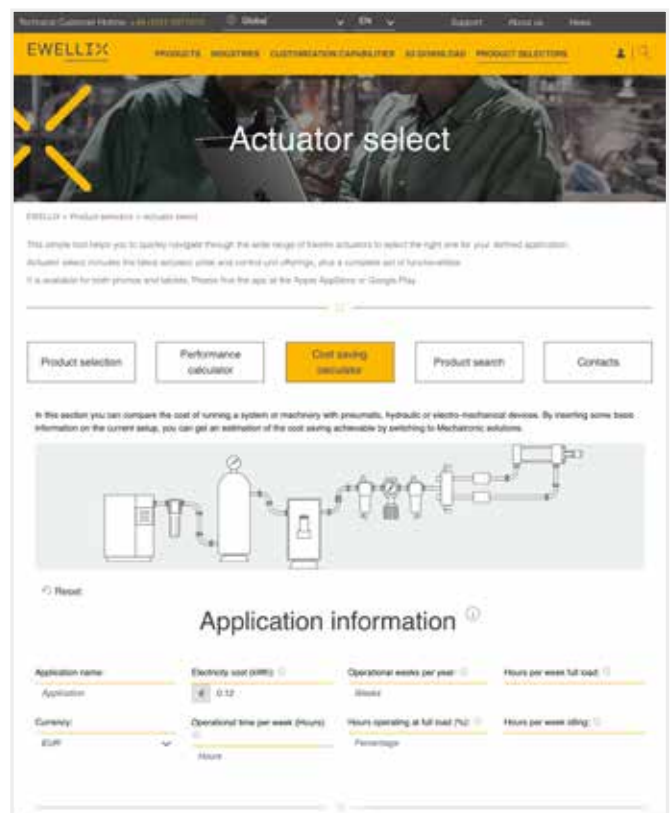
Actuator Select

Users can choose the desired product family among Columns, 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 Column or Actuator
- Cost saving calculator
- Direct link to product drawing, technical datasheet and catalogues

A web-based version of the tool is available at [ewellix.com/actuator-select](https://www.ewellix.com/actuator-select)



Actuation System set-up

Linear actuator definition and type

Electro-mechanical linear actuators enable precise, controlled, and repeatable push/pull movement in linear drive applications.

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

Standard versions can handle loads as great as 50 kN, deliver speeds over 150 mm/s, and travel as far as 700 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, ball detent 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 with a gearbox between the motor and the screw also present.

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.



Fig. 1
Ball screw

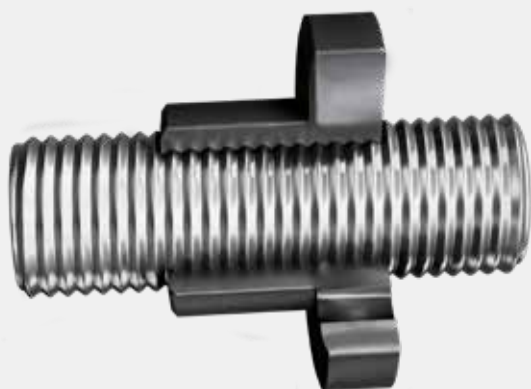


Fig.2
Acme screw

Ball screws

All-steel ball screws consist of a screw shaft, ball nut with a ball recirculation system to convert rotary motion into smooth, accurate, and reversible linear motion (or torque to thrust) (↳ **fig. 1**). The row of circular 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 screws can handle high loads, with a very good efficiency, achieve high duty cycles, operate over a wide temperature range, and deliver the precision necessary to enable actuators performing over long periods at high speeds and requiring high dynamic capability.

Brakes usually are adopted in ball screw actuators or non-self locking gear boxes to prevent back-drive and provide an high static load performance.

Acme screws

These screws transmit torque into linear motion through direct sliding friction. A typical assembly consists of a steel screw and plastic nut (↳ **fig. 2**).

Some of the products are equipped with acme screws with a relatively high friction coefficient that makes them well suited for self-locking applications. Acme screw actuators accommodate high static load, withstand excessive vibration, operate quietly, and represent cost-effective solutions. Brakes could be adopted to increase the static load performance.

Performance considerations

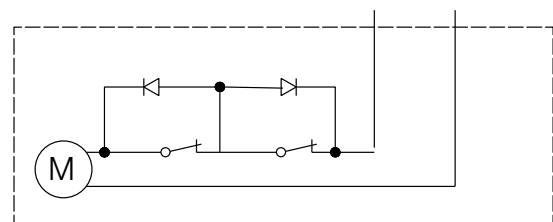
Beyond the basic fundamentals of actuator operation, applications may require feedback on position and/or direction, limits on motion or travel in a particular direction, or protection against dynamic overload. Enabling technologies have been developed for these purposes.

Limit switches

Its purpose is to limit actuator motion or travel in both direction. It is used on DC and AC versions (→ fig. 3). When activated, the switch typically opens an electrical contact integrated on the electrical circuit of the motor. By reversing the voltage, the limit switch circuit is over pass, the motor runs in the opposite direction and the switch is released. The second limit switch will proceed in the same way but for the opposite direction. These devices prevent actuators from running into the mechanical ends.

Fig. 3

Limit switches

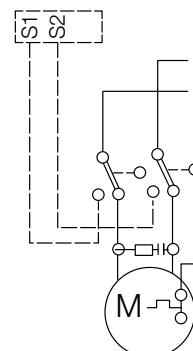


End-stop output

Its purpose is to provide output information on when the actuator reaches a position in a particular direction (→ fig. 4). 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 could be used on the application to prevent actuators from running into the mechanical ends and may allow for the adjustment of stroke length. End-stop output could be used by a control board to limit the stroke of the actuator, for instance.

Fig. 4

End-stop outputs

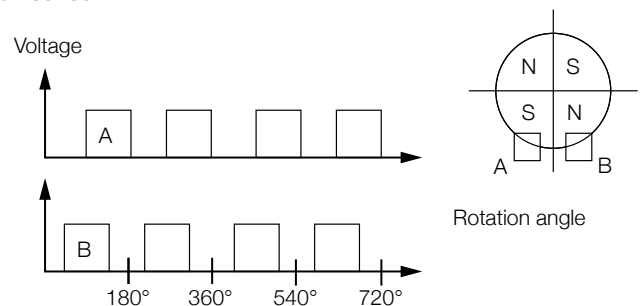


Hall sensors

These rotary or linear sensing devices are incremental no contact sensors that are used to define 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 travel feedback. Two sensors could detect also the direction of the movement (→ fig. 5). After a homing procedure, the travel distance can be defined with counting the pulse.

Fig. 5

Hall sensor

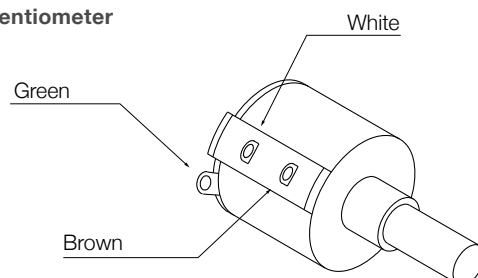


Potentiometer

A potentiometer is an analog feedback device. The potentiometer is considered an absolute sensor with unique value in each position. Sometimes it is called a variable resistance that can be read and fed into a controller for positioning control of the application (→ fig. 6).

Fig. 6

Potentiometer



Absolute analogue position output

An absolute analog position output uses a non-contact sensor, so no wear and the absolute positioning provide an unique value in each position by voltage from 0.5 to 4.5. The input voltage is 5V or 10 to 55 V depending the series. The output signal can be read and fed into a controller for positioning control of the application. It is the best of the two solutions, hall sensor or potentiometer without compromise (↳ **fig. 7**).

Friction clutch

This function will protect the actuator from mechanical damage when it reaches either of its mechanical 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 (↳ **fig. 8**).

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

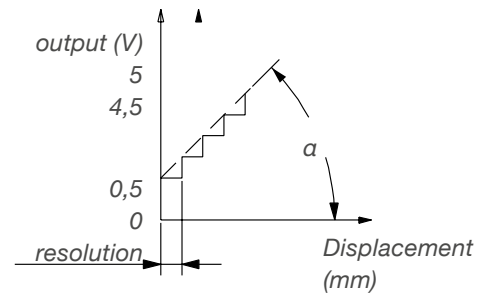
This prevents an actuator from collapsing if a drive nut fails. The back- up nut is usually in metal, exhibits greater anti-shear strength than the drive nut, and only makes contact with the threads of the spindle when the threads of the drive nut fail (↳ **fig. 9**). The back-up nut carries the load and may be able to lower the load (signaling need for repair).

Slip stick effect

The cycle of alternating slipping and sticking as two surfaces rub against each other results in vibration and noise. Resonances within other materials can occur. This effect can sometimes be heard, felt or seen. With linear actuators and columns, slip stick has been witnessed between the Delrin and aluminum or steel, such as between drive nut and spindle, and glide pad and extrusion.

Fig. 7

Absolute analogue position sensor



$$\tan(\alpha) = \text{output relation to displacement (V/mm)}$$

Fig. 8

Friction clutch

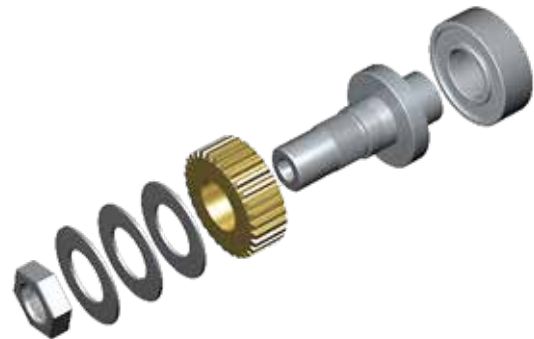


Fig. 9

Back-up nut



Product range comparison

Linear actuators

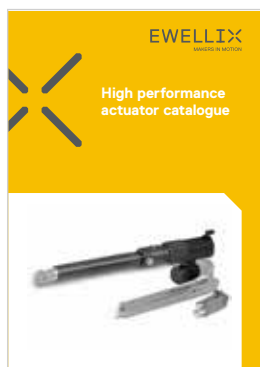
Ewellix offers a wide range of linear actuators in terms of push or pull load, speed, stroke length and input voltage. Most of them are approved as a component of a medical device that complies with IEC 60601-1 and UL mark RU.



| Family | Load kN | Speed mm/s | Stroke mm | Voltage V | | See page |
|-------------|------------|---------------|--------------|-------------------------|--|----------|
| MATRIX | 8 | 13 | 700 | 12, 24 | | 57 |
| RUNNER | 12 | 8 | 700 | 24 | | 70 |
| CAJA 35C | 3,5 | 7,5 | 250 | 24 | | 76 |
| Ecomag | 6 | 9 | 300 | 24 | | 80 |
| CAHB | 10 | 60 | 700 | 12, 24, 48 | | 84 |
| CAT and CAR | 4 | 193 | 700 | 12, 24, 120, 230, 3x400 | | 137 |
| CAHM | 50 | 74 | 700 | 24, 230, 3x400 | | 187 |

Harsh environment

Medical



Some products are designed for a specific application but are suitable for others applications that request the similar performance.

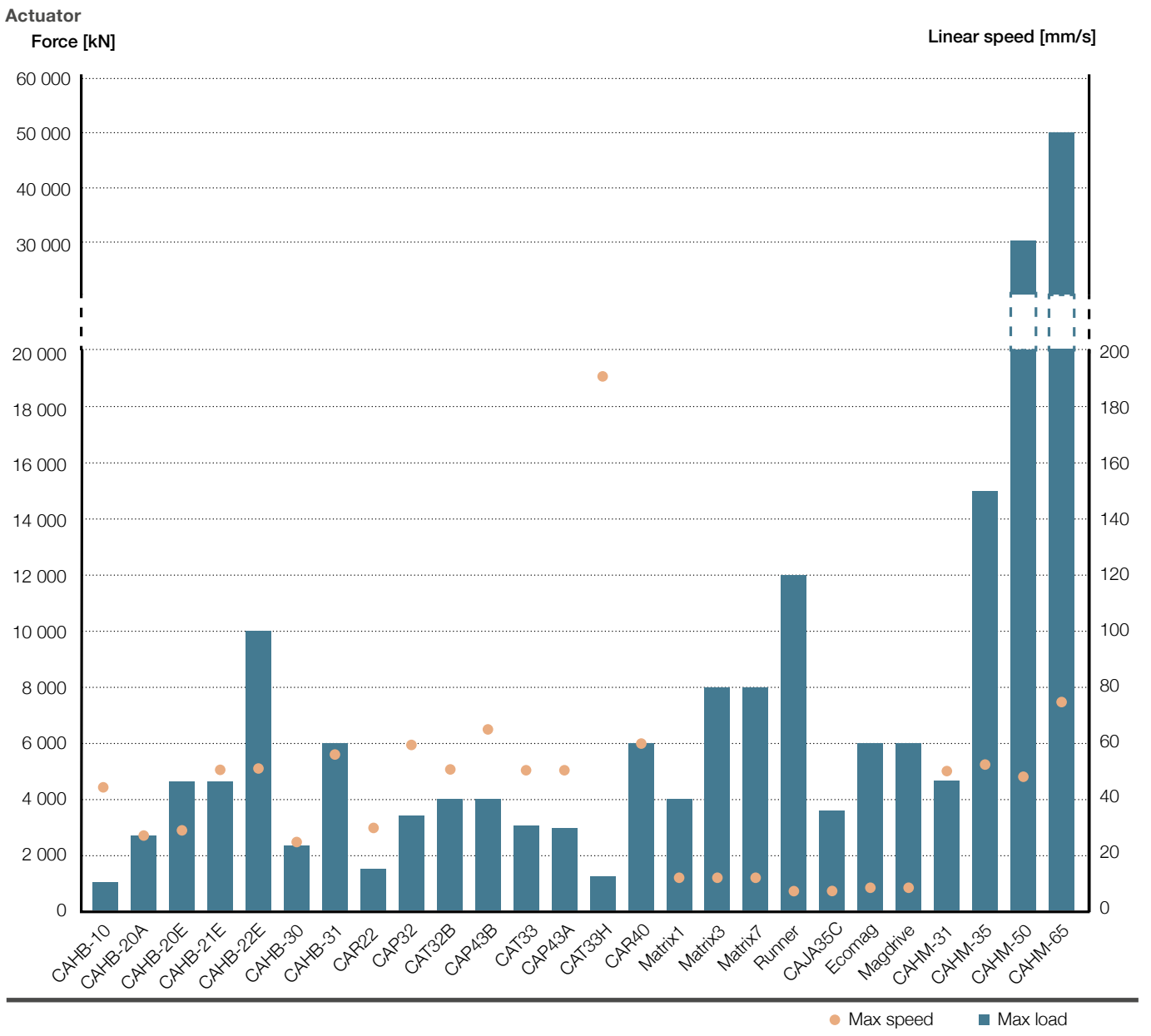
If you request a higher force than 12 kN, we invite you to review the **High performance actuator catalogue (PUB NUM IL-05001)**.

Force and speed capabilities

Diagram 1 provides a quick overview of the rated load and the speed of the actuators. Use this graph to quickly evaluate which actuator could fit best in your application.

The rated load describes the weight that the actuator can push or pull at the rated duty cycle without overheating. The speed is the maximum linear speed the actuator can reach without load when powered at the rated voltage.

Diagram 1



Columns

Ewellix offers a wide range of lifting columns in term of push and pull load, offset load in movement, stroke length and input voltage. Most of them are approved as a component of a medical device that complies with IEC 60601-1 and UL mark RU.



| Product | Load kN | Bending moment Nm | Speed mm/s | Stroke mm | Voltage V | | See page |
|---------|------------|----------------------|---------------|--------------|----------------|--|----------|
| CPMA-B | 2 | 250 | 15 | 400 | 24, 100 to 240 | | 194-202 |
| CPMT | 6 | 1 400 | 34 | 600 | 24 | | 210 |
| TFG | 2,5 | 500 | 15 | 700 | 120, 230 | | 216 |
| THG | 2 | 1 000 | 15 | 700 | 24 | | 220 |
| TLC | 4 | 2 100 | 11 | 700 | 120, 230 | | 224 |
| TLG | 4 | 2 800 | 10 | 700 | 24 | | 228 |
| TLT | 4 | 1 000 | 25 | 700 | 24 | | 232 |
| TXG | 1,5 | 210 | 17 | 600 | 24, 120, 230 | | 236 |
| FRE | - | - | - | 700 | - | | 240 |

Medical

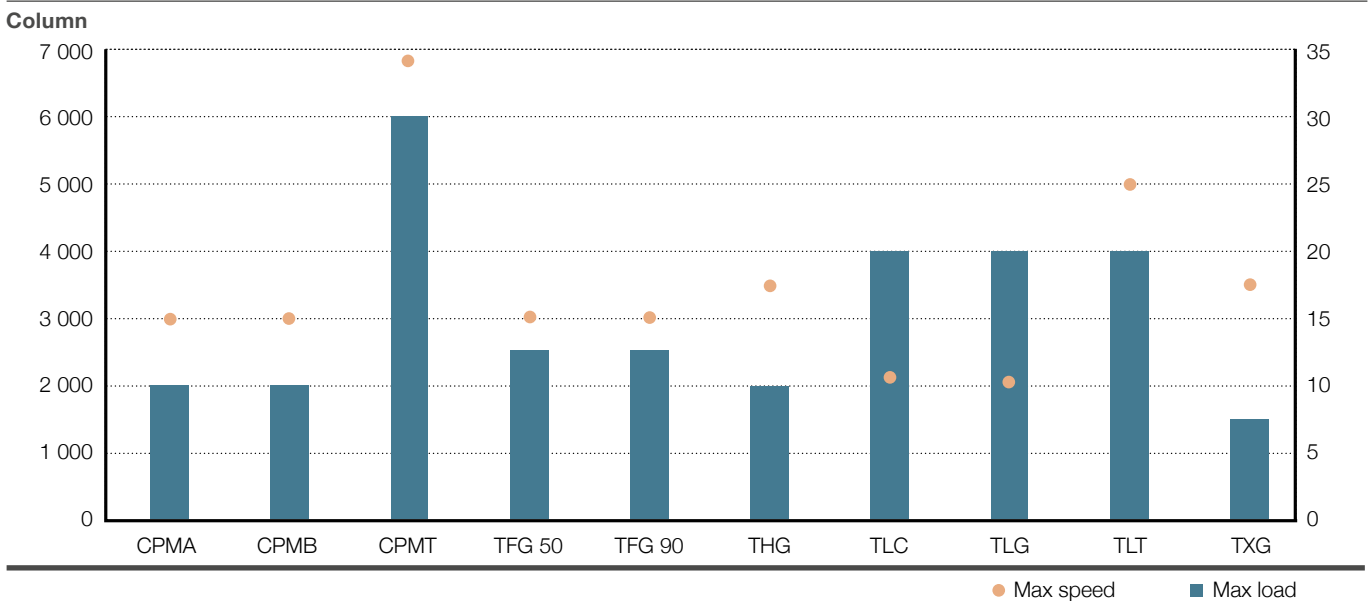
Force and speed capabilities

Diagram 2 provides a quick overview of the rated load and the speed of the actuators. Use this graph to quickly evaluate which actuator could fit best in your application.

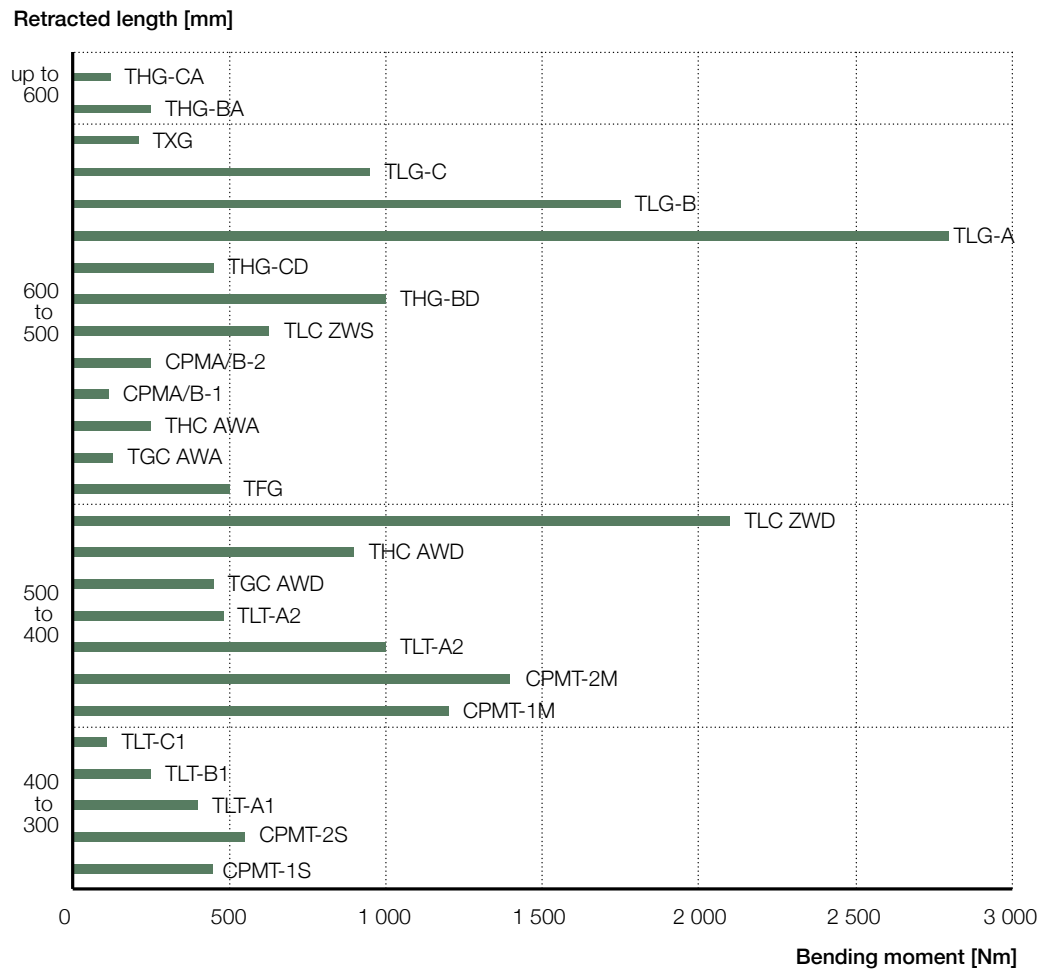
The rated load describes the weight that the actuator can push or pull at the rated duty cycle without overheating. The speed is the maximum linear speed the actuator can reach without load when powered at the rated voltage.

Some products are designed for a specific application but are suitable for others applications that request the similar performance

Diagram 2



Bending moment vs retracted length for stroke length of 400 mm



Control units

Ewellix offers a wide range of control units in terms of number of connections, functions and input voltage. They are compatible with Ewellix actuators and columns. Most of them are approved as components for medical devices that comply with IEC 60601-1 and UL mark RU.

In order to select the proper accessories for linear actuators and lifting columns, please use the table below.

Start selecting your actuator or column and find horizontally the compatible control units identified by a black dot, then vertically select the appropriate operating switches.

Some products do not need control units, so please continue horizontally to find the appropriate operating switches.



| Combination matrix Actuator | Control units | | | | | | Operating switches | | |
|-----------------------------|---------------|-----|-----|-----|-----|---------|--------------------|----------------|---------------|
| | BCU | VCU | SCU | MCU | SEM | COMPACT | Hand switches | Table switches | Foot switches |
| Linear actuators | | | | | | | | | |
| CAHB-10 | • | • | – | – | – | – | – | – | – |
| CAJA | • | • | • | – | – | – | – | – | – |
| ECOMAG | • | • | • | • | • | – | – | – | – |
| MAGDRIVE | • | • | • | • | – | – | – | – | – |
| MAX1/3 | • | • | • | • | – | – | – | – | – |
| MAX70 | – | – | – | – | – | – | PHC | PAM | PPF |
| MAX72 | – | – | – | – | – | – | EHA1 | STA | STF |
| RUNNER | • | • | • | • | – | – | – | – | – |
| Columns | | | | | | | | | |
| CPMA/CPMB | – | – | – | – | – | – | EHA4 | STK | STL |
| CPMT | • | • | • | – | – | – | – | – | – |
| TFG1 | • | • | • | – | – | • | – | – | – |
| TFG5/9 | – | – | – | – | – | – | EHA3 | STE | STJ |
| THG | • | • | • | • | – | – | – | – | – |
| TLC electric ¹⁾ | – | – | – | – | – | – | – | – | – |
| TLC low voltage | – | – | – | – | – | – | EHA1 | – | – |
| TLC pneumatic | – | – | – | – | – | – | PHC | PAM | PPF |
| TLG | • | • | • | • | – | – | – | – | – |
| TLT | • | • | • | • | – | – | – | – | – |
| TXG1 | – | – | – | – | – | • | – | – | – |
| TXG4/5/8/9 | – | – | – | – | – | – | EHE | STA | STF |
| Operating switches | | | | | | | | | |
| Hand switches | | | | | | | | | |
| EHA1 | – | – | – | • | – | – | | | |
| EHA3 | • | • | • | – | – | – | | | |
| EHE | – | – | – | – | • | – | | | |
| Table switches | | | | | | | | | |
| STA | – | – | – | • | – | – | | | |
| STE | • | • | • | – | – | – | | | |
| HSM | – | – | – | – | – | • | | | |
| HSF | – | – | – | – | – | • | | | |
| Foot switches | | | | | | | | | |
| STF | – | – | – | • | – | – | | | |
| STJ | • | • | • | – | – | – | | | |

¹⁾ No need of CU, but there is non OS provided by Ewellix

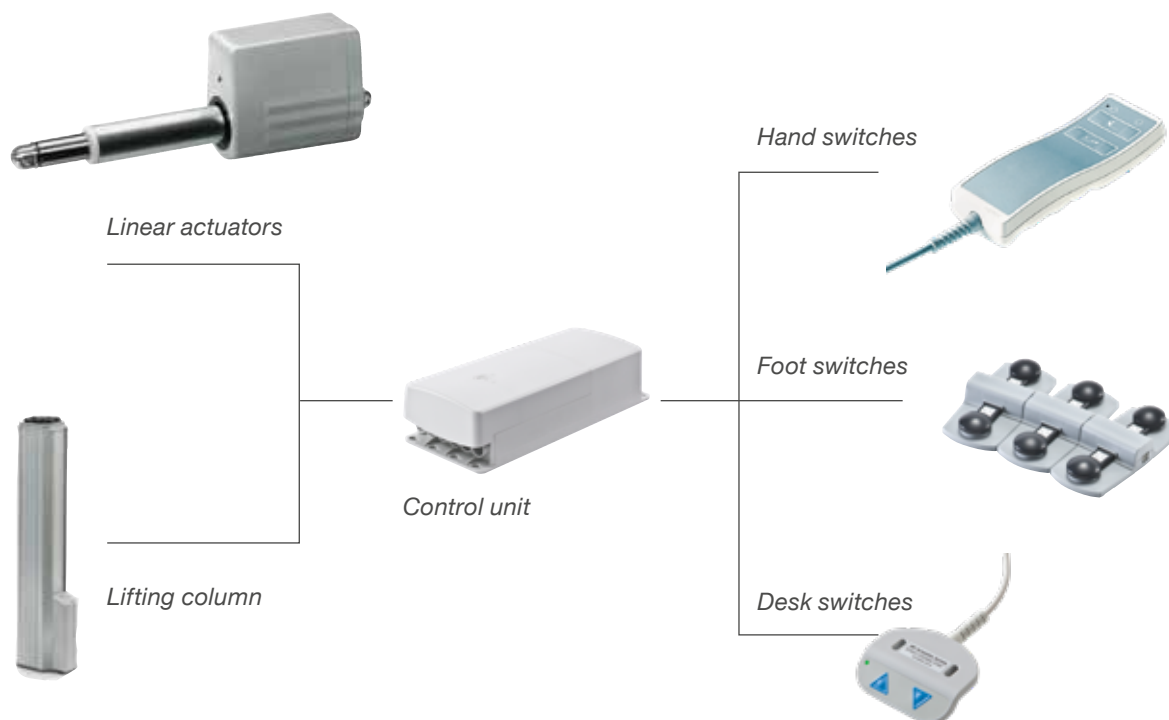
Operating switches

Ewellix offers a wide range of different operating switches to control the position of your equipment. The range includes: Hand switches, Foot switches, Desk switches.



Combination Matrix Control units

| | Operating switches | | |
|---------|--------------------|----------------|---------------|
| | Hand switches | Table switches | Foot switches |
| BCU | EHA3 | STE | STJ |
| VCU | EHA3 | STE | STJ |
| SCU | EHA3 | STE | STJ |
| MCU | EHA1 | STA | STF |
| COMPACT | - | HSM, HSF | - |
| SEM | EHE | - | - |



Input voltage

AC or DC, this is the voltage that is used to power the system or the stand alone linear actuator or lifting column.

For instance, a AC system is one powered by a cable connected to the mains power that provides alternating voltage, typically 230 V AC in Europe and 120 V AC in USA. AC system or linear actuator or lifting column doesn't say that the motor is an AC motor.

For a linear actuator or a lifting column, the motor voltage could be different than mains power. The control unit that

drives the DC lifting column or linear actuator is equipped with a power supply to convert the voltage. The linear actuator and the lifting column could be also equipped with a built-in power supply. In this case, the equipment is powered by the mains power but the motor and other equipment are powered by a DC cable. This is the most convenient system; easy to power and to control.



Case of stand alone lifting column with AC motor: TLC



Case of stand-alone linear actuator with DC motor and built in power supply: MAX7



Case of stand alone lifting column with DC motor and built in power supply: CPMA



Case of AC System with DC linear actuator and lifting column: SCU+TLG + Matrix

How to read a performance diagram

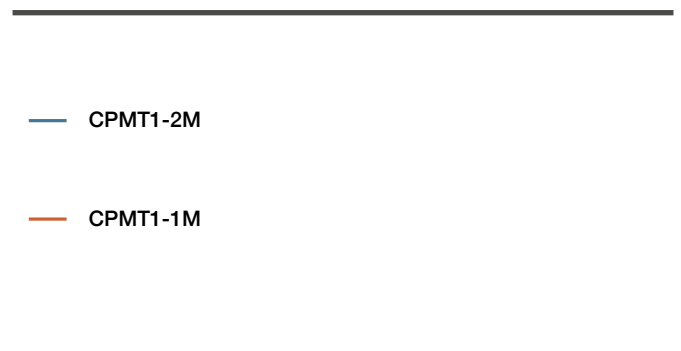
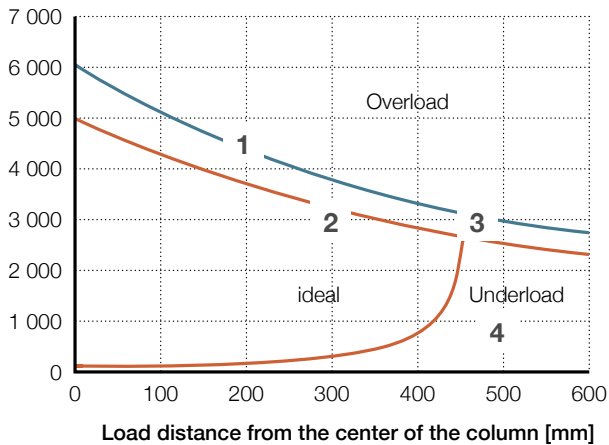
In the product range chapter, a technical description is available for each actuator family. This includes performance overview, a detailed product description, motors and adapter information. In addition to that, each actuator type and size has a dedicated table with the main technical data.

In particular, for the lifting column, we describe the offset load performance.

Here below is a general description on how to read the axial force /linear speed diagram.

CPMT1-1M, -2M

Load [N]



Offset load at full extension

For a CPMT1-2M

1. (4 500 N at 200 mm): The column can lift and lower a load of 450 kg with a center of gravity located at 200 mm from the center of the column.
2. (3 000 N at 300 mm): The column can lift and lower a load of 300 kg with a center of gravity located at 300 mm from the center of the column.
3. (3 000 N at 450 mm): The column can lift and lower a load of 300 kg with a center of gravity located at 450 mm from the center of the column.
4. (1 000 N at 450 mm): The column can lift a load of 100 kg with a center of gravity located at 450 mm from the

center of the column but during the lowering, the retraction will be not optimal. We recommend to increase the weight or change the load distance. To Increase the load distance, you can change the center of gravity of the lifted part.

Product benefits

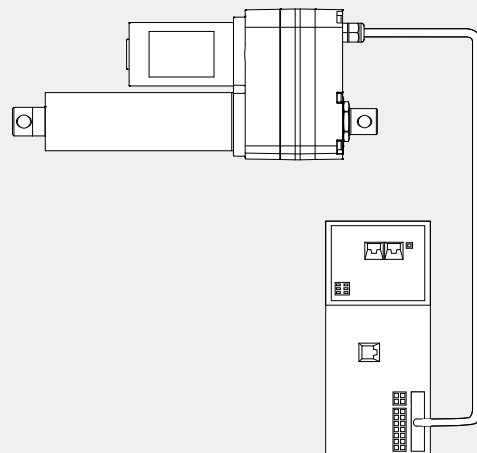
Pneumatic and hydraulic replacement

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

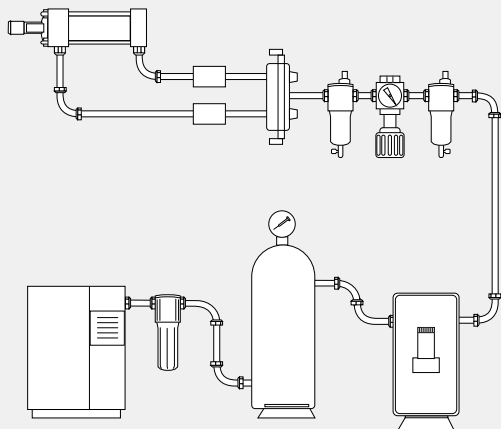
Along with the elimination of air or oil in applications, Ewellix electric linear actuators offer many advantages. Key benefits include a high degree of flexibility, positioning accuracy even to any intermediate target, improved productivity through low maintenance, new options in programming, and seamless integration into machine control systems. These benefits enable new and reliable concepts that can be integrated into a variety of production processes, ultimately allowing new application possibilities.

Electric linear actuators with ball screws provide an energy-saving alternative to pneumatic.

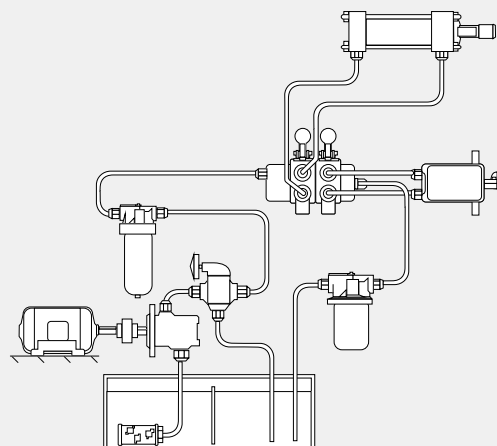
Electromechanical layout



Pneumatic layout



Hydraulic layout



Replacement of pneumatic cylinders

Pneumatic cylinders are based on a technology which was invented in the year 1728. The commercial use of this technology started at the beginning of the 20th century. The principle of pneumatic technology seems to be simple. Air is pressed via valves either on one side or the other side of a pneumatic cylinder to cause a movement of the push tube.

There is a lot of equipment needed to make the pneumatic system run. The more cylinders in a system, the smaller its section of the cost cake for each cylinder. For a low number of cylinders in a system, the common equipment cost is quite high.

Ewellix electric linear actuators operated by motors with position feedback are fully controllable.

Replacement of hydraulic cylinders

Hydraulic cylinders are traditionally used in high load applications. The force range of Ewellix electric linear actuators has been extended. Indeed, Ewellix electric linear actuators can provide a force up to 12 kN for DC motor version, up to 50 kN for AC motor version, opening up more applications to switch from hydraulic to electric solutions. Ewellix electric linear actuators are more reliable, easier to control and cleaner to operate than hydraulic cylinders. They eliminate typical operational problems such as contamination, oil leaks, fluid maintenance checks and disposal procedures and require no ancillary equipment.

The technology of hydraulic cylinders is based on Blaise Pascal's hydrostatic law and offers virtually unlimited force. It's the most powerful technology for many applications. The cost for a hydraulic cylinder is moderate, but there is a lot of installation equipment needed to make it work. The operating and maintenance cost is high while the waste disposal is problematic.

Hydraulic cylinders get their power from pressurized hydraulic fluid (typically oil). The installation requires expensive plumbing, filtering, pumps and electronic/ fluid interfaces (valves). The control is quite complicated when considering hysteresis, supply pressure and temperature changes. Hydraulic systems are reliable, as long as the hydraulic fluid is well maintained. With low maintenance, the seals are prone to leak which results in contamination.

Ewellix electric linear actuators solve many of the problems of hydraulic cylinders. The motor is directly linked with the linear movement of the push tube which allows excellent position feedback and full controllability. The power transmission is typically made with a rotating screw and a nut with or without rolling element to carry loads of up to 50 kN with AC motor version. The installation is simple, the maintenance low and there is less noise and no contamination. Due to the efficiency of up to 50%, the operating cost is very low.



Controllability

Electric drive systems use a screw that offers an easy controllability by counting the number of turns of the screw or other elements mechanically connected. You can control the position, the displacement as well as the speed.

Precision

The precision depends on the resolution of the position feedback system and how the output is used by the control board. The backlash of the driving mechanism will influence if the direction of the load and movement is changing. The accuracy also depends on the set up and homing procedure of the system.

Holding force

Electric drive systems offer a high stability and self-locking that prevent unplanned movement in case of static overload or shock applied even if not powered. In addition of built-in brake and the short circuit of the brushed DC motor used in the most of the case, all mechanical driving part participates of the stability.

Degrees of protection provided by enclosures

The IP Code, International Protection Marking, IEC standard 60529, sometimes interpreted as Ingress Protection Marking, classifies and rates the degree of protection provided against intrusion (body parts such as hands and fingers), dust, accidental contact, and water by mechanical casings and electrical enclosures (↳ **fig. 1**).

It is published by the International Electrotechnical Commission (IEC). The equivalent European standard is EN 60529.

Safety and environment friendly

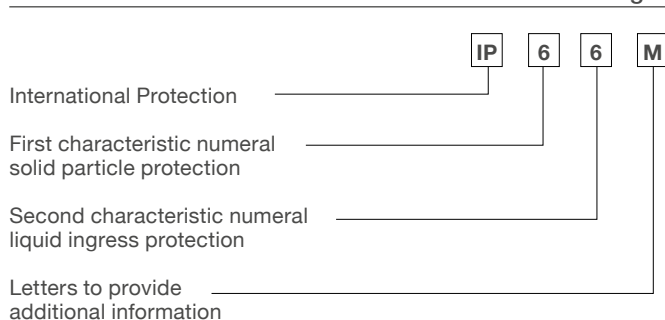
The safety typically starts by the high holding force as compared to the load applied during the normal use of the application that should be lower than the rated load of the electric drive system. The risk of abnormal use of the application should also be considered.

For some application or function in the Medical industry, the manufacturer of the medical device should manage the risk assessment and comply with some regulation as IEC 60601-1, general requirements for basic safety and essential performance. As a component of the medical device, some Ewellix electric drive systems were tested under the same condition to demonstrate compliance to IEC 60601-1 and are registered by UL to be marked RU. Saying that the Safety factor of the complete system is 2 or 2.5 or 4 is not enough. This standard requests that each individual component of the drive system used on a suspended mass be checked and could request a tensile safety factor up to 12, depending on the material, the possible alteration, the backup system and the calculation method.

Nor do electric cylinders have problems with fluid leaks or contaminated air. Moreover, the absence of fluid constantly operating under high-pressure eliminates potential risks to operators in case of cylinder failure.

Without fluid to drive or keep in position and with a good ingress protection up to IP66M, means during movement and IP69K when static, the risk of leakage and contamination is almost negligible. With a static ingress protection, the actuator can be cleaned easily. Actuators rated IP69K accept a high pressure and hot temperature cleaning procedure, that contribute to the later elimination of the risk of pollution.

Fig. 1



RoHS

Our standard products fall under category 11 in Annex I to Directive 2011/65/EU and therefore do not need to comply with the provisions in the directive before July 22, 2019.

Nevertheless, most of our standard products are already mentioned on a list where we declare that the products do not contain any of the restricted substances over the threshold values stated in the Annex II to Directive 2011/65/EU in any homogenous part of the product.

REACH

Ewellix has a policy, process and dedicated resources in order to comply with REACH, the Regulation concerning Registration, Evaluation, Authorization and Restriction of Chemicals.

CE mark

Most of our product have CE mark with a Certificate of Compliance signed by the factory.

Installation

The installation is simplified. In most cases, the electric drive systems request just the mechanical connection of the 2 attachment points and the electrical connector plug in. Then, it is ready to work.

Virtually maintenance-free

Ewellix expertise in manufacturing the main components of linear actuator – screws, bearings, guides, seals and lubrication – allows us to maximize service life. With the special hardening treatment of the screws and balls, the linear actuators keep high performance and efficiency during the service life. Compared to their fluid power alternatives, the electromechanical linear actuator systems require no maintenance.

With electromechanical system technology, filter changes and air bleeding are a thing of the past. Simply mount the actuator, plug in the cable to the control unit or a Programmable Logic Controller and you are up and running in record time.

Tests

Environmental, electrical and mechanical tests are performed in the Ewellix facilities or by external laboratories and recorded internally or by external bodies like UL.



Customization capabilities

Ewellix electric cylinder customization

On the standard electric cylinder product range, Ewellix 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 length
- Retracted length
- Attachment and Mounting holes
- Colors
- Cables and connectors
- De-rated load

Advanced customization

These design options are more complex and require a dedicated project with the customer:

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

Complete customization

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



Examples of basic and advanced customizations

CPMA coloured tubes

Lifting columns with cable through the tubes can allow the designer of the equipment to remove shroud or cover even if wires are requested at each side of the tube set. To enhance its integration in the application, Ewellix proposes a customized color for the inner and outer tubes. This is typically proposed with the CPMA and CPMB lifting column but can be also requested for other lifting columns or actuators (↳ **fig. 1**).

CAHB 10 with connector

Cable length and connector can be customized according to a request have perfect integration with a quick assembly on the application and a drop-in solution (↳ **fig. 2**).

CAHB 2xE with trunnion mount

To optimize the design of the application or to create a drop-in solution, Ewellix can customize the retracted and extended lengths and the attachments as well (↳ **fig. 3**).

Column low boy

Precise movement, stiffness and reliability are some of the key factors when it comes to patient tables. Ewellix Low-boy columns provide the precision for easy and safe patient entry with maximum lift functionality. The simple and open motor interface gives the option to mount every motor on customer's side and makes the system very flexible and accessible (↳ **fig. 4**).



Fig. 1



Fig. 2



Fig. 3



Fig. 4

Clam shell grill

Clam shell grills with electrical lifting are automatized with a linear actuator. The cooking of the steak is exactly as requested by the customer and the operator is more efficient (→ fig. 5).

A customization of the motor could be proposed if a long life time is requested.

To ensure perfect French fries, the lifting of basket is automatized with a linear actuator.

The operator appreciates also the simplicity and the comfort and can focus on other preparation.

Special motor and external switches

For specific applications such as commercial kitchen equipment where a higher duty cycle and long life time are requested, Ewellix can propose specific motors like brushless DC version. Ewellix could also propose the integration of external switches to have multiple adjustable position feedback or other full system integration (→ fig. 6).

Very long stroke and graduated tube

On Applications like Medical fluid carts where the liquid pressure is provided by the height of the liquid bag, Ewellix can provide an automatized solution based on a linear actuator with a long and stable inner tube of 1 meter to hang the liquid bag (→ fig. 7).

The laser etched graduated tube provides quick visual information about the height.

Marked on the tube

On Applications like Medical fluid carts where the liquid pressure is provided by the height of the liquid bag, Ewellix can provide an automatized solution based on a linear actuator with a long and stable inner tube of 1 meter to hang the liquid bag (→ fig. 8).

The laser etched graduated tube provides quick visual information about the height.

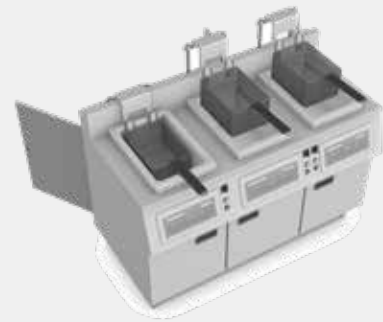


Fig. 5

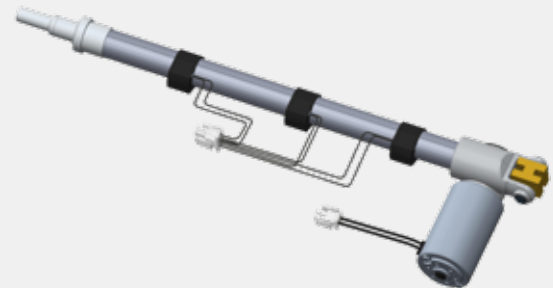


Fig. 6

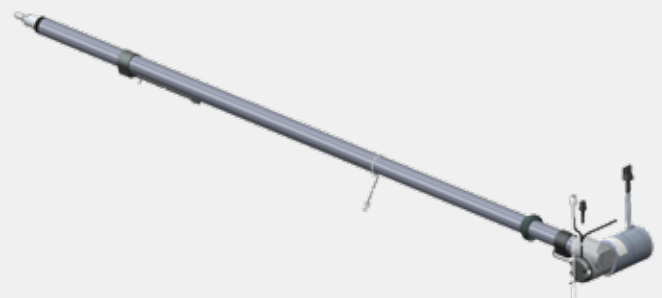


Fig. 7

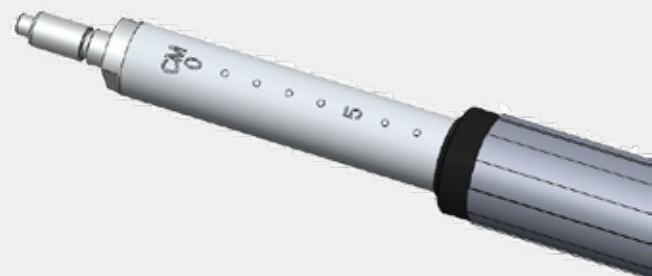


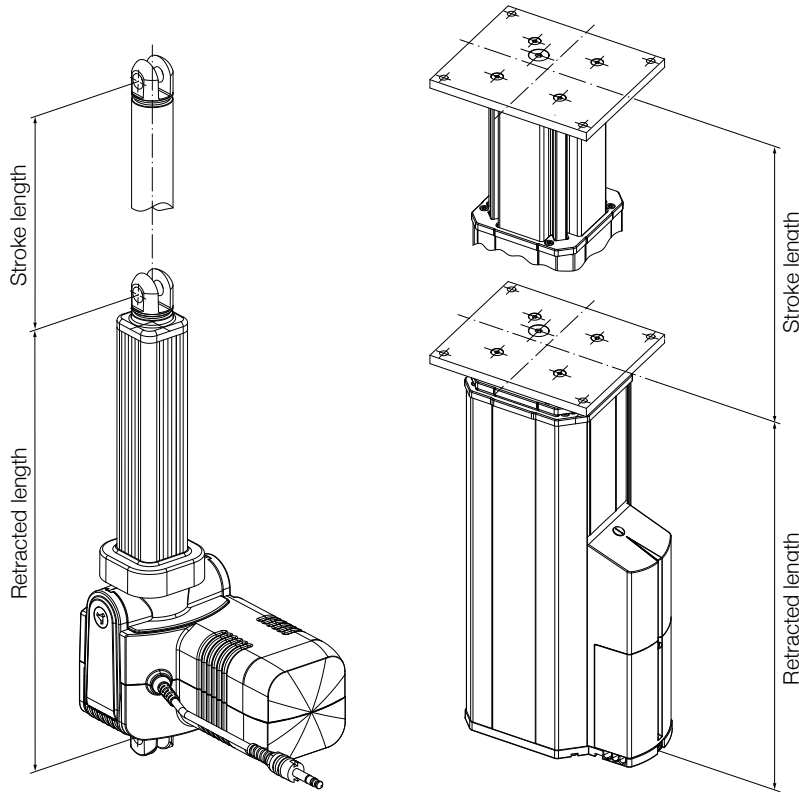
Fig. 8

Customization request form

Customization request for linear actuator or column

Company:
 Country:

Contact person:
 Preferred way to be contacted:.....
 Phone, Phone number:
 e-mail:



Preferred series (if known)

1. Stroke lengthmm
2. Retracted length:mm
3. Cable length:mm Connector: Pinning:
4. Rear attachment: rod with hole fork head with hole threaded Inner diameter and width
5. Front attachment: rod with hole fork head with hole threaded Inner diameter and width
6. Push / Pull max force:
7. Color:
8. If you need more, describe here:

.....



Rod with hole



Fork head with hole



Threaded

Application examples

Medical mobile C-arm

In mobile C-arms, the safe and smooth positioning of the x-ray system is essential.

Ewellix columns deliver high offset load capability, stability and safety to achieve the best possible performance in this application.

The columns can be individually configured to best match each customer's requirements. Additional customizations, such as cable channelling or special hardware interfaces, are possible and simplify the final installation.

Also the monitor can be adjusted the position (up and down); thanks to the Ewellix actuators is possible to set the right position according to the C-arm.

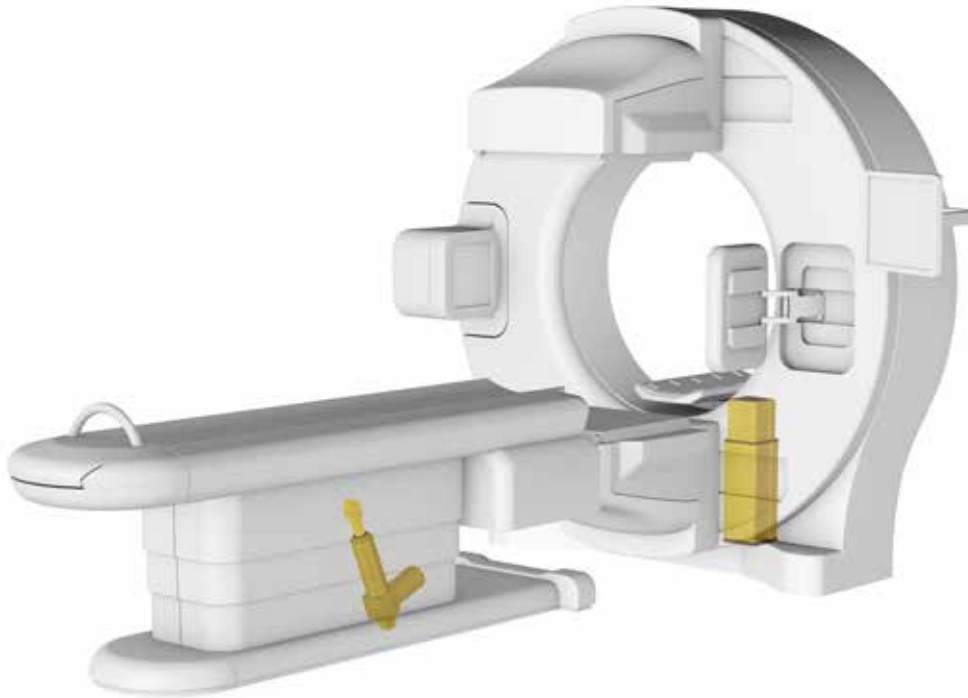


Medical imaging tables

Imaging tables are used for safely positioning patients during imaging procedures, such as general x-ray, CT or MRI.

Ewellix provides different solutions to design the lifting function. For scissor tables, Ewellix medical actuators with high safety levels can be used.

Alternatively, two synchronized columns deliver an easy to install and very stable complete solution for a table base. Such a column solution can greatly reduce development costs for our customers.

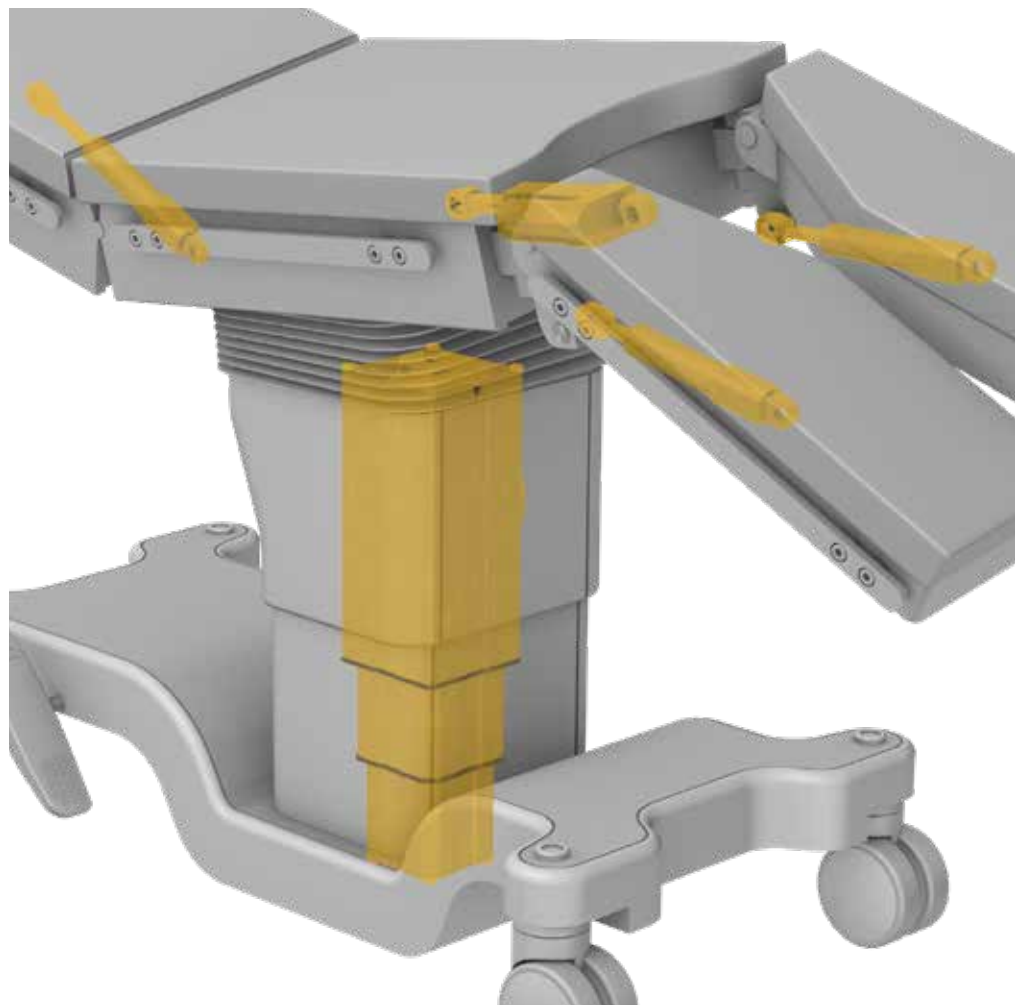
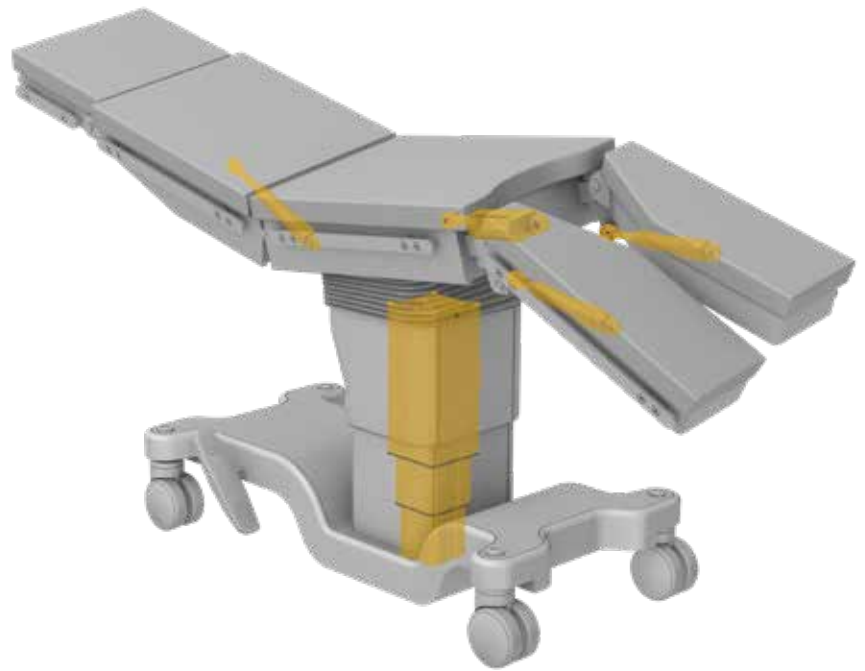


Medical surgical chair/table

Surgical tables or procedure chairs are used in a wide range of medical applications, either in the operating room or in smaller clinics. To optimally position a patient for different procedures, multiple actuators are installed.

Ewellix is able to provide a complete UL certified mechatronic system including actuators, columns and control units, to meet customer requirements for functionality and safety. Ewellix columns offer a strong single pedestal solution with low retracted height and high stroke options to meet market demands. Configurable medical controllers can be customized for each customer to exactly meet functional demands.

With an Ewellix system, the market challenges of increasing patient weight, lower entry height and faster patient throughput can be met.



Medical dental X-ray

1

Dental panoramic x-ray equipment is able to generate a detailed 2D/3D image of all teeth. Ewellix actuators and drive trains help our customers implement the height adjustment in this equipment. High speed, high stroke and a high level of safety are critical features of these actuators and a core strength of Ewellix. A modular set of screw and motors enable an optimal configuration to meet every customer's requirements.



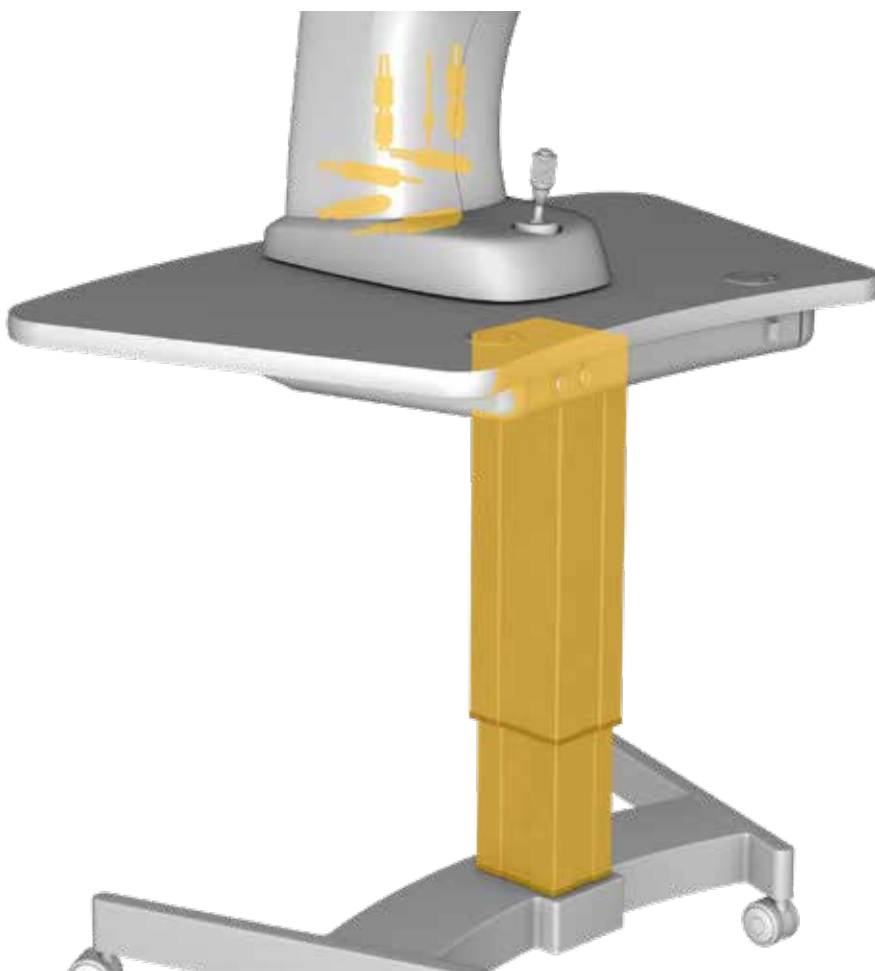
Medical incubator

Modern designs of incubators reduce the stress for babies and minimize the numbers of transfers from incubators to beds. Incubators require columns with very smooth movement to help keep babies safe and comfortable. Thanks to its long experience with medical equipment, Ewellix has identified such needs and developed columns to fulfil the exact needs and requirements of baby care, such as soft start/stop, extremely quiet operation and virtually vibration free movement.



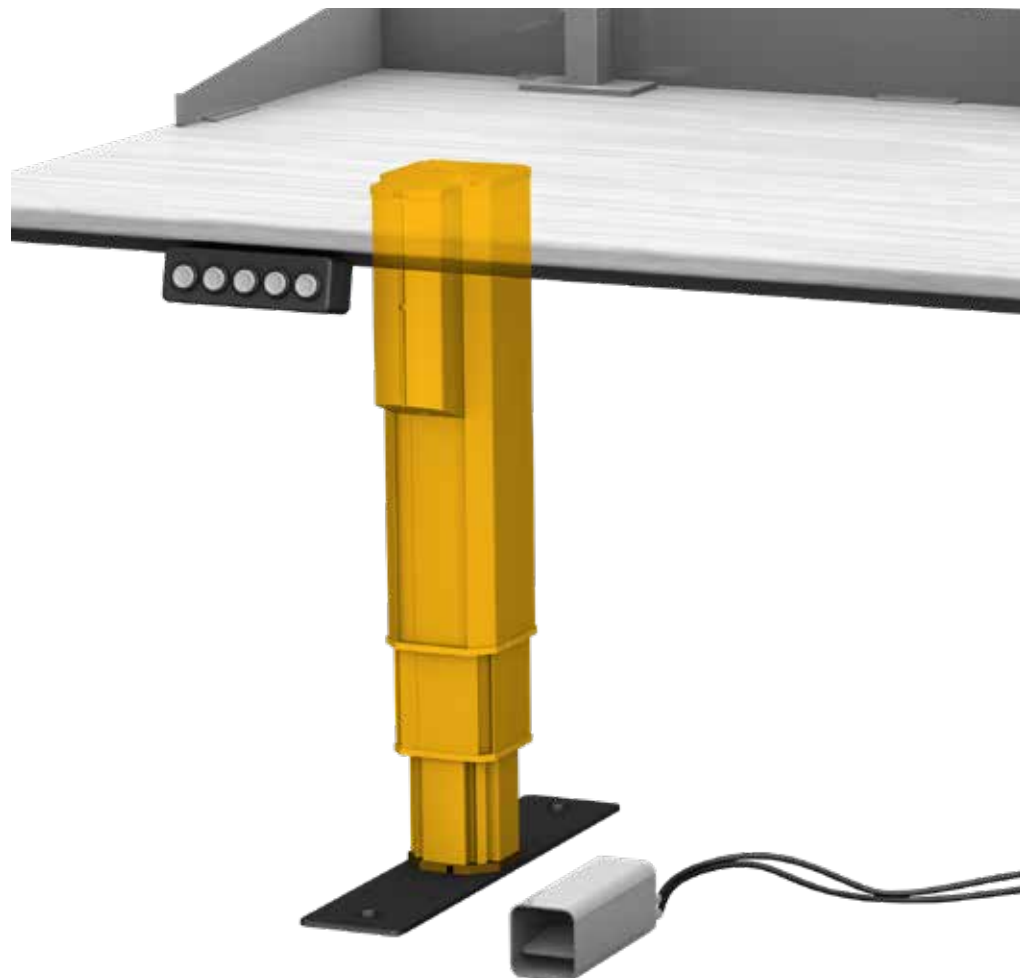
Medical ophthalmic

Ophthalmic instrument tables are used to lift the eye care instruments and measurement devices. All of these instruments and devices are placed on a small table plate and need to be adjusted in height to find the position when the doctor or nurse is doing the measurement on the patient sitting in front of the table. Ewellix columns offer all the needs of adjustable height functions like iteration or small movements to fine tune the position to help for better accessibility and comfort of the operators and patients.



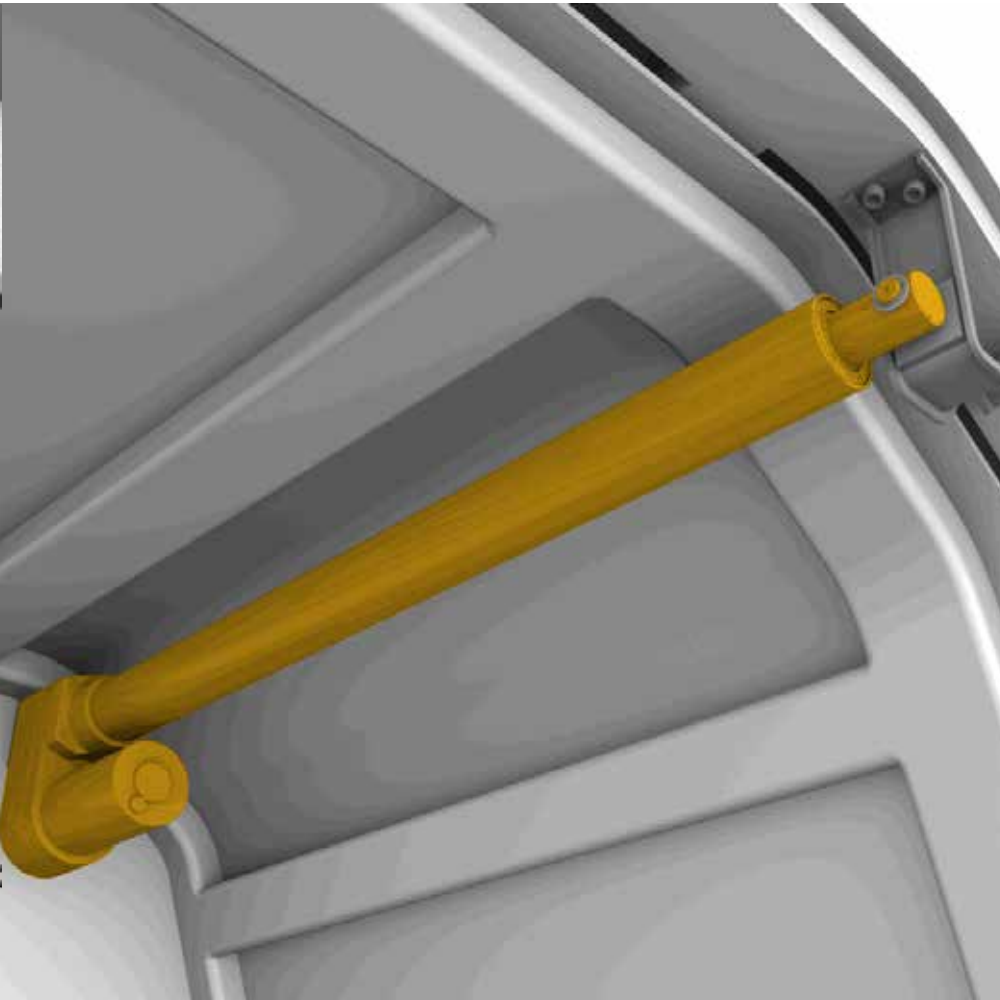
Adjustable industrial workstation

Incorporating Ewellix columns into your workstation will help create ergonomically appropriate work patterns and ultimately result in satisfied users and increased productivity. Our lifting columns offer the flexibility and reliability required to create a completely ergonomic workplace in a variety of industrial environments.



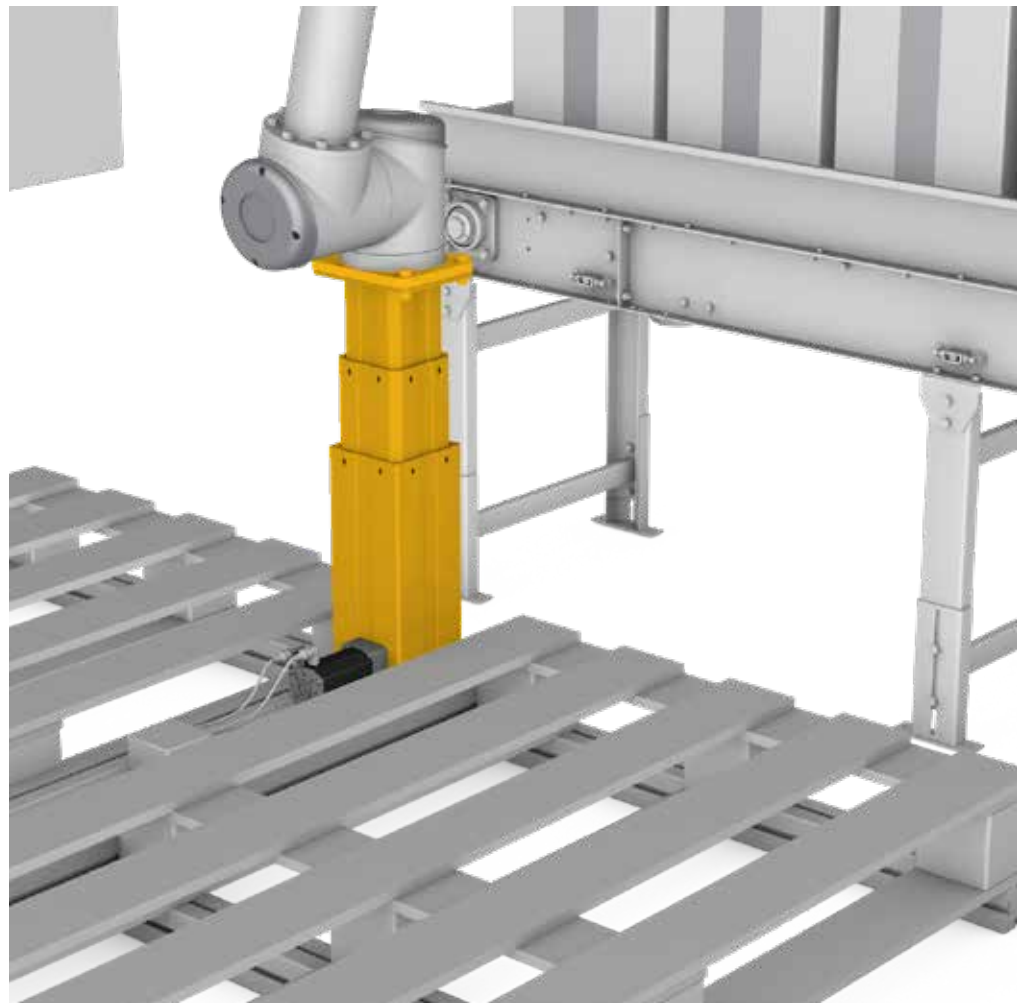
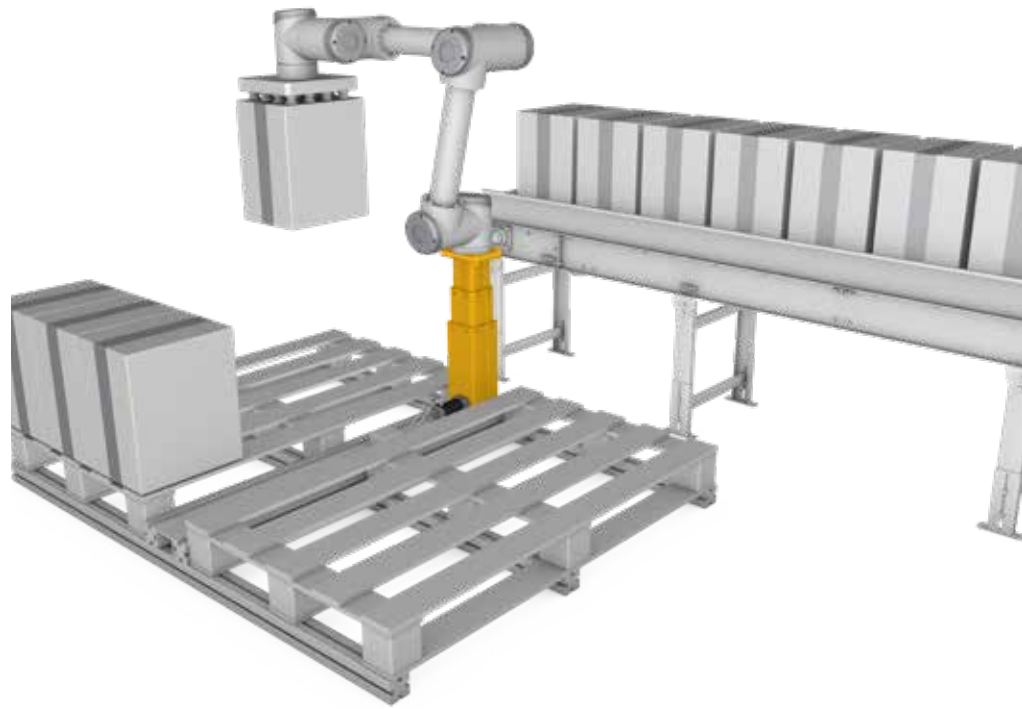
Industrial automation production machines

Electromechanical linear actuator can replace pneumatic or hydraulic cylinder to provide control positioning of the door or hood used time to time thanks to the positioning feed-back that secure the movement. It is also easy to operate by PLC or switches.



Factory automation

Competitiveness in factory automation entails a permanent productivity improvement process. In the search for more efficient and ergonomic solutions, many manufacturers have successfully used actuators in many working machinery. The automated movement for hoods and covers helps to reduce production downtime and lessen the workload for operators. In addition, quick lifting of heavy machine parts is helping to increase the speed of the machine maintenance. A lifting system will provide an easy access to component of the machine during maintenance operation like cleaning or repair.



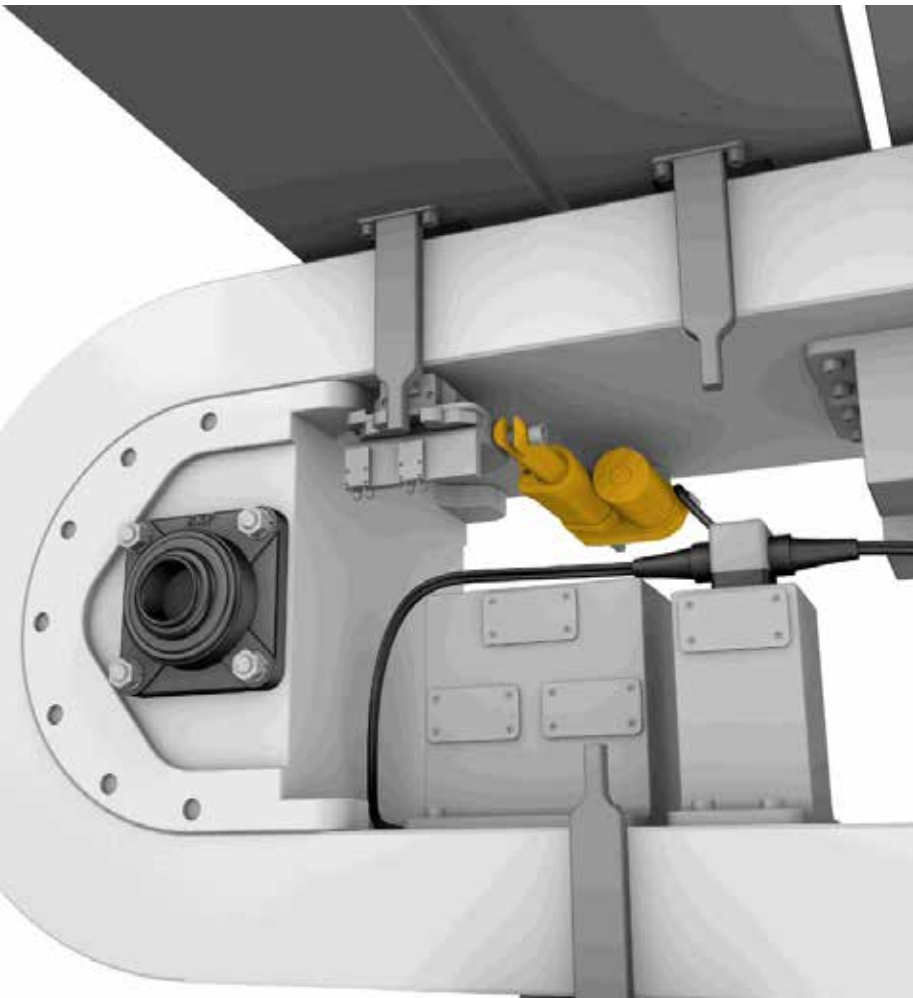
Automation conveyor system

1

Conveyor lines are heavily used across different industries and applications. The different automatized movements are usually achieved by pneumatic cylinders. The need of increasing energy efficiency and simplifying the system has led to a usage of electro-mechanical actuators over the conveyor line.

For a stop-pallet function, CAHB-10 actuators have been successfully used to replace standard pneumatic cylinder, thanks to their compact dimension and easy controllability.

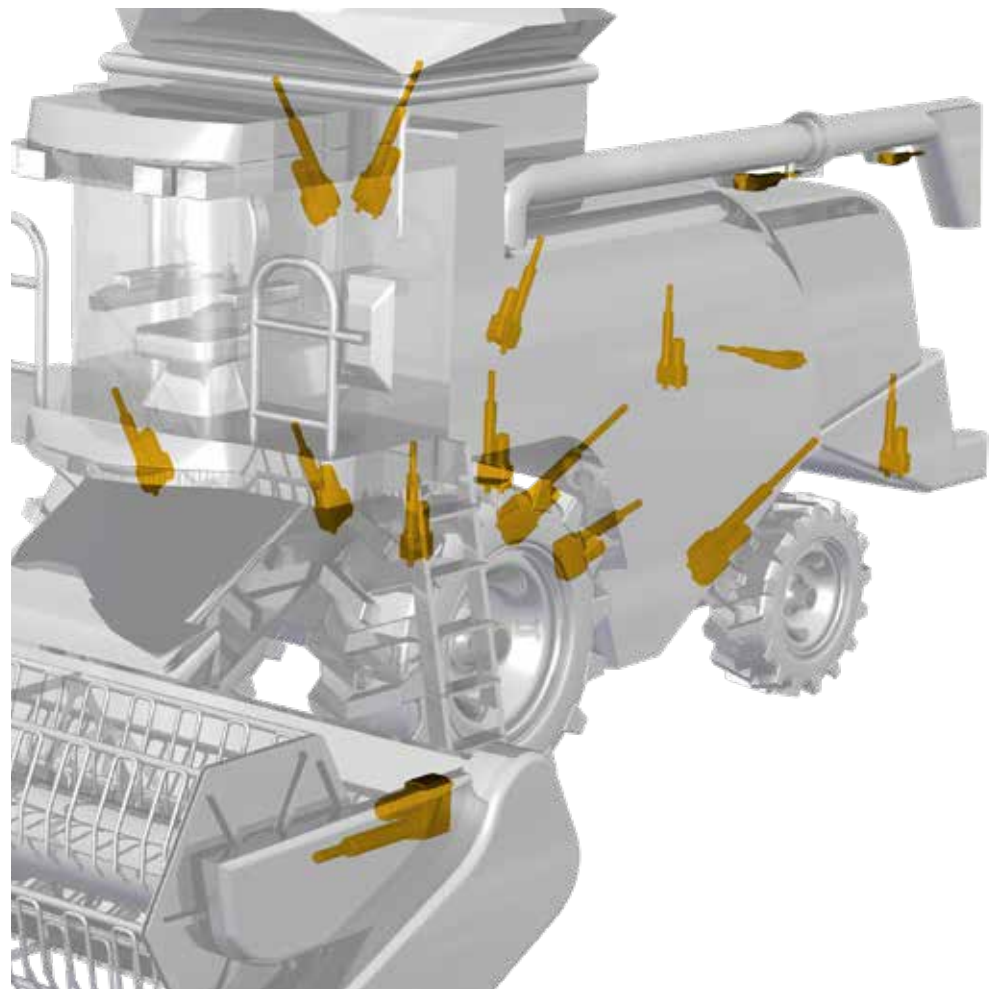
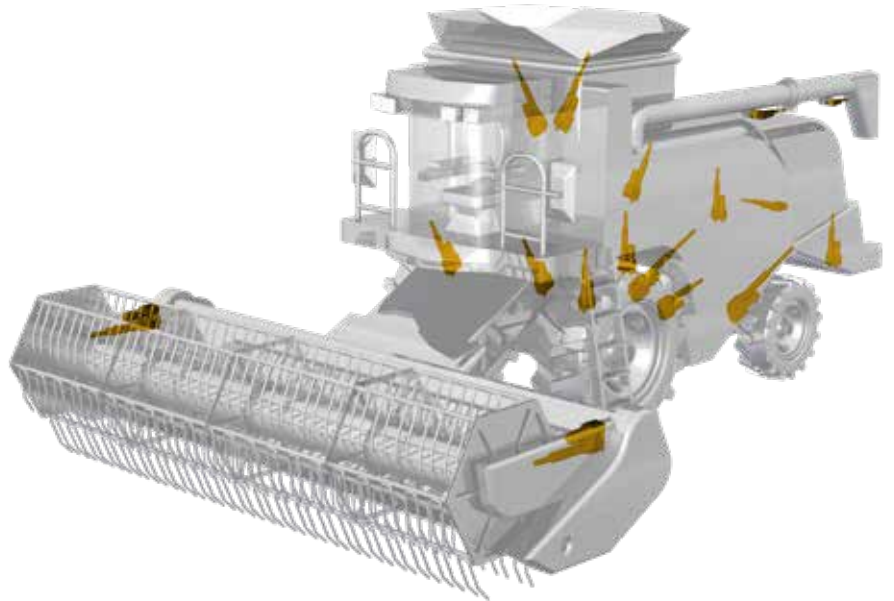
By using electro-mechanical actuators, it has been possible to have a fully electric line, getting rid of the whole pneumatic system (cylinders, hoses, valves...).



Agriculture equipment

Harvester combine

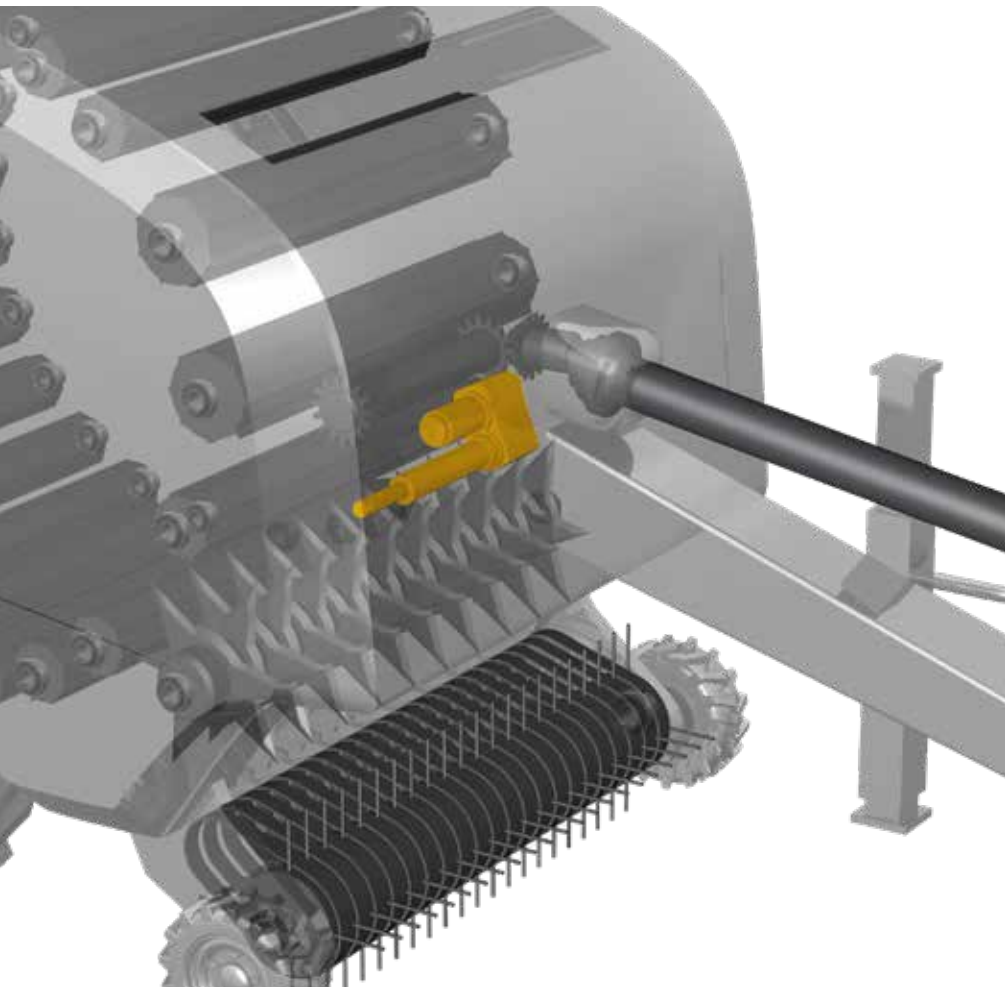
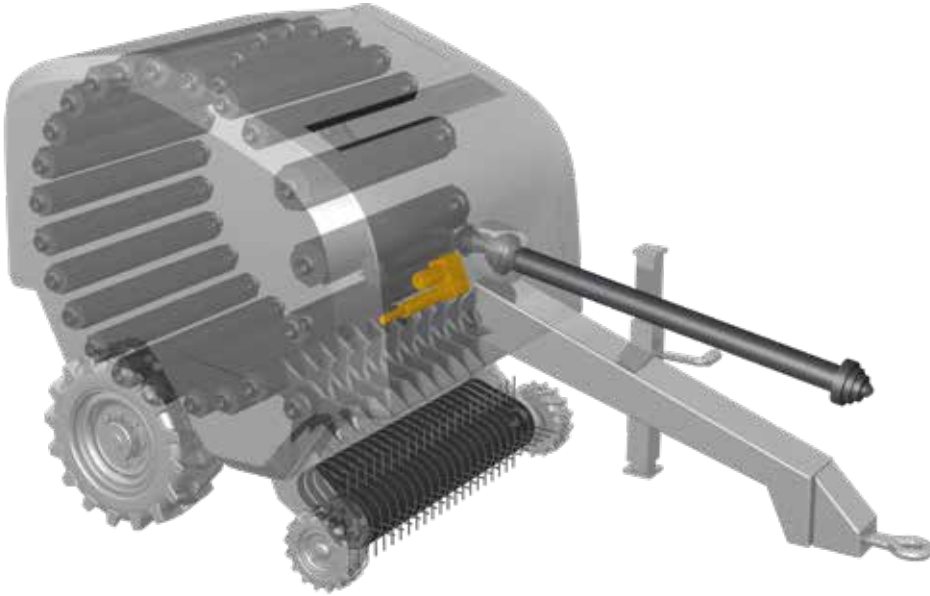
Today's farmers are challenged by the demands on cutting costs while increasing the crop yield. Modern harvester combines use many linear actuators to adjust on demand different equipment like sieve or concave clearance that help to minimize lost crops, thus resulting in the best crop yield. The position signal from the actuator ensures that the position is reached. At the appropriate adjustment, any shock or vibration should move the position of the actuator thanks to the high push and pull force and the high holding force of the linear actuator. To avoid pollution by oil leakage or missing a cleaning process, request the best class of Ingress protection IP69K/66M with a vent.



Round baler

Today's farmers are challenged by the demands to cut costs while increasing productivity. The wrapping process of rounded bales needs an accurate movement to position and cut the net or the twine.

1



Trucks

Today's freight companies are challenged by the demands on cutting fuel consumption and better productivity. The truck manufacturers develop innovative devices to optimize air circulation while driving, with or without a trailer. The linear actuator, with or without a motor, provides a quick, safe and precise adjustment of the roof air deflector.



Special vehicles Sweeper

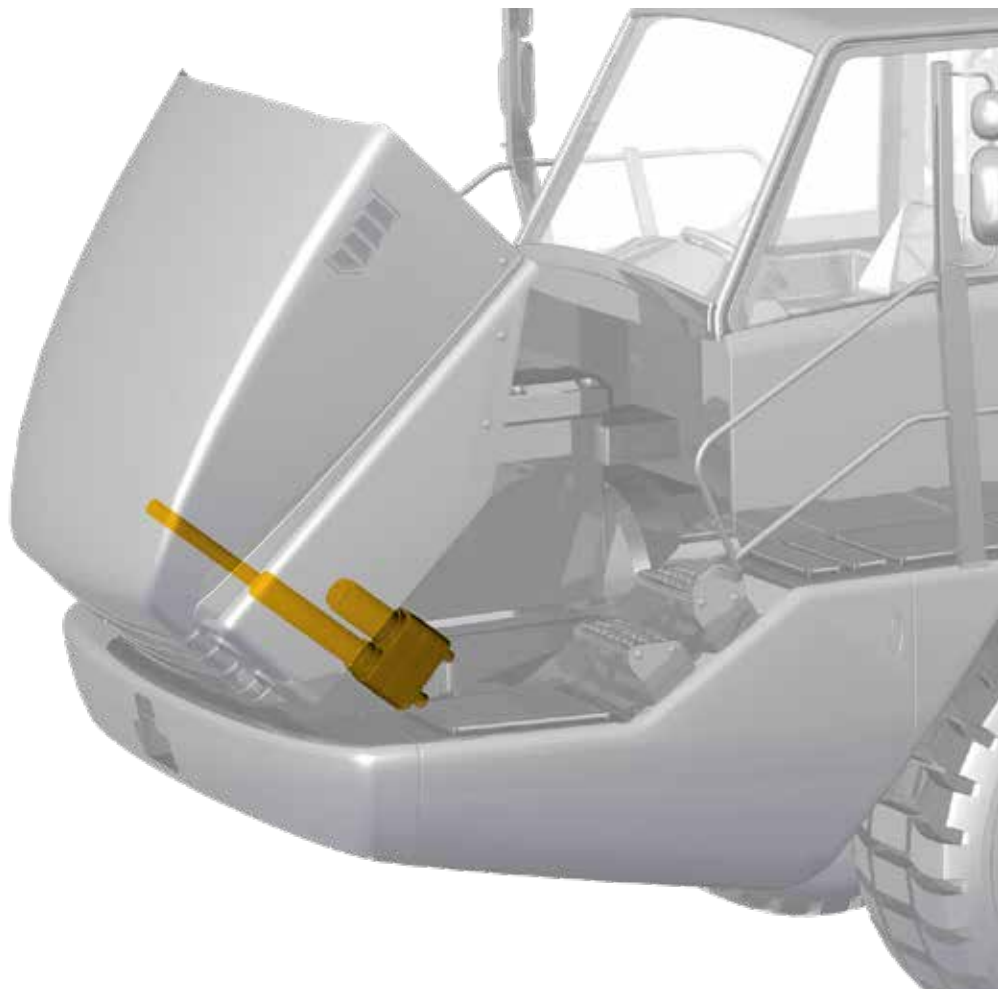
1

To improve the productivity and increase the comfort and safety of the worker, the electro mechanical linear electrical systems are used on many applications such as warning sign lifter on a vehicle or brush adjustment in the sweeper. Quick and easy to control, the linear actuators are also reliability with an ingress protection IP69K/66M and a vent.



Construction equipment

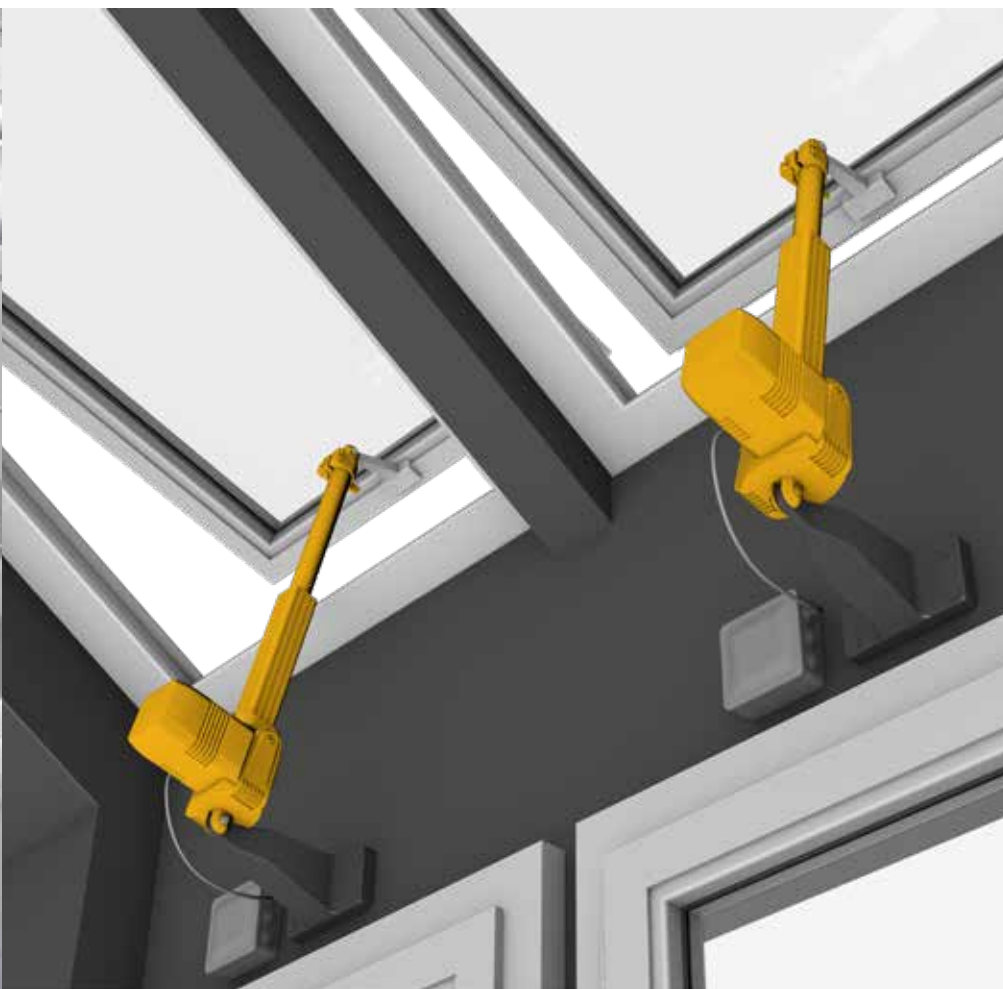
Today's construction companies are challenged by the demands on cutting fuel consumption and providing better productivity. Products such as Articulated Dump Trucks, wheel loaders or rollers, the engines are more sophisticated to comply with the CO₂ emission regulations and the engine hood are bigger and heavier due to the cooling system. The maintenance operation requires the engine hood be lifted. The operator needs a fast and safe operation. The linear actuator can quickly lift the engine hood but also keep it open thanks to the high push force and the high holding force that keep the hood at a stable position even if there is shock or wind.





Building automation

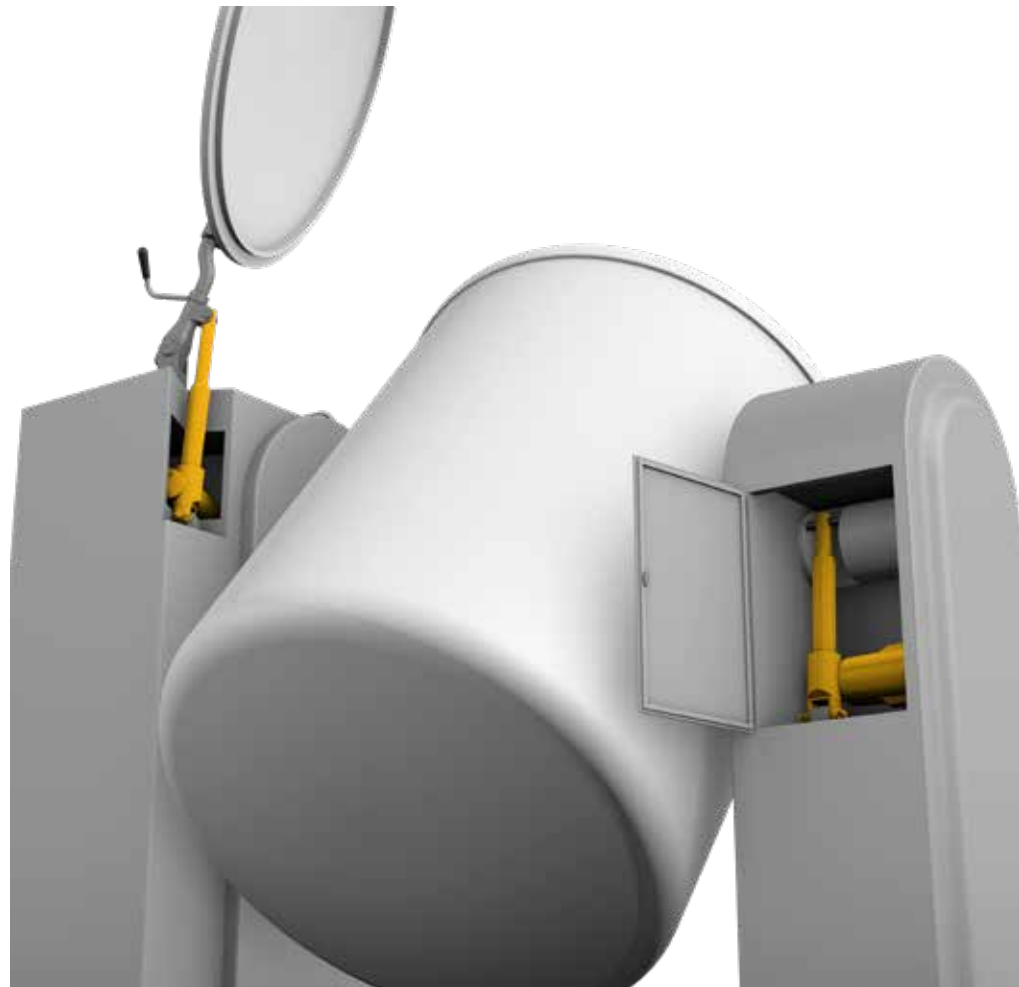
Modern commercial, administrative and industrial buildings, as well as schools and care centers are often fitted with a variety of small electronic appliances which can perform important functions remotely and simply. Actuators for light domes, doors, windows and smoke and heat outlet systems are installed in many modern buildings. These actuators open and close traditional and tilting windows, light domes, facade elements, sun blinds and smoke and heat outlet shutters, at the touch of a button or automatically, using climatic (wind/rain) sensors and temperature and smoke sensors.



Food and beverage Commercial kitchen equipment

Kettles

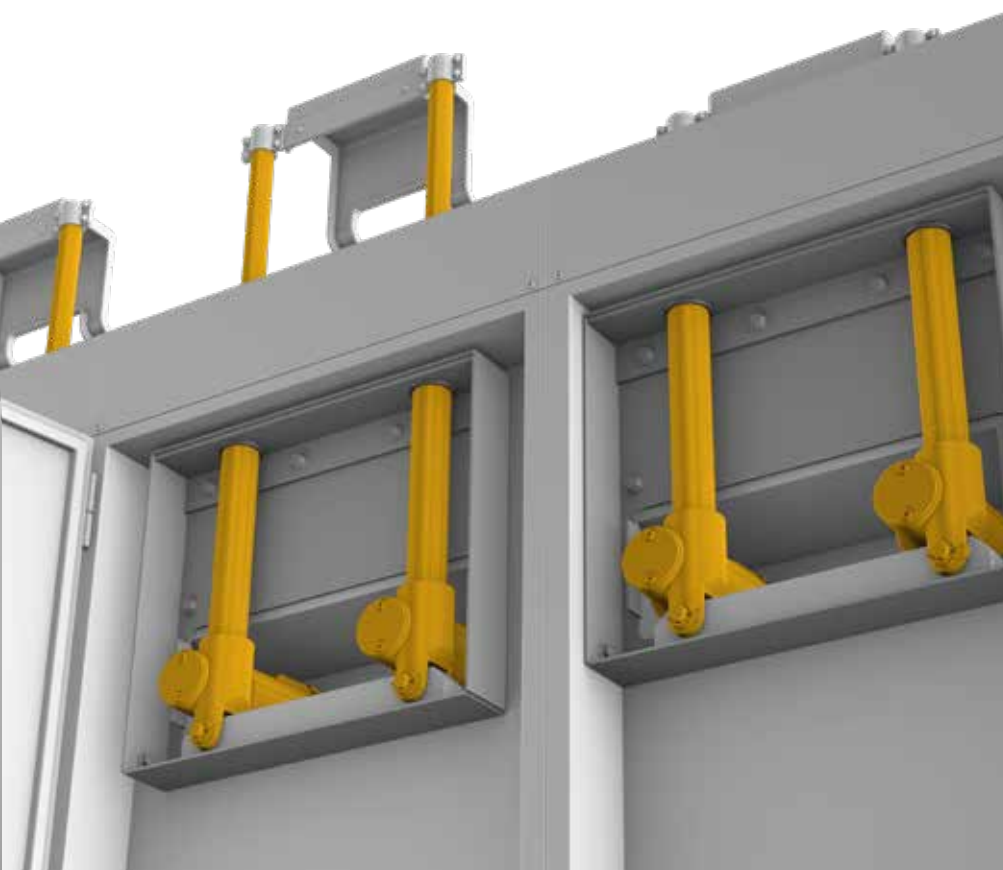
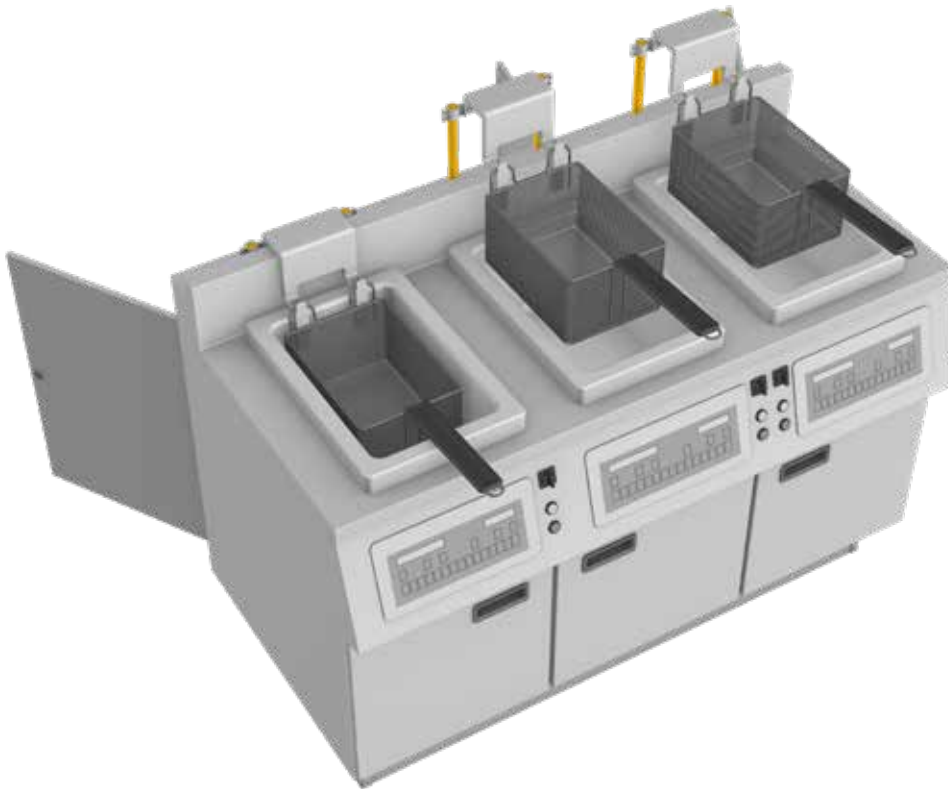
Machine flexibility, process control and cost efficiency are important in modern industrial kitchens. High end food processing equipment requires automated, repetitive and sometimes difficult operations. Whether it is raising or lowering an exhaust hood or a complete stove, actuators can enable people to work more comfortably and efficiently by adjusting the environment to their own personal needs.



Fryer basket

Clam shell grill with electrical lifting are automatized with a linear actuator. The cooking of the steak is exactly as requested by the customer and the operator is more efficient. A customization of the motor could be proposed if a long life time is requested.

To ensure perfect French fries, the lifting of basket is automatized with a linear actuator. The operator appreciates also the simplicity and comfort and can focus on other preparation.



2

Selection process

- Medical
- Harsh environment
- Automation



Simplified selection process

By following the described flow (↳ **diagram 1**), the user can select the right solution based on linear actuator, lifting column and electronics that fulfill the application needs. If further assistance is needed, please contact Ewellix to get complete technical support (↳ **page 3**).

AC version

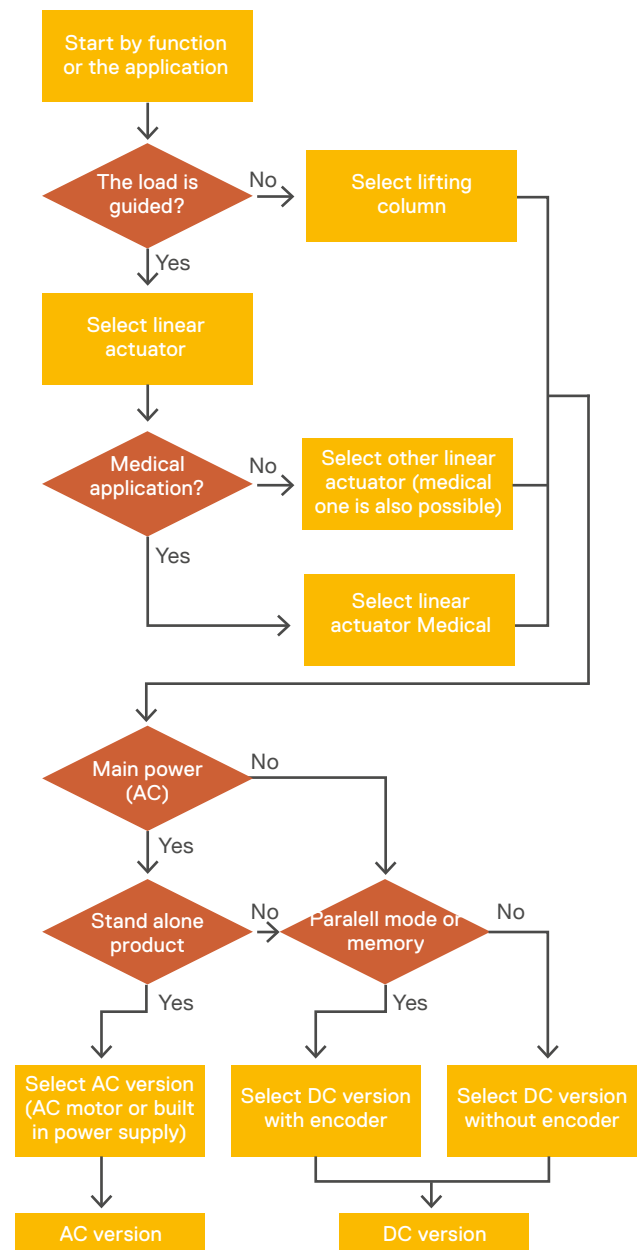
- Selection by load and direction, offset load if column, stroke, speed, IP, Self-locking/holding/static force dimension.
- Verify the environment and standard: IP, duty cycle, temperature, standard
- Select accessories if requested. Power cable or Power cord, connection plates, wires, inlet / outlet boxes
- Select the compatible operating device / switches per number of functions to control.

DC version

- Selection by load and direction, offset load if column, stroke, speed, IP, Self-locking/holding/static force dimension.
- Verify the environment and standard: IP, duty cycle, temperature, standard
- Select the control unit: Channel per motor, output per channel, Sum output power (see compatibility Matrix), accessories
- Select the compatible operating device / switches per number of functions to control.

See **pages 52** and **53** for more information.

Diagram 1



Selection by load and direction, off set load if column, stroke, speed, Self-locking/holding/static force, dimensions

- Rated load should match with the maximum force applied to the actuator by the application during the movement. Consider the “worst case scenario” and also the direction; push is the extension and pull is the retraction direction.
- For Column, it is the load and offset load / distance that should be considered.
- The static load should match with the force applied on the actuator by the application when the actuator is static. Consider the dynamic effect of vibration or chock on the application.
- The stroke length of the actuator including the tolerance should match with the travel distance of the application. In case of limit switches option, the extra stroke length to reach the mechanical end stop of the actuator could be considered for added safety.
- The speed should match with the expected running time. Consider that the speed will change depending on the load but also depending on the voltage fluctuation in case of a DC motor, except for a Switch Mode Power Supply.
- For some products, you could select the attachment dimension and retracted length. Consider the tolerance.

Verify the environment and standard: IP, duty cycle, temperature, standard

- Each product should have an Environmental and standard specification that should match the environment of the application.
- Ingress Protection.
- Ambient Temperature during working condition, storage condition.
- Duty cycle % or “**Time ON / Time OFF**” are specified.
- The longest running time should not exceed the **Time ON** specified.
- The shortest rest time should be longer than the running time multiplied by the “**Time ON / Time OFF**” specified, or running time multiplied by (1- Duty cycle specified) and divided by duty cycle.

Formula:

$$\text{Rest time} > \frac{\text{Running time} \times \text{Time ON}}{\text{Time OFF}}$$

or

$$\text{Rest time} > \frac{\text{Running time} \times (1 - \text{Duty Cycle}\%)}{\text{Duty Cycle}\%}$$

Example:

Time ON / Time OFF = 85 s / 340 s or Duty Cycle 20%;
the Running time must be less than 85 seconds.

If the running time is 30 seconds, the Rest Time should be more than

$$\frac{30 \times 340}{85} = 120 \text{ seconds}$$

or

$$\text{Rest time} > \frac{30 \times (1 - 20\%)}{20\%}$$

so

$$\text{Rest time} > \frac{30 \times (1 - 0,2)}{0,2}$$

so at least 120 seconds

Some products are designed for a specific application but are suitable for others applications that request the similar performance.

Select the Control Unit: Channel per motor, output per channel, Sum Output power (see compatibility Matrix)

- Select the control unit that is compatible with the actuator or column selected. Consider the sum of the number of channels requested by each product; some columns could request 2.
- Accessories can be selected: power cable or power cord, extra wires, Inlet and Outlet boxes, Connection plates.

Select the compatible operating device / buttons per number of functions to control

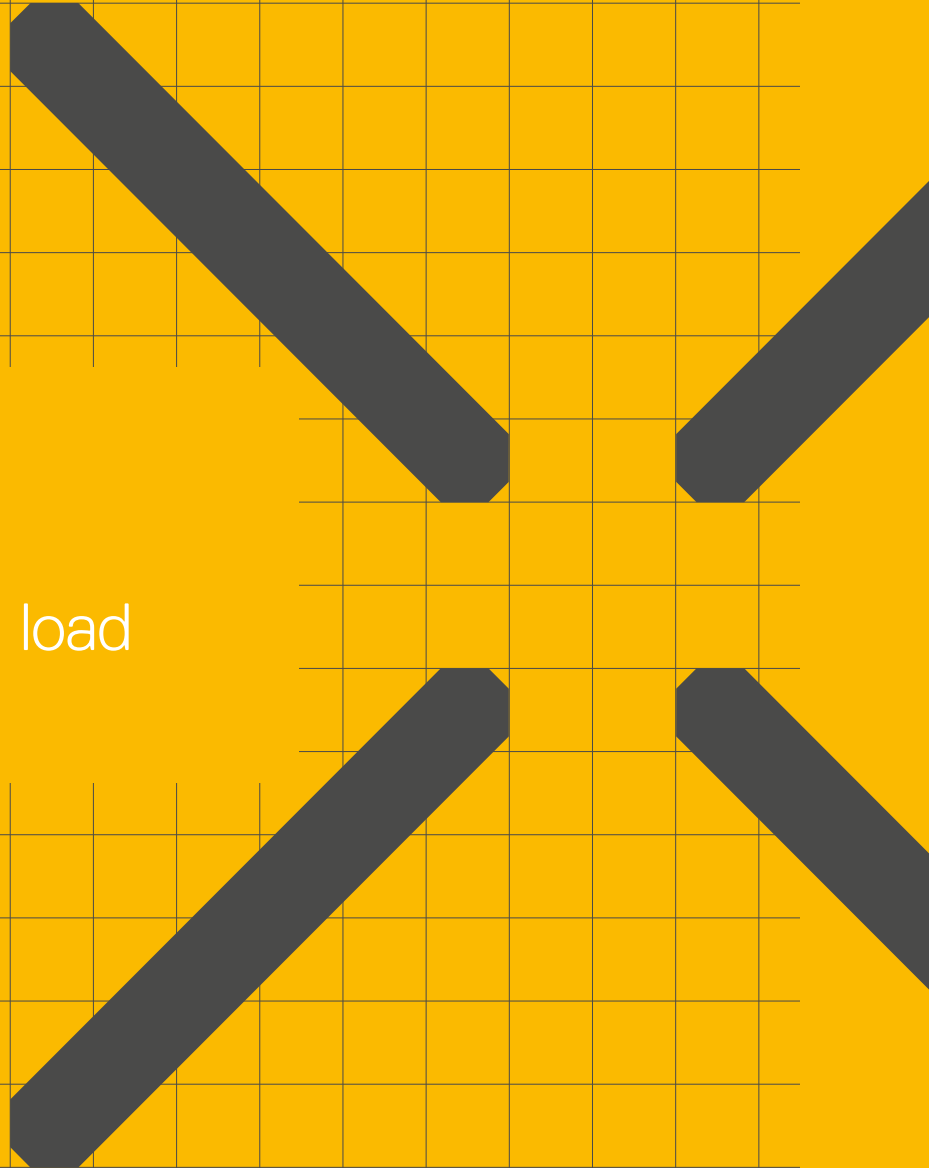
- Select the operating device that is compatible with the control unit.
- The type of switch must be selected: the switch can have different number of buttons according to the numbers of functions to drive (i.e. for only up and down function is necessary two buttons); number of buttons increase according to the number of actuators or columns to drive or if memory position or other functions are needed.



3

Actuators

Up to 50 kN rated load



Chapter contents

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Matrix series

The Matrix series is designed for medical devices and includes powerful AC and DC linear actuators using DC motor.

They run very quietly, take up little space and can be installed at virtually every angle in vertical or horizontal position. The series is medical approved by third parties and available with options like anti-pitching, incremental position feedback and emergency lowering. The Matrix series can be supplied as a full system with controls, operating units and accessories.



Features

- Designed for medical devices
- Full system with controls, operating units and accessories
- Back up nut as standard
- Safety factor up to 4

Benefits

- Synchronization possible
- Silent operation
- Compact and aesthetic
- Back-up nut as standard

Matrix1

Linear actuator



Benefits

- Silent operation
- Full system with control unit, switch and accessories
- Synchronization possible
- Compact and aesthetic
- Back-up nut as standard

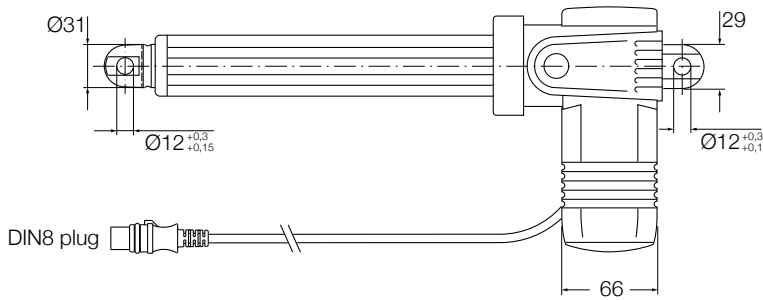
Technical data

| | Unit | MAX1..A.. | MAX1..B.. | MAX1..C.. |
|------------------------------|------|---------------------------|---------------------------|---------------------------|
| Rated push load | N | 4 000 | 2 000 | 1 500 |
| Rated pull load | N | 4 000 | 2 000 | 1 500 |
| Speed (full load to no load) | mm/s | 5 to 7 | 6 to 9 | 13 to 18 |
| Stroke | mm | 50 to 700 | 50 to 700 | 50 to 700 |
| Retracted length | mm | S + 195/260 ¹⁾ | S + 195/260 ¹⁾ | S + 195/260 ¹⁾ |
| Voltage | V DC | 24 | 24 | 24 |
| Power consumption | W | 120 | 120 | 120 |
| Current consumption | A | 5 | 5 | 5 |
| Duty cycle | % | 10 (1/9) | 10 (1/9) | 10 (1/9) |
| Ambient temperature | °C | 0 to +40 | 0 to +40 | 0 to +40 |
| Degree of protection | IP | 66S | 66S | 66S |
| Weight (at 200 mm stroke) | kg | 4 | 3,7 | 3,6 |
| Color | – | Grey | Grey | Grey |

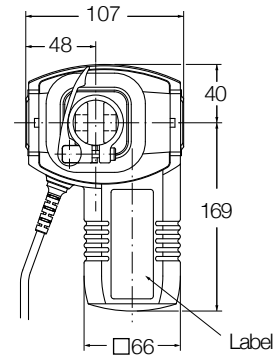
¹⁾ S < 350 mm, L = 195 + S
S > 350 mm, L = 260 + S

Dimensional drawing

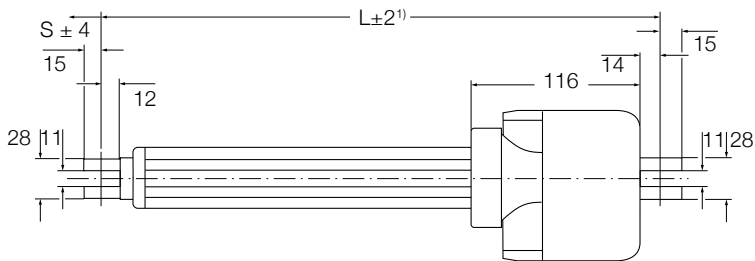
Side view



Front view

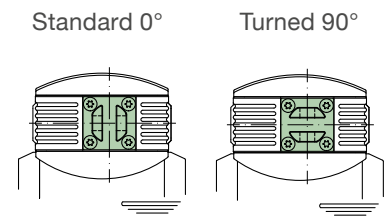


Top view

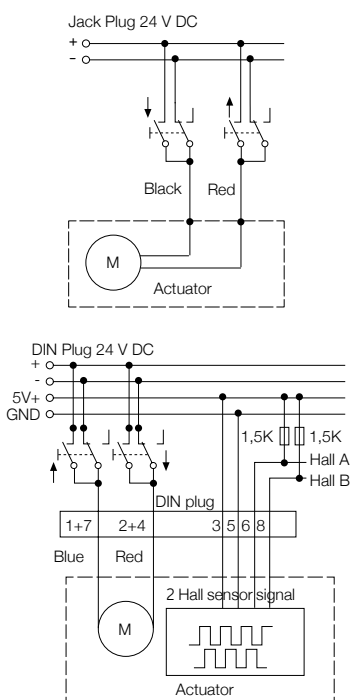


¹⁾ S < 350 mm; L = 195 + S
S > 350 mm; L = 260 + S

Rear view



Connecting diagrams



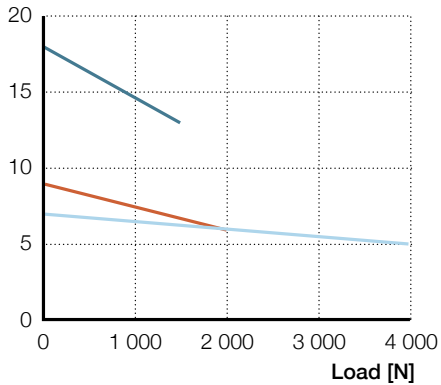
Suitable control units and accessories

| | Control units | | | |
|---------------------------|---------------|-------------|-----|-------------|
| | SCU | VCU | BCU | MCU |
| MAX 1 | • | • | • | • |
| Operating switches | | | | |
| EHA 1 | | | | • |
| EHA 3 | • | • | • | |
| STJ | • | • | • | |
| STF | | | | • |
| STE | • | • | • | |
| STA | | | | • |
| Hand switch | | Foot switch | | Desk switch |

Performance diagrams

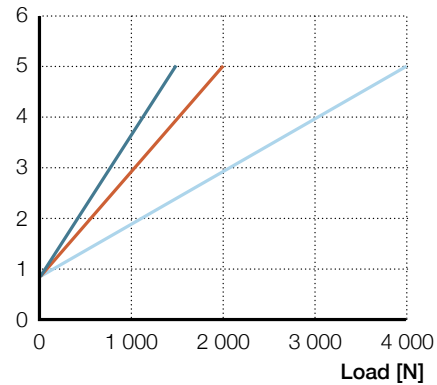
Speed-load diagram

Speed [mm/s]



Current-load diagram

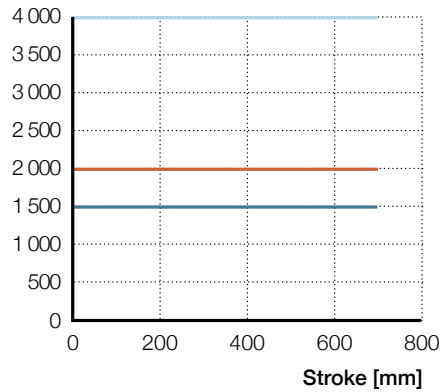
Current consumption [A]



— Rated push force 1 500 — Rated push force 2 000 — Rated push force 4 000

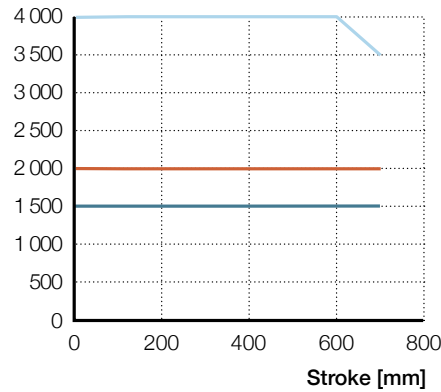
Safety factor load conditions

Load [N]



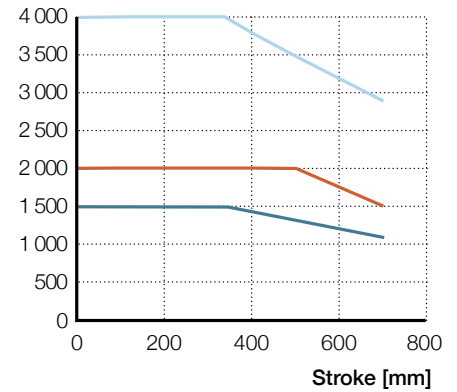
Push load reduction static
Safety factor S=1

Load [N]



Push load reduction static
Safety factor S=2

Load [N]



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

— Rated push force 1 500 — Rated push force 2 000 — Rated push force 4 000

Matrix3

Linear actuator



Benefits

- Silent operation
- Full system with control unit, switch and accessories
- Synchronization possible
- Compact and aesthetic
- Back-up nut as standard

Technical data

| | Unit | MAX3..A.. | MAX3..B.. | MAX3..C.. |
|------------------------------|------|---------------------------|---------------------------|---------------------------|
| Rated push load | N | 8 000 | 4 000 | 3 000 |
| Rated pull load | N | 6 000 ¹⁾ | 4 000 | 3 000 |
| Speed (full load to no load) | mm/s | 5 to 7 | 6 to 9 | 13 to 18 |
| Stroke | mm | 50 to 700 | 50 to 700 | 50 to 700 |
| Retracted length | mm | S + 215/280 ²⁾ | S + 215/280 ²⁾ | S + 215/280 ²⁾ |
| Voltage | V DC | 12 or 24 | 12 or 24 | 12 or 24 |
| Power consumption | W | 120 | 120 | 120 |
| Current consumption | A | 5 | 5,2 | 5,2 |
| Duty cycle | % | 10 (1/9) | 10 (1/9) | 10 (1/9) |
| Ambient temperature | °C | 0 to +40 | 0 to +40 | 0 to +40 |
| Degree of protection | IP | 66S | 66S | 66S |
| Weight (at 200 mm stroke) | kg | 4,5 | 4,2 | 4 |
| Color | – | Grey | Grey | Grey |

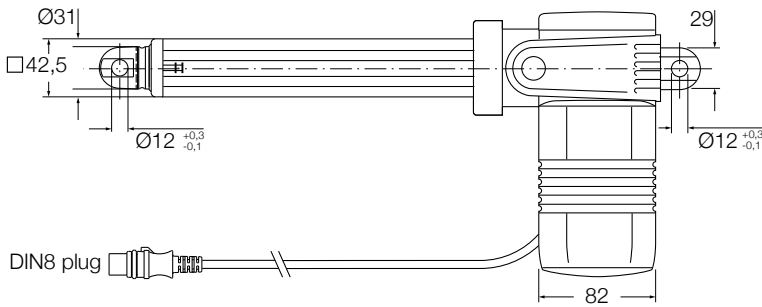
¹⁾ Max load for medical application is 5 000 N

²⁾ S ≤ 350 mm; L = S + 215

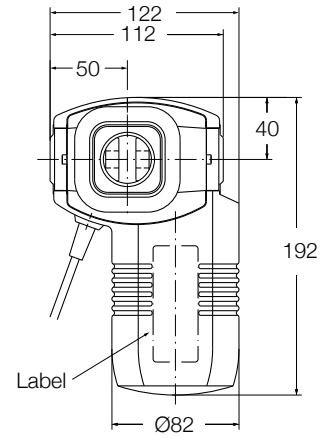
S > 350 mm; L = S + 280

Dimensional drawing

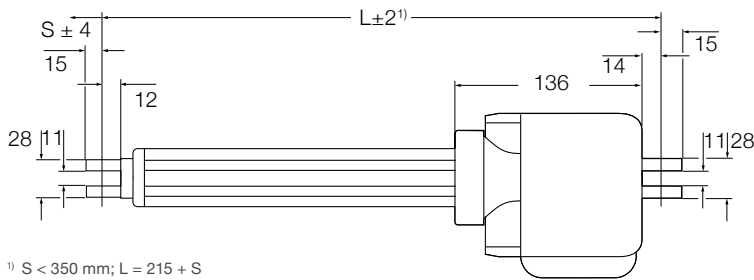
Side view



Front view

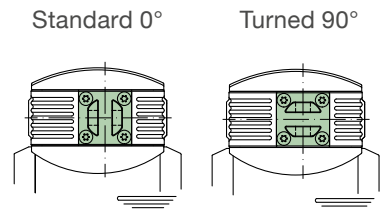


Top view

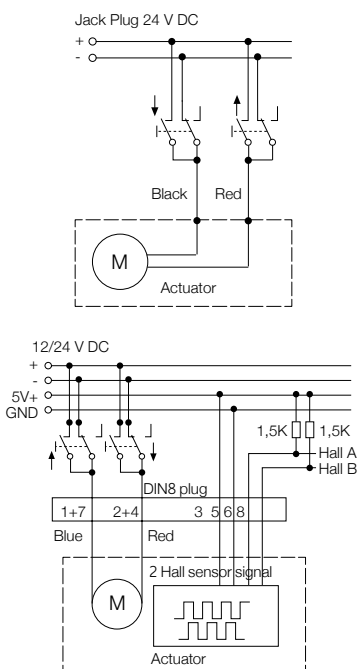


¹⁾ S < 350 mm; L = 215 + S
S > 350 mm; L = 280 + S

Rear view



Connecting diagrams



¹⁾ Only valid for MAX 31. MAX 30 must be operated by a BCU, MCU, SCU or VCU control unit.

Suitable control units and accessories

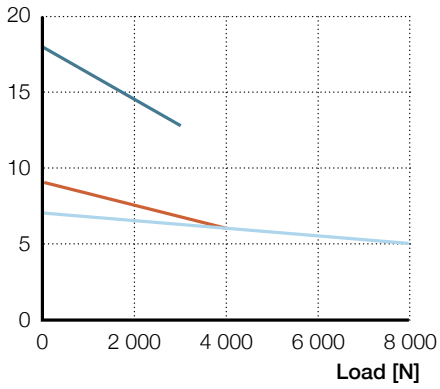
| | Control units | | | |
|---------------------------|---------------|-----|-----|-----|
| | SCU | VCU | BCU | MCU |
| MAX 3 | • | • | • | • |
| Operating switches | | | | |
| EHA 1 | | | | • |
| EHA 3 | • | • | • | |
| STJ | • | • | • | |
| STF | | | | • |
| STE | • | • | • | |
| STA | | | | • |

Hand switch
 Foot switch
 Desk switch

Performance diagrams

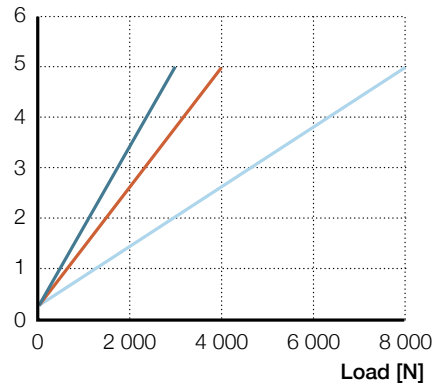
Speed-load diagram

Speed [mm/s]



Current-load diagram

Current consumption [A]



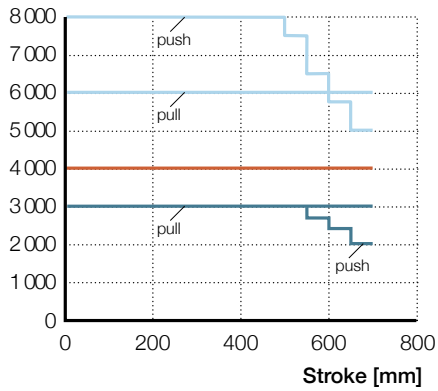
— Rated push force 3 000

— Rated push force 4 000

— Rated push force 8 000

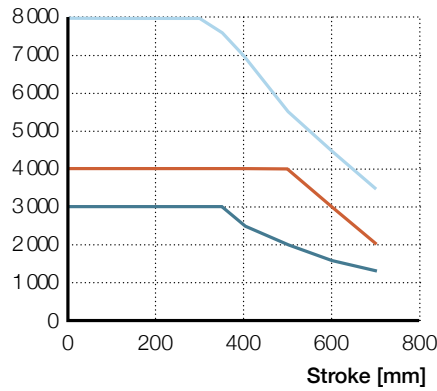
Safety factor load conditions

Load [N]



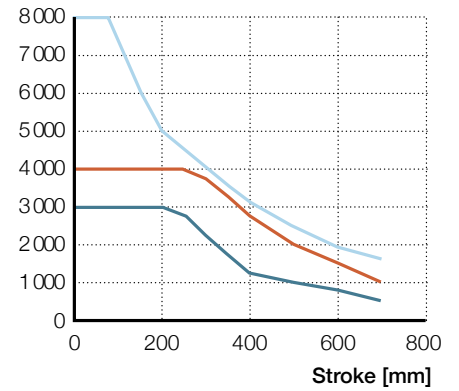
Push load reduction static
Safety factor S=1

Load [N]



Push load reduction static
Safety factor S=2

Load [N]



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

— Rated push force 3 000

— Rated push force 4 000

— Rated push force 8 000

Matrix7

Linear actuator



Benefits

- Universal power supply
- Power indicator
- Plug and play with integrated control unit
- Designed for medical devices, compliant to IEC 60601-1

Technical data

| | Unit | MAX7..A.. | MAX7..B.. | MAX7..C.. |
|------------------------------|----------|---------------------------|---------------------------|---------------------------|
| Rated push load | N | 8 000 | 4 000 | 3 000 |
| Rated pull load | N | 6 000 ¹⁾ | 4 000 | 3 000 |
| Speed (full load to no load) | mm/s | 6 to 7,5 | 8 to 10 | 13 to 18 |
| Stroke | mm | 50 to 700 | 50 to 700 | 50 to 700 |
| Retracted length | mm | S + 215/280 ²⁾ | S + 215/280 ²⁾ | S + 215/280 ²⁾ |
| Voltage | V | 100-240 AC 50/60 Hz | 100-240 AC 50/60 Hz | 100-240 AC 50/60 Hz |
| Power consumption | W | 180 | 180 | 180 |
| Current consumption | 100 V AC | A | 3,2 | 3,2 |
| | 240 V AC | A | 1,6 | 1,6 |
| Duty cycle | % | 10 (1/9) | 10 (1/9) | 10 (1/9) |
| Ambient temperature | °C | 0 to +40 | 0 to +40 | 0 to +40 |
| Degree of protection | IP | 66S | 66S | 66S |
| Weight (at 200 mm stroke) | kg | 4,8 | 4,5 | 4,2 |
| Color | – | Grey | Grey | Grey |

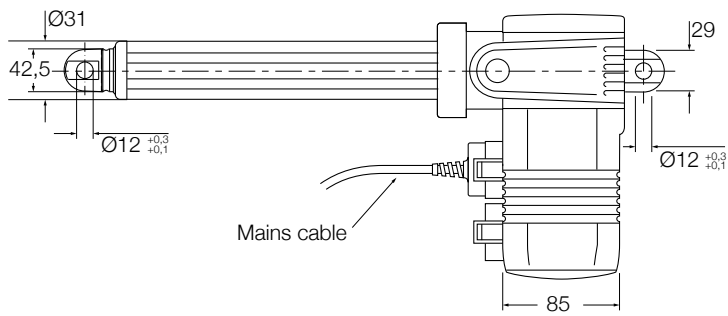
¹⁾ Max load for medical application is 5 000 N

²⁾ S < 350 mm; L = S + 215

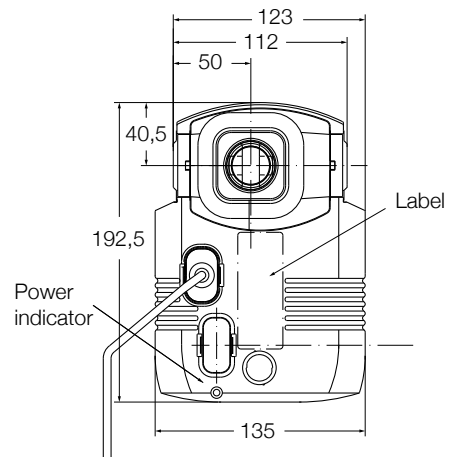
S > 350 mm; L = S + 280

Dimensional drawing

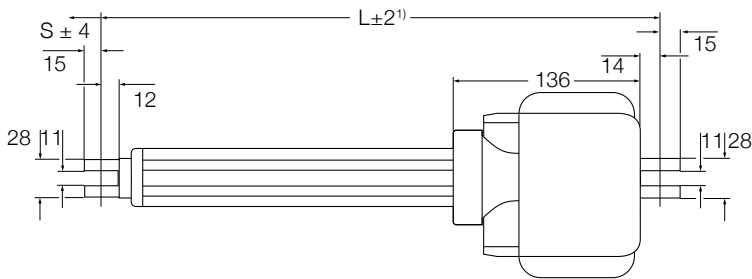
Side view



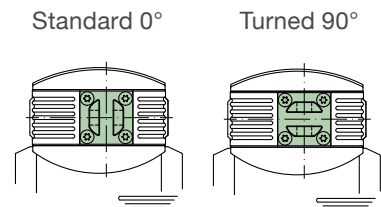
Front view



Top view

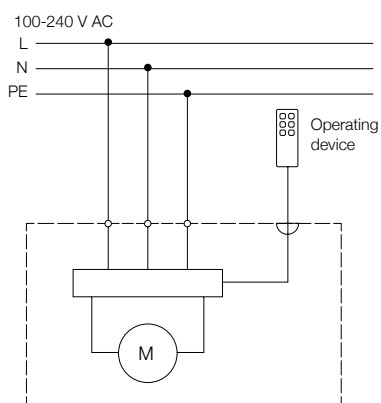


Rear view



¹⁾ S < 350 mm; L = 215 + S
S > 350 mm; L = 280 + S

Connecting diagrams



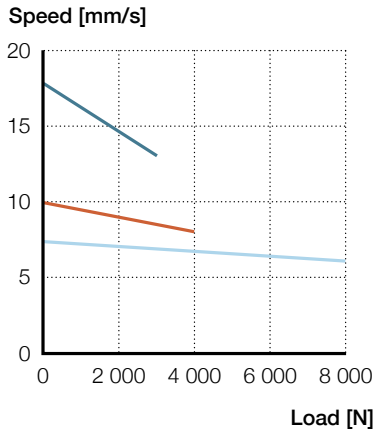
Suitable operating switches

| | Operating switches | | | | | |
|----------|--------------------|-----|-----|-----|-----|-----|
| | | | | | | |
| | EHA1 | PHC | STF | PFP | STA | PAM |
| MAX70 | | | | | | |
| MAX72/74 | | | | | | |

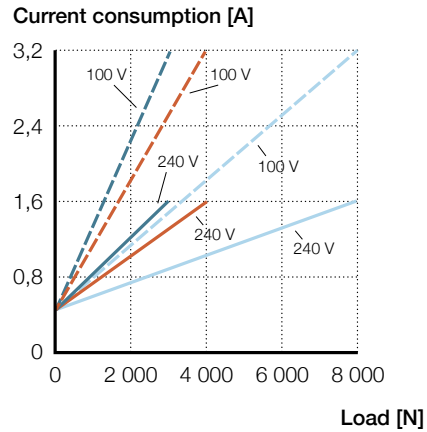
Hand switch
 Foot switch
 Desk switch

Performance diagrams

Speed-load diagram

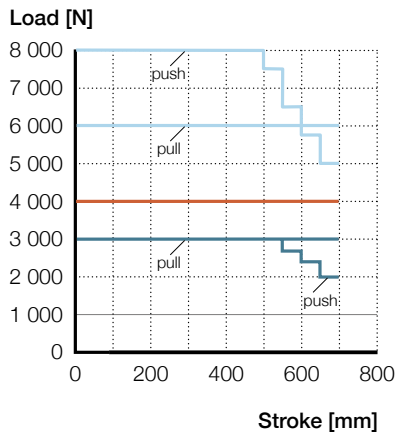


Current-load diagram

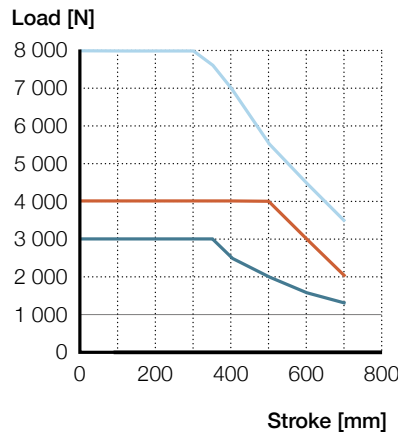


— Rated push force 3 000 — Rated push force 4 000 — Rated push force 8 000

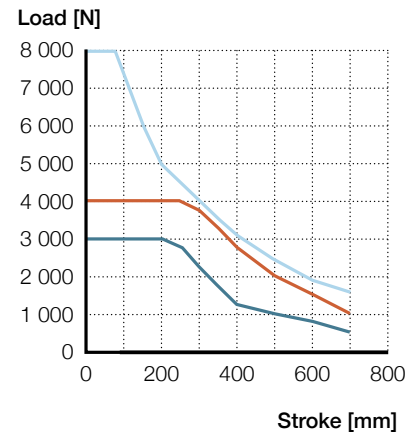
Safety factor load conditions



Push load reduction static
Safety factor S=1



Push load reduction static
Safety factor S=2



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

— Rated push force 3 000 — Rated push force 4 000 — Rated push force 8 000

Accessories

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

Runner

Linear actuator



Benefits

- High push/pull load
- Compact
- Back-up nut as standard
- High safety factor
- Silent operation

Technical data

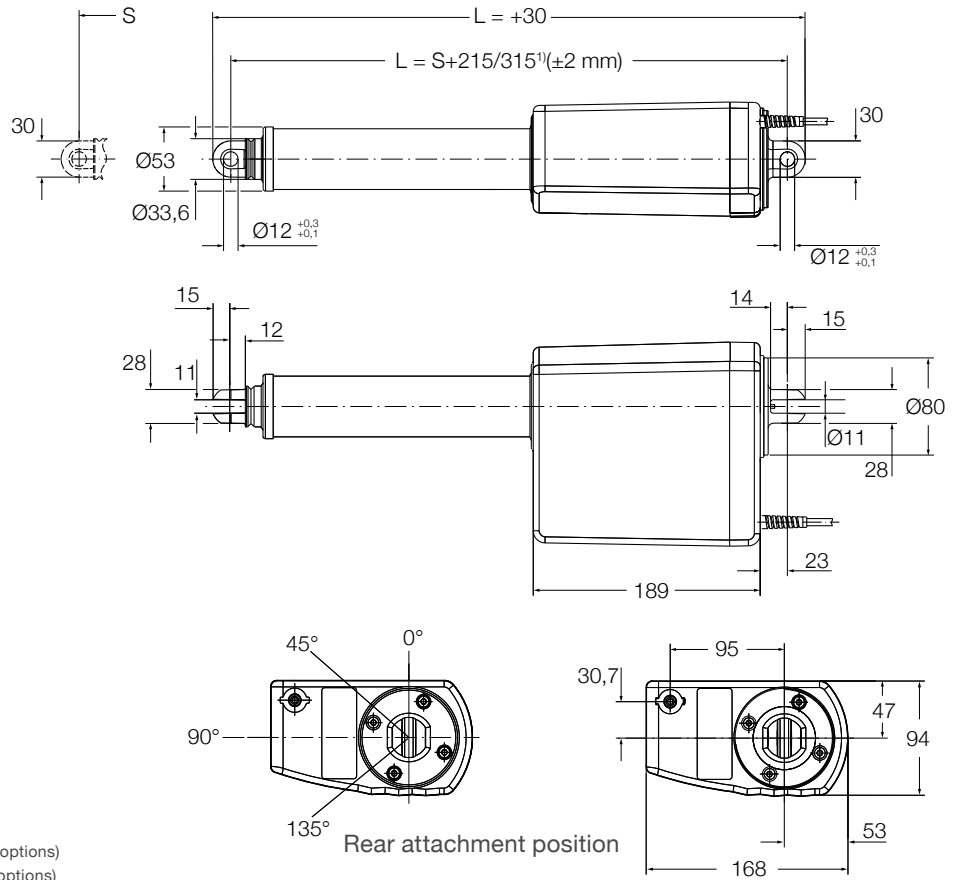
| | Unit | RU20 | RU21 | RU22 | RU23 | RU24 | RU25 |
|------------------------------|------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Rated push load | N | 8 000 | 10 000 | 12 000 ¹⁾ | 8 000 | 10 000 | 12 000 ¹⁾ |
| Rated pull load | N | 8 000 | 8 000 | 8 000 | 8 000 | 8 000 | 8 000 |
| Speed (full load to no load) | mm/s | 7 to 10 | 5 to 8 | 4 to 7 | 8 to 15 | 6 to 12 | 5 to 9 |
| Stroke | mm | 50 to 700 | 50 to 700 | 50 to 700 | 50 to 700 | 50 to 700 | 50 to 700 |
| Retracted length | mm | S+215/315 ²⁾ | S+215/315 ²⁾ | S+215/315 ²⁾ | S+215/315 ²⁾ | S+215/315 ²⁾ | S+215/315 ²⁾ |
| Voltage | V DC | 24 | 24 | 24 | 24 | 24 | 24 |
| Power consumption | W | N/A | N/A | N/A | N/A | N/A | N/A |
| Current consumption | A | 7 | 7 | 7 | 10 | 10 | 10 |
| Duty cycle | % | 10 (1/9) | 10 (1/9) | 10 (1/9) | 10 (1/9) | 10 (1/9) | 10 (1/9) |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | x4/x6S | x4/x6S | x4/x6S | x4/x6S | x4/x6S | x4/x6S |
| Weight | kg | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 |
| Color | – | Grey | Grey | Grey | Grey | Grey | Grey |

| | Unit | RU30 | RU31 | RU32 | RU33 | RU34 | RU35 |
|------------------------------|------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| Rated push load | N | 8 000 | 10 000 | 12 000 ¹⁾ | 8 000 | 10 000 | 12 000 ¹⁾ |
| Rated pull load | N | 8 000 | 8 000 | 8 000 | 8 000 | 8 000 | 8 000 |
| Speed (full load to no load) | mm/s | 14 to 15 | 11 to 13 | 9 to 10 | 17 to 24 | 14 to 20 | 11 to 15 |
| Stroke | mm | 50 to 700 | 50 to 700 | 50 to 700 | 50 to 700 | 50 to 700 | 50 to 700 |
| Retracted length | mm | S+215/315 ²⁾ | S+215/315 ²⁾ | S+215/315 ²⁾ | S+215/315 ²⁾ | S+215/315 ²⁾ | S+215/315 ²⁾ |
| Voltage | V DC | 36 | 36 | 36 | 36 | 36 | 36 |
| Power consumption | W | N/A | N/A | N/A | N/A | N/A | N/A |
| Current consumption | A | 7 | 7 | 7 | 10 | 10 | 10 |
| Duty cycle | % | 10 (1/9) | 10 (1/9) | 10 (1/9) | 10 (1/9) | 10 (1/9) | 10 (1/9) |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | x4/x6S | x4/x6S | x4/x6S | x4/x6S | x4/x6S | x4/x6S |
| Weight | kg | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 |
| Color | – | Grey | Grey | Grey | Grey | Grey | Grey |

¹⁾ Safety working load for medical application is 10 000 N (EN 60601)

²⁾ S ≤ 500 mm; L = S + 215
S > 500 mm; L = S + 315

Dimensional drawing



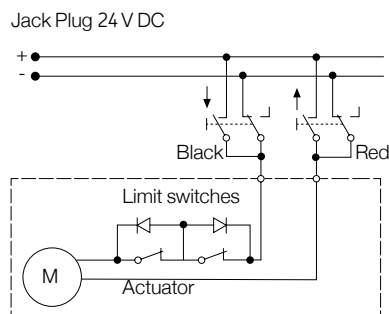
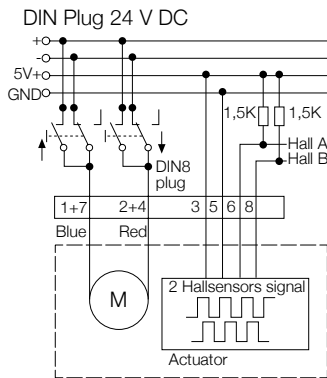
Legend:

S = stroke
L = retracted length

¹⁾ Retracted length:
up to 500 mm stroke: stroke +215 mm (plus options)
from 500 mm stroke: stroke +315 mm (plus options)



Connecting diagrams



Suitable control units and accessories

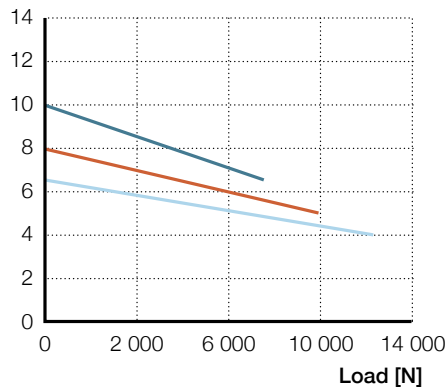
| | Control units | | | |
|---------------------------|---------------|-----|-----|-----|
| | SCU | VCU | BCU | MCU |
| RU20, RU21, RU22 | • | • | • | • |
| RU23, RU24, RU25 | • | • | • | • |
| Operating switches | | | | |
| EHA 1 | | | | • |
| EHA 3 | • | • | • | |
| STJ | • | • | • | |
| STF | | | | • |
| STE | • | • | • | |
| STA | | | | • |

Hand switch Foot switch Desk switch

Performance diagrams

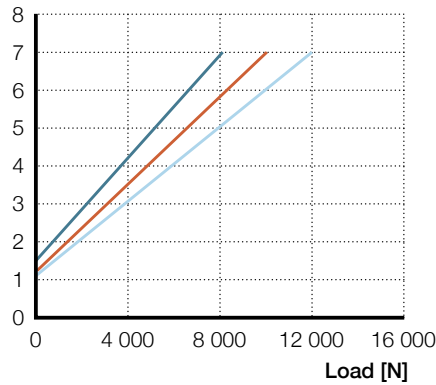
Speed-load diagrams

Speed [mm/s]



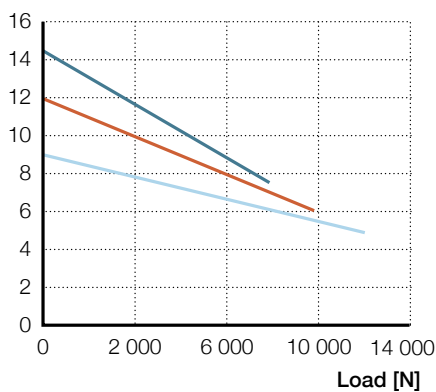
Current-load diagrams

Current consumption [A]

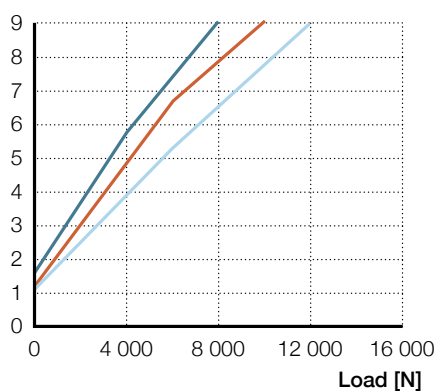


- Rated push load 8 000 RU20
- Rated push load 10 000 RU21
- Rated push load 12 000 RU22

Speed [mm/s]

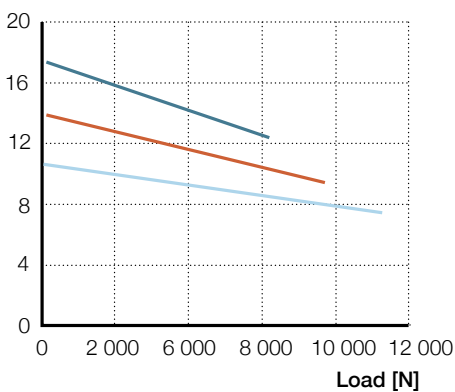


Current consumption [A]

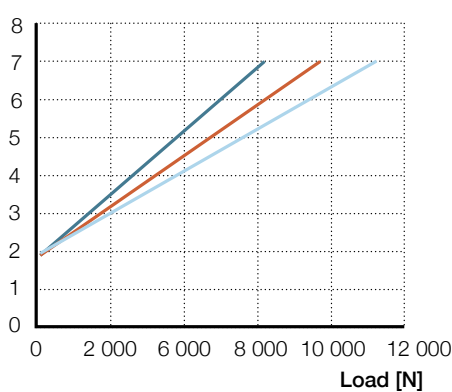


- Rated push load 8 000 RU23
- Rated push load 10 000 RU24
- Rated push load 12 000 RU25

Speed [mm/s]

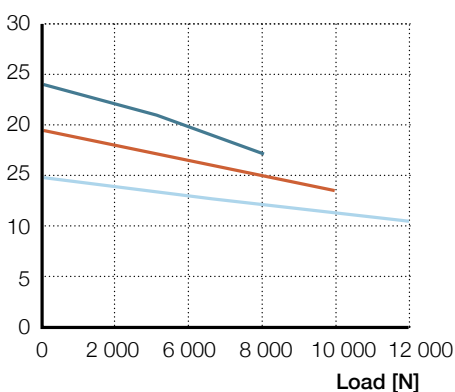


Current consumption [A]

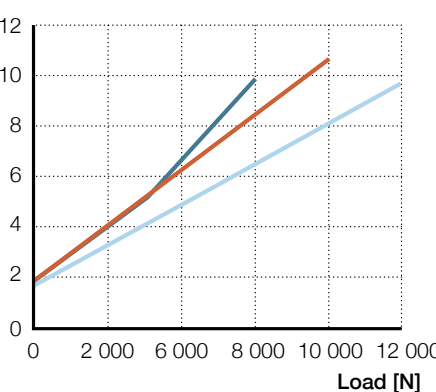


- Rated push load 8 000 RU30
- Rated push load 10 000 RU31
- Rated push load 12 000 RU32

Speed [mm/s]

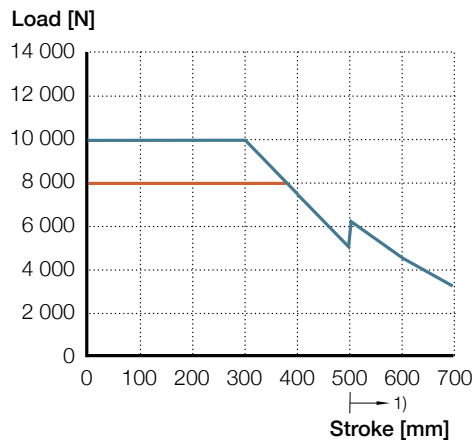


Current consumption [A]



- Rated push load 8 000 RU33
- Rated push load 10 000 RU34
- Rated push load 12 000 RU35

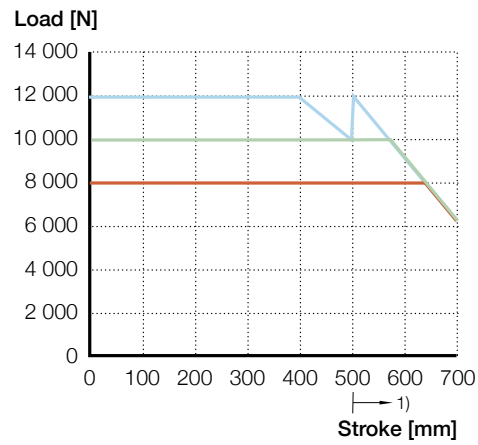
Safety factor load conditions



Push load limit, safety factor ²⁾ S=4 (EN 60601)

¹⁾ retracted length extension at stroke >500 mm
²⁾ with option "Emergency lowering", safety factor S=2.5

— RU21 RU22 RU24 RU25 — RU20 RU23
 RU31 RU32 RU34 RU35 RU30 RU33



Push load limit, safety factor S=2

¹⁾ retracted length extension at stroke >500 mm

— RU22 RU25 — RU21 RU24
 RU32 RU35 RU31 RU34



Ordering key



Type

Voltage

- 2 24 V DC
- 3 36 V DC

Load / Speed

| | 24 V DC | 36 V DC |
|---|----------------------|---------------|
| 0 | 8 000 N / 7-10 mm/s | 14 to 15 mm/s |
| 3 | 8 000 N / 8-15 mm/s | 17 to 24 mm/s |
| 1 | 10 000 N / 5-8 mm/s | 11 to 13 mm/s |
| 4 | 10 000 N / 6-12 mm/s | 14 to 20 mm/s |
| 2 | 12 000 N / 4-7 mm/s | 9 to 10 mm/s |
| 5 | 12 000 N / 5-9 mm/s | 11 to 15 mm/s |

Stroke (S) / Retracted length (L)

- 050 315 50 mm / 315 mm
- 100 315 100 mm / 315 mm
- 150 365 150 mm / 365 mm
- 200 415 200 mm / 415 mm
- 250 465 250 mm / 465 mm
- 300 515 300 mm / 515 mm
- 350 565 350 mm / 565 mm
- 400 615 400 mm / 615 mm
- 450 665 450 mm / 665 mm
- 500 715 500 mm / 715 mm
- 550 865 550 mm / 865 mm
- 600 915 600 mm / 915 mm
- 650 965 650 mm / 965 mm
- 700 XXX 700 mm / 1 015 mm
- SSS LLL 50 < S ≤ 500 mm / S+215
- SSS LLL 500 < S < 700 mm / S+315
- XXX XXX S > 700 mm (customized)

Degree of protection / Color

- A IP×4S, grey
- B IP×6S, grey

Cable

- 15 Straight cable, 1,5 m, DIN8 plug
- 0D Straight cable, 1,5 m, Jack plug 180°

Rear attachment orientation

- 0 0°
- 2 45°
- 4 90°
- 6 135°

Option 1

- 0 No option
- K Electrical anti-pinching (safety switch), pull load, L+20 mm
- L Electrical anti-pinching (safety switch), push load, L+20 mm
- M Mechanical end stop, L+25 mm
- N Electrical anti-pinching, pull load, with mechanical end stop, L+45 mm
- P Electrical anti-pinching, push load, with mechanical end stop, L+45 mm

Option 2

- 0 No option
- A 2-Hall encoder, 14 pulses, DIN8 plug

Option 3

- No option
- V Emergency lowering, L+53 mm (for push load only)

Customized

Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.



CAJA35C

Linear actuator

Benefits

- Quick-release solution for fast CPR intervention
- Detachable cable for quick assembly and service
- Integrated brake to maintain self-locking and stability under maximum static load in compression



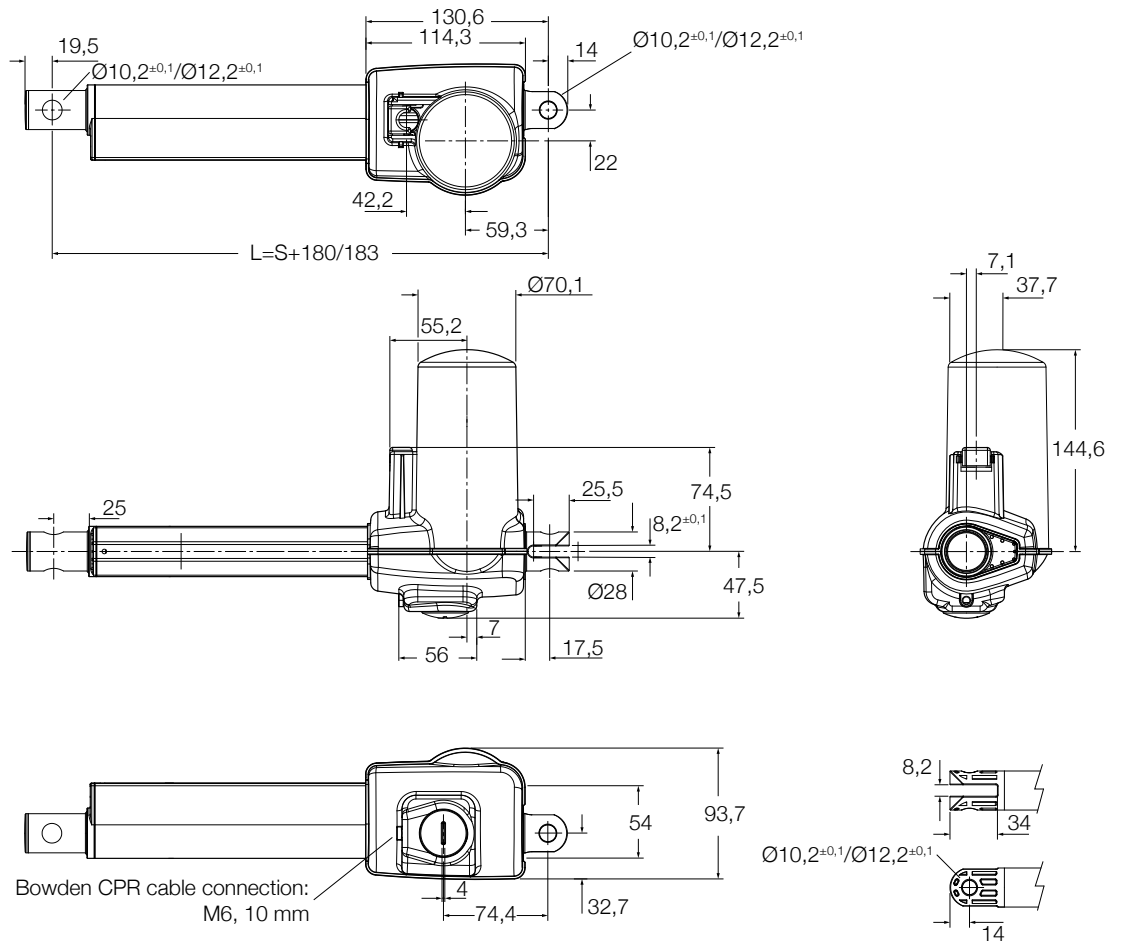
Technical data

| | Unit | CAJA35C |
|--------------------------------|------|---------------------|
| Push load | N | 3 500 |
| Speed (full load to no load) | mm/s | 5,5 to 8,5 |
| Stroke | mm | 30 to 250 |
| Retracted length ¹⁾ | mm | S+180 ²⁾ |
| Voltage | V DC | 24 |
| Current consumption | A | 4 |
| Duty cycle | % | 10 |
| Ambient temperature | °C | +10 to +40 |
| Degree of protection | IP | 56 |
| Weight | kg | 2,5 |
| Color | – | Grey |

¹⁾ Tolerance ±3 mm

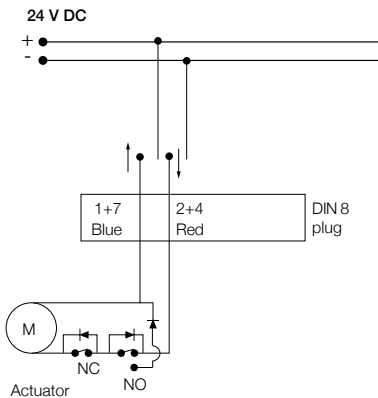
²⁾ Retracted length +3 mm if U fork used as front attachment (L = S + 183)

Dimensional drawing









Legend:
 S = stroke
 L = retracted length

Connecting diagrams
 DC version



Suitable control units and accessories

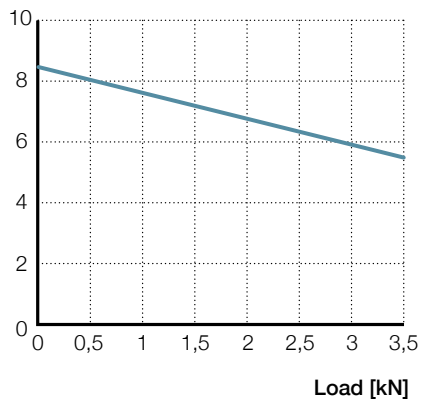
| | Control units | | |
|---|---------------|-----|-----|
| | SCU | VCU | BCU |
| CAJA 35C | • | • | • |
| Operating switches | | | |
| EHA 3  | • | • | • |
| STJ  | • | • | • |
| STE  | • | • | • |

 Hand switch  Foot switch  Desk switch

Performance diagrams

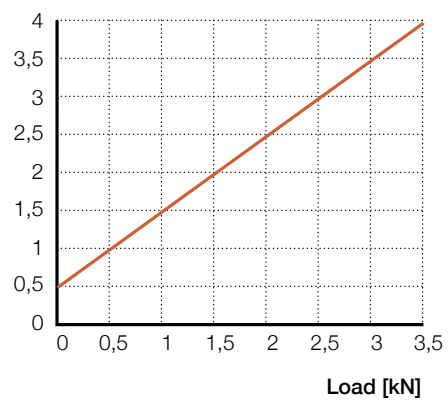
Speed-load diagram

Speed [mm/s]

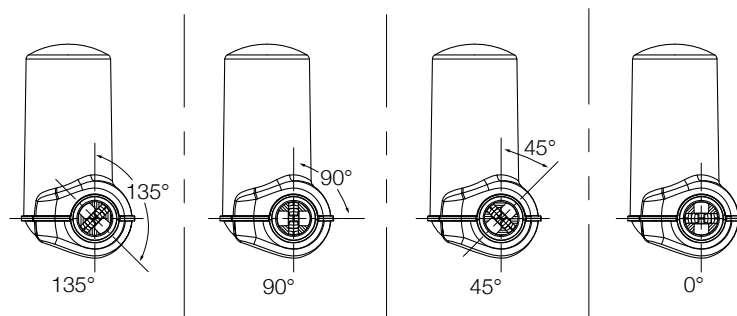


Current-load diagram

Current consumption [A]



Orientation



Accessories

| Straight motor cable | Length [mm] |
|----------------------|-------------|
| G517C0-094001-0460 | 460 |
| G517C0-094001-1350 | 1 350 |
| G517C0-094001-2650 | 2 650 |

Ordering key

Type _____

Stroke _____

100 100 mm
200 200 mm
250 250 mm
XXX All other customized strokes between 30-250 mm

Rear attachment _____

A U-fork, metal, Ø10,2 mm
B U-fork, metal, Ø12,2 mm

Front attachment _____

A Tube with hole and metal bushings, Ø10,2 mm
B Tube with hole and metal bushings, Ø12,2 mm
C U-fork end, metal, Ø10,2 mm (increase "L" by 3 mm)
D U-fork end, metal, Ø12,2 mm (increase "L" by 3 mm)

Attachment orientation (clockwise) _____

0 0°
1 45°
9 90°
2 135°

Housing material _____

ABS UL94 V0

Protection class (with power cables M6, 10 mm connected) _____

IP56

Option 1 _____

0 No option
1 Antipinching solution ("push only" actuator)

Option 2 _____

0 No option
1 With back-up nut (for "push" load)

Option 3 _____

0 No option
1 Motor with thermoswitch

Customization _____

000 Standard series

Ecomag

Linear actuator

Benefits

- Compact
- Cost effective
- Silent operation
- Control unit can be mounted to the actuator

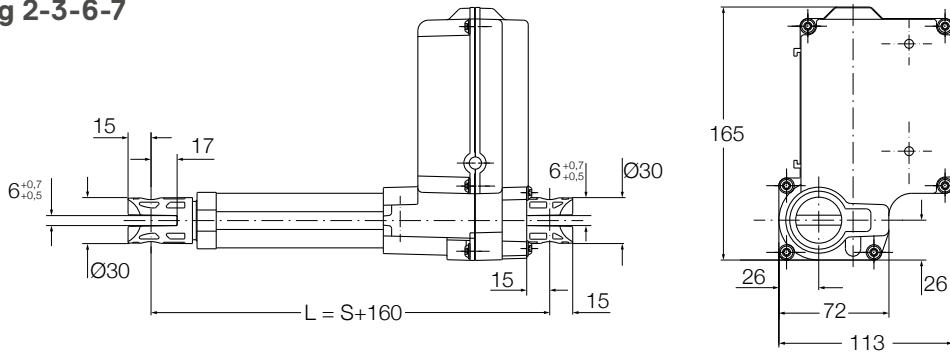


Technical data

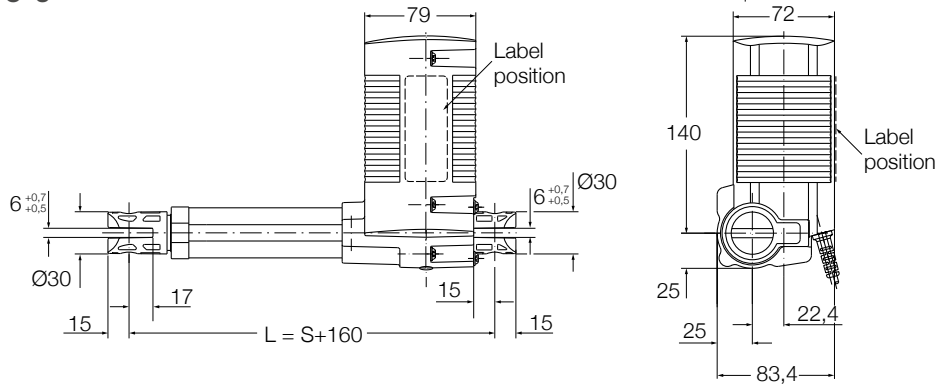
| | Unit | ECO 20/40 | ECO 60/80 | ECO 30/50 | ECO 70/90 |
|------------------------------|------|---------------|---------------|---------------|---------------|
| Rated push load | N | 2 000 | 6 000 | 2 000 | 6 000 |
| Rated pull load | N | 0 | 0 | 2 000 | 4 000 |
| Speed (full load to no load) | mm/s | 9 to 13 | 4 to 7 | 9 to 13 | 4 to 7 |
| Stroke | mm | 50 to 300 | 50 to 300 | 50 to 300 | 50 to 300 |
| Retracted length | mm | S+160 | S+160 | S+160 | S+160 |
| Voltage | V DC | 24 | 24 | 24 | 24 |
| Power consumption | W | 70 | 120 | 70 | 120 |
| Current consumption | A | 4 | 6 | 4 | 6 |
| Duty cycle | % | 10 (1/9) | 10 (1/9) | 10 (1/9) | 10 (1/9) |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | ×4S | ×4S | ×4S | ×4S |
| Weight | kg | 2,1 | 2,1 | 2,5 | 2,5 |
| Color | – | Black or grey | Black or grey | Black or grey | Black or grey |

Dimensional drawing

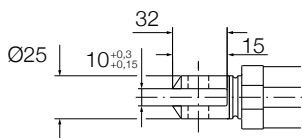
Ecomag 2-3-6-7



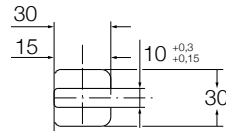
Ecomag 4 -5-8-9



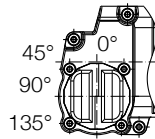
Front attachment
push and pull version



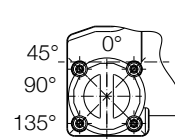
Rear attachment
push and pull version



Rear attachment
position



Push version only



Push and pull version

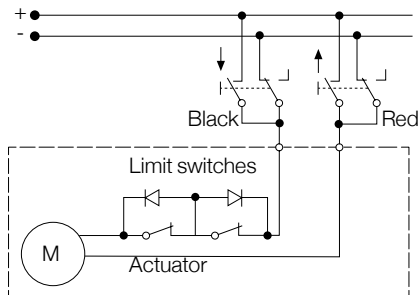
Legend:

S = stroke

L = retracted length

Connecting diagrams

Jack Plug 24 V DC



Suitable control units and accessories

| | Control units | | | | |
|---------------------------|---------------|-----|-----|-----|-----|
| | SCU | VCU | BCU | MCU | SEM |
| ECOMAG | • | • | • | • | • |
| Operating switches | | | | | |
| EHA 1 | Hand switch | | | | |
| EHA 3 | Hand switch | | | | |
| EHE | Hand switch | | | | |
| STJ | Foot switch | | | | |
| STF | Foot switch | | | | |
| STA | Desk switch | | | | |
| STE | Desk switch | | | | |

Hand switch

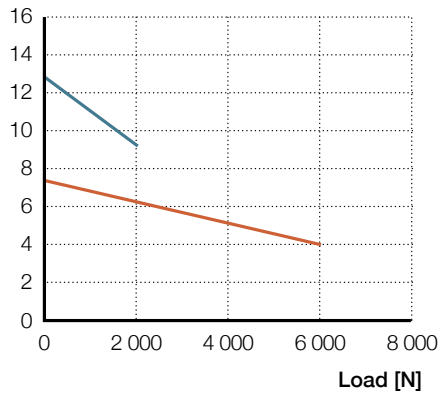
Foot switch

Desk switch

Performance diagrams

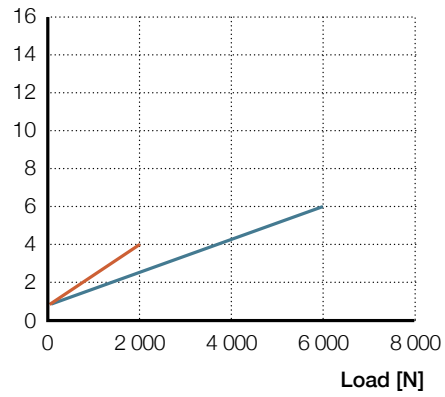
Speed-load diagram

Speed [mm/s]



Current-load diagram

Current consumption [A]

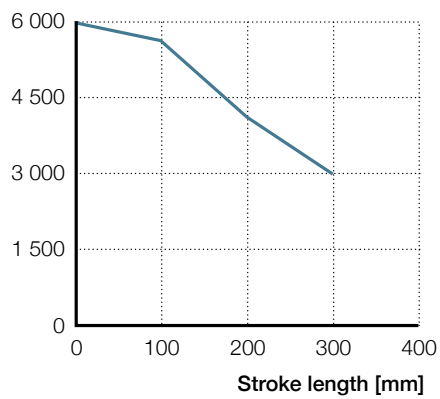


— ECO 20 / 30 / 40 / 50 — ECO 60 / 70 / 80 / 90

Safety factor load conditions

Push load reduction safety factor = 4

Push load [N]



Ordering key

Type _____

Load /Housing

| | Push | Pull | Housing |
|---|---------|---------|---------|
| 2 | 2 000 N | 0 N | Large |
| 3 | 2 000 N | 2 000 N | Large |
| 4 | 2 000 N | 0 N | Small |
| 5 | 2 000 N | 2 000 N | Small |
| 6 | 6 000 N | 0 N | Large |
| 7 | 6 000 N | 4 000 N | Large |
| 8 | 6 000 N | 0 N | Small |
| 9 | 6 000 N | 4 000 N | Small |

Encoder _____

0 No encoder, coiled cable, 2-pin Minitit plug or customization
 9 No encoder, coiled cable, DIN8 plug or customization
 F 2-Hall encoder, 8 pulses, straight cable, DIN8 plug (small housing only)

Current cut-off _____

0 No
 1 Yes (not available for ECO4.-/ECO5.-/ECO8.-/ECO9.-)

Stroke (S) _____

05 50 mm
 10 100 mm
 15 150 mm
 20 200 mm
 25 250 mm
 30 300 mm
 00 Other stroke lengths; 50<S<300 mm

Front attachment (groove depth 17 mm) _____

M Hole, Ø12 mm, groove width 10 mm
 X Customized

Rear attachment (groove depth 15 mm) _____

M Hole, w12 mm, groove width 10 mm
 X Customized

Orientation of rear attachment _____

1 0°
 3 45°
 5 90°
 7 135°

Color _____

A Black (available only for small housing)
 B Grey

Option _____

0 No option
 A Back-up nut (available only for drives with 6 kN, mandatory for IEC 60601-1) – only for ECO 7/9, L = +23 mm

Customization _____



Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

CAHB series

Linear actuator

CAHB series with 7 families of linear actuator, virtually maintenance-free, self-locking up to 2 times the rated load and up to IP69K/66M, covers low, medium and high loads for mobile applications,

Additional design options are available like limit switches, positioning feedback and manual override.

The smart CAHB-20S, CAHB-21S and CAHB-22S offer unique features at a competitive cost with integrated controller and advanced functions.



Features

New smart version CAHB-20S, -21S and -22S

- Integrated controller with I/O and CAN bus SAE J1939
- Motion with soft start / -stop and parallel movement of 2 actuators
- Key actuator functions monitoring with diagnostic

For all versions

- Electronic or mechanical overload protection and thermal protection
- Long stroke and high speed
- High holding force up to 20 000 N
- Low backlash
- Absolute or incremental Position feedback and limit switches option
- Manual override option
- Ingress protection IP69K/66M with vent
- Anti-rotation with free spinning (option for E design)
- Stainless steel push tube with anti rotation, free spinning attachment and corrosion protected metal parts
- Wide temperature range (-40 to 85 °C)
- High efficiency
- Virtually maintenance-free
- Mechanical, electrical and climatic tests

See **pages 130 to 135** for test results.

Benefits

- Higher productivity with fast and smooth movement
- Easy and quick integration into customer equipment
- Higher reliability and protection
- Cost effective and virtually maintenance-free
- Monitoring and onboard diagnostic

Performance overview of the CAHB series

| Family | Version | Rated force | Speed (up to) | Max stroke | Voltage | Smart | Page |
|----------------|------------------|-------------|---------------|------------|-----------------------------------|-----------------------|------|
| | | N | mm/s | mm | V | Integrated controller | |
| CAHB-10 xx A | CAHB-10-x1A | 120 | 56 | 300 | 12 or 24 VDC | No | 6 |
| | CAHB-10-x2A | 240 | 30 | 300 | 12 or 24 VDC | No | |
| | CAHB-10-x3A | 500 | 16 | 300 | 12 or 24 VDC | No | |
| | CAHB-10-x4A | 750 | 10 | 300 | 12 or 24 VDC | No | |
| | CAHB-10-x5A | 1 000 | 8 | 300 | 12 or 24 VDC | No | |
| | CAHB-10-x6A | 1 500 | 8 | 300 | 12 or 24 VDC | No | |
| CAHB-20 xx A | CAHB-20-x1A | 1 500 | 33 | 610 | 12 or 24 VDC | No | 12 |
| | CAHB-20-x2A | 2 500 | 17 | 610 | 12 or 24 VDC | No | |
| CAHB-20 xx E/S | CAHB-20-x1E or S | 1 500 | 31 | 700 | 12 or 24 or 48 or 24-48 VDC | Yes | 16 |
| | CAHB-20-x2E or S | 2 500 | 23 | 700 | 12 or 24 or 48 or 24-48 VDC | Yes | |
| | CAHB-20-x3E or S | 4 500 | 13 | 700 | 12 or 24 or 48 or 24-48 VDC | Yes | |
| CAHB-21 xx E/S | CAHB-21-x1E or S | 1 500 | 51 | 700 | 12 or 24 or 48 or 24-48 VDC | Yes | 20 |
| | CAHB-21-x2E or S | 2 500 | 41 | 700 | 12 or 24 or 48 or 24-48 VDC | Yes | |
| | CAHB-21-x3E or S | 4 500 | 23 | 700 | 12 or 24 or 48 or 24-48 VDC | Yes | |
| CAHB-22 xx E/S | CAHB-22-x1E or S | 2 300 | 57 | 700 | 12 or 24 or 48 or 24-48 VDC | Yes | 24 |
| | CAHB-22-x2E or S | 3 500 | 45 | 700 | 12 or 24 or 48 or 24-48 VDC | Yes | |
| | CAHB-22-x3E or S | 6 800 | 22 | 610 | 12 or 24 or 48 or 24-48 VDC | Yes | |
| | CAHB-22-x4E or S | 10 000 | 13 | 450 | 12 or 24 or 48 or 24-48 VDC | Yes | |
| CAHB-30 xx A | CAHB-30-x1A | 1 500 | 26 | 610 | 115 VAC / 60 Hz or 230 VAC / 50Hz | No | 42 |
| | CAHB-30-x2A | 2 300 | 13 | 610 | 115 VAC / 60 Hz or 230 VAC / 50Hz | No | |
| CAHB-31 xx N | CAHB-31-x1N | 2 300 | 57 | 610 | 115 VAC / 60 Hz or 230 VAC / 50Hz | No | 46 |
| | CAHB-31-x2N | 4 500 | 28 | 610 | 115 VAC / 60 Hz or 230 VAC / 50Hz | No | |
| | CAHB-31-x3N | 6 000 | 15 | 610 | 115 VAC / 60 Hz or 230 VAC / 50Hz | No | |



CAHB-10

Linear actuator

Benefits

- Designed and tested under demanding conditions
- Reliable and cost-effective
- Reduced overall set time
- Virtually maintenance-free

Features

- Compact and robust design, IP66S/69K, wide temperature range and corrosion resistant
- Integrated limit switches, optional absolute or incremental positioning feedback
- Integrated thermal protection



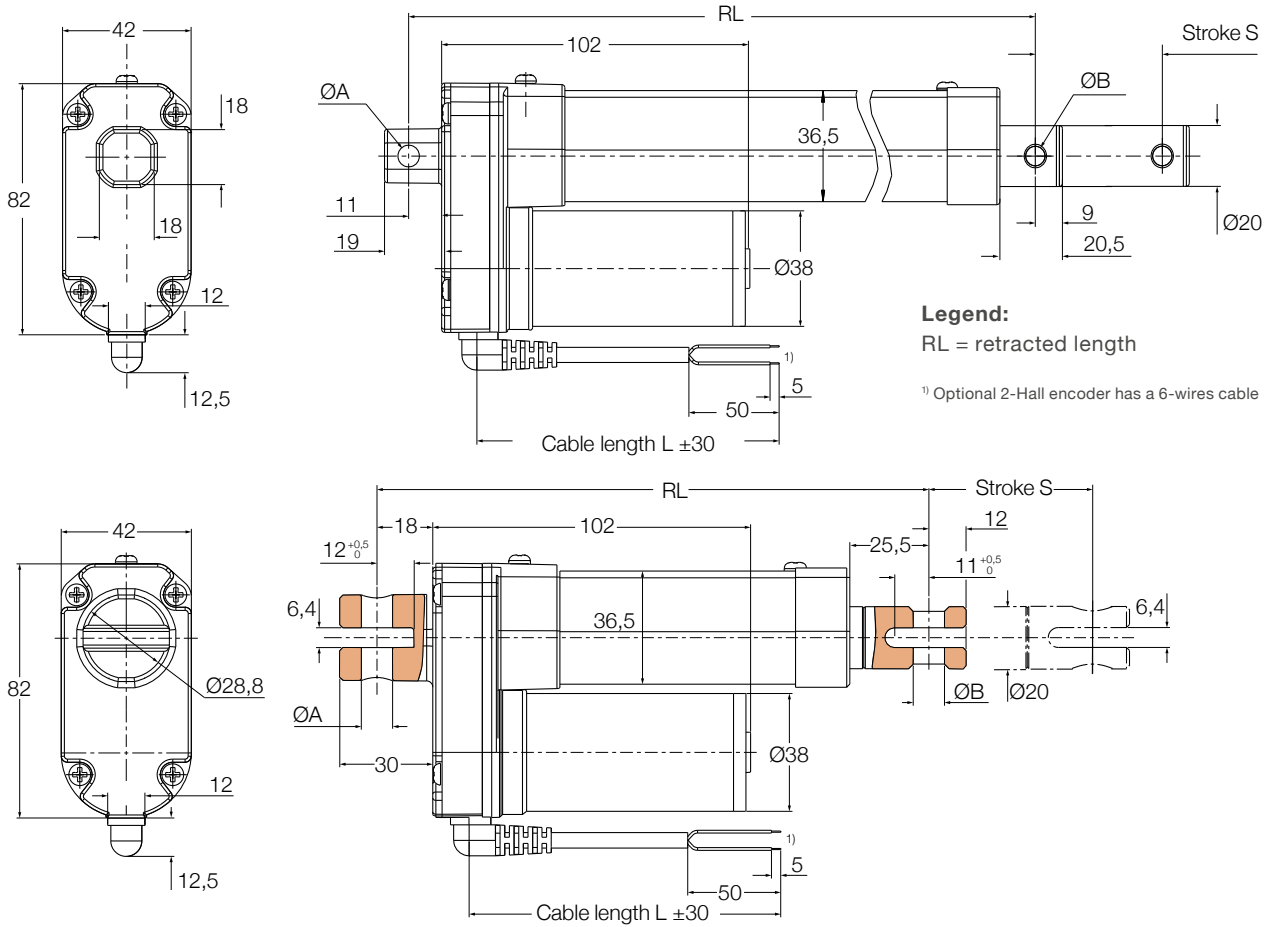
Technical data

| Designation | Unit | CAHB-10... 1 | CAHB-10... 2 | CAHB-10... 3 | CAHB-10... 4 | CAHB-10... 5 | CAHB-10... 6 |
|------------------------------|------|--------------|--------------|--------------|--------------|--------------|--------------|
| Rated push force | N | 120 | 240 | 500 | 750 | 1 000 | 1 500 |
| Rated pull force | N | 120 | 240 | 500 | 750 | 1 000 | 1 500 |
| Holding force ¹⁾ | N | 2 500 | 2 500 | 2 500 | 2 500 | 2 500 | 2 500 |
| Speed (full load to no load) | mm/s | 45 to 56 | 24 to 30 | 13 to 16 | 8 to 10 | 6 to 8 | 5 to 8 |
| Stroke | mm | 50 to 300 | 50 to 300 | 50 to 300 | 50 to 300 | 50 to 300 | 50 to 300 |
| Voltage | V DC | 12 or 24 | 12 or 24 | 12 or 24 | 12 or 24 | 12 or 24 | 12 or 24 |
| Nominal current 12 V DC | A | 4 | 3,5 | 3,2 | 3 | 2,8 | 4,4 |
| 24V DC | A | 2,2 | 2 | 1,8 | 1,8 | 1,6 | 2,8 |
| Duty cycle | % | 25 | 25 | 25 | 25 | 25 | 20 |
| Ambient temperature | °C | -40 to +85 | -40 to +85 | -40 to +85 | -40 to +85 | -40 to +85 | -40 to +85 |
| Type of protection | IP | 66s/69k | 66s/69k | 66s/69k | 66s/69k | 66s/69k | 66s/69k |
| Weight (at 300 mm stroke) | kg | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 | 1,5 |
| Color | - | Silver | Silver | Silver | Silver | Silver | Silver |
| Limit switches | - | Yes | Yes | Yes | Yes | Yes | Yes |
| Thermal protection | - | Yes | Yes | Yes | Yes | Yes | Yes |

¹⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards..

Dimensional drawing

Basic configuration and optional 2-Hall encoder



| Front / Rear attachment | Ø A | Ø B |
|--------------------------|----------------|----------------|
| Rod end with hole (A) | 6,4 (0, +0,1) | 6,4 (0, +0,1) |
| Rod end with hole (B) | 8,0 (0, +0,1) | 8,0 (0, +0,1) |
| Fork head with hole, (C) | 10,1 (0, +0,1) | 10,1 (0, +0,1) |

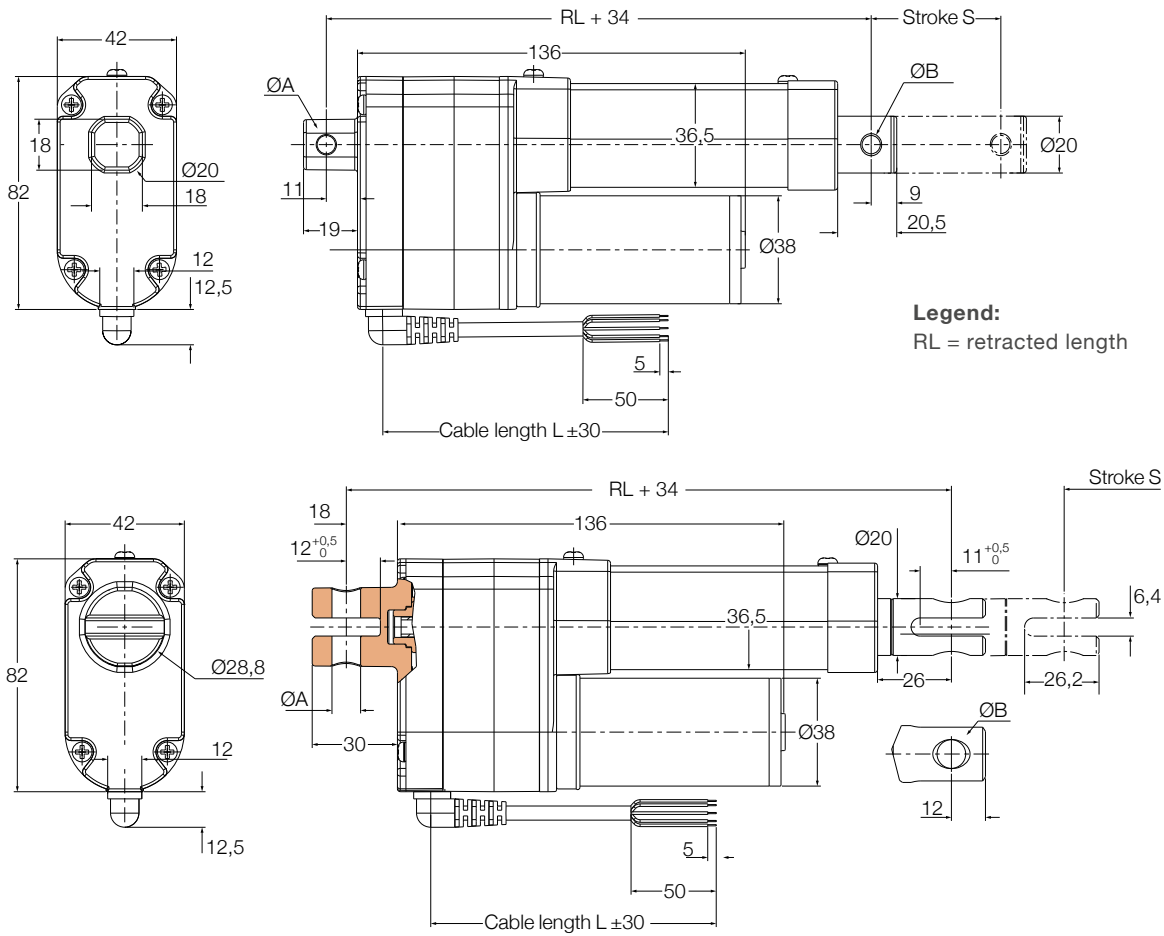
| | RL tolerance | S tolerance |
|------------------|--------------|-------------|
| CAHB10...1 and 2 | (-5, +1) | (-1, +5) |
| CAHB10...3 and 4 | (-3, +3) | (-3, +3) |
| CAHB10...5 and 6 | (-2, +4) | (-4, +2) |

Retracted length calculation (RL)

| Stroke [mm] | 50 | 100 | 150 | 200 | 250 | 300 |
|---|-----|-----|-----|-----|-----|-----|
| Retracted length (RL) with Rod end (Front) + Rod end (Rear) | 158 | 209 | 260 | 311 | 362 | 413 |
| Retracted length (RL) with Rod end (Front) + Fork head (Rear) | 165 | 216 | 267 | 318 | 369 | 420 |
| Retracted length (RL) with Fork head (Front) + Rod end (Rear) | 172 | 223 | 274 | 325 | 376 | 427 |
| Retracted length (RL) with Fork head (Front) + Fork head (Rear) | 179 | 230 | 281 | 332 | 383 | 434 |

Dimensional drawing

Optional potentiometer and absolut analogue



| Front / Rear attachment | Ø A | Ø B |
|--------------------------|----------------|----------------|
| Rod end with hole (A) | 6,4 (0, +0,1) | 6,4 (0, +0,1) |
| Rod end with hole (B) | 8,0 (0, +0,1) | 8,0 (0, +0,1) |
| Fork head with hole, (C) | 10,1 (0, +0,1) | 10,1 (0, +0,1) |

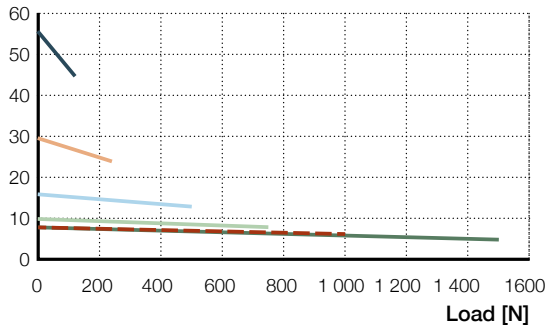
| | RL tolerance | S tolerance |
|------------------|--------------|-------------|
| CAHB10...1 and 2 | (-5, +1) | (-1, +5) |
| CAHB10...3 and 4 | (-3, +3) | (-3, +3) |
| CAHB10...5 and 6 | (-2, +4) | (-4, +2) |

Retracted length calculation (RL)

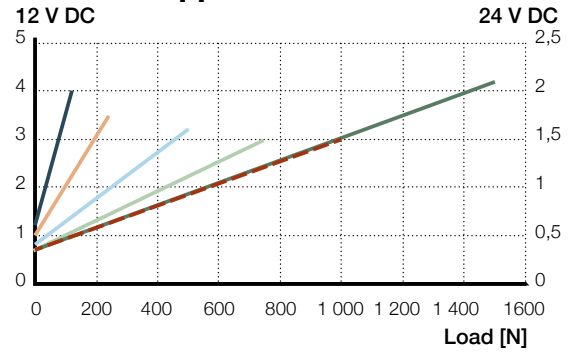
| Stroke [mm] | 50 | 100 | 150 | 200 | 250 | 300 |
|---|-----|-----|-----|-----|-----|-----|
| Retracted length (RL) with Rod end (Front) + Rod end (Rear) | 192 | 243 | 294 | 345 | 396 | 447 |
| Retracted length (RL) with Rod end (Front) + Fork head (Rear) | 199 | 250 | 301 | 352 | 403 | 454 |
| Retracted length (RL) with Fork head (Front) + Rod end (Rear) | 206 | 257 | 308 | 359 | 410 | 461 |
| Retracted length (RL) with Fork head (Front) + Fork head (Rear) | 213 | 264 | 315 | 366 | 417 | 468 |

Performance diagrams

Speed-load diagram
Speed [mm/s]



Current-load diagram
Nominal current [A]
12 V DC



- CAHB-10...1
- CAHB-10...2
- CAHB-10...3
- CAHB-10...4
- CAHB-10...5
- CAHB-10...6

Encoder resolution

| Type | CAHB-10...1 | CAHB-10...2 | CAHB-10...3 | CAHB-10...4 | CAHB-10...5/6 |
|----------|-------------|-------------|-------------|-------------|---------------|
| mm/pulse | 0,3 | 0,15 | 0,075 | 0,05 | 0,0375 |

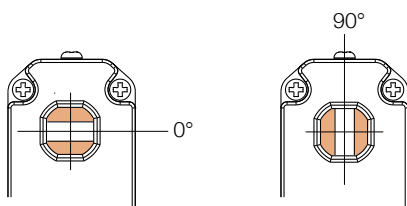
Potentiometer resolution

| Stroke [mm] | 50~80 | 80~160 | 160~300 |
|---|-------------|-------------|-------------|
| Minimum resistance value of potentiometer | 700~1 300 Ω | 700~1 300 Ω | 700~1 300 Ω |
| Potentiometer resolution | 100 Ω/mm | 50 Ω/mm | 16,6 Ω/mm |

Absolute analog output

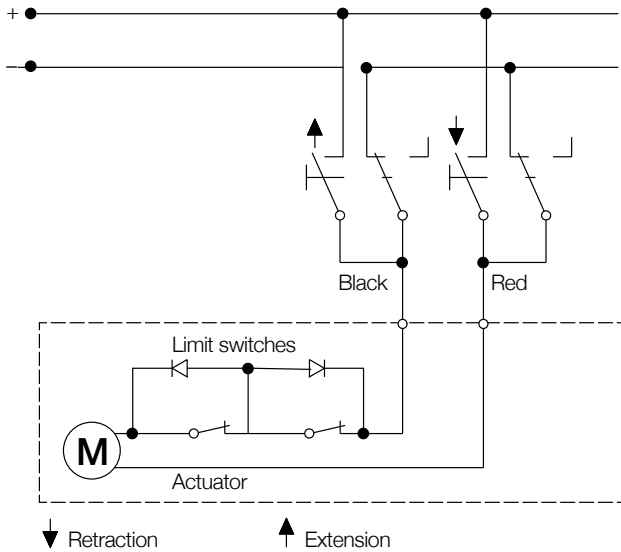
| Stroke [mm] | 50~80 | 80~160 | 160~300 |
|----------------------------------|-------|--------|---------|
| Initial value VS RL position (V) | 0,5 | 0,5 | 0,5 |
| Resolution (mm) | 0,024 | 0,049 | 0,146 |
| Position feedback change (V/mm) | 0,05 | 0,025 | 0,0083 |

Attachment orientation (refer to ordering key Attachment orientation)

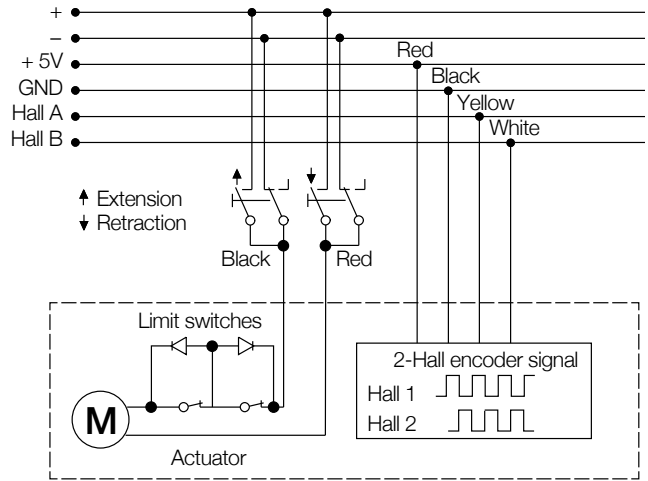


Connecting diagram

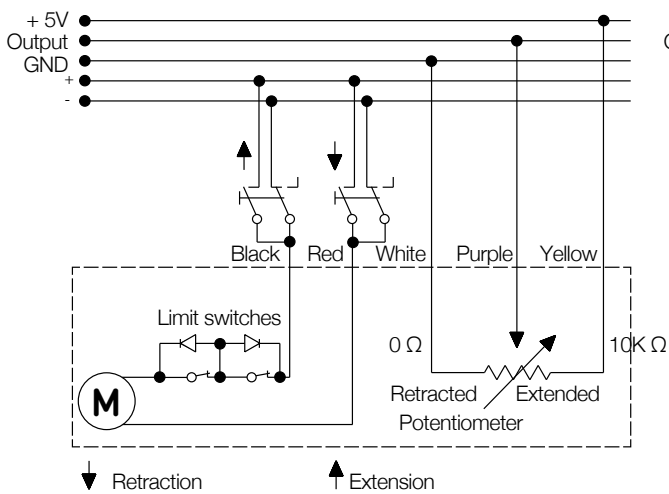
Basic configuration 12/24 V DC



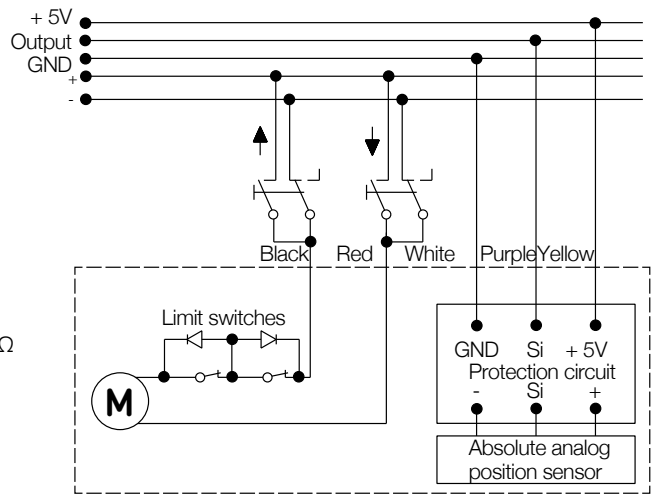
2-Hall encoder 12/24 V DC



Potentiometer 12/24 V DC



Absolute analog output 12/24 V DC



Ordering key

C
A
H
B
-
1
0
-

-

-
A

-
0
0
0

Type _____

Voltage _____

A 12 V DC
B 24 V DC

Load _____

1 120 N
2 240 N
3 500 N
4 750 N
5 1 000 N
6 1 500 N

Design _____

A TR12 screw
X Customized

3 digital Stroke and 3 digital Retracted length (mm) _____

| Stroke | Retracted length | | | |
|--------|--------------------|----------------------|---------------------|--|
| | Base ¹⁾ | with Front fork head | with Rear fork head | with Potentiometer or Absolute analog output |
| 050 | 158 | C +14 | C +7 | A, P +34 |
| 100 | 209 | +14 | +7 | +34 |
| 150 | 260 | +14 | +7 | +34 |
| 200 | 311 | +14 | +7 | +34 |
| 250 | 362 | +14 | +7 | +34 |
| 300 | 413 | +14 | +7 | +34 |

1) Base: the Retracted length with front and rear attachment "Rod with hole", without "Potentiometer" and without "Absolute analog output"

Ingress protection _____

A Standard (IP 66s/69k)

Front attachment _____

A Rod with hole Ø6,4 (0, +0,1) mm
B Rod with hole Ø8 (0, +0,1) mm
C Fork head with hole Ø10,1 (0, +0,1) mm
X Customized

Rear attachment _____

A Rod with hole Ø6,4 (0, +0,1) mm
B Rod with hole Ø8 (0, +0,1) mm
C Fork head with hole Ø10,1 (0, +0,1) mm
X Customized

Hole direction of the attachments _____

A 0°
B 90°

Option 1: Position output _____

0 None
A Absolute analog output
P Potentiometer
H 2-Hall encoder

Cable length _____

A 600 mm without connector
B 1 000 mm without connector
C 1 500 mm without connector
D 2 000 mm without connector
E 2 500 mm without connector
F 3 000 mm without connector

Customized _____

X

CAHB-20A

Linear actuator

Benefits

- Compact design which has been tested for vigorous use
- Robust and reliable
- Thermal protection and virtually maintenance-free

Features:

- Integrated overload and thermal protection
- Robust design
- IP66
- Optional potentiometer and limit switches



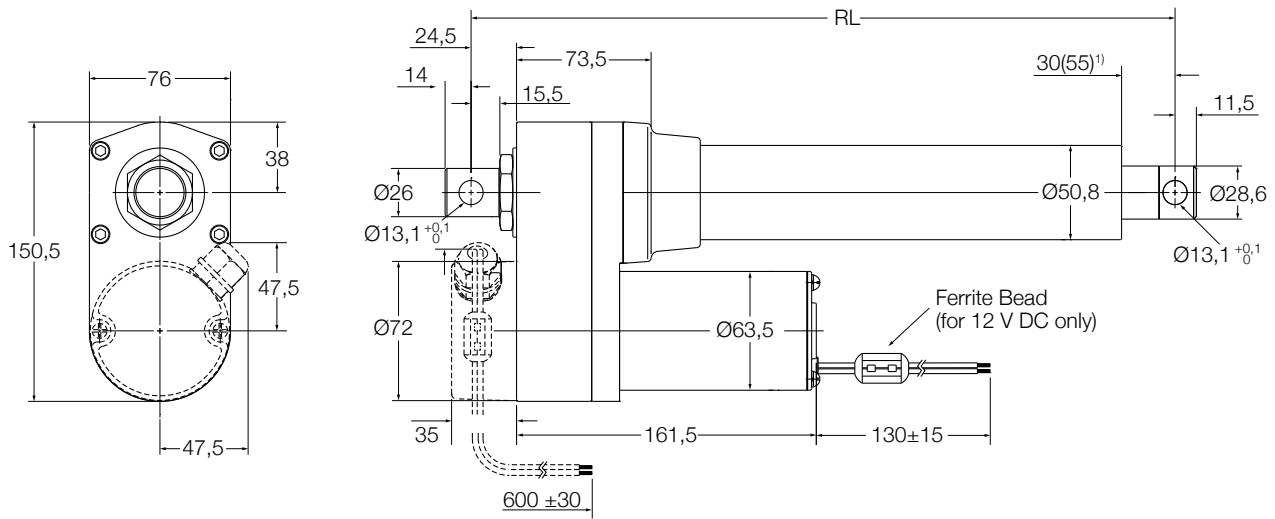
Technical data

| Designation | Unit | CAHB-20-x1A | CAHB-20-x2A |
|------------------------------|------|-------------|-------------|
| Performance data | | | |
| Rated push force | N | 1 500 | 2 500 |
| Rated pull force | N | 1 500 | 2 500 |
| Holding force ¹⁾ | N | 10 000 | 10 000 |
| Speed (full load to no load) | mm/s | 27 to 33 | 13 to 17 |
| Stroke | mm | 102 to 610 | 102 to 610 |
| Voltage | V DC | 12 or 24 | 12 or 24 |
| Nominal current 12 V DC | A | 16 | 14 |
| 24 V DC | A | 8 | 7 |
| Duty cycle | % | 25 | 25 |
| Ambient temperature | °C | -40 to +85 | -40 to +85 |
| Type of protection | IP | 66 | 66 |
| Weight (at 305 mm stroke) | kg | 5,5 | 5,5 |
| Color | - | Black | Black |

¹⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards.

Dimensional drawing

Basic configuration (dashed line for optional limit switch)



Attachment orientation (see page 94)

¹⁾ 55 = dimension with limit switch

Without limit switch:

RED (+) & BLACK (-) = retraction
 RED (-) & BLACK (+) = extension

With limit switch:

RED (+) & BLACK (-) = extension
 RED (-) & BLACK (+) = retraction

Legend:

RL = retracted length

Retracted length calculation (RL)

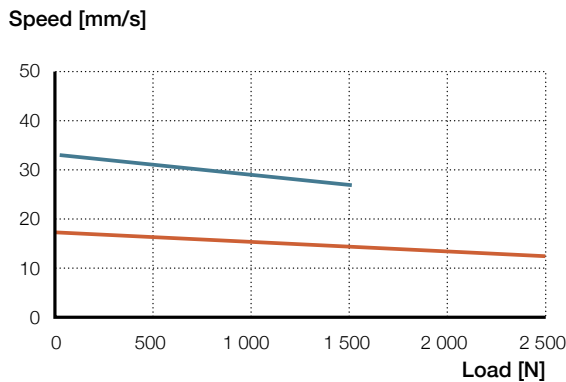
| Stroke [mm] | With limit switch ¹⁾ | | | | | | Without limit switch ²⁾ | | | | | |
|-----------------------|---------------------------------|-----|-----|-----|-----|-----|------------------------------------|-----|-----|-----|-----|-----|
| | 102 | 153 | 204 | 305 | 457 | 610 | 102 | 153 | 204 | 305 | 457 | 610 |
| Retracted length (RL) | 338 | 389 | 440 | 592 | 744 | 897 | 262 | 313 | 364 | 465 | 668 | 821 |

¹⁾ Tolerance: S and RL = ± 5,0 mm (If S ≥ 305 mm, S = ± 7,5 mm)

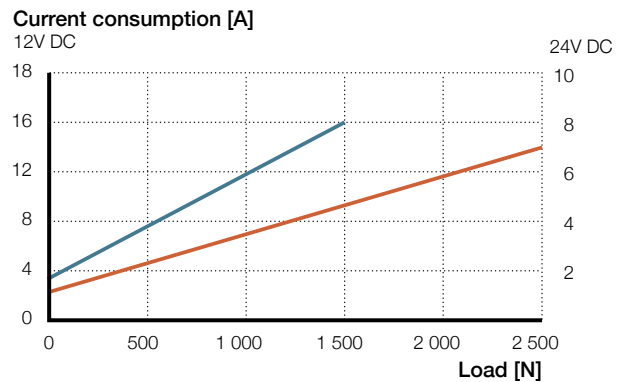
²⁾ Tolerance: S = ± 2,5 mm and L = ± 3,8 mm

Performance diagrams

Speed-load diagram



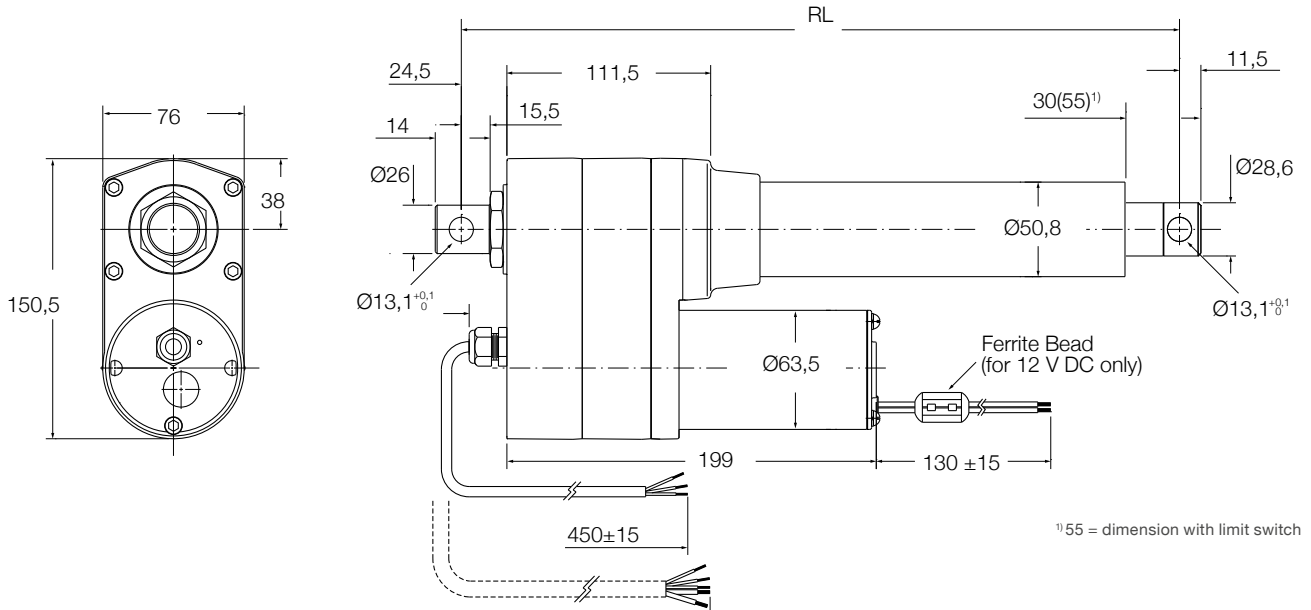
Current-load diagram



— CAHB-20...1 — CAHB-20...2

Dimensional drawing

Optional potentiometer (dashed line for optional limit switch)



Without limit switch:
 RED (+) & BLACK (-) = retraction
 RED (-) & BLACK (+) = extension

With limit switch:
 RED (+) & BLACK (-) = extension
 RED (-) & BLACK (+) = retraction

Legend:
 RL = retracted length

Retracted length calculation (RL)

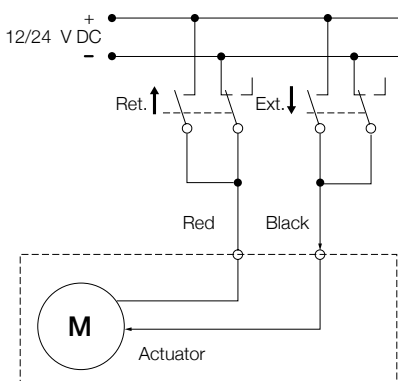
| Stroke [mm] | With limit switch ¹⁾ | | | | | | Without limit switch ²⁾ | | | | | |
|-----------------------|---------------------------------|-----|-----|-----|-----|-----|------------------------------------|-----|-----|-----|-----|-----|
| | 102 | 153 | 204 | 305 | 457 | 610 | 102 | 153 | 204 | 305 | 457 | 610 |
| Retracted length (RL) | 376 | 427 | 478 | 630 | 782 | 935 | 300 | 351 | 402 | 503 | 706 | 859 |

¹⁾ Tolerance: S and RL = ± 5,0 mm (If S ≥ 305 mm, S = ± 7,5 mm)
²⁾ Tolerance: S = ± 2,5 mm and RL = ± 3,8 mm

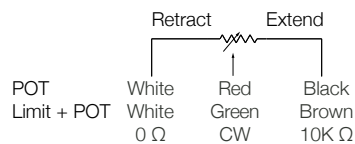
Potentiometer resolution

| Stroke [mm] | 102 | 153 | 204 | 305 | 457 | 610 |
|-------------|------|------|------|------|------|------|
| Ω/mm | 59,0 | 59,0 | 29,5 | 29,5 | 9,84 | 9,84 |

Connecting diagram

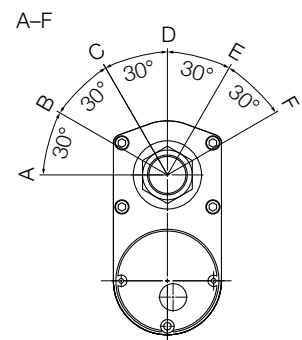


Electrical diagrams



Attachment orientation

(refer to ordering key Attachment orientation)



CAHB-20E and -20S

Linear actuator



Benefits

- High productivity
- Reliability and safety
- Save development time
- Cost effectiveness
- Quick time to market (for Smart version)

Features:

- Holding force
- Overload protection
- Corrosion protection and stainless steel tube
- Manual override option
- Enhanced ingress protection and virtually maintenance free

Smart version S features

- Integrated controller with complete motion control
- True absolute position contactless sensor
- Monitoring and onboard diagnostic (force, voltage, temperature)
- I/O and CAN bus SAE J1939 communication

Technical data

| Designation | Unit | CAHB-20E / 12 V | | | CAHB-20E / 24 V | | |
|--|------|--|------------|------------|-----------------|------------|------------|
| Performance data | | | | | | | |
| Rated Push Force | N | 1 500 | 2 500 | 4 500 | 1 500 | 2 500 | 4 500 |
| Rated Pull Force | N | 1 500 | 2 500 | 4 500 | 1 500 | 2 500 | 4 500 |
| Max pull / push Force ¹⁾ | N | 2 600 | 3 800 | 6 300 | 2 600 | 3 800 | 6 300 |
| Holding force ²⁾ | N | | | | | | |
| Speed without load ³⁾ | mm/s | 27,0 | 23,5 | 13,5 | 29,0 | 22,0 | 13,0 |
| Speed with the rated force ³⁾ | mm/s | 24,5 | 17,5 | 10,5 | 25,5 | 19,0 | 11,0 |
| Electric data | | | | | | | |
| Nominal voltage | V DC | 12 | 12 | 12 | 24 | 24 | 24 |
| Nominal current @ rated load ³⁾ | A | 12,5 | 15 | 17 | 5 | 6,5 | 8 |
| Rated current (clutch activation) | A | 18,4 | 21 | 22,4 | 6,8 | 8,8 | 10,4 |
| Duty cycle | % | 10 | 10 | 10 | 20 | 20 | 20 |
| ON time / OFF time | s | 85/765 | 85/765 | 85/765 | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 |
| Backlash | mm | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| Weight for 200 mm stroke | kg | 4,5 | 4,5 | 4,5 | 4,5 | 4,5 | 4,5 |
| Colour | – | Black | Black | Black | Black | Black | Black |
| Environment and standards | | | | | | | |
| Ambient temperature ⁴⁾ | °C | –40 ... 85 | –40 ... 85 | –40 ... 85 | –40 ... 85 | –40 ... 85 | –40 ... 85 |
| Degree of protection | – | IP 69K/66M | | | | | |
| Standards / EMC | – | EN61000-6-2:2005, EN61000-6-4:2007/A1:2011 | | | | | |
| Salt spray test | – | ISO 9227:2012, 250 hours | | | | | |

¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate Static Load, refer to the "Static load" diagrams

³⁾ The data of speed and current on this list is defined at +20 °C

⁴⁾ Full performance from 0 °C to +40 °C

| Designation | Unit | CAHB-20E / 48 V | | |
|--|------|--|------------|------------|
| Performance data | | | | |
| Rated Push Force | N | 1 500 | 2 500 | 4 500 |
| Rated Pull Force | N | 1 500 | 2 500 | 4 500 |
| Max pull / push Force ¹⁾ | N | 2 600 | 3 800 | 6 300 |
| Holding force ²⁾ | N | | | |
| Speed without load ³⁾ | mm/s | 31,0 | 23,0 | 13,0 |
| Speed with the rated force ³⁾ | mm/s | 27,5 | 20,0 | 11,0 |
| Electric data | | | | |
| Nominal voltage | V DC | 48 | 48 | 48 |
| Nominal current @ rated load ³⁾ | A | 2,6 | 3,8 | 4,2 |
| Rated current (clutch activation) | A | 4,3 | 5,6 | 5,8 |
| Duty cycle | % | 20 | 20 | 20 |
| ON time / OFF time | s | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 700 |
| Backlash | mm | 0,6 | 0,6 | 0,6 |
| Weight for 200 mm stroke | kg | 4,5 | 4,5 | 4,5 |
| Colour | – | Black | Black | Black |
| Environment and standards | | | | |
| Ambient temperature ⁴⁾ | °C | –40 ... 85 | –40 ... 85 | –40 ... 85 |
| Degree of protection | – | IP 69K/66M | | |
| Standards / EMC | – | EN61000-6-2:2005, EN61000-6-4:2007/A1:2001 | | |
| Salt spray test | – | ISO 9227:2012, 250 hours | | |

¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate Static Load, refer to the "Static load" diagrams

³⁾ The data of speed and current on this list is defined at +20 °C

⁴⁾ Full performance from 0 °C to +40 °C

| Designation | Unit | CAHB-20S / 12 V | | | CAHB-20S / 24 – 48 V | | |
|---|------|---|------------|------------|----------------------|-------------|-------------|
| Performance data | | | | | | | |
| Rated Push Force | N | 1 500 | 2 500 | 4 500 | 1 500 | 2 500 | 4 500 |
| Rated Pull Force | N | 1 500 | 2 500 | 4 500 | 1 500 | 2 500 | 4 500 |
| Max pull / push Force ¹⁾ | N | 2 600 | 3 800 | 6 300 | 2 600 | 3 800 | 6 300 |
| Holding force ²⁾ | N | | | | | | |
| Speed without load ³⁾ | mm/s | 27,0 | 23,5 | 13,5 | 29,0 | 22,0 | 13,0 |
| Speed with the rated force ³⁾ | mm/s | 24,5 | 17,5 | 10,5 | 25,5 | 19,0 | 11,0 |
| Electric data | | | | | | | |
| Nominal voltage ⁴⁾ | V DC | 12 | 12 | 12 | 24 – 48 | 24 – 48 | 24 – 48 |
| Nominal current ³⁾ | A | 12,5 | 15,0 | 17,0 | 5,0 – 2,5 | 6,5 – 3,3 | 8,0 – 4,0 |
| Max. current, rated current ⁵⁾ | A | 31,3 | 31,3 | 31,3 | 20,7 – 10,4 | 20,7 – 10,4 | 20,7 – 10,4 |
| Duty cycle ⁶⁾ | % | 10 | 10 | 10 | 20 | 20 | 20 |
| ON time / OFF time | s | 85/765 | 85/765 | 85/765 | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 |
| Backlash | mm | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| Max. manual override torque | Nm | 1,5 | 1,2 | 1,0 | 1,5 | 1,2 | 1,0 |
| Max. manual override speed | rpm | 1 600 | 1 600 | 1 600 | 1 600 | 1 600 | 1 600 |
| Weight for 200 mm stroke | kg | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 |
| Colour | – | Black | Black | Black | Black | Black | Black |
| Environment and standards | | | | | | | |
| Ambient temperature ⁷⁾ | °C | –40 ... 85 | –40 ... 85 | –40 ... 85 | –40 ... 85 | –40 ... 85 | –40 ... 85 |
| Degree of protection | – | IP69K/66M | | | | | |
| Standards / EMC | – | refer to environmental performances - electrical tests, page 55 | | | | | |
| Salt spray test | – | ISO 9227:2012 500 hours | | | | | |

¹⁾ Upper limit of the pull/push force, limited by the E-clutch.

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate static load, refer to the "Static load" diagrams.

³⁾ The data of speed and current on this list is defined temperature at +20°C, PWM 100%

⁴⁾ 12 V version use 12 V DC motor, 24 – 48 V version use 24 V DC motor.

⁵⁾ Max. current is the upper limit of the input current to the actuator. In any circumstances, the current will not exceed to max. current.

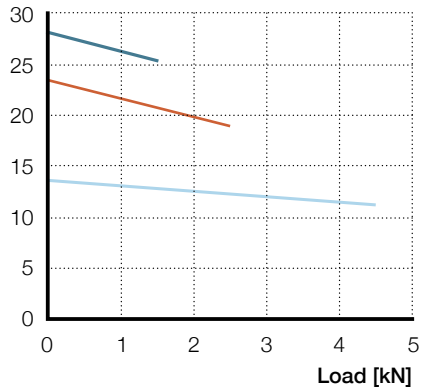
⁶⁾ Duty cycle is defined temperature at +20°C.

⁷⁾ Full performance from 0°C to +40°C

Performance diagrams

Speed-Load diagram

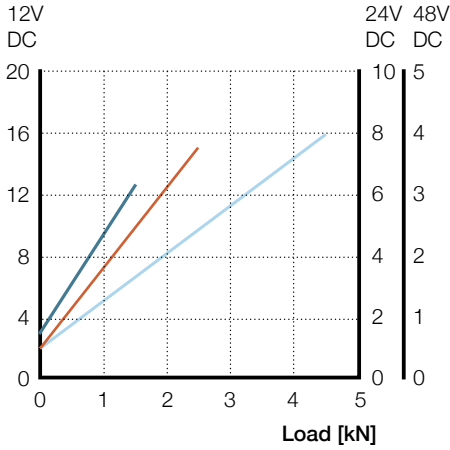
Speed [mm/s]



- CAHB-20-x1E
- CAHB-20-x2E
- CAHB-20-x3E

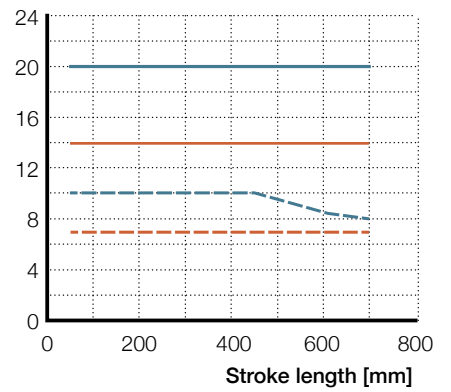
Current-Load diagram

Current consumption [A]



Static load-Stroke length

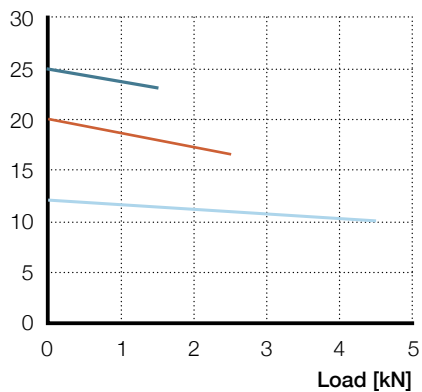
Load [kN]



- Ultimate CAHB-20-xxE (pull)
- - - Ultimate CAHB-20-xxE (push)
- Recommended CAHB 20-xxE (pull)
- - - Recommended CAHB 20-xxE (push)

Speed-Load diagram

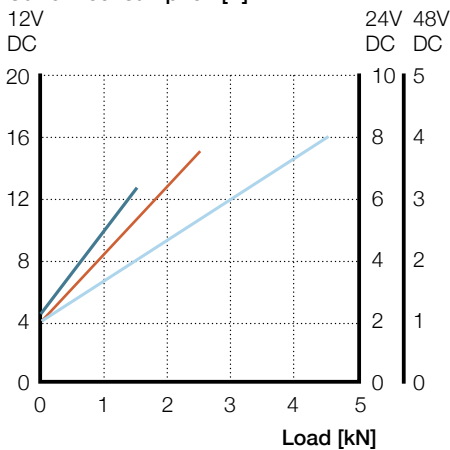
Speed [mm/s]



- CAHB-20-x1S
- CAHB-20-x2S
- CAHB-20-x3S

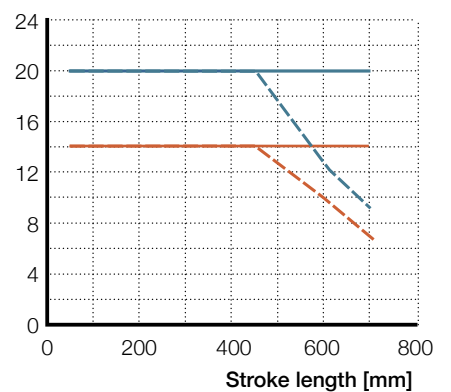
Current-Load diagram

Current consumption [A]



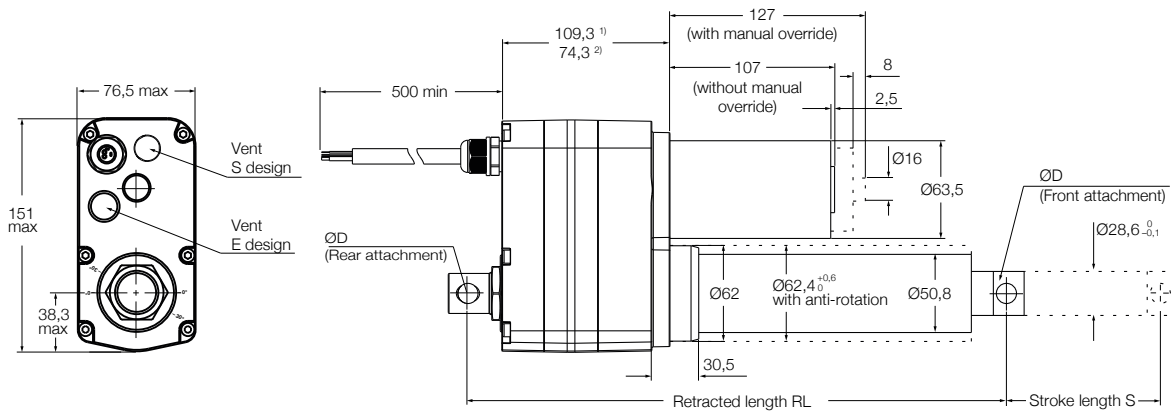
Static load-Stroke length

Load [kN]



- Ultimate CAHB-20-xxS (pull)
- - - Ultimate CAHB-20-xxS (push)
- Recommended CAHB-20-xxS (pull)
- - - Recommended CAHB-20-xxS (push)

Dimensional drawing CAHB-20E and -20S



¹⁾ 109,3 for E design with position output
²⁾ 74,3 for E design without position output and S design

| | Stroke tolerance | Retracted length tolerance |
|----------|------------------|----------------------------|
| E design | ±2 | ±2 |
| S design | ±1 | ±1 |

Retracted length calculation (RL)

| Stroke [mm] | Baseline: Rod with hole attachment | | Fork head attachment | Anti-rotation tube with free spinning front attachment | | Rod end Spherical plain bearing with anti rotation tube | |
|--|---------------------------------------|---------|----------------------|--|---------|---|---------|
| | 50-305 | 306-700 | 50-700 | 50-305 | 306-700 | 50-305 | 306-700 |
| CAHB-20E | | | | | | | |
| Retracted length (RL) no position output ¹⁾ | 160 + S | 211 + S | +12 | +5 | -11 | +47 | +19 |
| Retracted length (RL) with position output ²⁾ | 195 + S | 246 + S | +12 | +5 | -11 | +47 | +19 |
| CAHB-20S | | | | | | | |
| Retracted length (RL) | 167+S | 202+S | +12 | +0 | +0 | +43 | +33 |

Example for Ordering key, in red baseline configuration:

¹⁾ **160 + 50** (stroke) **+12** (Fork head attachment) **+5** (Anti-rotation tube with free spinning front attachment) = **227**

²⁾ **246 + 400** (stroke) **+19** (Rod end Spherical plain bearing with anti rotation tube)= **665**



CAHB-21E and -21S

Linear actuator



Benefits

- High productivity
- Reliability and safety
- Save development time
- Cost effectiveness
- Quick time to market (for Smart version)

Features:

- High holding force
- High speed
- Mechanical overload protection
- Corrosion protection and stainless steel tube
- Manual override option
- Enhanced ingress protection, virtually maintenance free

Smart version S features

- Integrated controller with complete motion control
- True absolute position contactless sensor
- Monitoring and on board diagnostic (force, voltage, temperature)
- I/O and CAN bus SAE J1939 communication

Technical data

| Designation | Unit | CAHB-21E / 12 V | | | CAHB-21E / 24 V | | |
|--|------|--|------------|------------|-----------------|------------|------------|
| Performance data | | | | | | | |
| Rated Push Force | N | 1 500 | 2 500 | 4 500 | 1 500 | 2 500 | 4 500 |
| Rated Pull Force | N | 1 500 | 2 500 | 4 500 | 1 500 | 2 500 | 4 500 |
| Max pull / push Force ¹⁾ | N | 2 500 | 3 600 | 6 300 | 2 500 | 3 600 | 6 300 |
| Holding force ²⁾ | N | | | | | | |
| Speed without load ³⁾ | mm/s | 49,5 | 37 | 24,0 | 52,5 | 38 | 22,5 |
| Speed with the rated force ³⁾ | mm/s | 43 | 31,5 | 19,0 | 50 | 31,5 | 21,0 |
| Electric data | | | | | | | |
| Nominal voltage | V DC | 12 | 12 | 12 | 24 | 24 | 24 |
| Nominal current @ rated load ³⁾ | A | 14,5 | 16 | 19 | 7 | 7,5 | 10,5 |
| Rated current (clutch activation) | A | 19,2 | 20,2 | 24,8 | 9,1 | 9,3 | 13,7 |
| Duty cycle ⁴⁾ | % | 10 | 10 | 10 | 20 | 20 | 20 |
| ON time / OFF time | s | 85/765 | 85/765 | 85/765 | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 |
| Backlash | mm | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| Weight for 200 mm stroke | kg | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 |
| Colour | - | Black | Black | Black | Black | Black | Black |
| Environment and standards | | | | | | | |
| Ambient temperature ⁵⁾ | °C | -25...85 | -25...85 | -25...85 | -25...85 | -25...85 | -25...85 |
| Degree of protection | - | IP 69K/66M | | | | | |
| Standards / EMC | - | EN61000-6-2:2005, EN61000-6-4:2007/A1:2011 | | | | | |
| Salt spray test | - | ISO 9227:2012, 250 hours | | | | | |

¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate Static Load, refer to the "Static load" diagrams

³⁾ The data of speed and current on this list is defined at +20 °C

⁴⁾ Duty cycle: actuator output force and actuator movement are in the same waydirect, otherwise, duty cycle is 10% (25 s ON / 225 s OFF)

⁵⁾ Full performance from 0 °C to +40 °C contact Ewellix for application operating at low temperature (-40 to -25°C)

| Designation | Unit | CAHB-21E / 48 V | | |
|--|------|--|------------|------------|
| Performance data | | | | |
| Rated Push Force | N | 1 500 | 2 500 | 4 500 |
| Rated Pull Force | N | 1 500 | 2 500 | 4 500 |
| Max pull / push Force ¹⁾ | N | 2 500 | 3 600 | 6 300 |
| Holding force ²⁾ | N | | | |
| Speed without load ³⁾ | mm/s | 51,5 | 41,0 | 23,5 |
| Speed with the rated force ³⁾ | mm/s | 46,0 | 33,5 | 19,0 |
| Electric data | | | | |
| Nominal voltage | V DC | 48 | 48 | 48 |
| Nominal current @ rated load ³⁾ | A | 4,0 | 4,5 | 5,0 |
| Rated current (clutch activation) | A | 5,6 | 6,1 | 6,4 |
| Duty cycle ⁴⁾ | % | 20 | 20 | 20 |
| ON time / OFF time | s | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 700 |
| Backlash | mm | 0,6 | 0,6 | 0,6 |
| Weight for 200 mm stroke | kg | 4,8 | 4,8 | 4,8 |
| Colour | – | Black | Black | Black |
| Environment and standards | | | | |
| Ambient temperature ⁵⁾ | °C | –25...85 | –25...85 | –25...85 |
| Degree of protection | – | IP 69K/66M | | |
| Standards / EMC | – | EN61000-6-2:2005, EN61000-6-4:2007/A1:2011 | | |
| Salt spray test | – | ISO 9227:2012, 250 hours | | |

¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate Static Load, refer to the "Static load" diagrams

³⁾ The data of speed and current on this list is defined at +20 °C

⁴⁾ Duty cycle: actuator output force direction is same with the actuator movement direction. otherwise, duty cycle is 10%(25 s ON / 225 s OFF)

⁵⁾ Full performance from 0 °C to +40 °C, contact Ewellix for application operating at low temperature (-40 to -25°C)

| Designation | Unit | CAHB-21S / 12 V | | | CAHB-21S / 24 – 48 V | | |
|---|------|---|------------|------------|----------------------|-------------|-------------|
| Performance data | | | | | | | |
| Rated Push Force | N | 1 500 | 2 500 | 4 500 | 1 500 | 2 500 | 4 500 |
| Rated Pull Force | N | 1 500 | 2 500 | 4 500 | 1 500 | 2 500 | 4 500 |
| Max pull / push Force ¹⁾ | N | 2 500 | 3 600 | 6 300 | 2 500 | 3 600 | 6 300 |
| Holding force ²⁾ | N | | | | | | |
| Speed without load ³⁾ | mm/s | 49,5 | 37,0 | 24,0 | 52,5 | 38,0 | 22,5 |
| Speed with the rated force ³⁾ | mm/s | 43,0 | 31,5 | 19,0 | 50,0 | 31,5 | 21,0 |
| Electric data | | | | | | | |
| Nominal voltage ⁴⁾ | V DC | 12 | 12 | 12 | 24 – 48 | 24 – 48 | 24 – 48 |
| Nominal current ³⁾ | A | 14,5 | 16,0 | 19,0 | 7,0 – 3,5 | 7,5 – 3,8 | 10,5 – 5,3 |
| Max. current, rated current ⁵⁾ | A | 31,3 | 31,3 | 31,3 | 20,7 – 10,4 | 20,7 – 10,4 | 20,7 – 10,4 |
| Duty cycle ⁶⁾ | % | 10 | 10 | 10 | 20 | 20 | 20 |
| ON time / OFF time | s | 85/765 | 85/765 | 85/765 | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 | 50 ... 700 |
| Backlash | mm | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 | 0,6 |
| Max. manual override torque | Nm | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 |
| Max. manual override speed | rpm | 1 600 | 1 600 | 1 600 | 1 600 | 1 600 | 1 600 |
| Weight for 200 mm stroke | kg | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 |
| Colour | – | Black | Black | Black | Black | Black | Black |
| Environment and standards | | | | | | | |
| Ambient temperature ⁷⁾ | °C | –25...85 | –25...85 | –25...85 | –25...85 | –25...85 | –25...85 |
| Degree of protection | – | IP69K/66M | | | | | |
| Standards / EMC | – | Refer to environmental performances - electrical tests, page 55 | | | | | |
| Salt spray test | – | ISO 9227:2012 500 hours | | | | | |

¹⁾ Upper limit of the pull/push force, limited by the E-clutch.

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate static load, refer to the "Static load" diagrams.

³⁾ The data of speed and current on this list is defined temperature at +20°C, PWM 100%

⁴⁾ 12 V version use 12 V DC motor, 24 – 48 V version use 24 V DC motor

⁵⁾ Max. current is the upper limit of the input current to the actuator. In any circumstances, the current will not exceed to max. current.

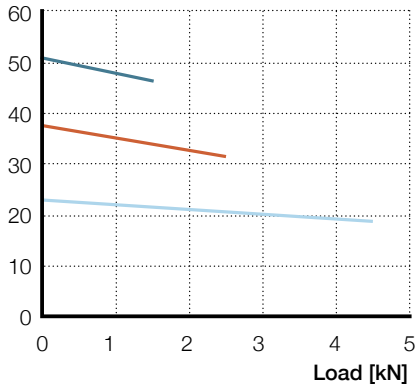
⁶⁾ Duty cycle is defined temperature at +20° C, and actuator output force direction is same with the actuator movement direction. otherwise, duty cycle is 10%(25 s ON / 225 s OFF

⁷⁾ Full performance from 0°C to +40°C, contact Ewellix for application operating at low temperature (-40 to -25°C)

Performance diagrams

Speed-Load diagram

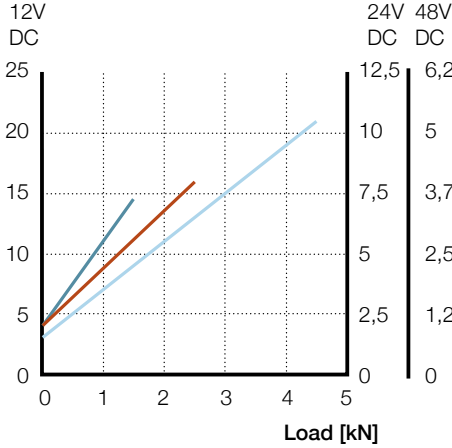
Speed [mm/s]



- CAHB-21-x1E
- CAHB-21-x2E
- CAHB-21-x3E

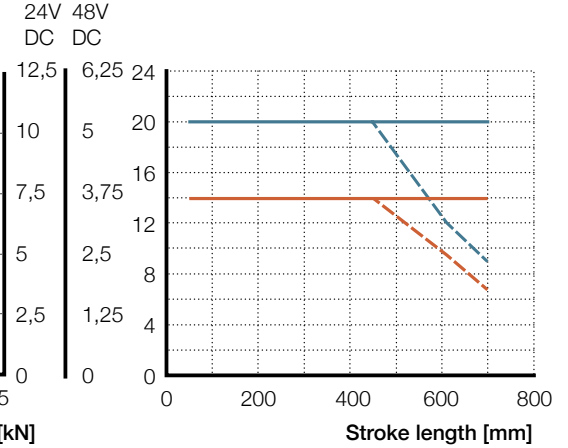
Current-Load diagram

Current consumption [A]



Static load-Stroke length

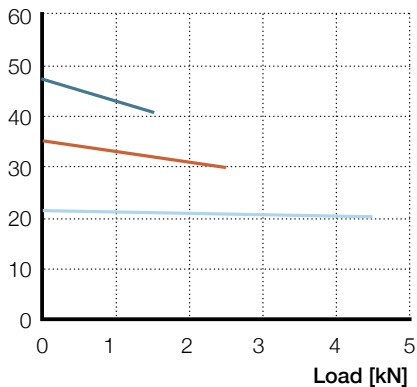
Load [kN]



- Ultimate CAHB-21-xxE (pull)
- - - Ultimate CAHB-21-xxE (push)
- Recommended CAHB 21-xxE (pull)
- - - Recommended CAHB 21-xxE (push)

Speed-Load diagram

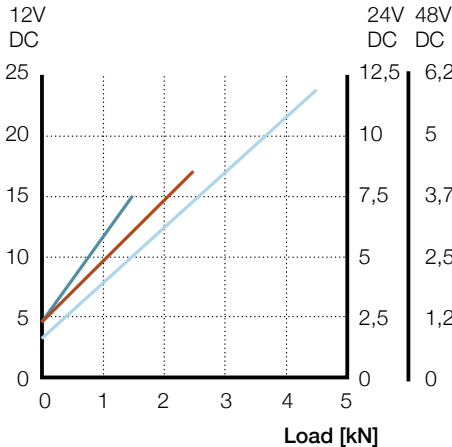
Speed [mm/s]



- CAHB-21-x1S
- CAHB-21-x2S
- CAHB-21-x3S

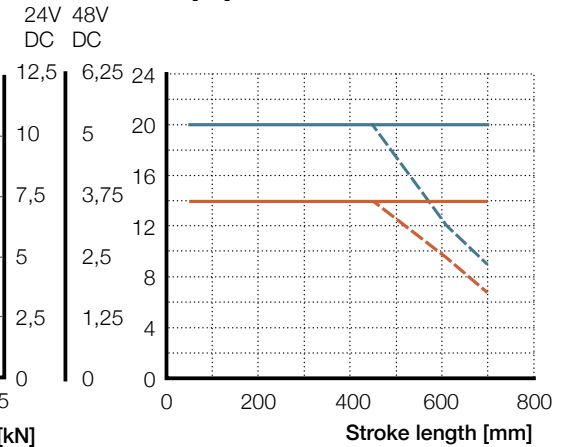
Current-Load diagram

Current consumption [A]



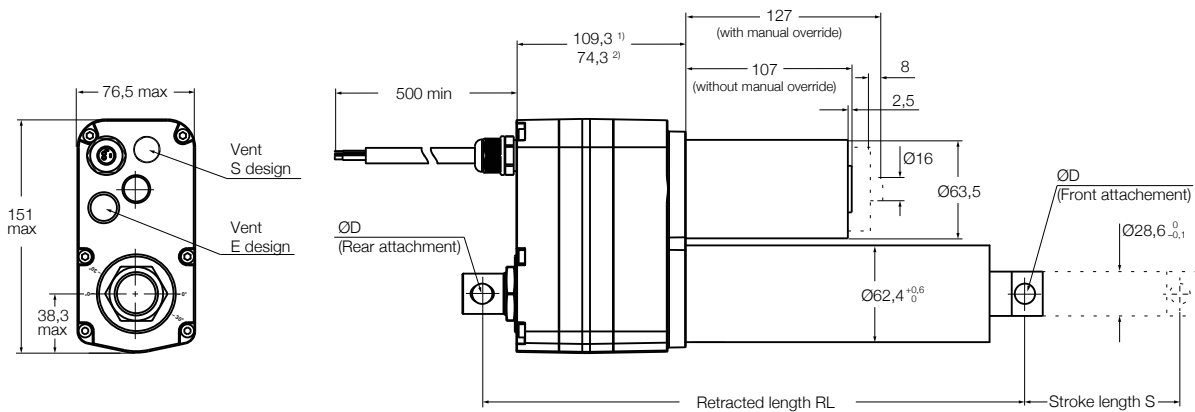
Static load-Stroke length

Load [kN]



- Ultimate CAHB-21-xxS (pull)
- - - Ultimate CAHB-21-xxS (push)
- Recommended CAHB-21-xxS (pull)
- - - Recommended CAHB-21-xxS (push)

Dimensional drawing CAHB-21E and -21S



¹⁾ 109,3 for E design with position output
²⁾ 74,3 for E design without position output and S design

| | Stroke tolerance | Retracted length tolerance |
|------------------------------|------------------|----------------------------|
| E design with LS (S<=305) | ±2 | ±2 |
| E design without LS (S<=305) | (-2, -0.5) | ±2 |
| E design with LS (S>305) | ±3 | ±2 |
| E design without LS (S>305) | (-3, -1) | ±2 |
| S design | ±1 | ±1 |

Retracted length calculation (RL)

| S Stroke [mm] | Baseline: Rod with hole attachment | | Fork head attachment | Anti-rotation tube with free spinning front attachment | Rod end Spherical plain bearing with anti rotation tube | |
|---|---------------------------------------|---------|----------------------|--|---|---------|
| | 50-305 | 306-700 | 50-700 | 50-700 | 50-305 | 306-700 |
| CAHB-21E | | | | | | |
| Retracted length (RL) no option ¹⁾ | 182+S | 217+S | +12 | +1 | +43 | +31 |
| Retracted length (RL) with LS | 191+S | 226+S | +12 | +1 | +43 | +31 |
| Retracted length (RL) with position output | 217+S | 252+S | +12 | +1 | +43 | +31 |
| Retracted length (RL) with LS and position output ²⁾ | 226+S | 261+S | +12 | +1 | +43 | +31 |
| CAHB-21S | | | | | | |
| Retracted length (RL) | 182+S | 217+S | +12 | +0 | +43 | +33 |

Example for Ordering key, in red baseline configuration:

¹⁾ 182 + 50 (stroke) + 12 (Fork head attachment) + 1 (Anti-rotation tube with free spinning front attachment) = 245

²⁾ 261 + 400 (stroke) + 31 (Rod end Spherical plain bearing with anti rotation tube) = 692



CAHB-22E and -22S

Linear actuator



Benefits

- High productivity
- Reliability and safety
- Save development time
- Cost effectiveness
- Quick time to market (for Smart version)

Features

- High force
- High speed
- High holding force
- Mechanical overload protection
- Corrosion protection and stainless steel tube
- Manual override option
- Enhanced ingress protection, virtuality maintenance free

Smart version S features

- Integrated controller with complete motion control
- True absolute position contactless sensor
- Monitoring and onboard diagnostic (force, voltage, temperature)
- I/O and CAN bus SAE J1939 communication

Technical data

| Designation | Unit | CAHB-22E / 12 V | | | | CAHB-22E / 24 V | | | |
|--|------|--|------------|------------|------------|-----------------|------------|------------|------------|
| Performance data | | | | | | | | | |
| Rated Push Force | N | 2 300 | 3 500 | 6 800 | 10 000 | 2 300 | 3 500 | 6 800 | 10 000 |
| Rated Pull Force | N | 2 300 | 3 500 | 6 800 | 10 000 | 2 300 | 3 500 | 6 800 | 10 000 |
| Max pull / push Force ¹⁾ | N | 3 500 | 4 900 | 9 500 | 14 000 | 3 500 | 4 900 | 9 500 | 14 000 |
| Holding force ²⁾ | N | | | | | | | | |
| Speed without load ³⁾ | mm/s | 55,0 | 45,0 | 22,0 | 13,0 | 53,0 | 45,0 | 22,0 | 13,0 |
| Speed with the rated force ³⁾ | mm/s | 42,0 | 36,0 | 15,5 | 10,2 | 42,0 | 37,0 | 17,0 | 10,2 |
| Electric data | | | | | | | | | |
| Nominal voltage | V DC | 12 | 12 | 12 | 12 | 24 | 24 | 24 | 24 |
| Nominal current @ rated load ³⁾ | A | 18 | 19,5 | 19,5 | 19 | 8 | 9,5 | 9,5 | 8,5 |
| Rated current (clutch activation) | A | 24,3 | 25,5 | 25,5 | 25 | 10,6 | 12,3 | 12,3 | 10,9 |
| Duty cycle ⁴⁾ | % | 10 | 10 | 10 | 10 | 20 | 20 | 20 | 20 |
| ON time / OFF time | s | 85/765 | 85/765 | 85/765 | 85/765 | 85/340 | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | | | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 610 | 50 ... 450 | 50 ... 700 | 50 ... 700 | 50 ... 610 | 50 ... 450 |
| Backlash | mm | 1,0 | 1,0 | 0,6 | 0,6 | 1,0 | 1,0 | 0,6 | 0,6 |
| Weight for 200 mm stroke | kg | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 |
| Colour | - | Black | Black | Black | Black | Black | Black | Black | Black |
| Environment and standards | | | | | | | | | |
| Ambient temperature | °C | -25...85 | -25...85 | -25...85 | -25...85 | -25...85 | -25...85 | -25...85 | -25...85 |
| Degree of protection | - | IP 69K/66M | | | | | | | |
| Standards / EMC | - | EN61000-6-2:2005, EN61000-6-4:2007/A1:2011 | | | | | | | |
| Salt spray test | - | ISO 9227:2012, 250 hours | | | | | | | |

¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate Static Load, refer to the "Static load" diagrams

³⁾ The data of speed and current on this list is defined at +20 °C

⁴⁾ Duty cycle: actuator output force direction is same with the actuator movement direction. otherwise, duty cycle is 10%(25 s ON / 225 s OFF)

⁵⁾ Full performance from 0 °C to +40 °C, contact Ewellix for application operating at low temperature (-40 to -25°C)

| Designation | Unit | CAHB-22E / 48 V | | | |
|--|------|--|------------|------------|------------|
| Performance data | | | | | |
| Rated Push Force | N | 2 300 | 3 500 | 6 800 | 10 000 |
| Rated Pull Force | N | 2 300 | 3 500 | 6 800 | 10 000 |
| Max pull / push Force ¹⁾ | N | 3 500 | 4 900 | 9 500 | 14 000 |
| Holding force ²⁾ | N | | | | |
| Speed without load ³⁾ | mm/s | 57,0 | 45,0 | 22,0 | 13,0 |
| Speed with the rated force ³⁾ | mm/s | 50,0 | 37,0 | 18,5 | 10,2 |
| Electric data | | | | | |
| Nominal voltage | V DC | 48 | 48 | 48 | 48 |
| Nominal current @ rated load ³⁾ | A | 4,5 | 5 | 5 | 4,3 |
| Rated current (clutch activation) | A | 6,5 | 7 | 7 | 5,5 |
| Duty cycle ⁴⁾ | % | 20 | 20 | 20 | 20 |
| ON time / OFF time | s | 85/340 | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 610 | 50 ... 450 |
| Backlash | mm | 1,0 | 1,0 | 0,6 | 0,6 |
| Weight for 200 mm stroke | kg | 4,8 | 4,8 | 4,8 | 4,8 |
| Colour | – | Black | Black | Black | Black |
| Environment and standards | | | | | |
| Ambient temperature ⁵⁾ | °C | –25...85 | –25...85 | –25...85 | –25...85 |
| Degree of protection | – | IP 69K/66M | | | |
| Standards / EMC | – | EN61000-6-2:2005, EN61000-6-4:2007/A1:2011 | | | |
| Salt spray test | – | ISO 9227:2012, 250 hours | | | |

¹⁾ Upper limit of the pull/push force limited by the clutch. The lower limit is just above the rated force. The limitation of the force will happen between these 2 limits

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate Static Load, refer to the "Static load" diagrams

³⁾ The data of speed and current on this list is defined at +20 °C

⁴⁾ Duty cycle: actuator output force direction is same with the actuator movement direction. otherwise, duty cycle is 10%(25 s ON / 225 s OFF)

⁵⁾ Full performance from 0 °C to +40 °C, contact Ewellix for application operating at low temperature (-40 to -25°C)

| Designation | Unit | CAHB-22S / 12 V | | | | CAHB-22S / 24 – 48 V | | | |
|---|------|---|------------|------------|------------|----------------------|-------------|-------------|-------------|
| | | | | | | | | | |
| Performance data | | | | | | | | | |
| Rated Push Force | N | 2 300 | 3 500 | 6 800 | 10 000 | 2 300 | 3 500 | 6 800 | 10 000 |
| Rated Pull Force | N | 2 300 | 3 500 | 6 800 | 10 000 | 2 300 | 3 500 | 6 800 | 10 000 |
| Max pull / push Force ¹⁾ | N | 3 500 | 4 900 | 9 500 | 14 000 | 3 500 | 4 900 | 9 500 | 14 000 |
| Holding force ²⁾ | N | | | | | | | | |
| Speed without load ³⁾ | mm/s | 55,0 | 45,0 | 22,0 | 13,0 | 53,0 | 45,0 | 22,0 | 13,0 |
| Speed with the rated force ³⁾ | mm/s | 42,0 | 36,0 | 15,5 | 10,2 | 42,0 | 37,0 | 17,0 | 10,2 |
| Electric data | | | | | | | | | |
| Nominal voltage ⁴⁾ | V DC | 12 | 12 | 12 | 12 | 24 – 48 | 24 – 48 | 24 – 48 | 24 – 48 |
| Nominal current ³⁾ | A | 18,0 | 19,5 | 19,5 | 19,0 | 8,0 – 4,0 | 9,5 – 4,8 | 9,5 – 4,8 | 8,5 – 4,3 |
| Max. current, rated current ⁵⁾ | A | 31,3 | 31,3 | 31,3 | 31,3 | 20,7 – 10,4 | 20,7 – 10,4 | 20,7 – 10,4 | 20,7 – 10,4 |
| Duty cycle ⁶⁾ | % | 10 | 10 | 10 | 10 | 20 | 20 | 20 | 20 |
| ON time / OFF time | s | 85/765 | 85/765 | 85/765 | 85/765 | 85/340 | 85/340 | 85/340 | 85/340 |
| Mechanical data | | | | | | | | | |
| Stroke | mm | 50 ... 700 | 50 ... 700 | 50 ... 610 | 50 ... 450 | 50 ... 700 | 50 ... 700 | 50 ... 610 | 50 ... 450 |
| Backlash | mm | 1,0 | 1,0 | 0,6 | 0,6 | 1,0 | 1,0 | 0,6 | 0,6 |
| Max. manual override torque | Nm | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 | 1,0 |
| Max. manual override speed | rpm | 1 600 | 1 600 | 1 600 | 1 600 | 1 600 | 1 600 | 1 600 | 1 600 |
| Weight for 200 mm stroke | kg | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 | 4,8 |
| Colour | – | Black | Black | Black | Black | Black | Black | Black | Black |
| Environment and standards | | | | | | | | | |
| Ambient temperature ⁷⁾ | °C | –25...85 | –25...85 | –25...85 | –25...85 | –25...85 | –25...85 | –25...85 | –25...85 |
| Degree of protection | – | IP69K/66M | | | | | | | |
| Standards / EMC | – | refer to environmental performances - electrical tests, page 55 | | | | | | | |
| Salt spray test | – | ISO 9227:2012 500 hours | | | | | | | |

¹⁾ Upper limit of the pull/push force, limited by the E-clutch.

²⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards. Ultimate static load, refer to the "Static load" diagrams.

³⁾ The data of speed and current on this list is defined temperature at +20°C, PWM 100%

⁴⁾ 12 V version use 12 V DC motor, 24 – 48 V version use 24 V DC motor.

⁵⁾ Max. current is the upper limit of the input current to the actuator. In any circumstances, the current will not exceed to max. current.

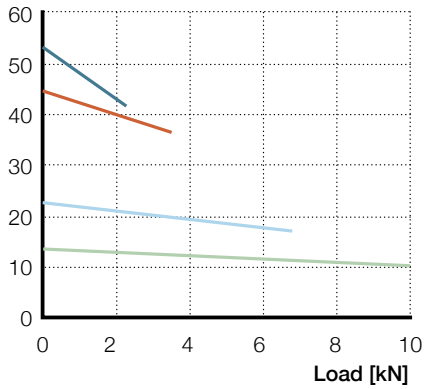
⁶⁾ Duty cycle is defined temperature at +20°C, and actuator output force direction is same with the actuator movement direction. otherwise, duty cycle is 10%(25 s ON / 225 s OFF)

⁷⁾ Full performance from 0°C to +40°C, contact Ewellix for application operating at low temperature (-40 to -25°C)

Performance diagrams

Speed-Load diagram

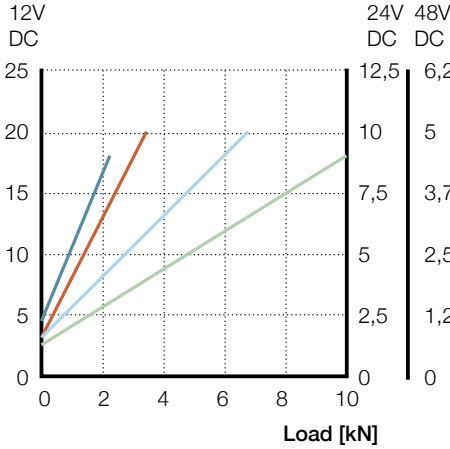
Speed [mm/s]



- CAHB-22-x1E
- CAHB-22-x2E
- CAHB-22-x3E
- CAHB-22-x4E

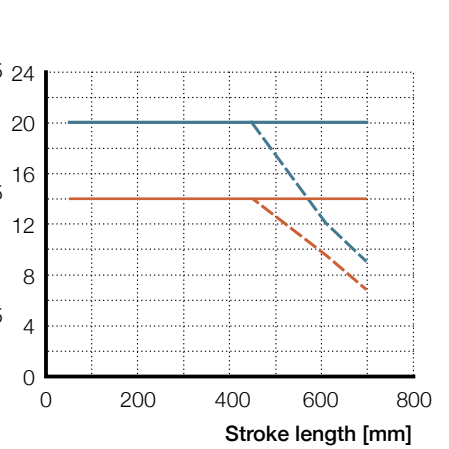
Current-Load diagram

Current consumption [A]



Static load-Stroke length

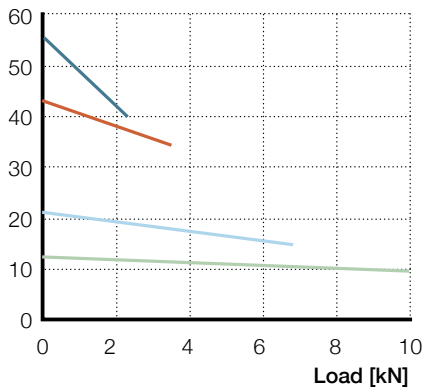
Load [kN]



- Ultimate CAHB-22-xxE (pull)
- - - Ultimate CAHB-22-xxE (push)
- Recommended CAHB 22-xxE (pull)
- - - Recommended CAHB 22-xxE (push)

Speed-Load diagram

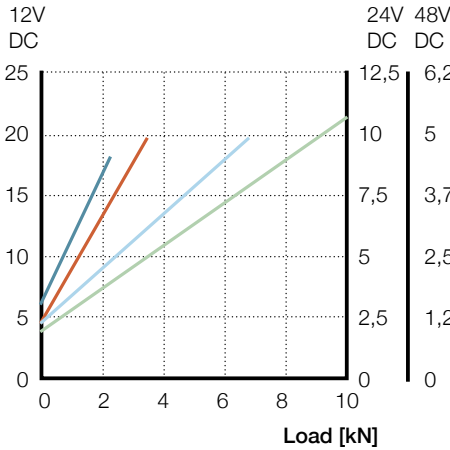
Speed [mm/s]



- CAHB-22-x1S
- CAHB-22-x2S
- CAHB-22-x3S
- CAHB-22-x4S

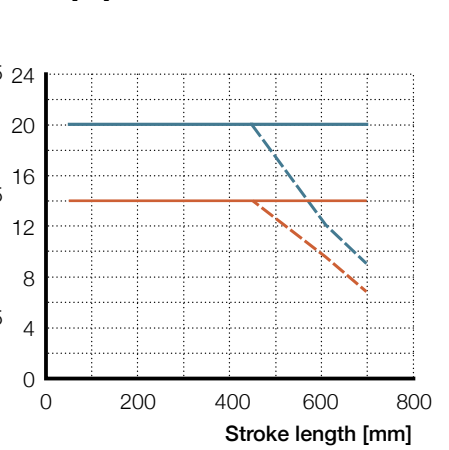
Current-Load diagram

Current consumption [A]



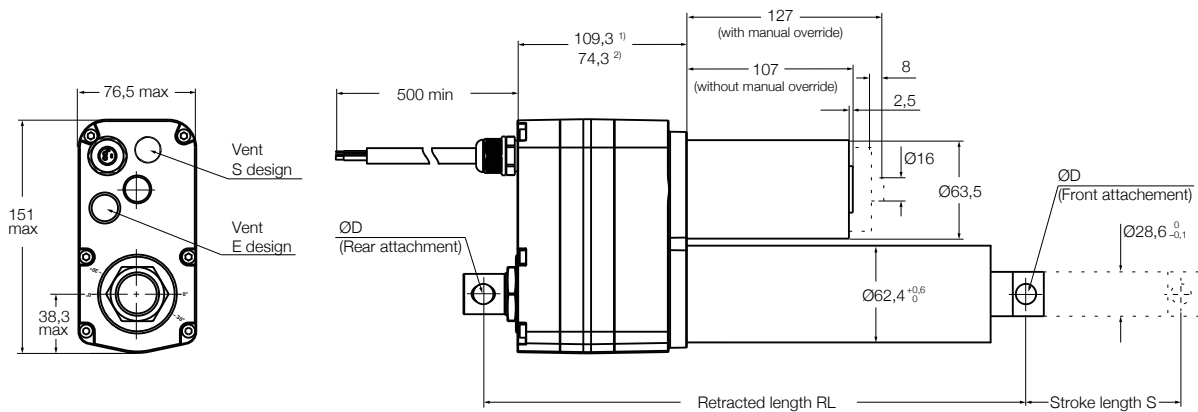
Static load-Stroke length

Load [kN]



- Ultimate CAHB-22-xxS (pull)
- - - Ultimate CAHB-22-xxS (push)
- Recommended CAHB-22-xxS (pull)
- - - Recommended CAHB-22-xxS (push)

Dimensional drawing CAHB-22E and -22S



¹⁾ 109,3 for E design with position output

²⁾ 74,3 for E design without position output and S design

| | Stroke tolerance | Retracted length tolerance |
|-------------------------------------|------------------|----------------------------|
| E design with LS (S<=305) | ±2 | (0, +4) |
| E design without LS, 1E/2E (S<=305) | (-3, -1.5) | (0, +4) |
| E design without LS, 3E/4E (S<=305) | (-2, -0.5) | (0, +4) |
| E design with LS (S>305) | ±3 | (0, +4) |
| E design without LS, 1E/2E (S>305) | (-4, -2) | (0, +4) |
| E design without LS, 3E/4E (S>305) | (-3, -1) | (0, +4) |
| S design | ±1 | ±1 |

Retracted length calculation

| Stroke [mm] | Baseline: Rod with hole attachment | | Fork head attachment | Anti-rotation tube with free spinning front attachment | Rod end Spherical plain bearing with anti rotation tube | |
|---|---------------------------------------|---------|----------------------|--|---|---------|
| | 50-305 | 306-700 | 50-700 | 50-700 | 50-305 | 306-700 |
| CAHB-22E | | | | | | |
| Retracted length (RL) no option ¹⁾ | 194+S | 229+S | +12 | +7 | +49 | +37 |
| Retracted length (RL) with LS | 200+S | 235+S | +12 | +7 | +49 | +37 |
| Retracted length (RL) with position output | 229+S | 264+S | +12 | +7 | +49 | +37 |
| Retracted length (RL) with LS and position output ²⁾ | 235+S | 270+S | +12 | +7 | +49 | +37 |
| CAHB-22S | | | | | | |
| Retracted length (RL) | 200+S | 235+S | +12 | +0 | +43 | +33 |

Example for Ordering key, in **red** baseline configuration:

¹⁾ **194 + 50** (stroke) + **12** (Fork head attachment) + **7** (Anti-rotation tube with free spinning front attachment) = **263**

²⁾ **270 + 400** (stroke) + **37** (Rod end Spherical plain bearing with anti rotation tube) = **707**

Electrical specifications (valid for CAHB-20E, -21E, -22E)

Power input voltage tolerance

| Power input | Tolerance |
|-----------------|------------|
| 12 V DC version | 10-16 V DC |
| 24 V DC version | 21-26 V DC |
| 48 V DC version | 40-55 V DC |

Wire connection without position output

| Wire no. | AWG | Colour | Application |
|----------|-----|--------|--|
| 1 | 14 | Red | Motor power(+) □ Extension, (-) □ Retraction |
| 2 | 14 | Black | Motor power(-) □ Extension, (+) □ Retraction |

Cable reference standard: UL758, UL1581 & CSA C22.2 No. 210

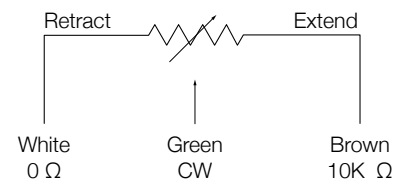
Wire connection with position output

Wire connection with potentiometer

| Wire no. | AWG | Colour | Application |
|----------|-----|--------|--|
| 1 | 22 | Green | See picture description |
| 2 | 22 | White | See picture description |
| 3 | 22 | Brown | See picture description |
| 4 | 14 | Red | Motor power(+) □ Extension, (-) □ Retraction |
| 5 | 14 | Black | Motor power(-) □ Extension, (+) □ Retraction |

Cable reference standard: UL758, UL1581 & CSA C22.2 No. 210

Potentiometer

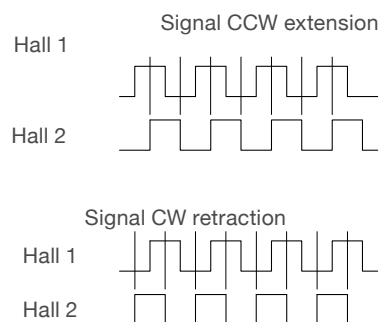


Wire connection with encoder

| Wire no. | AWG | Colour | Application |
|----------|-----|--------|--|
| 1 | 26 | Green | Sensor signal 1 Encoder |
| 2 | 26 | Yellow | Sensor signal 2 Encoder |
| 3 | 26 | Black | Sensor power GND Encoder |
| 4 | 26 | Red | Sensor power 5 V Encoder |
| 5 | 14 | Red | Motor power(+) □ Extension, (-) □ Retraction |
| 6 | 14 | Black | Motor power(-) □ Extension, (+) □ Retraction |

Cable reference standard: UL758, UL1581 & CSA C22.2 No. 210

Encoder



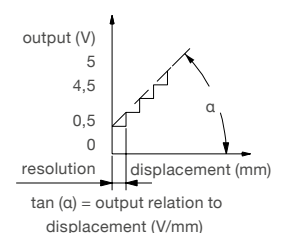
Wire connection with absolute analog output

| Wire no. | AWG | Colour | Application |
|----------|-----|--------|--|
| 1 | 22 | Green | Output signal |
| 2 | 22 | White | Sensor power GND |
| 3 | 22 | Brown | Sensor power +10~55 VDC |
| 4 | 14 | Red | Motor power(+) □ Extension, (-) □ Retraction |
| 5 | 14 | Black | Motor power(-) □ Extension, (+) □ Retraction |

Cable reference standard: UL758, UL1581 & CSA C22.2 No. 210

Absolut analog position output

Input voltage: 10~55 V DC
 Current consumption: 15 mA max.
 Output analog signal (voltage): 0~5 V DC
 Max current output: 5 mA
 Absolute analog output set up:
 retracted 0,5±0,15 V
 extended 4,5 V to the maximum



Output relation to displacement and resolution

| Actuator type | Hall sensor [pulses/mm] | Potentiometer [Ω /mm] | Absolute analogue position output [V/mm] | Resolution of the absolute analog position output [mm] |
|---------------|----------------------------|----------------------------------|---|---|
| CAHB-20...E | 2,76 | 59,06 if S=050-125 | 0,0295 if S=050-125 | 0,0413 if S=050-125 |
| | | 29,53 if S=126-250 | 0,0148 if S=126-250 | 0,0827 if S=126-250 |
| | | 9,84 if S=251-700 | 0,0049 if S=251-700 | 0,2480 if S=251-700 |
| CAHB-21...E | 1,56 | 33,33 if S=050-222 | 0,0167 if S=050-222 | 0,0732 if S=050-222 |
| | | 16,67 if S=223-444 | 0,0083 if S=223-444 | 0,1465 if S=223-444 |
| | | 5,56 if S=445-700 | 0,0028 if S=445-700 | 0,4395 if S=445-700 |
| CAHB-22...1E | 1,4 | 30 if S=050-254 | 0,0150 if S=050-254 | 0,0814 if S=050-254 |
| CAHB-22...2E | 1,4 | 15 if S=255-508 | 0,0075 if S=255-508 | 0,1628 if S=255-508 |
| | | 5 if S=509-700 | 0,0025 if S=509-700 | 0,4883 if S=509-700 |
| CAHB-22...3E | 2,8 | 60 if S=050-127 | 0,030 if S=050-127 | 0,0407 if S=050-127 |
| CAHB-22...4E | 2,8 | 30 if S=128-254 | 0,015 if S=128-254 | 0,0814 if S=128-254 |
| | | 10 if S=255-700 | 0,005 if S=255-700 | 0,2441 if S=255-700 |

Electrical specifications (valid for CAHB-20S, -21S, -22S)

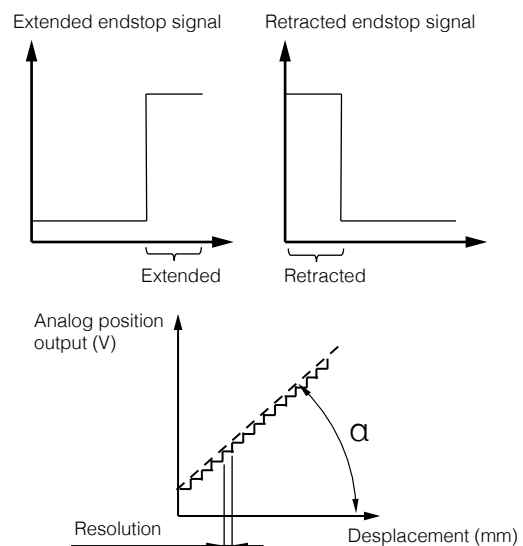
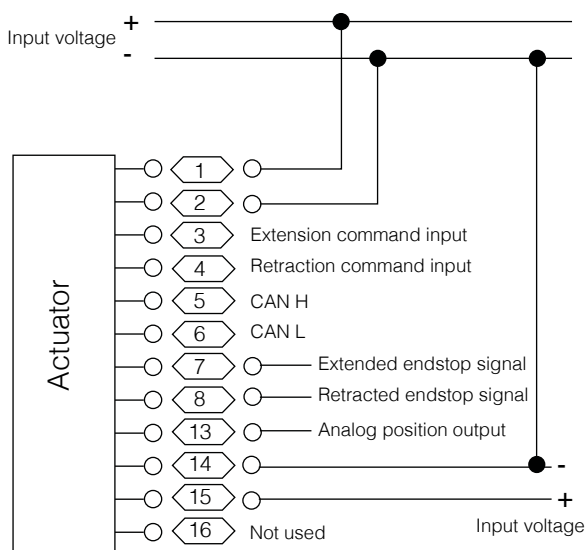
CAN bus + I/O

Ordering key pages 37, 39, 41 (Cable and I/O Option 1: code A and code C)

| Wire no. | AWG | Colour | Application |
|----------|-----|--------|---|
| 1 | 14 | Red | Power (+) VCC Connect to positive 9 to 16 V DC (12 V version) 18 to 55 V DC (24 – 48 V version) |
| 2 | 14 | Black | Power (-) GND Connect to negative |
| 3 | 26 | Red | Extension command input High: 5 to 55 VDC Low: 0 to 1.19 VDC Max. current consumption: 1mA Delay before movement and stop: 50 ms |
| 4 | 26 | Black | Retraction command input High: 5 to 55 VDC Low: 0 to 1.19 VDC Max. current consumption: 1mA Delay before movement and stop: 50 ms |
| 5 | 26 | Yellow | CAN H (CAN bus J1939) |
| 6 | 26 | Blue | CAN L (CAN bus J1939) |
| 7 | 26 | Grey | End stop signal (Digital output, open collector) Normal (L): High-Z Extended (H): V power - 1.8 V Max. current consumption: 10 mA |
| 8 | 26 | Orange | End stop signal (Digital output, open collector) Normal (L): High-Z Retracted (H): V power - 1.8 V Max. current consumption: 10 mA |
| 13 | 26 | Green | Analog position signal output Retracted position: 0,5±0,02 V Extended position: 5 V or 10 V (default) Max. current output: 15 mA Ripple max: 200 mV Transaction delay: 20 ms Linear feedback 0,5% tan(α)=4,5 / stroke (V/mm), code A or 9,5 / stroke (V/mm), code C Resolution: 10 V / 4 000 / tan(α) |
| 14 | 26 | White | Analog position sensor power (-) GND Common ground with wire No. 2 |
| 15 | 26 | Brown | Analog position sensor power (+) For 0~5 V position sensor output ¹⁾ : 8 to 27 V DC For 0~10 V position sensor output ¹⁾ : 13 to 27 V DC Max. current consumption: 15 mA |
| 16 | 26 | Purple | Reserved, not to be connected |

¹⁾ Position sensor output to select by the ordering key

Cable reference standard: UL758, UL1581 & CSA C22.2 No. 210

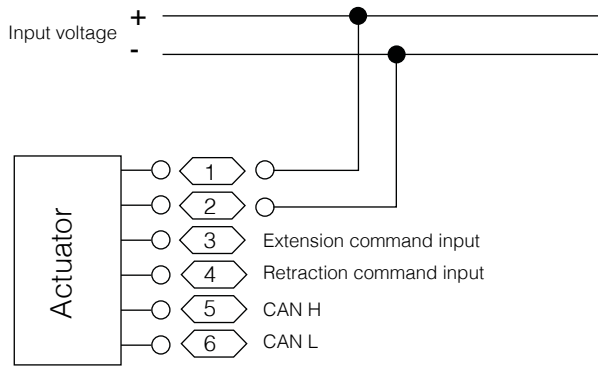


CAN bus + Input

Ordering key pages 37, 39, 41 (Cable and I/O Option 1: code B)

| Wire no. | AWG | Colour | Application |
|----------|-----|--------|---|
| 1 | 14 | Red | Power (+) VCC Connect to positive 9 to 16 V DC (12 V version) 18 to 55 V DC (24 – 48 V version) |
| 2 | 14 | Black | Power (-) GND Connect to negative |
| 3 | 26 | Red | Extension command input High: 5 to 55 VDC Low: 0 to 1.19 VDC Max. current consumption: 1mA Delay before movement and stop: 50 ms |
| 4 | 26 | Black | Retraction command input High: 5 to 55 VDC Low: 0 to 1.19 VDC Max. current consumption: 1mA Delay before movement and stop: 50 ms |
| 5 | 26 | Yellow | CAN H (CAN bus J1939) |
| 6 | 26 | Blue | CAN L (CAN bus J1939) |

Cable reference standard: UL758, UL1581 & CSA C22.2 No. 210

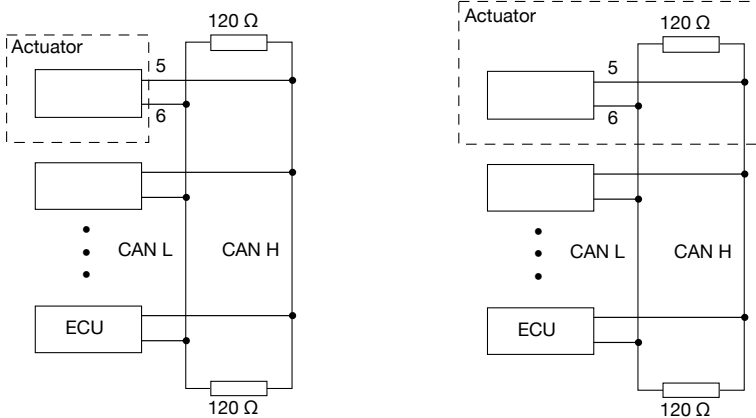


Termination resistance option

Ordering key pages 37, 39, 41 (Bus type Option 2)

Without termination resistor (code C)

With termination resistor (code T)



NOTE.

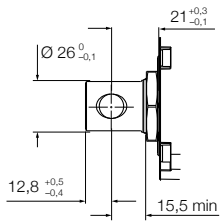
The CAN bus system of the vehicle request termination resistor.
The CAHB 2xS could be equipped one.

Attachment option (valid for CAHB-20, -21, -22 E and S)

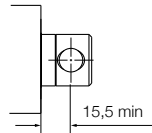
Attachment type

Rod end with hole (refer to ordering key Attachment diameter A - E)

Rear attachment

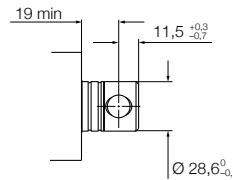


Front attachment without anti rotation tube

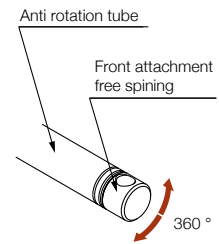


Attachment orientation: "A" to "F"

Front attachment with anti rotation tube



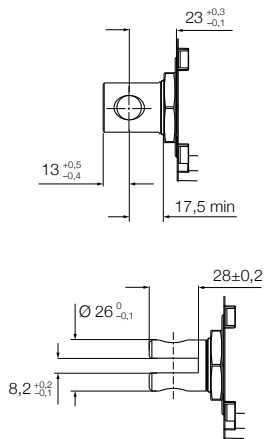
Attachment orientation: "G" to "L"



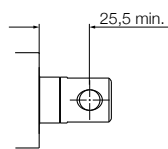
| Hole version | A | B | C | D | E |
|----------------------|------|------|------|-----|------|
| Hole diameter Ø [mm] | 13,1 | 12,8 | 12,5 | 14 | 12,2 |
| Tolerance | H11 | H11 | H11 | H11 | H11 |

Fork head with hole (refer to ordering key Attachment diameter F - G)

Rear attachment

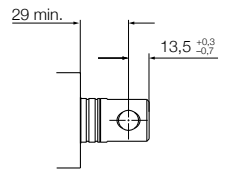


Front attachment without anti rotation tube

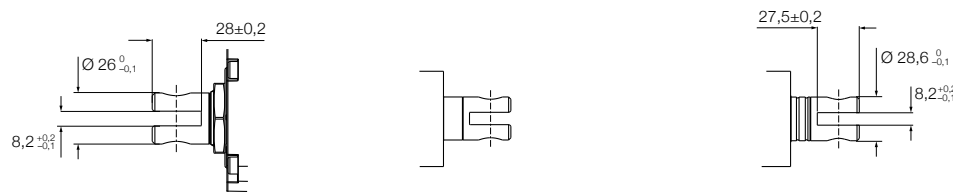
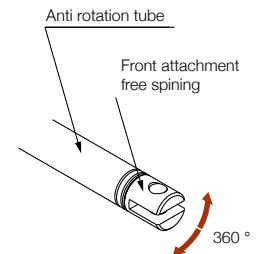


Attachment orientation: "A" to "F"

Front attachment with anti rotation tube



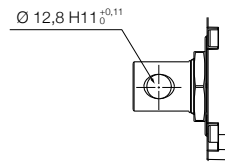
Attachment orientation: "G" to "L"



| Hole version | F | G |
|----------------------|------|------|
| Hole diameter Ø [mm] | 12,2 | 12,8 |
| Tolerance | H11 | H11 |

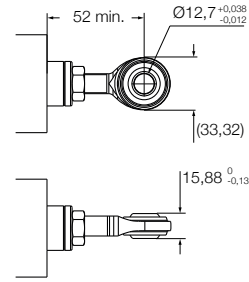
Rod end Spherical plain bearing (refer to ordering key Attachment diameter I)

Rear attachment



"I" and "B" have the same rear attachment

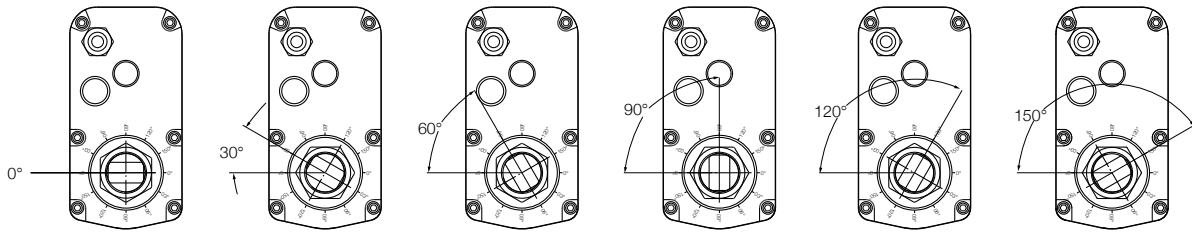
Front attachment with anti rotation tube



Attachment orientation: "G" to "L"

| | | |
|----------------------------------|---------------------|----------------------|
| Hole version | I (Rear Attachment) | I (front Attachment) |
| Hole diameter \varnothing [mm] | 12,8 | 12,7 |

Attachment orientation (refer to ordering key Attachment orientation)



Orientation A / G

Orientation B / H

Orientation C / I

Orientation D / J

Orientation E / K

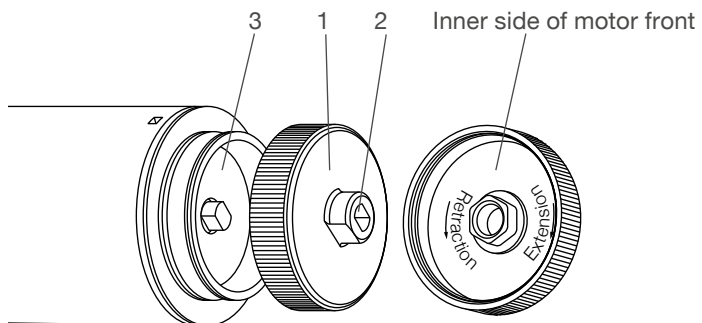
Orientation F / L

| Attachment orientation | Description |
|------------------------|---|
| A | 0° without anti rotation tube |
| B | 30° without anti rotation tube |
| C | 60° without anti rotation tube |
| D | 90° without anti rotation tube |
| E | 120° without anti rotation tube |
| F | 150° without anti rotation tube |
| G | 0°: with anti rotation tube and free spinning front attachment |
| H | 30° with anti rotation tube and free spinning front attachment |
| I | 60° with anti rotation tube and free spinning front attachment |
| J | 90° with anti rotation tube and free spinning front attachment |
| K | 120° with anti rotation tube and free spinning front attachment |
| L | 150° with anti rotation tube and free spinning front attachment |

3

Manual override

Release the motor cover (1). Use the slot (2) to rotate the motor shaft (3) in the proper direction



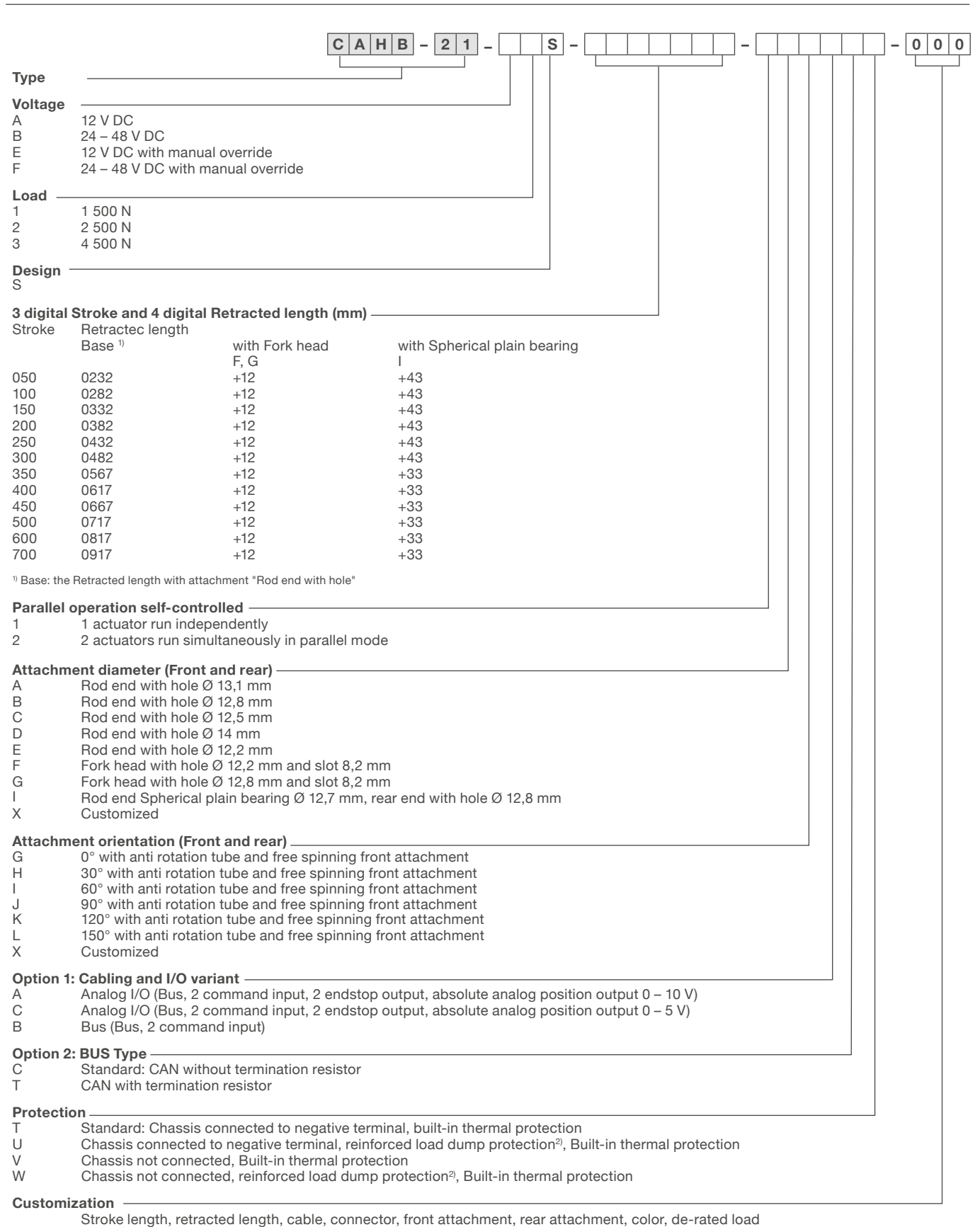
List of function CAHB-20S, -21S, -22S

| | | CAHB-2xS only | CAN bus + I/O Ordering key Option 1 code A or C | CAN bus + Input Ordering key Option 1 code B |
|---|--|--|---|--|
| Interface | Voltage version | 12 VDC | ● | ● |
| | | 24-48 VDC | ● | ● |
| | Cable | Power wires | 2 | 2 |
| | | Low current wires | 10 | 4 |
| BUS | CAN bus SAE J1939, 250 or 500 kbps ¹⁾ | ● | ● | |
| Functions | Motion | soft start / soft stop | ● | ● |
| | E clutch | Force limitation (calibration, temperature compensation) | ● | ● |
| | Adjustable end stops | Adjustable retracted and extended length by I/O and CAN bus | – | – |
| | Parallel motion | Drive actuator with the same length up to | 2 pcs | 2 pcs |
| Command | Command I/O | Motion Extend / Retract | ● | ● |
| | | Motion Extend / Retract | ● | ● |
| | Command CAN bus J1939 | Run to an actuator length in 1/10 mm | ● | ● |
| | | Speed, command set in % | ● | ● |
| | | Set max force in N | ● | ● |
| Real-time feedback | I/O End stop signal | End stop extended | ● | – |
| | | end stop retracted | ● | – |
| | position feedback by I/O | 0-10V or 0-5V absolute analog | ● | – |
| | | Actuator length in 1/10 mm | ● | ● |
| | CAN bus J1939 feedback | Force in N | ● | ● |
| | | Speed in % | ● | ● |
| | | Flag of Endstop retracted | ● | ● |
| | | Flag of endstop extended | ● | ● |
| | | Flag of run in retraction | ● | ● |
| Diagnostic by CAN bus (Onboard) | Application monitoring | Flag of run in extension | ● | ● |
| | | Voltage upper limit reached | ● | ● |
| | | Temperature upper limit reached | ● | ● |
| | | Force upper limit reached | ● | ● |
| | Integrity monitoring | Actuator blocking | ● | ● |
| Regulation and test | Compliance | Error code | ● | ● |
| | | CE marking, Declaration of incorporation for partly completed machine: RoHS, EMC + Reach | ● | ● |
| | | Mechanic | Extended, see page 132 | Extended, see page 132 |
| | | Climatic | Extended, see page 131 | Extended, see page 131 |
| | Environmental test (see pages 130-135) | Electric | Extended, see page 134 | Extended, see page 134 |
| | | Load Dump protection, chassis connected to negative terminal | ● | ● |
| | | Load Dump protection, chassis not connected | ● | ● |
| | | Reinforced load dump protection ²⁾ , chassis connected to negative terminal | Option for 12 VDC | Option for 12 VDC |
| Reinforced load dump protection ²⁾ , chassis not connected | Option for 12 VDC | Option for 12 VDC | | |

● Available

¹⁾ By default, the baud rate is 250 kbps. To change the CAN baud rate by CAN message, the ECU used for the setting must support both 500Kbps and 250Kbps.

²⁾ For vehicle without centralized load dump protection



²⁾ For vehicle without centralized load dump protection, option valid only for 12V.



Type

Voltage

- A 12 V DC
- B 24 V DC
- D 48 V DC
- E 12 V DC with manual override
- F 24 V DC with manual override
- H 48 V DC with manual override

Load

- 1 2 300 N
- 2 3 500 N
- 3 6 800 N
- 4 10 000 N

Design

E

3 digital Stroke and 4 digital Retracted length (mm)

Stroke Retracted length

| | Base ¹⁾ | with Fork head F, G | with Spherical plain bearing ²⁾ I | with Anti rotation G to L | with Limit switch L | with Position output A, P, E |
|-----|--------------------|------------------------|--|------------------------------|------------------------|---------------------------------|
| 050 | 0244 | +12 | +42 | +7 | +6 | +35 |
| 100 | 0294 | +12 | +42 | +7 | +6 | +35 |
| 150 | 0344 | +12 | +42 | +7 | +6 | +35 |
| 200 | 0394 | +12 | +42 | +7 | +6 | +35 |
| 250 | 0444 | +12 | +42 | +7 | +6 | +35 |
| 300 | 0494 | +12 | +42 | +7 | +6 | +35 |
| 350 | 0579 | +12 | +30 | +7 | +6 | +35 |
| 400 | 0629 | +12 | +30 | +7 | +6 | +35 |
| 450 | 0679 | +12 | +30 | +7 | +6 | +35 |
| 500 | 0729 | +12 | +30 | +7 | +6 | +35 |
| 600 | 0829 | +12 | +30 | +7 | +6 | +35 |
| 700 | 0929 | +12 | +30 | +7 | +6 | +35 |

¹⁾ Base: the Retracted length with attachment "Rod end with hole", "without Anti rotation tube", without "Position output"

²⁾ With attachment "Spherical plain bearing", option "Anti rotation tube" is mandatory, the length "with Anti rotation" must be added to calculate the Retracted length

Ingress protection

B Standard: IP69K/IP66M

Attachment diameter (Front and rear)

- A Rod end with hole Ø 13,1 mm
- B Rod end with hole Ø 12,8 mm
- C Rod end with hole Ø 12,5 mm
- D Rod end with hole Ø 14 mm
- E Rod end with hole Ø 12,2 mm
- F Fork head with hole Ø 12,2 mm and slot 8,2 mm
- G Fork head with hole Ø 12,8 mm and slot 8,2 mm
- I Rod end Spherical plain bearing Ø 12,7 mm, rear end with hole Ø 12,8 mm (request anti rotation tube option)
- X Customized

Attachment orientation (Front and rear)

- A 0° without anti rotation tube
- B 30° without anti rotation tube
- C 60° without anti rotation tube
- D 90° without anti rotation tube
- E 120° without anti rotation tube
- F 150° without anti rotation tube
- G 0°: with anti rotation tube and free spinning front attachment
- H 30° with anti rotation tube and free spinning front attachment
- I 60° with anti rotation tube and free spinning front attachment
- J 90° with anti rotation tube and free spinning front attachment
- K 120° with anti rotation tube and free spinning front attachment
- L 150° with anti rotation tube and free spinning front attachment
- X Customized

Option 1: Limit switch

- 0 None (mandatory for 2 300 N, 3 500 N version and the 48 VDC version)
- L Limit switch (valid for load version 6 800 N and 10 000 N)

Option 2: Position output

- 0 None
- A Absolute analog output
- P Potentiometer
- E Encoder

Thermal protection

T Standard: Built-in thermal switch

Customization

Stroke length, retracted length, cable, connector, front attachment, rear attachment, color, de-rated load

Standard actuators are IP69K / IP66M and equipped a vent, built-in thermal protection, protection Clutch and EMC filter.



Type

Voltage

- A 12 V DC
- B 24 – 48 V DC
- E 12 V DC with manual override
- F 24 – 48 V DC with manual override

Load

- 1 2 300 N
- 2 3 500 N
- 3 6 800 N
- 4 10 000 N

Design

S

3 digital Stroke and 4 digital Retracted length (mm)

| Stroke | Retracted length | |
|--------|--------------------|--|
| | Base ¹⁾ | with Fork head F, G with Spherical plain bearing I |
| 050 | 0250 | +43 |
| 100 | 0300 | +43 |
| 150 | 0350 | +43 |
| 200 | 0400 | +43 |
| 250 | 0450 | +43 |
| 300 | 0500 | +43 |
| 350 | 0585 | +33 |
| 400 | 0635 | +33 |
| 450 | 0685 | +33 |
| 500 | 0735 | +33 |
| 600 | 0835 | +33 |
| 700 | 0935 | +33 |

¹⁾ Base: the Retracted length with attachment "Rod end with hole"

Parallel operation self-controlled

- 1 1 actuator run independently
- 2 2 actuators run simultaneously in parallel mode

Attachment diameter (Front and rear)

- A Rod end with hole Ø 13,1 mm
- B Rod end with hole Ø 12,8 mm
- C Rod end with hole Ø 12,5 mm
- D Rod end with hole Ø 14 mm
- E Rod end with hole Ø 12,2 mm
- F Fork head with hole Ø 12,2 mm and slot 8,2 mm
- G Fork head with hole Ø 12,8 mm and slot 8,2 mm
- I Rod end Spherical plain bearing Ø 12,7 mm, rear end with hole Ø 12,8 mm
- X Customized

Attachment orientation (Front and rear)

- G 0° (Standard) with Free spinning
- H 30° with Free spinning
- I 60° with Free spinning
- J 90° with Free spinning
- K 120° with Free spinning
- L 150° with Free spinning

Option 1: Cabling and I/O variant

- A Analog I/O (Bus, 2 command input, 2 endstop output, absolute analog position output 0 – 10 V)
- C Analog I/O (Bus, 2 command input, 2 endstop output, absolute analog position output 0 – 5 V)
- B Bus (Bus, 2 command input)

Option 2: BUS Type

- C Standard: CAN without termination resistor
- T CAN with termination resistor

Protection

- T Standard: Chassis connected to negative terminal, built-in thermal protection
- U Chassis connected to negative terminal, reinforced load dump protection²⁾, Built-in thermal protection
- V Chassis not connected, Built-in thermal protection
- W Chassis not connected, reinforced load dump protection²⁾, Built-in thermal protection

Customization

Stroke length, retracted length, cable, connector, front attachment, rear attachment, color, de-rated load



²⁾ For vehicle without centralized load dump protection, option valid only for 12V.

CAHB-30A

Linear actuator

Benefits

- Powered by AC voltage
- Designed and tested for harsh environments
- Reliable and cost-effective
- Reduced development and start-up times
- Virtually maintenance-free

Features

- Optional potentiometer and limit switches
- Self-locking
- Integrated thermal and overload protection
- Robust design, IP65, wide temperature range, corrosion resistant



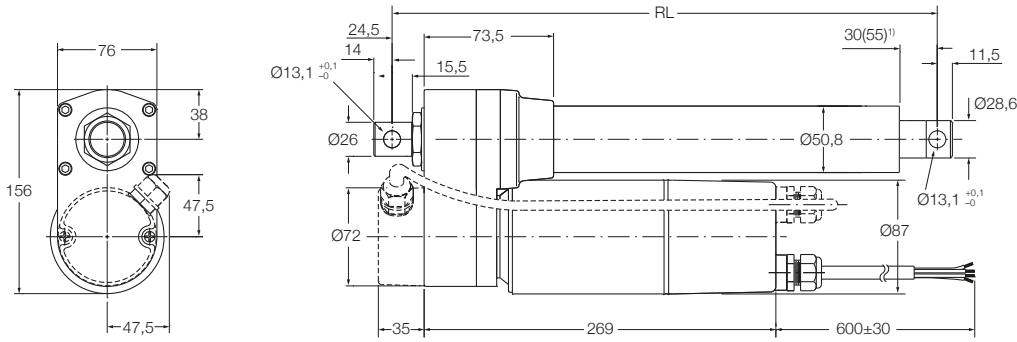
Technical data

| | | Unit | CAHB-30A... 1 | CAHB-30A... 2 |
|------------------------------|----------------|------|---------------|---------------|
| Rated push load | | N | 1 500 | 2 300 |
| Rated pull load | | N | 1 500 | 2 300 |
| Holding force ¹⁾ | | N | 10 000 | 10 000 |
| Speed (full load to no load) | 115 V AC/60 Hz | mm/s | 25 to 26 | 12 to 13 |
| | 230 V AC/50 Hz | mm/s | 21 to 22 | 11 to 12 |
| Stroke | | mm | 102 to 610 | 102 to 610 |
| Voltage | | V AC | 115 or 230 | 115 or 230 |
| Nominal current | 115 V AC/60 Hz | A | 2,3 | 1,8 |
| | 230 V AC/50 Hz | A | 1,35 | 1,4 |
| Duty cycle | | % | 25 | 25 |
| ON time / OFF time | | s | 94/376 | 94/376 |
| Ambient temperature | | °C | -26 to +65 | -26 to +65 |
| Type of protection | | IP | 65S | 65S |
| Weight | | kg | 9 | 9 |
| Color | | - | Black | Black |

¹⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards.

Dimensional drawing

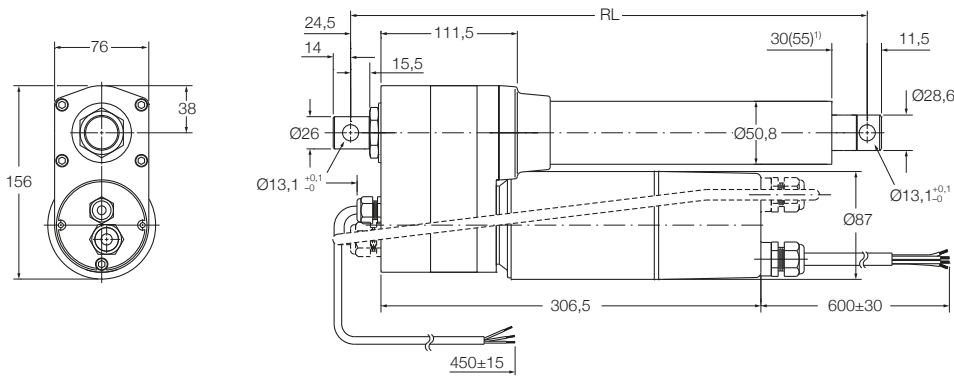
Basic configuration (dashed line for optional limit switch)



Legend:
RL = retracted length

¹⁾ 55 = dimension with limit switch

Optional potentiometer (dashed line for optional limit switch)



Legend:
RL = retracted length

¹⁾ 55 = dimension with limit switch

Retracted length calculation (RL)

Basic configuration

| Stroke [mm] | With limit switch ¹⁾ | | | | | | Without limit switch ²⁾ | | | | | |
|-----------------------|---------------------------------|-----|-----|-----|-----|-----|------------------------------------|-----|-----|-----|-----|-----|
| | 102 | 153 | 204 | 305 | 457 | 610 | 102 | 153 | 204 | 305 | 457 | 610 |
| Retracted length (RL) | 440 | 440 | 440 | 592 | 744 | 897 | 380 | 415 | 415 | 465 | 668 | 821 |

¹⁾ Tolerance: S and RL = ± 5,0 mm (If S ≥ 305 mm, S = ± 7,5 mm)

²⁾ Tolerance: S = ± 2,5 mm and RL = ± 3,8 mm

Optional potentiometer

| Stroke [mm] | With limit switch ¹⁾ | | | | | | Without limit switch ²⁾ | | | | | |
|-----------------------|---------------------------------|-----|-----|-----|-----|-----|------------------------------------|-----|-----|-----|-----|-----|
| | 102 | 153 | 204 | 305 | 457 | 610 | 102 | 153 | 204 | 305 | 457 | 610 |
| Retracted length (RL) | 478 | 478 | 478 | 630 | 782 | 935 | 418 | 453 | 453 | 503 | 706 | 859 |

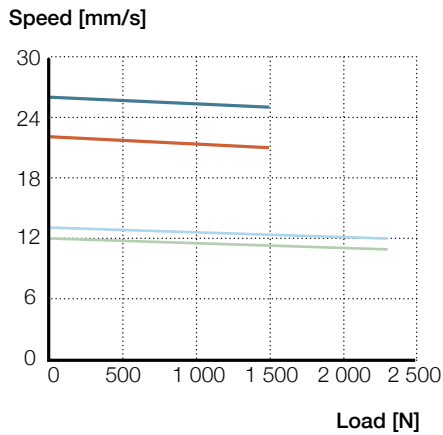
¹⁾ Tolerance: S and RL = ± 5,0 mm (If S ≥ 305 mm, S = ± 7,5 mm)

²⁾ Tolerance: S = ± 2,5 mm and RL = ± 3,8 mm

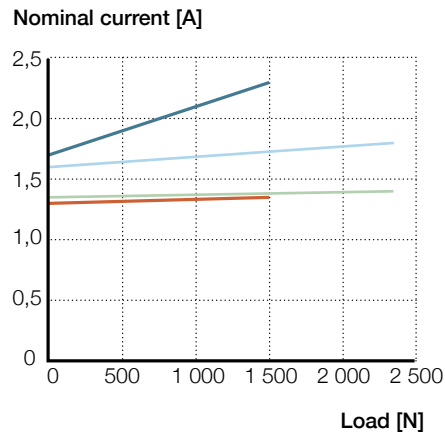


Performance diagrams

Speed-load diagram



Current-load diagram



— 1 (115 VAC) — 1 (230 VAC) — 2 (115 VAC) — 2 (230 VAC)

Electrical specifications

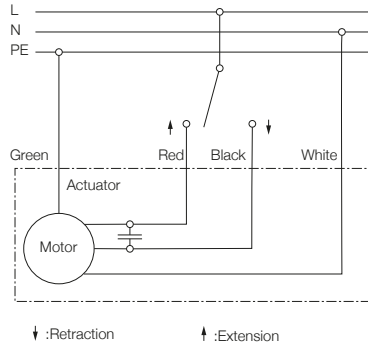
Potentiometer resolution

| Stroke [mm] | 102 | 153 | 204 | 305 | 457 | 610 |
|--------------|------|------|------|------|------|------|
| Ω /mm | 59,0 | 59,0 | 29,5 | 29,5 | 9,84 | 9,84 |

CAHB-3x

Connecting Diagram

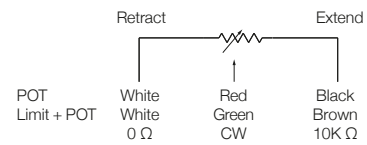
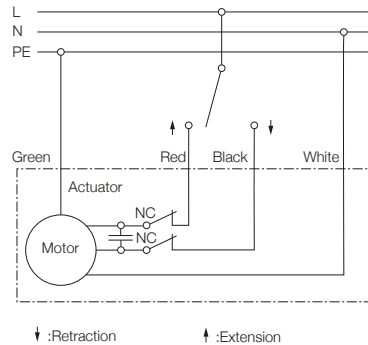
115/230 VAC, 50/60 Hz



CAHB-3x with limit switch

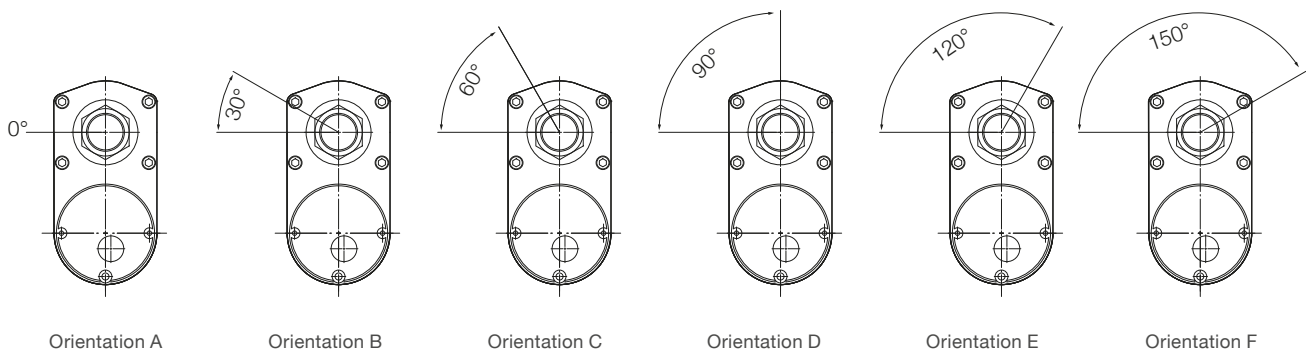
Connecting Diagram

115/230 VAC, 50/60 Hz

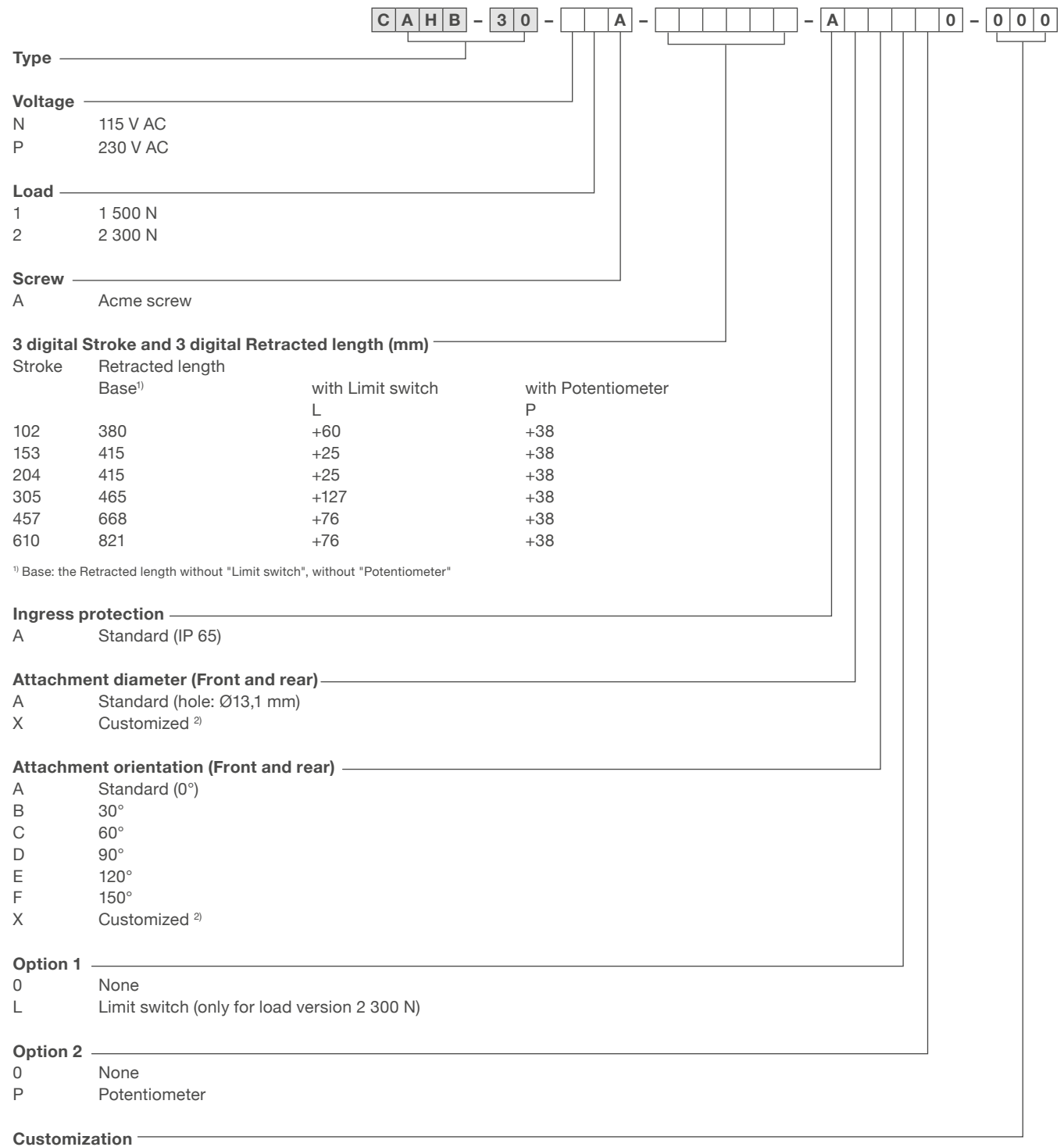


Attachment orientation

(refer to ordering key Attachment orientation)



Ordering key



²⁾ Only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

CAHB-31N

Linear actuator

Benefits

- Powered by AC voltage
- High efficiency
- Designed and tested for harsh environments
- Reliable and cost-effective
- Reduced development and start-up times
- Virtually maintenance-free

Features

- Optional potentiometer and limit switches
- Ball screw with a brake
- Self-locking
- Integrated thermal and overload protection
- Robust design, IP65, wide temperature range, corrosion resistant



Technical data

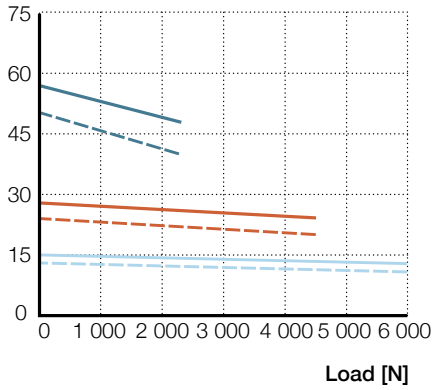
| | | Unit | CAHB-31N... 1 | CAHB-31N... 2 | CAHB-31N... 3 |
|------------------------------|----------------|------|---------------|---------------|---------------|
| Rated push load | | N | 2 300 | 4 500 | 6 000 |
| Rated pull load | | N | 2 300 | 4 500 | 6 000 |
| Holding force ¹⁾ | | N | 13 600 | 13 600 | 13 600 |
| Speed (full load to no load) | 115 V AC/60 Hz | mm/s | 48 to 57 | 22 to 28 | 13 to 15 |
| | 230 V AC/50 Hz | mm/s | 40 to 50 | 20 to 24 | 11 to 13 |
| Stroke | | mm | 102 to 610 | 102 to 610 | 102 to 610 |
| Voltage | | V AC | 115 or 230 | 115 or 230 | 115 or 230 |
| Nominal current | 115 V AC/60 Hz | A | 3 | 2,6 | 2,2 |
| | 230 V AC/50 Hz | A | 1,5 | 1,4 | 1,4 |
| Duty cycle | | % | 25 | 25 | 25 |
| ON time / OFF time | | s | 94/376 | 94/376 | 94/376 |
| Ambient temperature | | °C | -26 to +65 | -26 to +65 | -26 to +65 |
| Type of protection | | IP | 65S | 65S | 65S |
| Weight | | kg | 9,5 | 9,5 | 9,5 |
| Color | | - | Black | Black | Black |

¹⁾ The holding force is the highest load a powered-down actuator can statically hold without slipping backwards.

Performance diagrams

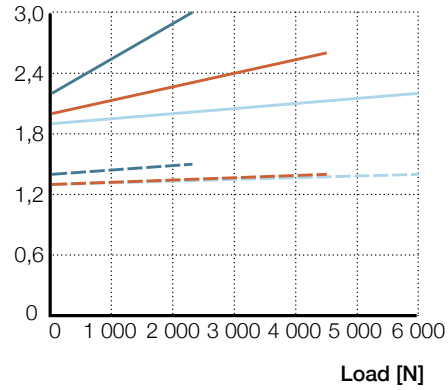
Speed-load diagram

Speed [mm/s]



Current-load diagram

Nominal current [A]



- 1 (115 VAC) — 2 (115 VAC) — 3 (115 VAC)
- - - 1 (230 VAC) - - - 2 (230 VAC) - - - 3 (230 VAC)

Electrical specifications

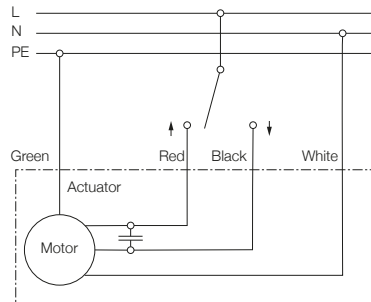
Potentiometer resolution

| Stroke [mm] | 102 | 153 | 204 | 305 | 457 | 610 |
|--------------|------|------|------|------|------|------|
| Ω /mm | 59,0 | 59,0 | 29,5 | 29,5 | 9,84 | 9,84 |

CAHB-3x

Connecting Diagram

115/230 VAC, 50/60 Hz

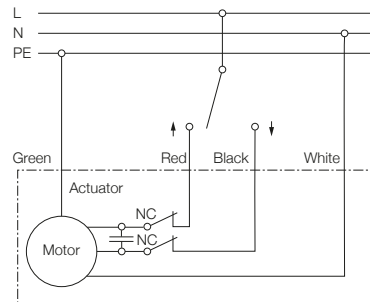


↓ :Retraction ↑ :Extension

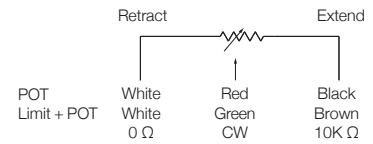
CAHB-3x with limit switch

Connecting Diagram

115/230 VAC, 50/60 Hz

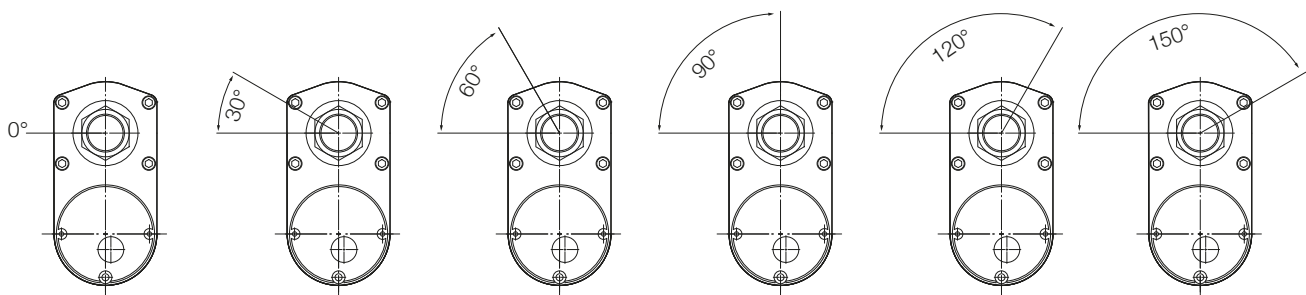


↓ :Retraction ↑ :Extension



Attachment orientation

(refer to ordering key Attachment orientation)



Orientation A Orientation B Orientation C Orientation D Orientation E Orientation F

Ordering key

C
A
H
B
-
3
1
-

-
N
-

-

-
A
-

-
0
-
0
0
0

Type _____

Voltage

N 115 V AC

P 230 V AC

Load

1 2 300 N

2 4 500 N

3 6 000 N

Screw

N Ball screw

3 digital Stroke and 3 digital ¹⁾ Retracted length (mm)

| Stroke | Retracted length | | |
|--------|--------------------|------------------------|-------------------------|
| | Base ²⁾ | with Limit switch L | with Potentiometer P |
| 102 | 380 | +64 | +38 |
| 153 | 419 | +25 | +38 |
| 204 | 419 | +76 | +38 |
| 305 | 521 | +138 | +38 |
| 457 | 735 | +76 | +38 |
| 610 | 888 | +76 | +38 |

¹⁾ Use the letter "A" to represent "10" if the Retracted length exceeds 999 mm, for example: 1002 mm is A02

²⁾ Base: the Retracted length without "Limit switch", without "Potentiometer"

Ingress protection

A Standard (IP 65)

Attachment diameter (Front and rear)

A Standard (hole: Ø13,1 mm)

X Customized ³⁾

Attachment orientation (Front and rear)

A Standard (0°)

B 30°

C 60°

D 90°

E 120°

F 150°

X Customized ³⁾

Option 1

0 None

L Limit switch (only for load version 6 000 N)

Option 2

0 None

P Potentiometer

Customization _____



¹⁾ Only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

CAHB series - Environmental tests

| Climatic tests | | | | | | |
|--|---|------------------|---|--------------------------------------|--|------------------|
| Test and Standard | CAHB-20xE, CAHB-21xE, CAHB-22xE | | CAHB-10 | | CAHB-30, CAHB-31 | |
| | Performance | Report No. | Performance | Report No. | Performance | Report No. |
| Cold test EN60068-2-1 (Ab) | Storage at low temperature Temperature: -40 °C Duration: 6 hours Not connected Tested at room temperature. | PH_TR0295 | Storage at low temperature Temperature: -40 °C Duration: 96 hours Not connected Tested at room temperature. | "Low temperature for CAHB-10" | Storage at low temperature: Temperature: -40 °C Duration: 8 hours Not connected Tested at room temperature. | PH_TR0265 |
| Cold test EN60068-2-1 (Ad) | Storage at low temperature Temperature: -30 °C Duration: 6 hours Actuator is not activated/ connected Tested at low temperature. | PH_TR0295 | Storage at low temperature Temperature: -20 °C Duration: 96 hours Actuator is not activated/ connected Tested at low temperature. | "Low temperature for CAHB-10" | Storage at low temperature: Temperature: -26 °C Duration: 8 hours Not connected Tested at room temperature. | PH_TR0265 |
| Dry Heat EN60068-2-2 (Bb) | Storage at high temperature Temperature: +90 °C Duration: 72 hours Actuator is not activated/ connected. Tested at room temperature | PH_TR0278 | Storage at high temperature Temperature: +85 °C Duration: 96 hours Actuator is not activated/ connected. Tested at room temperature | "High temperature for CAHB-10" | - | - |
| Change of temperature EN60068-2-14 (Na) | Rapid change of temperature High temperature: +100 °C in 60 min. Low temperature: -30 °C in 60 min. Transition time: < 10 seconds Duration: 100 cycles Actuator is not activated/ connected. Tested at room temperature. | PH_TR0278 | - | - | - | - |
| Salt mist EN60068-2-52 (Kb) | Salt spray test Salt solution: 5 % sodium chloride (NaCl) 4 spraying periods, each of 2 hours. Humidity storage 7 days after each. Actuator not activated/ connected. Exposure time: 250 hours | PH_TR0268 | Salt spray test Salt solution: 5 % sodium chloride (NaCl) 4 spraying periods, each of 2 hours. Humidity storage 7 days after each. Actuator not activated/ connected. Exposure time: 96 hours | "Salt spray test for CAHB-10" | - | - |
| Degrees of protection IEC 60529 | 1. Test Item: IP6XM Test Condition: Movement Test Dust: Talcum powder Dust Concentration: 2 kg/m ³ chamber volume and be kept in suspension during the test Test Duration: 8 hours | SHIN1607036235PS | 1. Test Item: IP6XS Test Condition: Static Type of dust: Talcum powder Test Duration: 8 hours | COM12-GPE080184AN, COM12-GPE080183AN | - | - |
| Degrees of protection IEC 60529 | 2. Test Item: IPX6M Test Condition: Movement Flux: 100 L/min Nozzle diameter: Ø12,5 mm Distance: 2,5 ~ 3,0 m Test duration: 3 min | SHIN1607036235PS | 2. Test Item: IPX6S Test Condition: Static Flux: 100 (1 ±5 %) L/min Nozzle diameter: Ø12,5 mm Distance: 2,5 ~ 3,0 m Test duration: 3 min | COM12-GPE080184AN, COM12-GPE080183AN | 2. Test Item: IPX5S Test Condition: Static Flux: 12,5 L/min Nozzle diameter: Ø6,3 mm Distance: 2,5 ~ 3,0 m Test duration: 3 min | SHIN1608042057MR |
| Degrees of protection ISO 20653:2013 | 3. Test Item: IPX9K Test Condition: Static Water flow: 14~16 L/min Water pressure: 8 000~10 000 kPa Water temperature: 80 to -5 °C Test angle: 0°, 30°, 60°, 90° Test distance from jet to sample: 100~150 mm Test duration: 30 s/position | SHIN1607036235PS | 3. Test Item: IPX9K Test Condition: Static Water flow: 14~16 L/min Water pressure: 8 000~10 000 kPa Water temperature: 80 to -5 °C Test angle: 0°, 30°, 60°, 90° Test distance from jet to sample: 100~150 mm Test duration: 30 s/position | SHIN1510048959MR-01 | - | - |

| Climatic tests | | | | | | |
|--------------------------------|---------------------------------|------------|--|---------------------|------------------|------------|
| Test and Standard | CAHB-20xE, CAHB-21xE, CAHB-22xE | | CAHB-10 | | CAHB-30, CAHB-31 | |
| | Performance | Report No. | Performance | Report No. | Performance | Report No. |
| Resistance to chemical product | - | - | Reagent on the surface 3 days 100 hours 0# Diesel Mobile H46 antiwear hydraulic Hydraulic DOT brake oil 50% Ethyleneglycol solution Urea saturated solution DEF NPK (15-15-15) | SHIN2104020949MR-01 | - | - |

| Climatic tests | | |
|--|--|---------------------|
| Test and Standard | CAHB-20xS, CAHB-21xS, CAHB-22xS Performance | Report No. |
| Temperature shock test | -55°C to +95°C, ≤15S 100 cycles | SHIN2007039234MR |
| Temperature cycle test | -40°C to +85°C 18h/cycle 10 cycles | SHIN2106042981PS |
| High temperature soak test (Operational) | +85°C, 96 hours | SHIN2012077900MR-01 |
| Low temperature soak test (Operational) | -40°C, 96 hours | SUIN2101000352MR |
| Storage temperature | -55°C to +110°C, 24 hours | SUIN2012009686MR |
| Humidity and temperature cycles ISO16750-4:2010 Section 5.6 | +25°C, 95%RH to +55°C, 95%RH 24 hours/cycle, 6 cycles | SUIN2012009687MR |
| Salt mist EN60068-2-52 (Kb) | 500 hours | PH_TR0404 |
| Degrees of protection IEC 60529 | IP6xS, IP6xM | SHIN1607036235PS |
| Degrees of protection ISO 20653: 2013 | IPx9K | SHIN1607036235PS |
| Resistance to chemical product | Reagent on the surface 3 days 100 hours 0# Diesel Mobile H46 antiwear hydraulic Hydraulic DOT brake oil 50% Ethyleneglycol solution Urea saturated solution DEF NPK (15-15-15) | SHIN2104020959MR-01 |

Mechanical tests

| Test and Standards | CAHB-20xE, CAHB-21xE, CAHB-22xE | | CAHB-10 | | CAHB-30, CAHB-31 | |
|--------------------------|--|------------------------------|----------------------------|------------------|------------------|------------|
| | Performance | Report No. | Performance | Report No. | Performance | Report No. |
| Vibration | Test Item: Random vibration | SHIN1607036235PS | - | - | - | - |
| EN60068-2-6 (Fdb) | Frequency (Hz) | Power spectral density level | SHIN1702007025PS | | | |
| EN60068-w2-6(Fc) | 10 | 0,005 | | | | |
| | 200 | 0,02 | | | | |
| | 300 | 0,01 | | | | |
| | 350 | 0,002 | | | | |
| | Test Direction: X/Y/Z axis | | | | | |
| | Test Duration: 2 hours/axis, Total 6 hours | | | | | |
| | Test Item: Sinusoidal vibration | | | | | |
| | Test Condition: | | | | | |
| | Frequency range: 5~25~200 Hz | | | | | |
| | Amplitude: 3,3 mm (p-p) | | | | | |
| | Acceleration: 4g | | | | | |
| | Sweep Rate: 10 ct/min | | | | | |
| | Test Direction: X/Y/Z axis | | | | | |
| | Test Duration: 2 hours/axis, Total 6 hours | | | | | |
| Vibration | - | - | Test Item: | SHIN1805034119SC | - | - |
| Ewellix Specified | | | Vibration Set Point (Grms) | Dwell Time(min) | SHIN1805032588SC | |
| Conditions | | | 5 | 10 | | |
| | | | 10 | 10 | | |
| | | | 15 | 10 | | |
| | | | 20 | 10 | | |
| | | | 20 | 20 | | |
| | | | 20 | 30 | | |
| | | | Test Equipment Name | | | |
| | | | Halt Tester | Typhoon-2,5+ | | |

Mechanical tests

| Test and Standard | CAHB-20xS, CAHB-21xS, CAHB-22xS Performance | Report No. |
|---|---|---------------------|
| Mechanical shock | 245-500 m/s ² 3-100 impacts/axis | SUIN2106004489MR |
| Mechanical shock (Drop) | 1m height onto concrete | PH_TR0430 |
| Random vibration for AG/CE wheeled vehicle | 24 hours/axis 5 Hz @ PSD 5.29 (m/s ²) ² /Hz 100 Hz @ PSD 14.44 (m/s ²) ² /Hz 1 000 Hz @ PSD 14.44 (m/s ²) ² /Hz 2 000 Hz @ PSD 3.66 (m/s ²) ² /Hz | SUIN2106004491MR-01 |
| Vibration-random resistance | 6.9 g RMS 2 hours/axis | SHIN2011076082PS |

| Electrical tests | | | | | | |
|---|--|--|-------------------------------------|-------------------|---|--|
| Test and Standards | CAHB-20xE, CAHB-21xE, CAHB-22xE | | CAHB-10 | | CAHB-30, CAHB-31 | |
| | Performance | Report No. | Performance | Report No. | Performance | Report No. |
| Power supply 12 VDC ASAE EP455 (1990) | Operating voltages: +10 V ~ +16 V Over voltage: +26 V / 5 min. Reverse polarity: -26 V / 5 min. Short circuit to ground: 16 V / 5 min. Short circuit to supply: 16 V | PH_TR0267 PH_TR0302 | - | - | - | - |
| Power supply 24 VDC ASAE EP455 (1990) | Operating voltages: +21 V ~ +26 V Over voltage: +36 V / 5 min Reverse polarity: -36 V / 5 min Short circuit to ground: 32 V / 5 min Short circuit to supply: 32 V | PH_TR0267 PH_TR0302 | - | - | - | - |
| Safety Low Voltage Directive EN 60335-1: 2012 + A11: 2014 | - | - | - | - | Rated Voltage: 230 V AC Rated frequency: 50 Hz Rated Current: 1,5 A Degree of protection: IP65 | UL 4787638796 |
| EN 60335-2-97: 2006 + A11: 2008 + A2:2010 + A12: 2015 EN 62233: 2008 | - | - | - | - | Rated Voltage: 230 V AC Rated frequency: 50 Hz Rated Current: 1,5 A Degree of protection: IP65 | UL 4787638796 |
| EMC, HF-immunity EN 61000-6-1 | - | - | Pass the test for 12 V / 24 V Motor | 70.888.12.1063.02 | - | - |
| EN 61000-6-2 | Pass the test for 12 V / 24 V Motor | 708881688102-00 | | | | |
| EMC, Emission EN 61000-6-3 | - | - | Inside limits for 12 V / 24 V motor | 70.888.12.1063.02 | - | - |
| EN 61000-6-4 | Inside limits for 12 V / 24 V motor | 708881688102-00 | - | - | - | - |
| EN 50081-2 (1993) EN 55011 (1998) | - | - | - | - | Class B | EM99777 (IA4=CAHB-30 CAHB-31 series) |
| EMC, Automotive transients ISO 7637-2 | ISO 7637 Load dump test only accepted on motor power connection | 708881688103-00 | - | - | - | - |
| UL certification | | | | | UL 325 ANSI/CAN/UL-Door | 20190822-E507157 |
| UL registration | Cable flammability test VW-1 (UL758, UL1581, CSA C22.2 N°.210) | BELDEN E357312-S 2C14 SHIELDED BELDEN E357312-S 3C22 2C14 BELDEN E357312-S 2C14 4C26 | | | | |

| Electrical tests | | |
|--|--|--|
| Test and Standard | CAHB-20xS, CAHB-21xS, CAHB-22xS Performance | Report No. |
| Electrical Steady State 12 VDC ISO16750-2 3rd edition | <ul style="list-style-type: none"> • Operating voltage: 14±0.2 (Engine running), 12±0.2 (Engine not running) • Over Voltage: 18V/60mins • Reverse Polarity: -26V/5mins • Short circuit to ground: 16V/5mins • Short circuit to supply: 16V/1mins/10times • Jump Start: 24V/60±6s • Ground Reference and Supply Offset: power line offset ±2 V, ground line offset ±1 V • Ground Reference Disconnection • Power Supply Disconnection • Superimposed Alternating Voltage on Supply lines: 16 V/Upp 4 V/120s/5times • Start Cycle: Level I to IV/Tol. -0.2V/Duration ±10% • Slow Decrease and Increase of Supply Voltage: Us-min 6 - 10V, Us-max 16 - 21V, 0.5V/min • Momentary drop in supply voltage: 100ms/4.5V • Reset behavior after voltage drop: Us-min 4.5V decrease 0.5V/10s • Load Dump: Test A(without centralized protection) 100V/400ms/1Ω (valid for 12 V version, Protection code "U") | WTU21U03019493V-2 (valid for 12V version, Protection code "T" and "U") |
| Electrical Steady State 24 VDC ISO16750-2 3rd edition | <ul style="list-style-type: none"> • Operating voltage: 28±0.2 (Engine running), 24±0.2 (Engine not running) • Over Voltage: 36V/60mins • Reverse Polarity: -36V/5mins • Short circuit to ground: 32V/5mins • Short circuit to supply: 32V/1mins/10times • Jump Start: 36V/60±6s • Ground Reference and Supply Offset: power line offset ±2 V, ground line offset ±1 V • Ground Reference Disconnection • Power Supply Disconnection • Superimposed Alternating Voltage on Supply lines: 32 V/Upp 4 V/120s/5times • Start Cycle: Level I to III/Voltage tol. -0.2V/Duration ±10% • Slow Decrease and Increase of Supply Voltage: Us-min 8 - 18V, Us-max 32V, 0.5V/min • Momentary drop in supply voltage: 100ms/9V • Reset behavior after voltage drop: Us-min 10V decrease 0.5V/10s • Load Dump: Test B(with centralized protection) 58V/350ms/2Ω (valid for 24 V version, Protection code "T") | WTU21U03019492V-2 (valid for 24V version, Protection code "T") |
| Sinusoid Changes of Supply Voltage | 12V systems: Test level: Vb1: 12V, Vb2: 6V, Vb3: 8V 24V systems: Test level: Vb1: 24V, Vb2: 8V, Vb3: 10V | WTU21U03019493V-2 (valid for 12 version, Protection code "T") WTU21U03019492V-2 (valid for 24 version, Protection code "T") |
| EMC Transient Conducted Disturbances ISO7637-3 | CCC, ICC | WTU21U03019493V-1 (valid for 12 version, Protection code "T") WTU21U03019492V-1 (valid for 24 version, Protection code "T") |
| EMC Conducted Transient Immunity Power Line ISO7637-2 | Positive Inductance Transient Tests Pulse 2a 2b Positive and Negative Burst Coupling Tests Pulse 3a 3b Pulse 4, Cranking Test Cranking Test at Low Temperature Pulse 4 | WTU21U03019493V-1 (valid for 12 version, Protection code "T") WTU21U03019492V-1 (valid for 24 version, Protection code "T") |
| EMC Conducted Emissions/Interference Test | Class 3 | WTU21U08086163V (valid for 12 version, Protection code "T") |
| EMC Conducted Emission EN61000-6-4 | 0.15 to 0.5 MHz QP=79, AV=66 (dBµV) 0.5 to 30 MHz QP=73, AV=60 (dBµV) | EED39M000483 (valid for 12 version, Protection code "T") |
| EMC Radiated Emissions/Interference Test CISPR 25-2008 | Class 3 | WTU21U08086163V (valid for 12 version, Protection code "T") |
| EMC Radiated Emission EN61000-6-4 | 30 to 230 MHz QP=50 (dBµV/m) 230 to 1000 MHz QP=57 (dBµV/m) | EED39M000483 (valid for 12 version, Protection code "T") EED39M000482 (valid for 24 version, Protection code "T") |
| EMC Radiated Emission EN55011 | Class A | WTU21U09098252E (valid for 24 version, Protection code "V") |
| EMC ESD IEC61000-4-2 | Air discharge: ±8kV Contact discharge: ±4kV | EED39M000483 (valid for 12 version, Protection code "T") EED39M000482 (valid for 24 version, Protection code "T") |
| EMC Electrical fast transient/burst immunity (EFT) IEC61000-4-4 | 5kHz, 5/50 ns, 15ms, 300ms Power line ±2kV, signal line ±1kV | EED39M000483 (valid for 12 version, Protection code "T") EED39M000482 (valid for 24 version, Protection code "T") |
| EMC Power-frequency magnetic field immunity IEC61000-4-8 | 50Hz, 1min, XYZ, 30A/m | EED39M000483 (valid for 12 version, Protection code "T") EED39M000482 (valid for 24 version, Protection code "T") |
| UL registration | Cable flammability test VW-1 (UL758, UL1581, CSA C22.2 N°:210) | BELDEN E357312-S 1PR14 1PR26 2C26 BELDEN E357312-S |



CAR, CAP & CAT series

The CAR, CAP, CAT modular design concept makes it easy to interchange critical components such as motors, gears, screws, attachments, etc. Custom-built actuators are easily and cost efficiently built from standard parts. The CAT range flexibility makes it suitable for a high number of applications.



Features

- Compact
- Robust
- Modular
- Lubricated for service life
- High efficiency

Benefits

- Industrial reliable and robust actuator
- Wide range of components
- Right-hand and left-hand version
- Incremental or absolute position feedback option

CAR 22

Linear actuator

Benefits

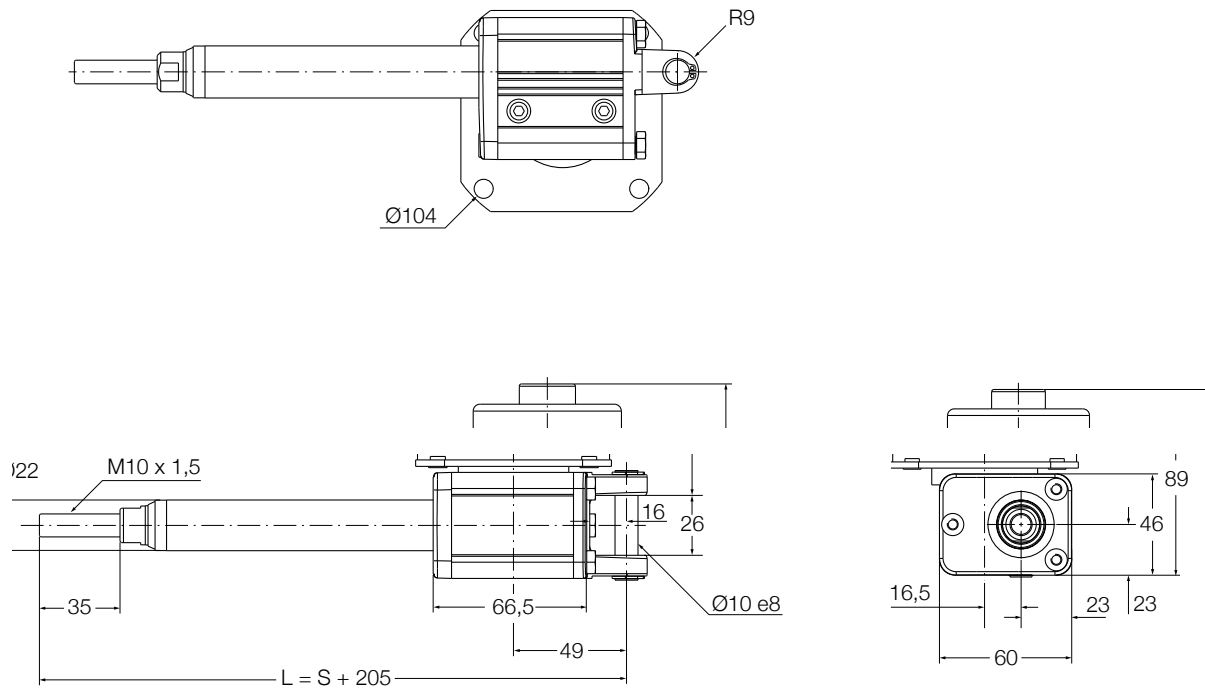
- Reliable and robust industrial actuator
- Right- and left-hand version
- Maintenance free



Technical data

| | Unit | CAR 22 | |
|------------------------------|---------|----------------|----|
| Rated push load | N | 1 000 to 1 500 | |
| Rated pull load | N | 1 000 to 1 500 | |
| Speed (full load to no load) | mm/s | 11 to 34 | |
| Stroke | mm | 50 to 300 | |
| Retracted length | mm | S+ 205 | |
| Voltage | V AC | 12 or 24 | |
| Power consumption | W | 120 | |
| Current consumption | 12 V DC | A | 10 |
| | 24 V DC | A | 4 |
| Duty cycle | % | 25 | |
| Ambient temperature | °C | -20 to +70 | |
| Degree of protection | IP | 44 | |
| Weight | kg | 1,2 to 1,6 | |

Dimensional drawing

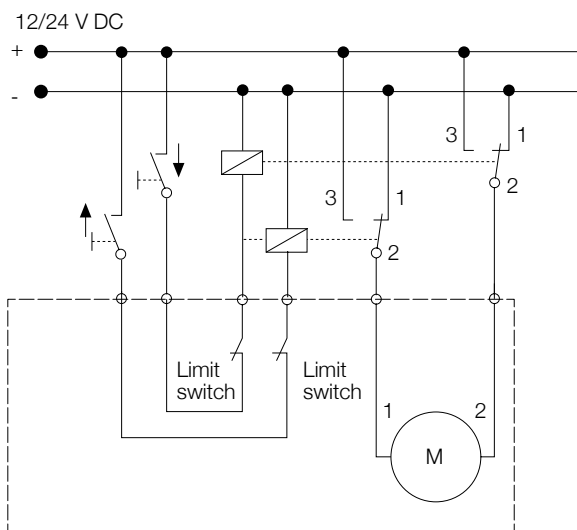


Legend:

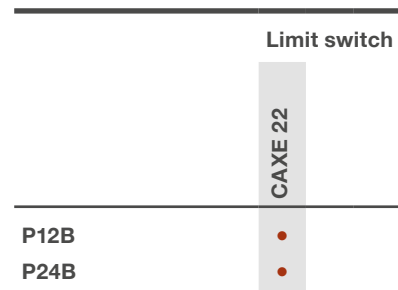
S = stroke

L = retracted length

Connecting diagrams

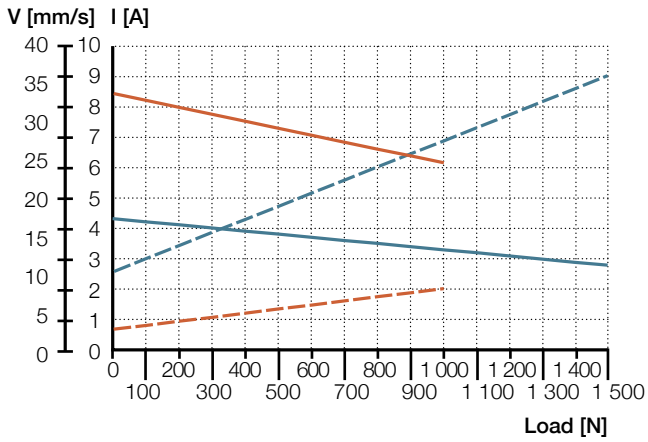


Suitable control units and accessories

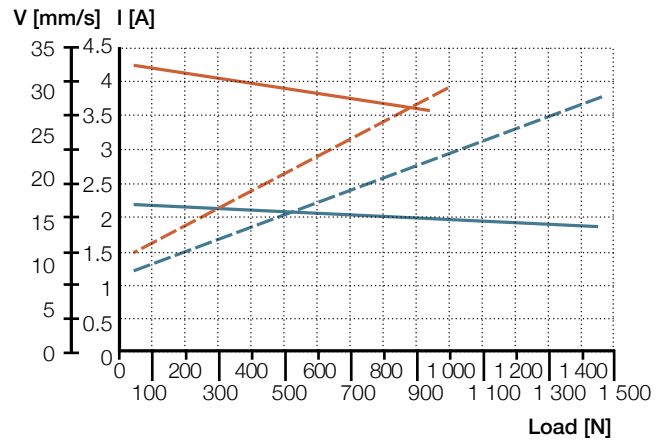


Performance diagrams

CAR 22.../P12B



CAR 22.../P24B



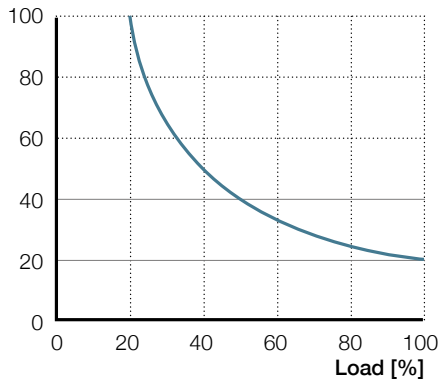
Gear 1 — V (mm/s) - - I (A)

Gear 2 — V (mm/s) - - I (A)

*There may be deviations of +/-10% from the values in the chart.

Duty cycle

Duty factor [%] at 20 °C



CAP 32

Linear actuator



Benefits

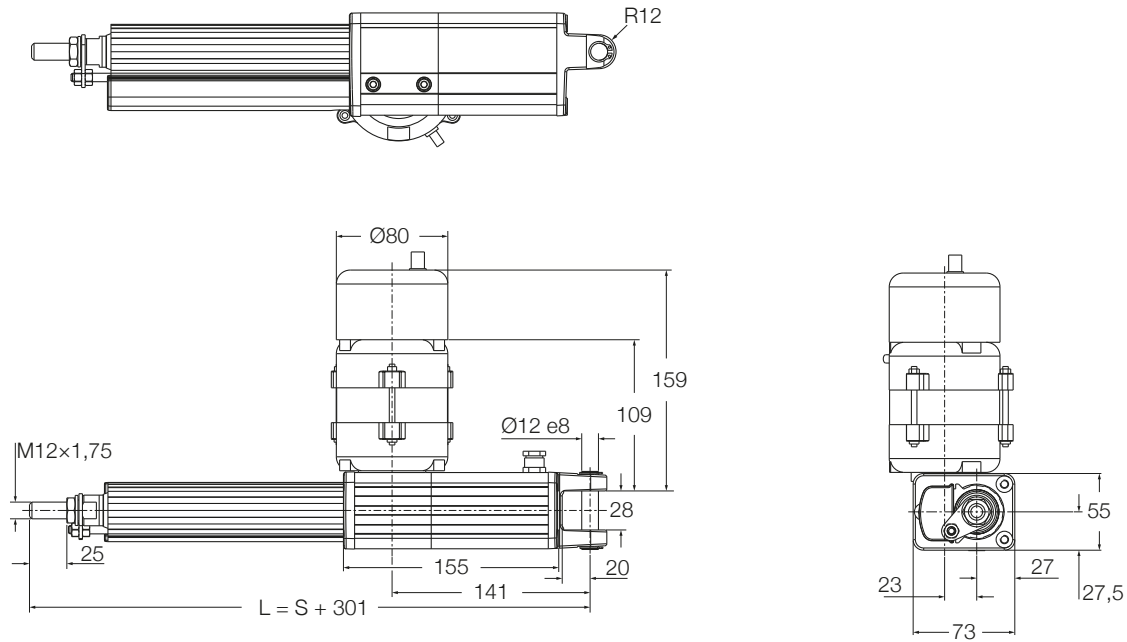
- High efficiency ball screw
- Extension tube (stainless steel)
- Protection tube (steel)
- Enhanced corrosion resistance
- Mechanical overload protection (clutch)
- Lubricated for service life
- Robust, designed for tough environment
- No back driving
- Motor with thermal protection

Technical data

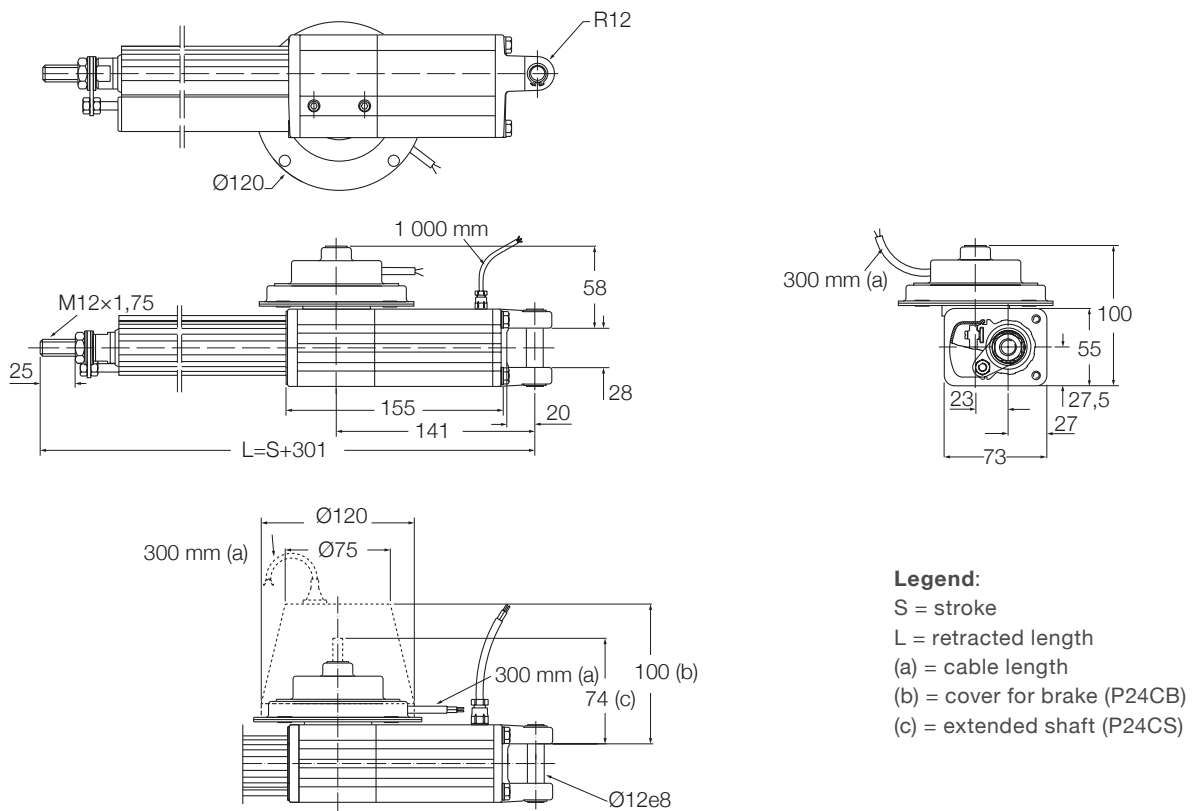
| | | Unit | CAP 32 – AC version | CAP 32 – DC version |
|------------------------------|---------------|------|-----------------------|-----------------------|
| Rated push load | | N | 1 500 to 3 500 | 1 000 to 3 500 |
| Rated pull load | | N | 1 500 to 3 500 | 1 000 to 3 500 |
| Speed (full load to no load) | | mm/s | 6 to 32 ¹⁾ | 6 to 66 ¹⁾ |
| Stroke | | mm | 50 to 700 | 50 to 700 |
| Retracted length | | mm | S+301 | S+301 |
| Voltage | | V AC | 120 or 230 | – |
| | | V DC | – | 12 or 24 |
| Power consumption | 120 V AC | W | 98 (brake 133,2 W) | N/A |
| | 230 V AC | W | 92 (brake 117,3 W) | – |
| | 12 or 24 V DC | W | – | N/A |
| Current consumption | 120 V AC | A | 0,82 (brake +0,29 A) | – |
| | 230 V AC | A | 0,4 (brake + 0,11 A) | – |
| | 12 V DC | A | – | 13 |
| | 24 V DC | A | – | 9 |
| | 24 V DC | A | – | 5 (for motor P24CW) |
| Duty cycle | | % | 30 | 25 |
| Ambient temperature | | °C | –20 to +50 | –20 to +50 |
| Degree of protection | | IP | 20/54 | 20/44 |
| Weight | | kg | 2,9 to 5,0 | 2,9 to 5,0 |

¹⁾ Depending on selected motor

Dimensional drawing – AC version



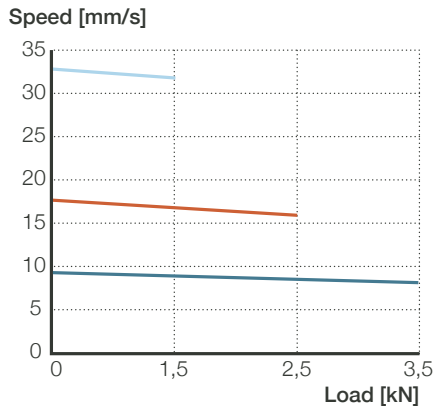
Dimensional drawing – DC version



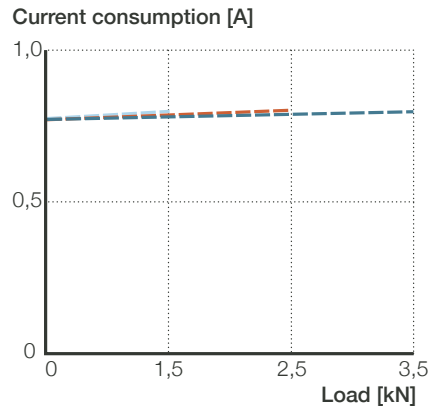
3

Performance diagrams – AC version

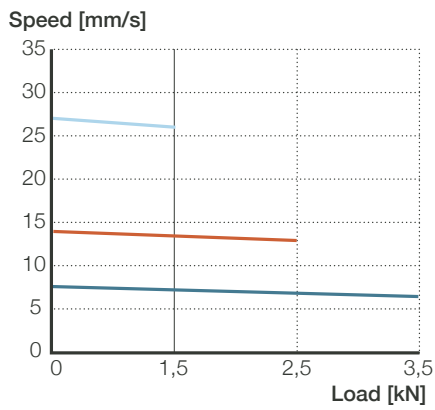
Speed-load diagram CAP 32 ... 120 V AC



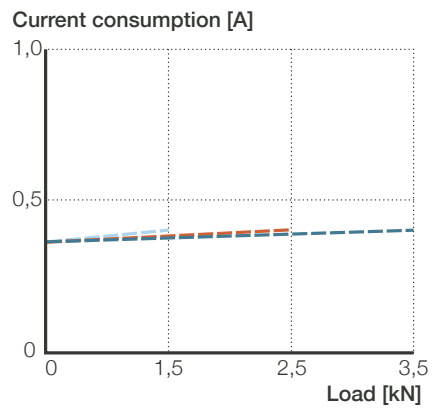
Current-load diagram CAP 32 ... 120 V AC



Speed-load diagram CAP 32 ... 230 V AC



Current-load diagram CAP 32 ... 230 V AC



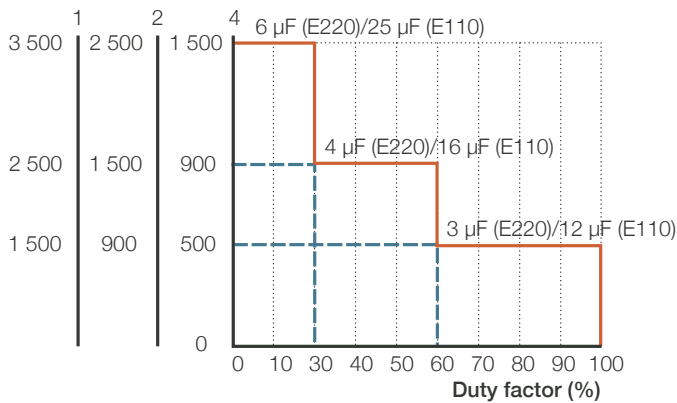
Gear 1 — V (mm/s) — I (A) Gear 2 — V (mm/s) — I (A) Gear 4 — V (mm/s) — I (A)

*There may be deviations of +/-10% from the values in the chart.

Duty cycle – AC version

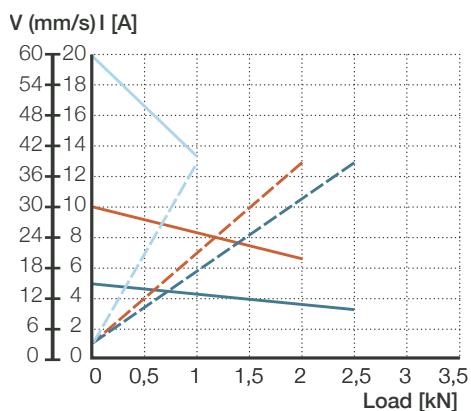
CAP 32 ... 230/120 V AC

F (N) Gear

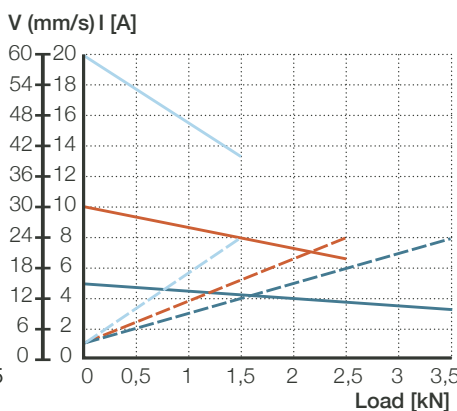


Performance diagrams – DC version

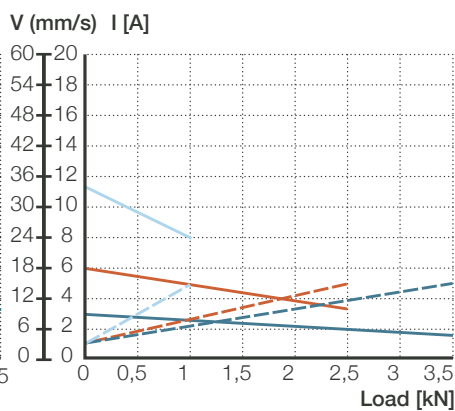
CAP 32.../P12C



CAP 32.../P24C/P24CS/P24CB



CAP 32.../P24CW



Gear 1 — V (mm/s) — I (A)

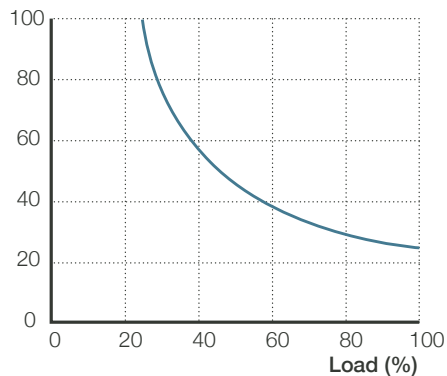
Gear 2 — V (mm/s) — I (A)

Gear 4 — V (mm/s) — I (A)

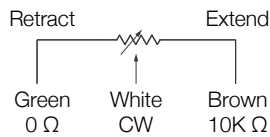
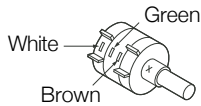
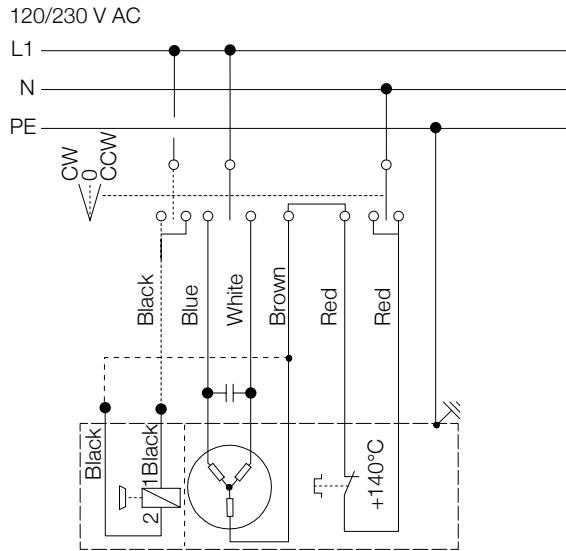
*There may be deviations of +/-10% from the values in the chart.

Duty cycle – DC version

Duty factor (%) at 20°C

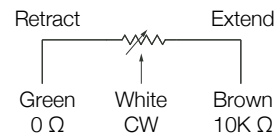
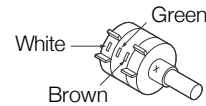
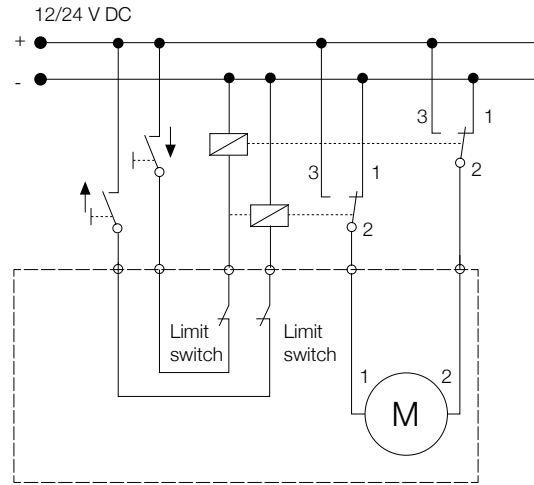


Connecting diagrams – AC version



Connection diagram for rotating potentiometer

Connecting diagrams – DC version



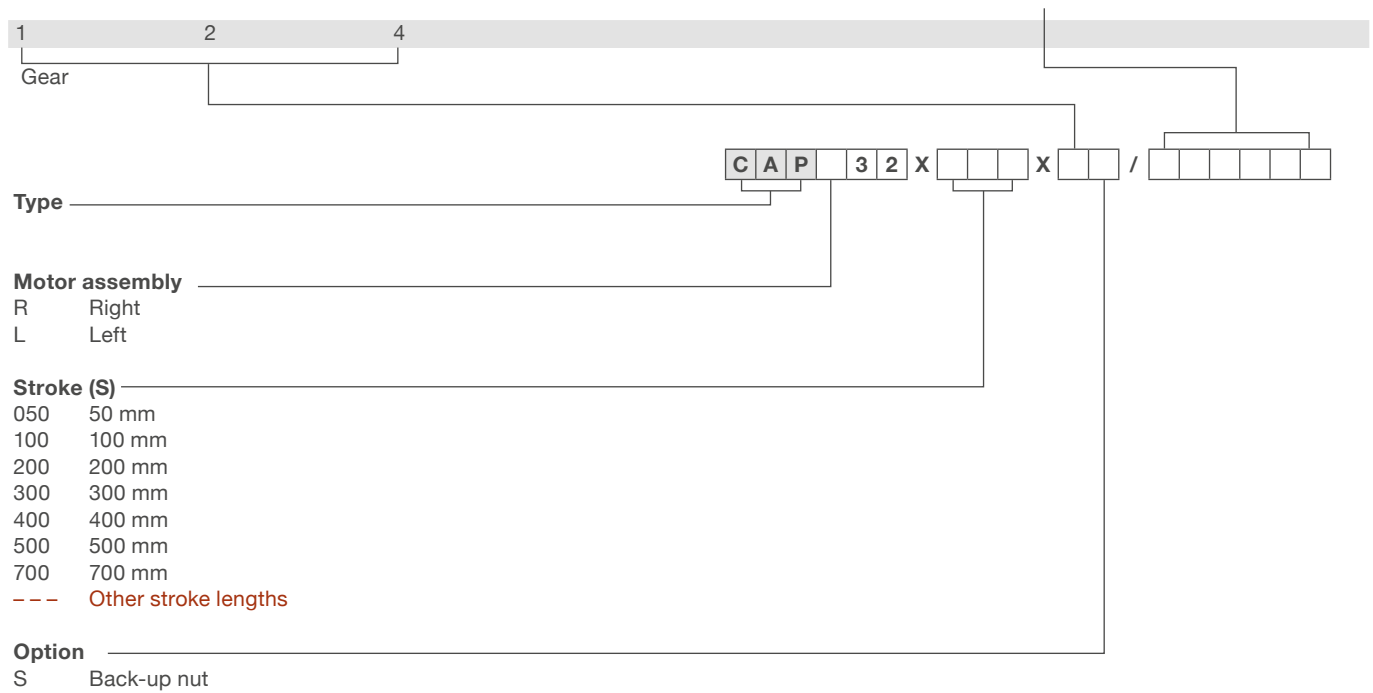
Connection diagram for rotating potentiometer

CAP 32 – Type codes for accessories and spare parts

| Item code | Type code | Order N° |
|---|-----------------------|---------------|
| 12 V DC motor (flat motor) | P12C | M/0405518-V01 |
| 24 V DC motor (flat motor) | P24C | M/0405519-V01 |
| 24 V DC motor (flat motor with brake) | P24CB | M/0405523-V01 |
| 24 V DC motor (flat motor with extended shaft) | P24CS | M/0405522-V01 |
| 24 V DC motor (flat motor with low speed) | P24CW | M/0405521-V01 |
| 120 V AC motor (cylindrical motor) | E110C | M/0405533 |
| 120 V AC motor (cylindrical motor with brake) | E110CB | M/0405534 |
| 230 V AC motor (cylindrical motor) | E220C | M/0405531 |
| 230 V AC motor (cylindrical motor with brake) | E220CB | M/0405532 |
| Capacitor value 25 μF (120 V AC) | Capacitor 25 μF | M/0430670-16 |
| Capacitor value 6 μF (230 V AC) | Capacitor 6 μF | M/0430670-03 |
| Limit switch for stroke = 50 mm | CAXE 32 × 50 | M/0412030 |
| Limit switch for stroke = 100 mm | CAXE 32 × 100 | M/0412031 |
| Limit switch for stroke = 200 mm | CAXE 32 × 200 | M/0412033 |
| Limit switch for stroke = 300 mm | CAXE 32 × 300 | M/0412034 |
| Limit switch for stroke = 500 mm | CAXE 32 × 500 | M/0412036 |
| Limit switch for stroke = 700 mm | CAXE 32 × 700 | M/0412037 |
| Proximity switch for CAXE | CAXE Proximity switch | M/0432369 |
| Front mounting attachments type Rod-end | 575-32 | M/0430575-32 |
| Front mounting attachments type Clevis | 576-32 | M/0430576-32 |
| Rear mounting attachments type Single ear bracket | 580-32 | M/0430580-32 |
| Rear mounting attachments type Universal joint | 582-32 | M/0431780-32 |

Ordering key

| Dynamic load (N) / Speed (mm/s) | | | Motor options | |
|---------------------------------|-------------|-------------|---|--------|
| 3 500xx | 2 500/xx | 1 500/xx | No motor | 0000 |
| 3 500/8 | 2 500/16 | 1 500/32 | 120 V AC/60 Hz, 1-phase, IP54 | E110C |
| 3 500/8 | 2 500/16 | 1 500/32 | 120 V AC/60 Hz, 1-phase, brake, IP20 | E110CB |
| 3 500/6 | 2 500/13 | 1 500/26 | 230 V AC/50 Hz, 1-phase, IP54 | E220C |
| 3 500/6 | 2 500/13 | 1 500/26 | 230 V AC/50 Hz, 1-phase, brake, IP20 | E220CB |
| 3 500/xx | 2 500/xx | 1 500/xx | No motor | 0000 |
| 2 500/15-10 | 2 000/30-20 | 1 000/60-40 | 12 V DC, flat motor, IP44 | P12C |
| 3 500/15-10 | 2 500/30-20 | 1 500/60-40 | 24 V DC, flat motor, IP44 | P24C |
| 3 500/10-6 | 2 500/18-12 | 1 500/36-26 | 24 V DC, flat motor, low speed, IP44 | P24CW |
| 3 500/15-10 | 2 500/30-20 | 1 500/60-40 | 24 V DC, flat motor, extended shaft, IP44 | P24CS |
| 3 500/15-10 | 2 500/30-20 | 1 500/60-40 | 24 V DC, flat motor, brake, IP20 | P24CB |



Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

CAT 32B and CAP 43B

Linear actuator

Benefits

- Compact
- Robust
- Modular
- Lubricated for service life
- High efficiency
- Digital encoder feedback



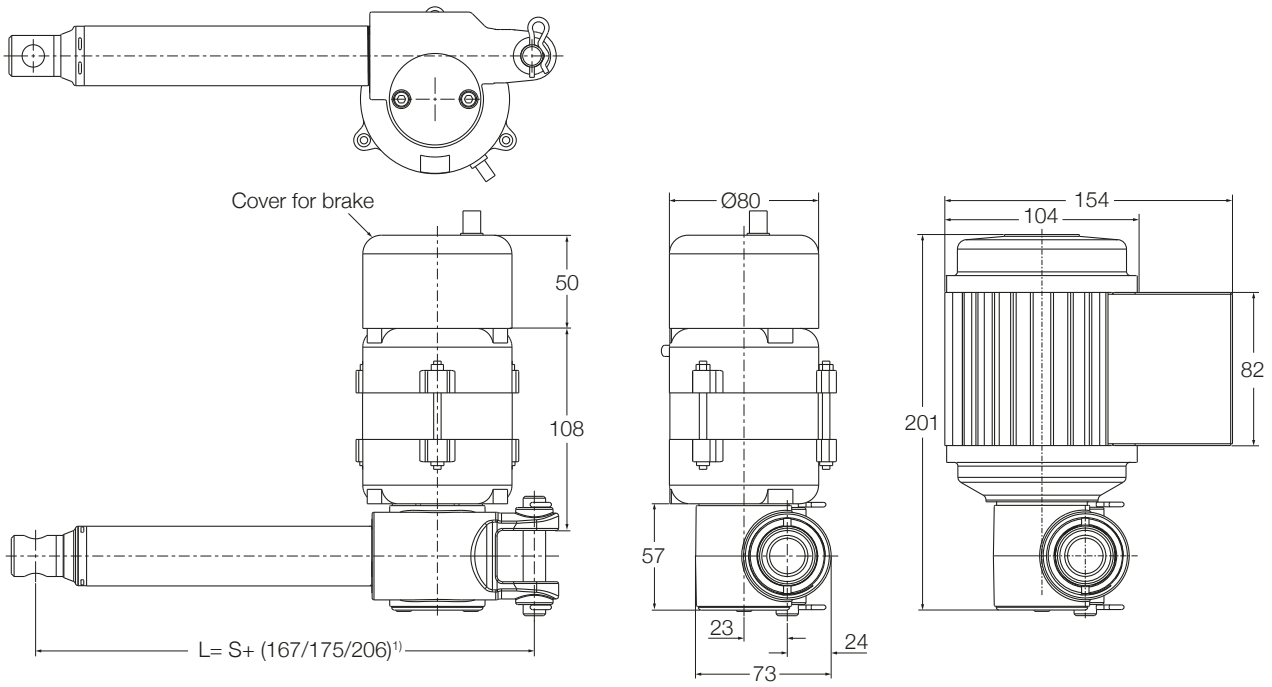
Technical data

| | Unit | CAT 32B – AC version | CAT 32B – DC version | CAP 43B |
|----------------------|---------------|-----------------------------|-----------------------------|--------------------------------|
| Rated push load | N | 1 500 to 3 500 | 1 000 to 4 000 | 1 500 to 4 000 |
| Rated pull load | N | 1 500 to 3 500 | 1 000 to 4 000 | 1 500 to 4 000 |
| Speed (at full load) | mm/s | 6,5 to 32 ¹⁾ | 6 to 66 ¹⁾ | 6 to 66 ¹⁾ |
| Stroke | mm | 50 to 700 | 50 to 700 | 50 to 700 |
| Retracted length | mm | S+167/175/206 ²⁾ | S+167/175/206 ²⁾ | S+167/175/206 ²⁾ |
| Voltage | V AC | 120, 230 or 400 | – | – |
| | V DC | – | 12 or 24 | 24 |
| Power consumption | 120 V AC | W | 98 (brake 133,2 W) | – |
| | 230 V AC | W | 92 (brake 117,3 W) | – |
| | 400 V AC | W | 80 | – |
| | 12 or 24 V DC | W | – | N/A |
| Current consumption | 120 V AC | A | 0,82 (brake +0,29 A) | – |
| | 230 V AC | A | 0,4 (brake +0,11 A) | – |
| | 400 V AC | A | 0,2 | – |
| | 12 V DC | A | – | 18 |
| | 24 V DC | A | – | 9 |
| | 24 V DC | A | – | 5 (for motors C24CW and P24CW) |
| Duty cycle | % | 30 | 20 | 20 |
| Ambient temperature | °C | –20 to +50 | –20 to +50 | –20 to +50 |
| Degree of protection | IP | 20/54/55 | 20/44/66 ¹⁾ | 44 |
| Weight | kg | 2 to 3,5 | 2 to 3,5 | 2,0 to 2,7 |

¹⁾ Depending on selected motor

²⁾ Dimension depends on selected front attachment

Dimensional drawing – CAT 32B AC version



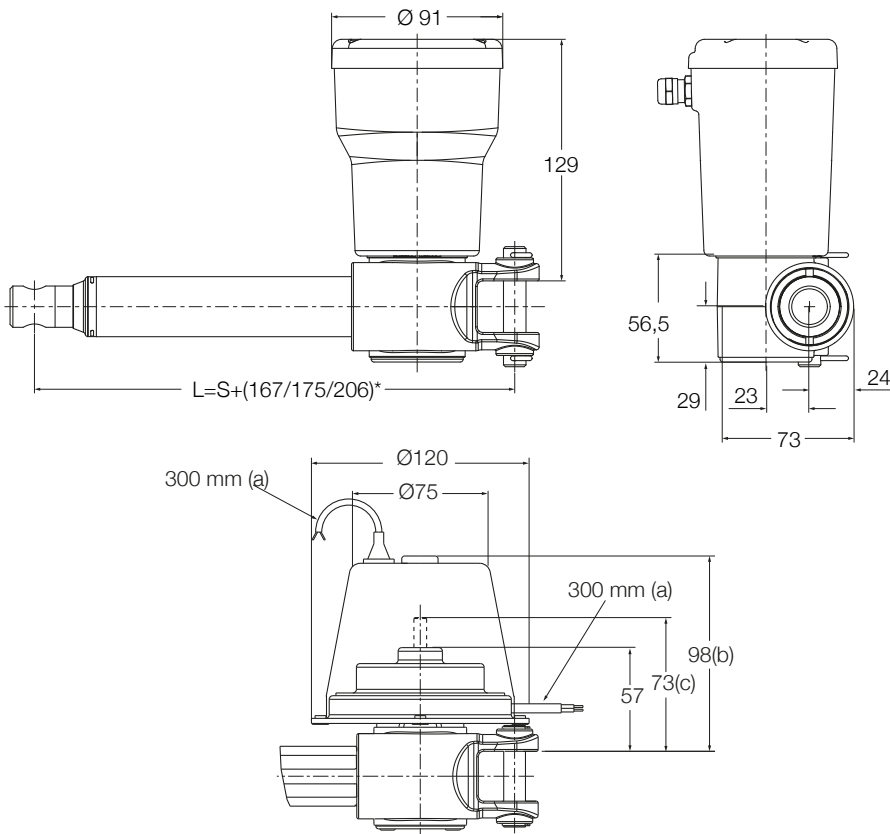
Legend:

S = stroke

L = retracted length

¹ Dimension depends on selected front attachment

Dimensional drawing – CAT 32B DC version



Legend:

S = stroke

L = retracted length

(a) = cable length

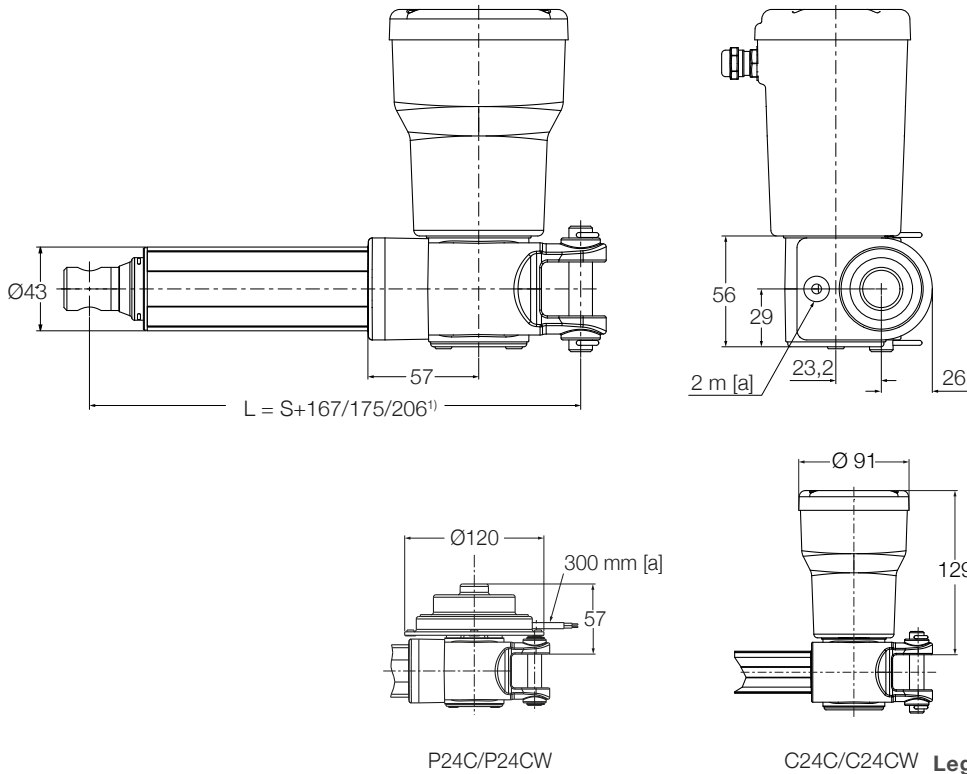
(b) = cover for brake (P24CB)

(c) = extended shaft (P24CS)

P12C, P24C, P24CB, P24CS, P24CW



Dimensional drawing – CAP 43B

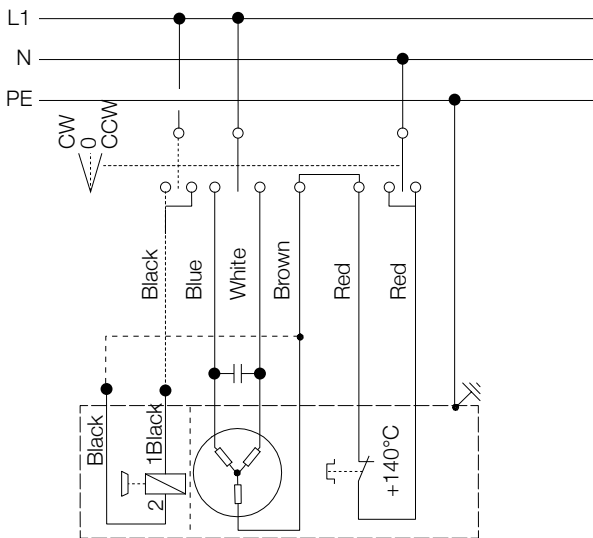


Legend:
 S = stroke
 L = retracted length
 [a] = cable length

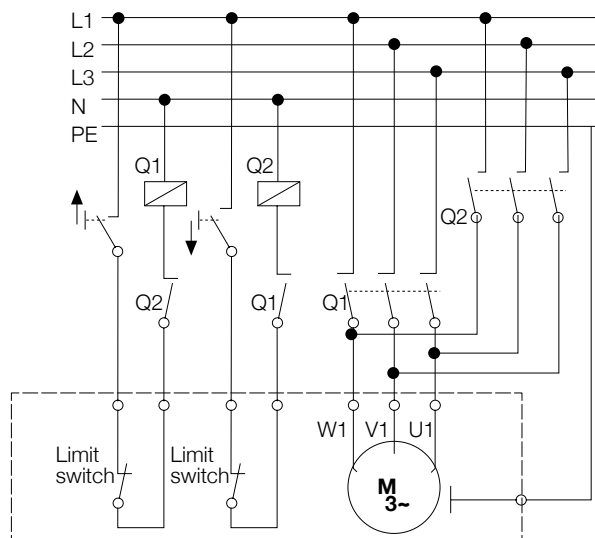
¹⁾ Dimension depends on selected front attachment

Connecting diagrams – AC version

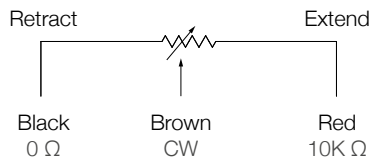
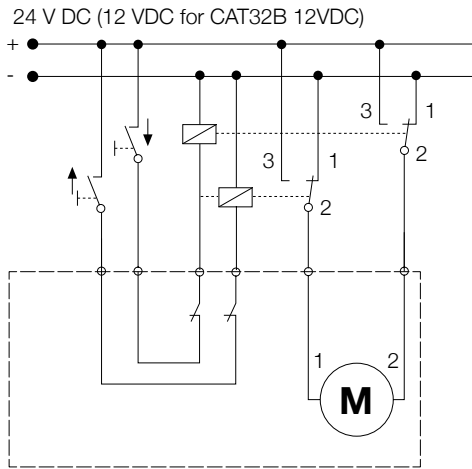
120/230 V AC



400 V AC



Connecting diagrams – DC version



Connection diagram for linear potentiometer only for CAP 43B.



Suitable control units and accessories AC version

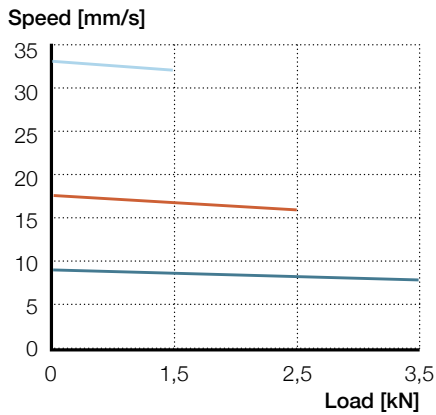
| | Limit switch | Encoder |
|--------|--------------|---------|
| | CAXE32B | E2 |
| E110C | • | • |
| E110CB | • | • |
| E220C | • | • |
| E220CB | • | • |
| E380C | • | • |

Suitable control units and accessories DC version

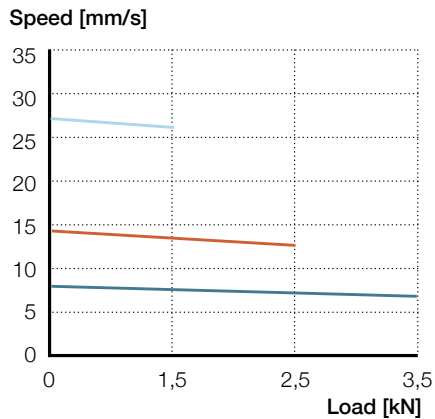
| | Limit switch | Encoder |
|-------|--------------|---------|
| | CAXE32B | E2 |
| C12C | • | • |
| P12C | • | • |
| C24C | • | • |
| C24CW | • | • |
| P24C | • | • |
| P24CB | • | • |
| P24CS | • | • |
| P24CW | • | • |

Performance diagrams – AC version

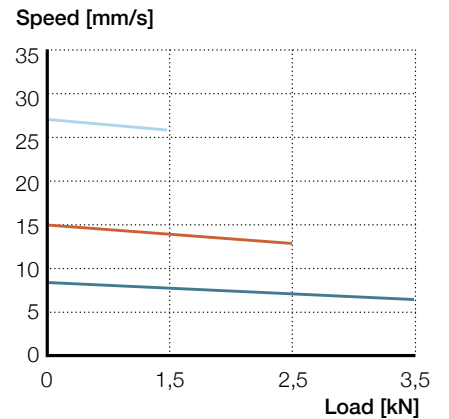
Speed-load diagram CAT 32B ... 120 V AC



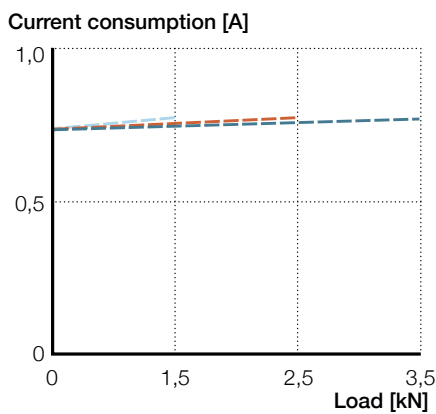
Speed-load diagram CAT 32B ... 230 V AC



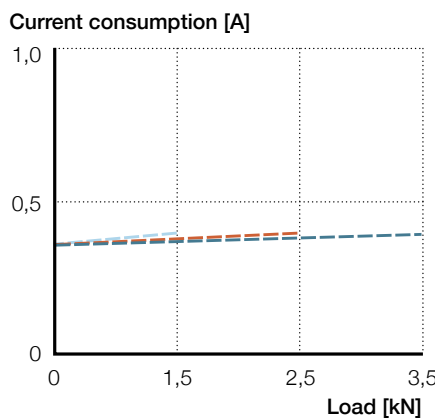
Speed-load diagram CAT 32B ... 400 V AC



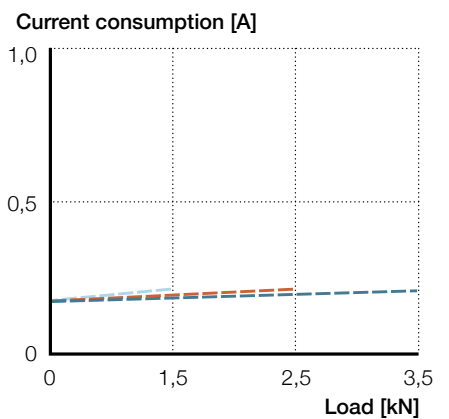
Current-load diagram CAT 32B ... 120 V AC



Current-load diagram CAT 32B ... 230 V AC



Current-load diagram CAT 32B ... 400 V AC



Gear 1 — V (mm/s) — I (A)

Gear 2 — V (mm/s) — I (A)

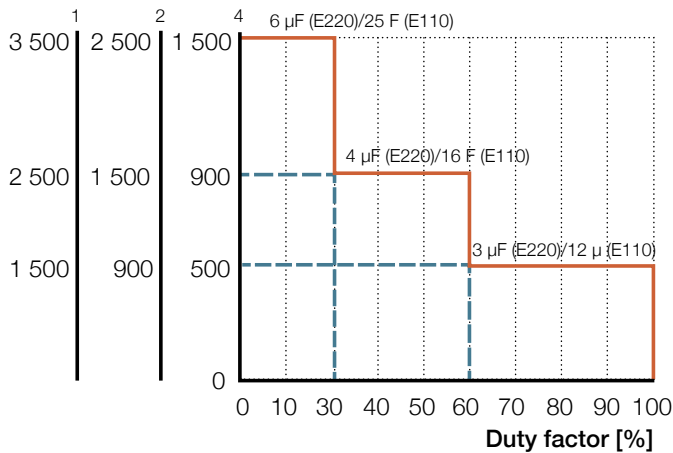
Gear 4 — V (mm/s) — I (A)

*There may be deviations of +/-10% from the values in the chart.

Duty cycle – AC version

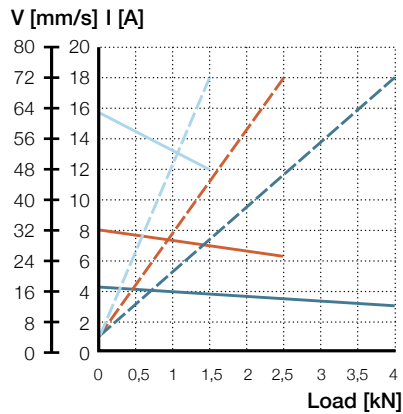
CAT 32B...230/120 V AC

F [N] Gear

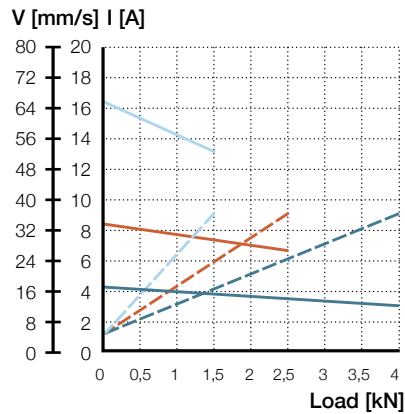


Performance diagrams – DC version

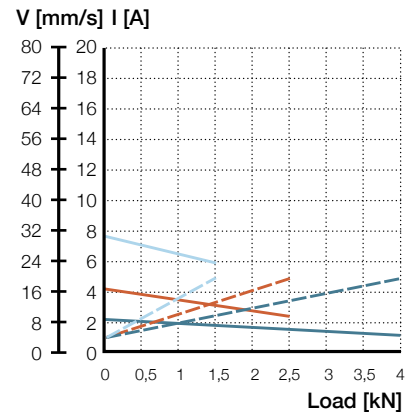
CAT 32B.../C12C



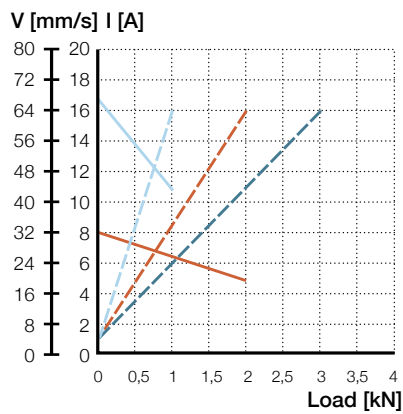
CAT 32B.../C24C
CAP 43B.../C24C



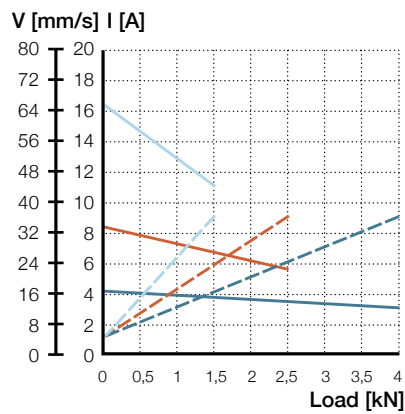
CAT 32B.../C24CW
CAP 43B.../C24CW



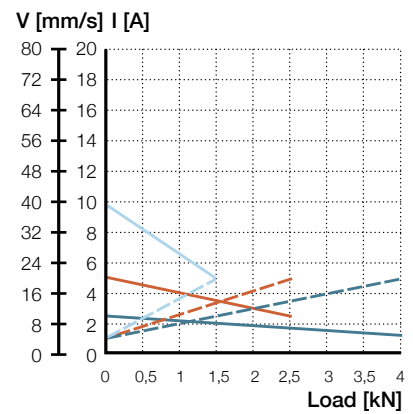
CAT 32B.../P12C



CAT 32B.../P24C/P24CB/P24CS
CAP 43B.../P24C



CAT 32B.../P24CW
CAP 43B.../P24CW



Gear 1 — V (mm/s) — I (A)

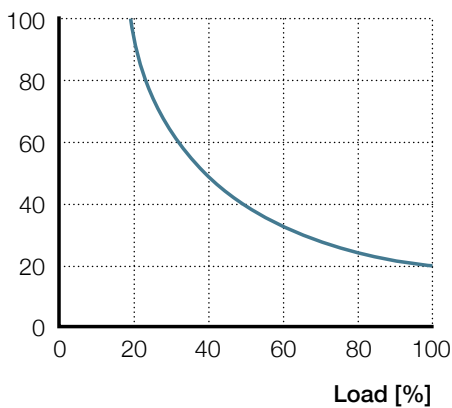
Gear 2 — V (mm/s) — I (A)

Gear 4 — V (mm/s) — I (A)

*There may be deviations of +/-10% from the values in the chart.

Duty cycle – DC version

Duty factor [%] at 20 °C



CAT 32B – Type codes for accessories and spare parts

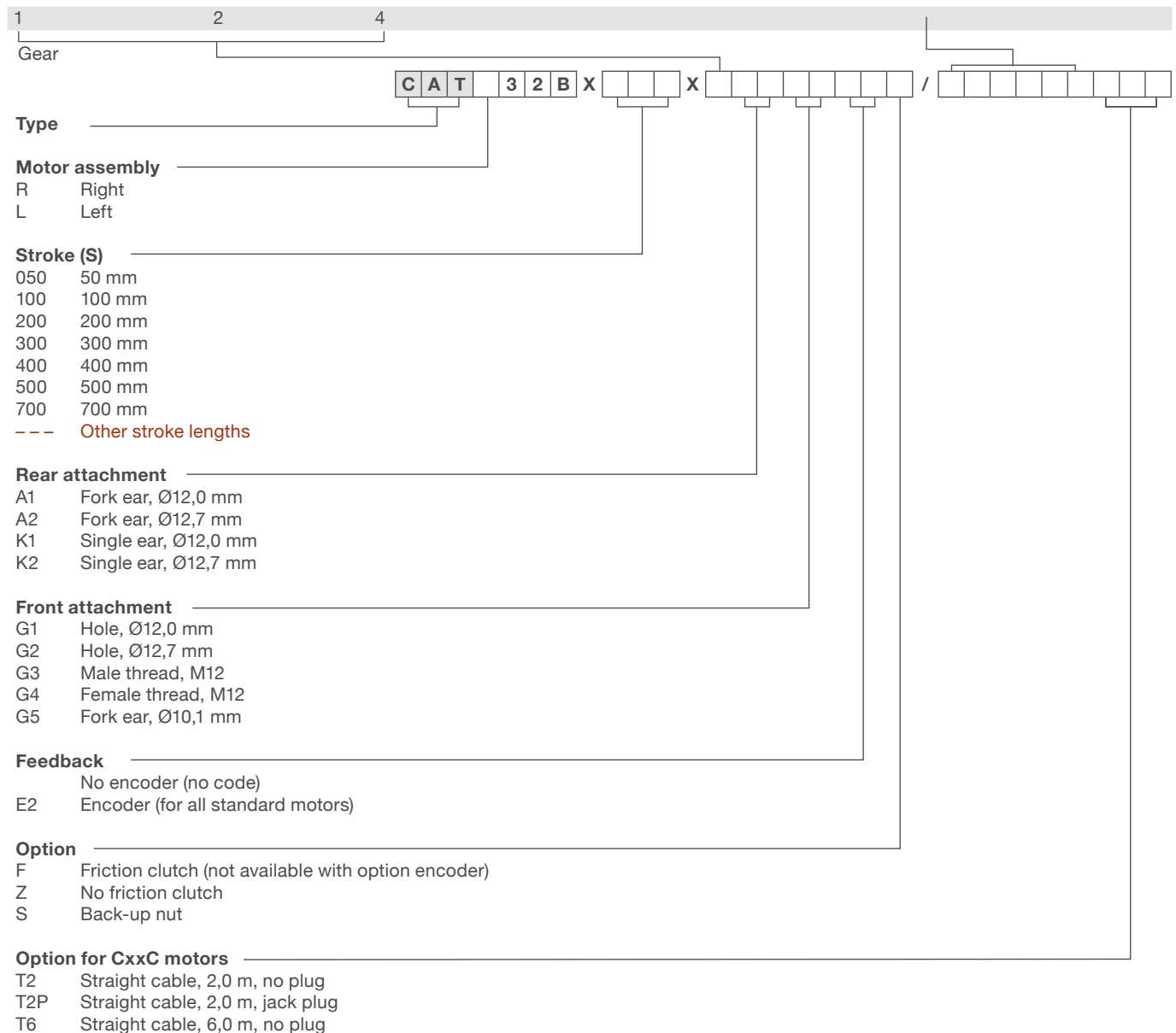
| Item code | Type code | Order N° |
|---|-----------------------|---------------|
| 12 V DC motor (cylindrical motor) | C12C | M/0405535 |
| 12 V DC motor (flat motor) | P12C | M/0405518-V01 |
| 24 V DC motor (cylindrical motor) | C24C | M/0405536 |
| 24 V DC motor (cylindrical with low speed) | C24CW | M/0405537 |
| 24 V DC motor (flat motor) | P24C | M/0405519-V01 |
| 24 V DC motor (flat motor with brake) | P24CB | M/0405523-V01 |
| 24 V DC motor (flat motor with extended shaft) | P24CS | M/0405522-V01 |
| 24 V DC motor (flat motor with low speed) | P24CW | M/0405521-V01 |
| 120 V AC motor (cylindrical motor) | E110C | M/0405533 |
| 120 V AC motor (cylindrical motor with brake) | E110CB | M/0405534 |
| 230 V AC motor (cylindrical motor) | E220C | M/0405531 |
| 230 V AC motor (cylindrical motor with brake) | E220CB | M/0405532 |
| 400 V AC motor (cylindrical motor) | E380C | M/0411607 |
| Capacitor value 25 µF (120 V AC) | Capacitor 25 µF | M/0430670-16 |
| Capacitor value 6 µF (230 V AC) | Capacitor 6 µF | M/0430670-03 |
| Limit switch for stroke = 50 mm | CAXE 32B × 50 | M/0412070 |
| Limit switch for stroke = 100 mm | CAXE 32B × 100 | M/0412071 |
| Limit switch for stroke = 200 mm | CAXE 32B × 200 | M/0412073 |
| Limit switch for stroke = 300 mm | CAXE 32B × 300 | M/0412074 |
| Limit switch for stroke = 400 mm | CAXE 32B × 400 | M/0412075 |
| Limit switch for stroke = 500 mm | CAXE 32B × 500 | M/0412076 |
| Limit switch for stroke = 700 mm | CAXE 32B × 700 | M/0412077 |
| Proximity switch for CAXE | CAXE Proximity switch | M/0432369 |
| Front mounting attachments type Rod-end | 575-32 | M/0430575-32 |
| Front mounting attachments type Clevis | 576-32 | M/0430576-32 |
| Rear mounting attachments type Single ear bracket | 580-32 | M/0430580-32 |
| Rear mounting attachments type Universal joint | 582-32 | M/0431780-32 |

CAP 43B – Type codes for accessories and spare parts

| Item code | Type code | Order N° |
|---|-----------|---------------|
| 24 V DC motor (cylindrical motor) | C24C | M/0405536 |
| 24 V DC motor (cylindrical with low speed) | C24CW | M/0405537 |
| 24 V DC motor (flat motor) | P24C | M/0405519-V01 |
| 24 V DC motor (flat motor with low speed) | P24CW | M/0405521-V01 |
| Front mounting attachments type Rod-end | 575-32 | M/0430575-32 |
| Front mounting attachments type Clevis | 576-32 | M/0430576-32 |
| Rear mounting attachments type Single ear bracket | 580-32 | M/0430580-32 |
| Rear mounting attachments type Universal joint | 582-32 | M/0431780-32 |

Ordering key

| Load [N] / Full Load Speed [mm/s] | | | Motor options | |
|-----------------------------------|-------------|-------------|--------------------------------------|--------|
| 4 000/xx | 2 500/xx | 1 500/xx | No motor | 0000 |
| 3 000/17-11 | 2 000/34-19 | 1 000/67-43 | 12 V DC, flat motor, IP44 | P12C |
| 3 500/8 | 2 500/16 | 1 500/32 | 120 V AC/60 Hz, 1-phase, IP54 | E110C |
| 3 500/8 | 2 500/16 | 1 500/32 | 120 V AC/60 Hz, 1-phase, brake, IP20 | E110CB |
| 3 500/6,5 | 2 500/13 | 1 500/26 | 230 V AC/50 Hz, 1-phase, IP54 | E220C |
| 3 500/6,5 | 2 500/13 | 1 500/26 | 230 V AC/50 Hz, 1-phase, brake, IP20 | E220CB |
| 3 500/7 | 2 500/14 | 1 500/32 | 400 V AC/50 Hz, 3-phase, IP55 | E380C |
| 4 000/xx | 2 500/xx | 1 500/xx | No motor | 0000 |
| 4 000/17-12 | 2 500/32-25 | 1 500/63-48 | 12 V DC, IP66 | C12C |
| 4 000/17-13 | 2 500/33-26 | 1 500/65-52 | 24 V DC, IP66 | C24C |
| 4 000/9-5 | 2 500/17-10 | 1 500/31-24 | 24 V DC, low speed motor, IP66 | C24CW |
| 4 000/16-12 | 2 500/33-22 | 1 500/65-44 | 24 V DC, flat motor, IP44 | P24C |
| 4 000/16-12 | 2 500/33-22 | 1 500/65-44 | 24 V DC, flat motor, brake, IP20 | P24CB |
| 4 000/16-12 | 2 500/33-22 | 1 500/65-44 | 24 V DC, flat motor, ext.shaft, IP44 | P24CS |
| 4 000/10-6 | 2 500/18-12 | 1 500/36-26 | 24 V DC, flat motor, low speed, IP44 | P24CW |



Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

Ordering key

| Load [N] / Full Load Speed [mm/s] | | | Motor options | |
|-----------------------------------|-------------|-------------|--------------------------------------|-------|
| 4 000/xx | 2 500/xx | 1 500/xx | No motor | 0000 |
| 4 000/17-13 | 2 500/33-26 | 1 500/65-52 | 24 V DC, IP44 | C24C |
| 4 000/9-5 | 2 500/17-10 | 1 500/31-24 | 24 V DC, low speed, IP44 | C24CW |
| 4 000/17-11 | 2 500/34-19 | 1 500/66-38 | 24 V DC, flat motor, IP44 | P24C |
| 4 000/10-6 | 2 500/18-12 | 1 500/36-26 | 24 V DC, flat motor, low speed, IP44 | P24CW |

| | | | |
|---|---|---|--|
| 1 | 2 | 4 | |
|---|---|---|--|

Gear

C A P 4 3 B X X X X X X X X X X X / X X X X X X X X X X

Type

Motor assembly
 R Right
 L Left

Stroke [S]
 100 100 mm
 200 200 mm
 300 300 mm
 400 400 mm
 500 500 mm
 700 700 mm

Rear attachment
 A1 Fork ear, Ø12,0 mm
 A2 Fork ear, Ø12,7 mm
 K1 Single ear, Ø12,0 mm
 K2 Single ear, Ø12,7 mm

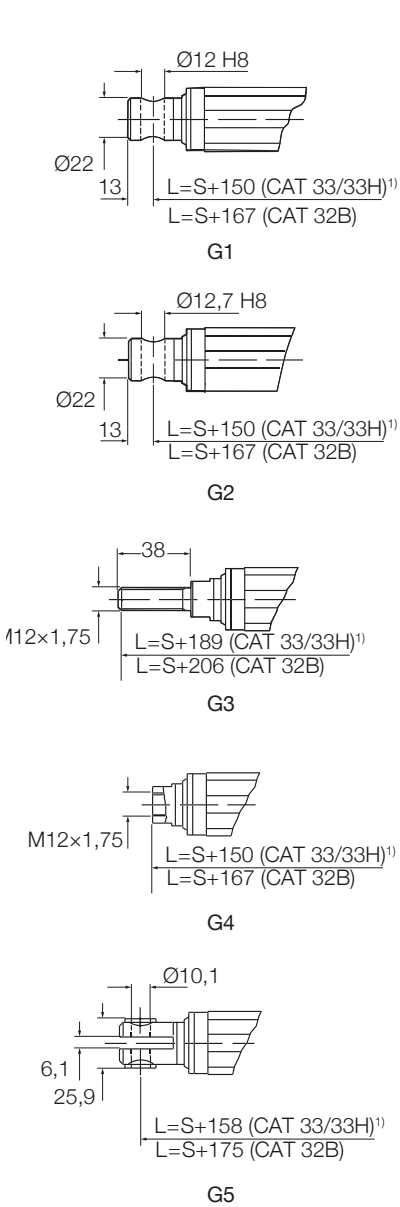
Front attachment
 G1 Hole, Ø12,0 mm
 G2 Hole, Ø12,7 mm
 G3 Male thread, M12
 G4 Female thread, M12
 G5 Fork ear, Ø10,1 mm

Option
 F Friction clutch
 S Back-up nut

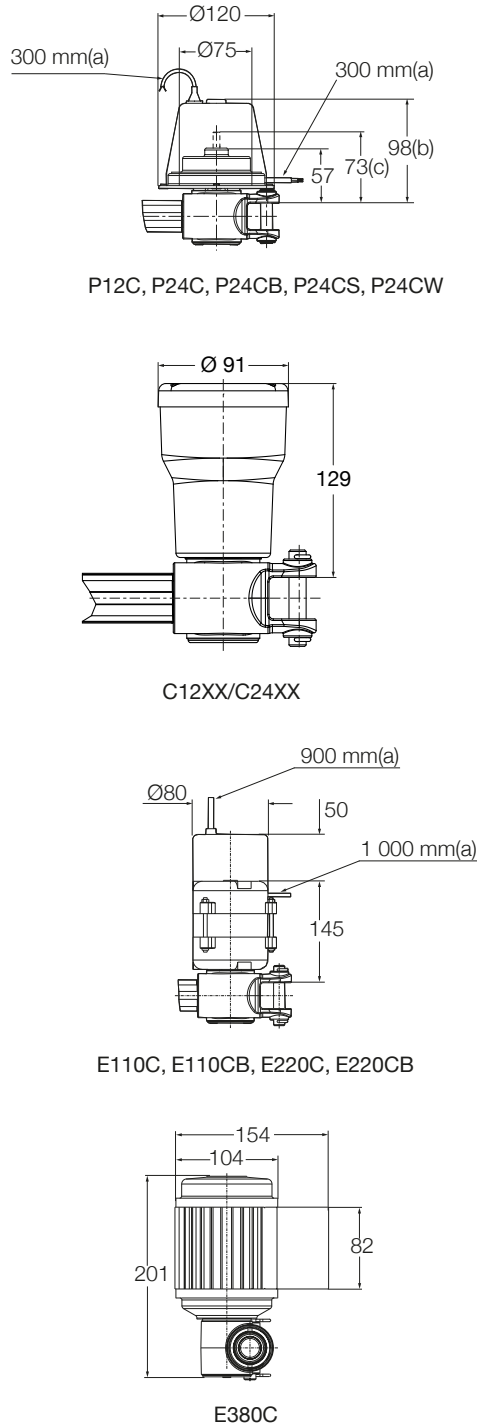
Cable option for C24C[W] motors
 T2 Straight, 2,0 m
 T6 Straight cable, 6,0 m, no plug

Detailed drawings of front and rear attachments for CAT and CAP 43 and motor options for CAT

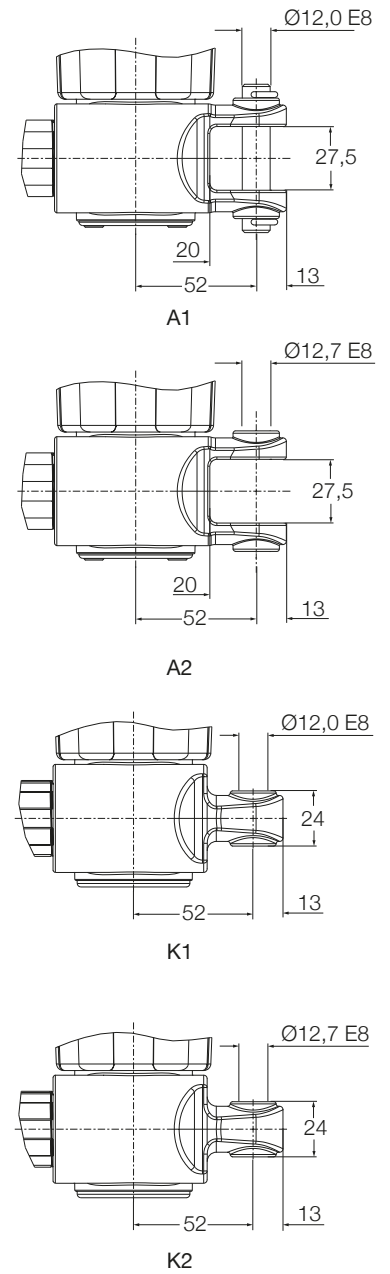
Front attachments and retracted length



Motor options for CAT



Rear attachments



Legend:

- S = stroke
- L = retracted length
- (a) = cable length
- (b) = cover for brake
- (c) = extended shaft

¹⁾ If S = 400, add 50 mm to retracted length.



CAT 33 and CAP 43A

Linear actuator

Benefits

- Small
- Robust
- Highly efficient
- Lubricated for service life
- Digital encoder feedback



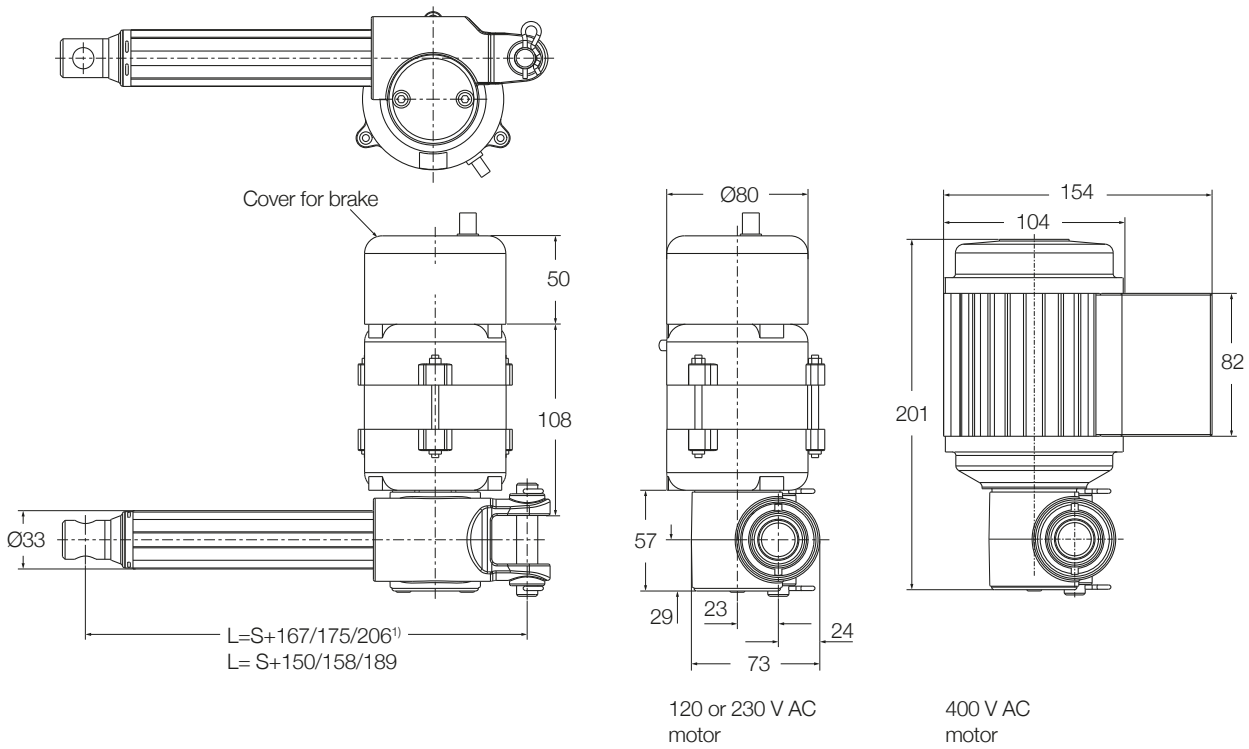
Technical data

| | Unit | CAT 33 - AC version | CAT 33 - DC version | CAP 43A |
|----------------------|---------------|-----------------------------|-----------------------------|--------------------------------|
| Rated push load | N | 800 to 3 000 | 800 to 3 000 | 1 000 to 3 000 |
| Rated pull load | N | 800 to 3 000 | 800 to 3 000 | 1 000 to 3 000 |
| Speed (at full load) | mm/s | 5 to 24 ¹⁾ | 6 to 66 ¹⁾ | 6 to 66 ¹⁾ |
| Stroke | mm | 100 to 400 | 100 to 400 | 100 to 400 |
| Retracted length | mm | S+150/158/189 ²⁾ | S+150/158/189 ²⁾ | S+150/158/189 ²⁾ |
| Voltage | V AC | 120, 230 or 400 | – | – |
| | V DC | – | 12 or 24 | 24 |
| Power consumption | 120 V AC | W | 98 (brake 133,2 W) | – |
| | 230 V AC | W | 92 (brake 117,3 W) | – |
| | 400 V AC | W | 80 | – |
| | 12 or 24 V DC | W | – | N/A |
| Current consumption | 120 V AC | A | 0,82 (brake +0,29 A) | – |
| | 230 V AC | A | 0,4 (brake + 0,11 A) | – |
| | 400 V AC | A | 0,2 | – |
| | 12 V DC | A | – | 18 |
| | 24 V DC | A | – | 9 |
| | 24 V DC | A | – | 5 (for motors C24CW and P24CW) |
| Duty cycle | % | 30 | 15 | 15 |
| Ambient temperature | °C | –20 to +50 | –20 to +50 | –20 to +50 |
| Degree of protection | IP | 20/54/55 | 20/44/66 ¹⁾ | 44 |
| Weight | kg | 2 to 2,7 | 2 to 2,7 | 2,0 to 2,7 |

¹⁾ Depending on selected motor

²⁾ Dimension depends on selected front attachment

Dimensional drawing – CAT 33 AC version



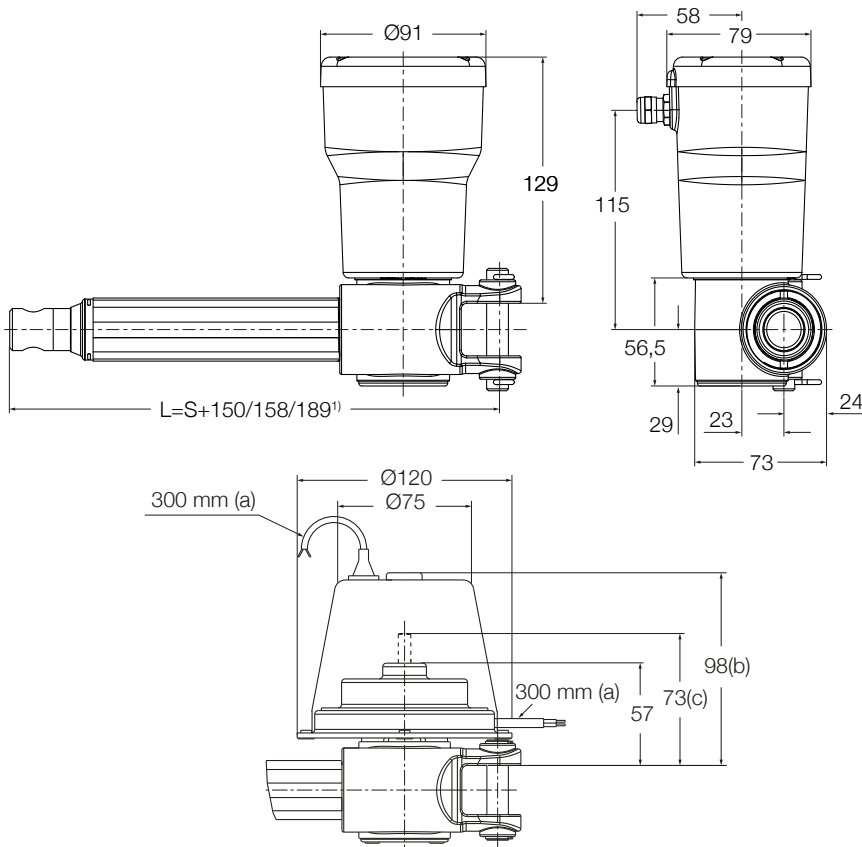
Legend:

S = stroke

L = retracted length

¹⁾ Dimension depends on selected front attachment

Dimensional drawing – CAT 33 DC version



Legend:

S = stroke

L = retracted length

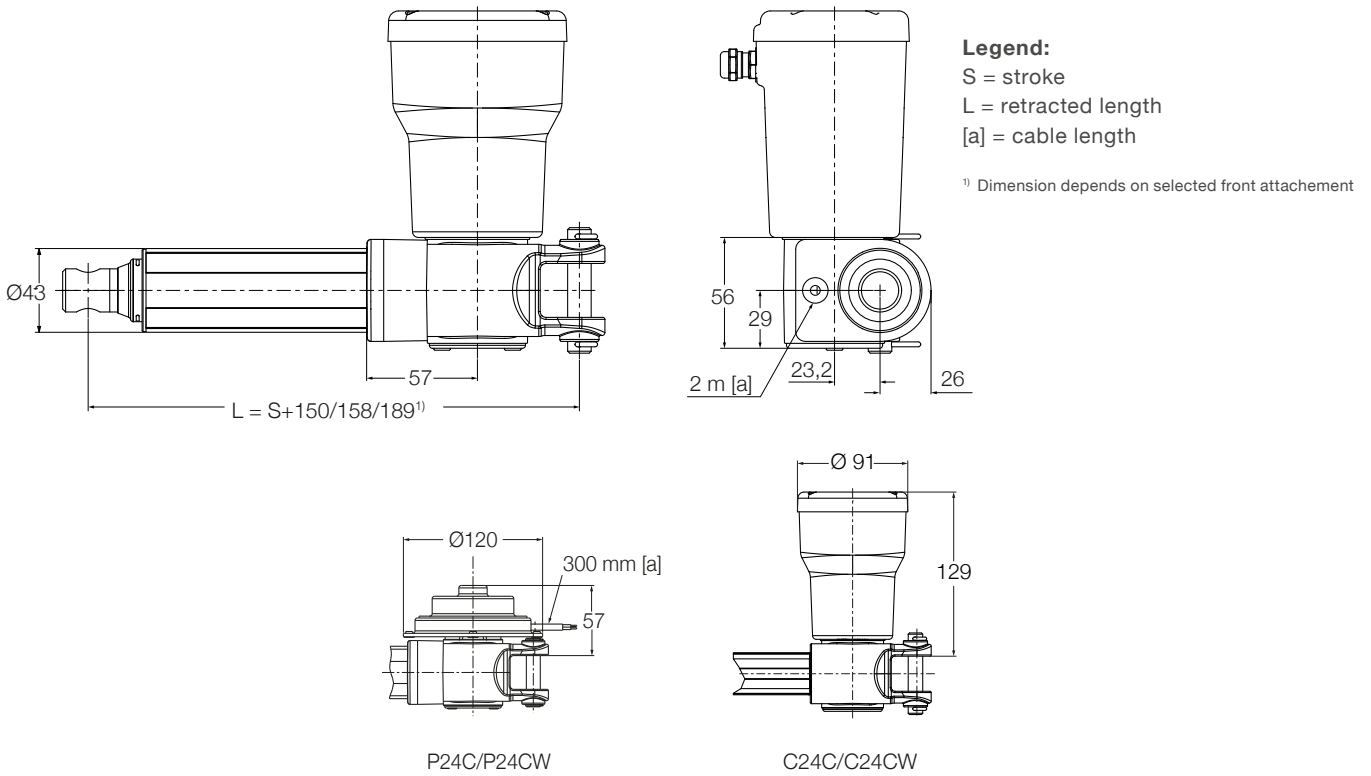
(a) = cable length

(b) = cover for brake (P24CB)

(c) = extended shaft (P24CS)

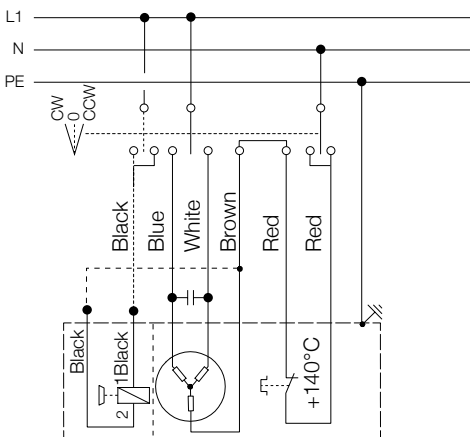
¹⁾ Dimension depends on selected front attachment

Dimensional drawing – CAP 43A

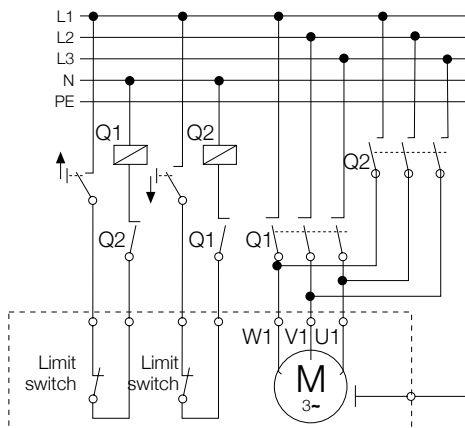


Connecting diagrams – CAT 33 AC version

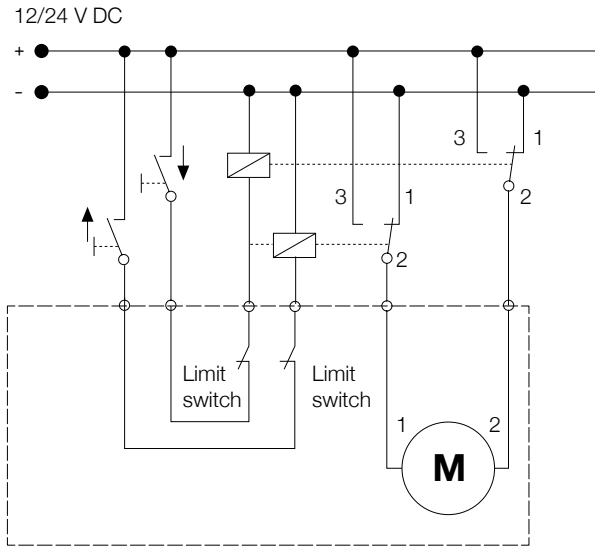
120/230 V AC



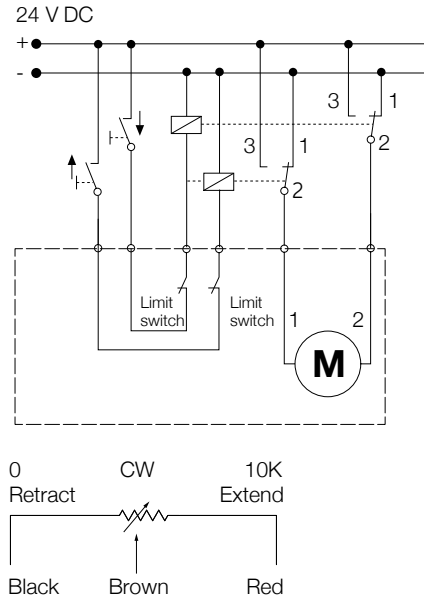
400 V AC



Connecting diagrams – CAT 33 DC version



Connecting diagrams – CAP 43A



Connection diagram for linear potentiometer

Suitable control units and accessories AC version

| | Limit switch | Encoder |
|--------|--------------|---------|
| | CAXD33 | E2 |
| E110C | • | • |
| E110CB | • | • |
| E220C | • | • |
| E220CB | • | • |
| E380C | • | • |

Suitable control units and accessories DC version

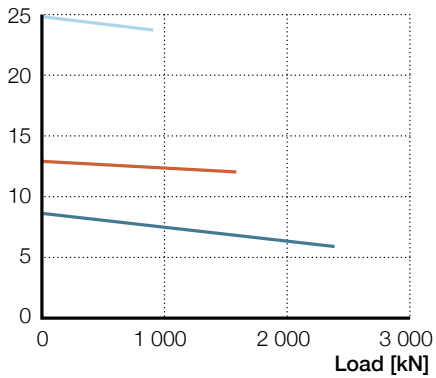
| | Encoder |
|-------|---------|
| | E2 |
| C12C | • |
| P12C | • |
| C24C | • |
| C24CW | • |
| P24C | • |
| P24CB | • |
| P24CS | • |
| P24CW | • |



Performance diagrams – AC version

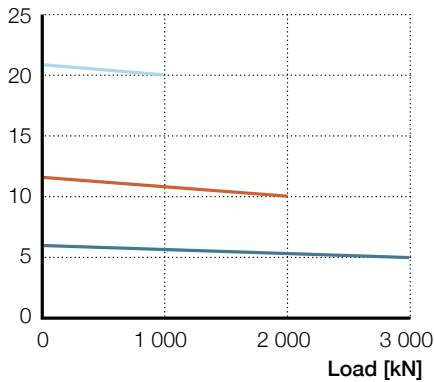
Speed-load diagram CAT 33 ... 120 V AC

Speed [mm/s]



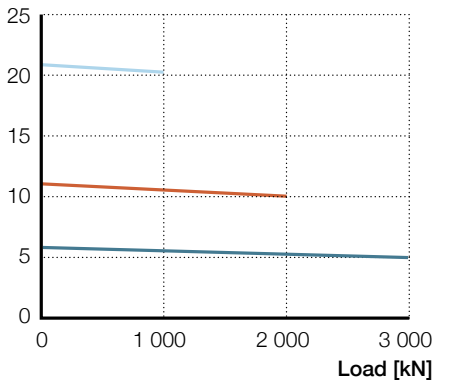
Speed-load diagram CAT 33 ... 230 V AC

Speed [mm/s]



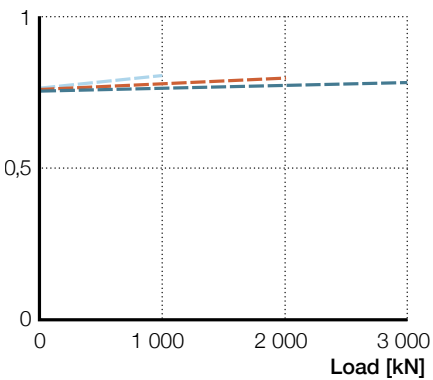
Speed-load diagram CAT 33 ... 400 V AC

Speed [mm/s]



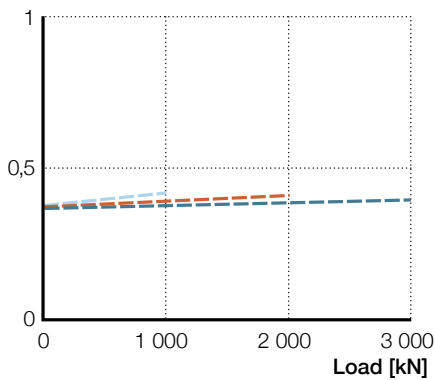
Current-load diagram CAT 33 ... 120 V AC

Current consumption [A]



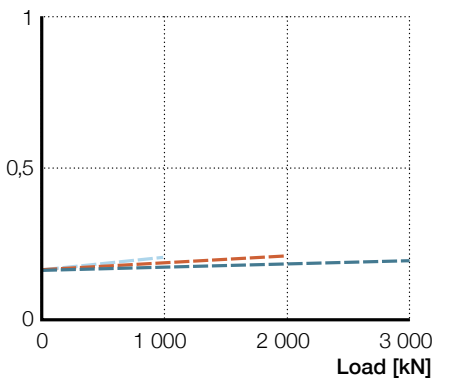
Current-load diagram CAT 33 ... 230 V AC

Current consumption [A]



Current-load diagram CAT 33 ... 400 V AC

Current consumption [A]



Gear 1 — V (mm/s) — I (A)

Gear 2 — V (mm/s) — I (A)

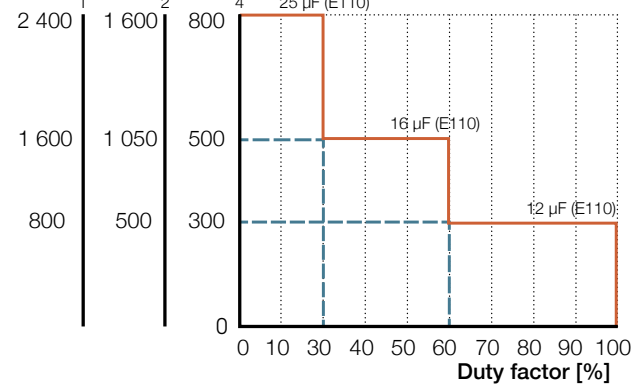
Gear 4 — V (mm/s) — I (A)

*There may be deviations of +/-10% from the values in the chart.

Duty cycle

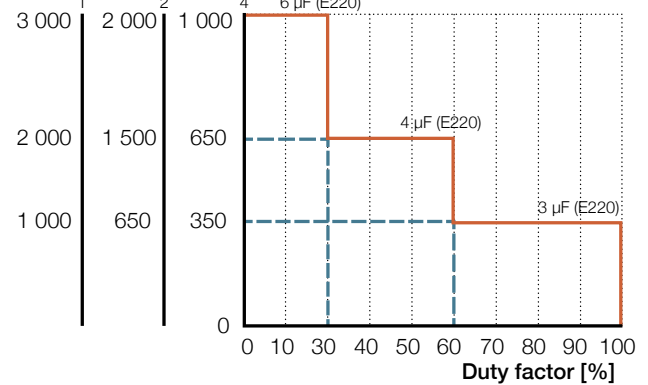
CAT 33 ... 120 V AC

F [N] Gear



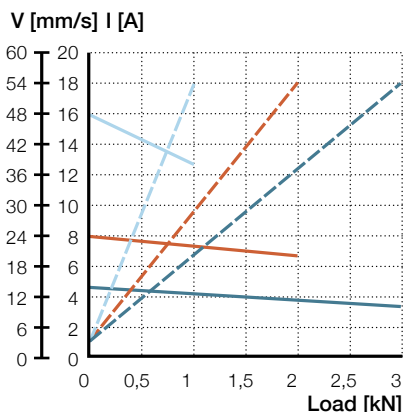
CAT 33 ... 230 V AC

F [N] Gear

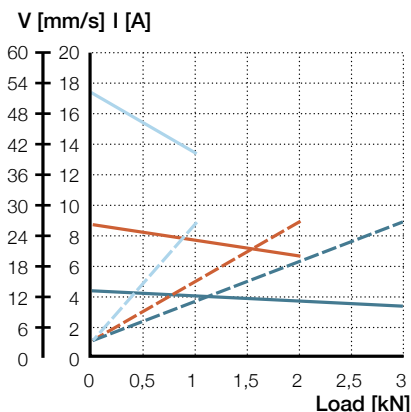


Performance diagrams – DC version

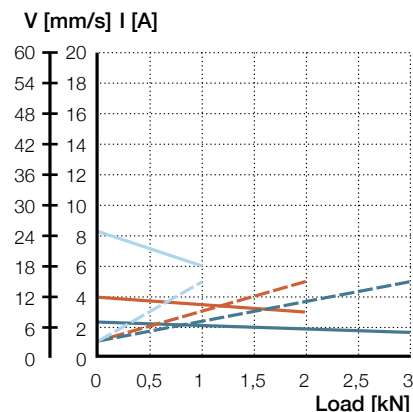
CAT 33.../C12C



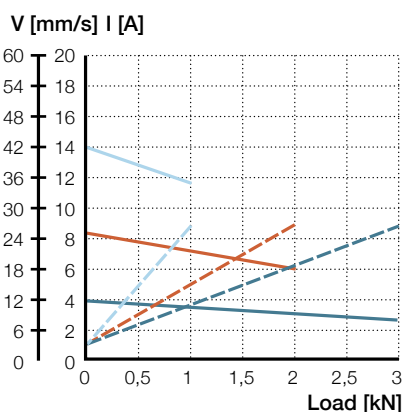
CAT 33.../C24C
CAP 43A.../C24C



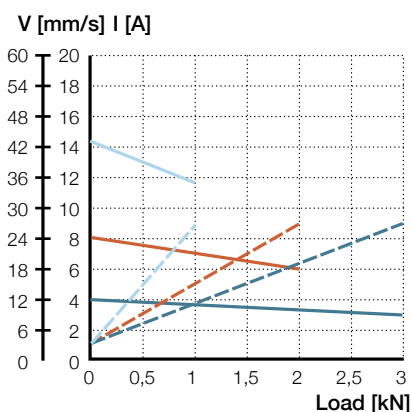
CAT 33.../C24CW
CAP 43A.../C24CW



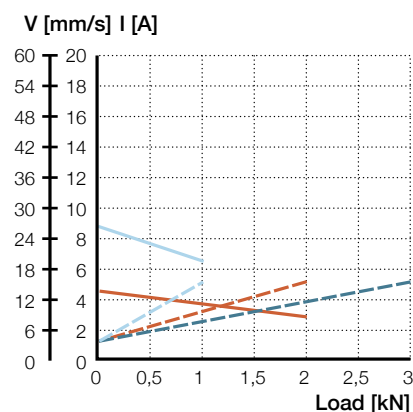
CAT 33.../P12C



CAT 33.../P24C/P24CB/P24CS
CAP 43A.../P24C



CAT 33.../P24CW
CAP 43A.../P24CW



Gear 1 — V (mm/s) — I (A)

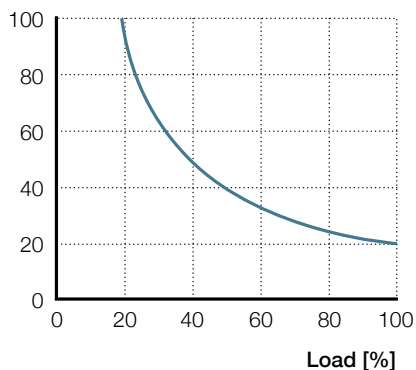
Gear 2 — V (mm/s) — I (A)

Gear 4 — V (mm/s) — I (A)

*There may be deviations of +/-10% from the values in the chart.

Duty cycle – DC version

Duty factor [%] at 20 °C



CAT 33 – Type codes for accessories and spare parts

| Item code | Type code | Order N° |
|---|-----------------|---------------|
| 12 V DC motor (cylindrical motor) | C12C | M/0405535 |
| 12 V DC motor (flat motor) | P12C | M/0405518-V01 |
| 24 V DC motor (cylindrical motor) | C24C | M/0405536 |
| 24 V DC motor (cylindrical with low speed) | C24CW | M/0405537 |
| 24 V DC motor (flat motor) | P24C | M/0405519-V01 |
| 24 V DC motor (flat motor with brake) | P24CB | M/0405523-V01 |
| 24 V DC motor (flat motor with extended shaft) | P24CS | M/0405522-V01 |
| 24 V DC motor (flat motor with low speed) | P24CW | M/0405521-V01 |
| 120 V AC motor (cylindrical motor) | E110C | M/0405533 |
| 120 V AC motor (cylindrical motor with brake) | E110CB | M/0405534 |
| 230 V AC motor (cylindrical motor) | E220C | M/0405531 |
| 230 V AC motor (cylindrical motor with brake) | E220CB | M/0405532 |
| 400 V AC motor (cylindrical motor) | E380C | M/0411607 |
| Capacitor value 25 µF (120 V AC) | Capacitor 25 µF | M/0430670-16 |
| Capacitor value 6 µF (230 V AC) | Capacitor 6 µF | M/0430670-03 |
| Limit switch for any stroke, normally closed | CAXD33, NC | M/0440054 |
| Limit switch for any stroke, normally open | CAXD33, NO | M/0440053 |
| Front mounting attachments type Rod-end | 575-32 | M/0430575-32 |
| Front mounting attachments type Clevis | 576-32 | M/0430576-32 |
| Rear mounting attachments type Single ear bracket | 580-32 | M/0430580-32 |
| Rear mounting attachments type Universal joint | 582-32 | M/0431780-32 |

CAP 43A – Type codes for accessories and spare parts

| Item code | Type code | Order N° |
|---|-----------|---------------|
| 24 V DC motor (cylindrical motor) | C24C | M/0405536 |
| 24 V DC motor (cylindrical with low speed) | C24CW | M/0405537 |
| 24 V DC motor (flat motor) | P24C | M/0405519-V01 |
| 24 V DC motor (flat motor with low speed) | P24CW | M/0405521-V01 |
| Front mounting attachments type Rod-end | 575-32 | M/0430575-32 |
| Front mounting attachments type Clevis | 576-32 | M/0430576-32 |
| Rear mounting attachments type Single ear bracket | 580-32 | M/0430580-32 |
| Rear mounting attachments type Universal joint | 582-32 | M/0431780-32 |

Ordering key

| Load [N] / Full Load Speed [mm/s] | | | Motor options | |
|-----------------------------------|-------------|-------------|-------------------------------------|-------|
| 3 000/xx | 2 000/xx | 1 000/xx | No motor | 0000 |
| 3 000/13-10 | 2 000/26-20 | 1 000/52-40 | 24 VDC, IP44 | C24C |
| 3 000/7-5 | 2 000/13-9 | 1 000/25-18 | 24 VDC, IP44 | C24CW |
| 3 000/17-11 | 2 000/34-19 | 1 000/66-38 | 24 VDC, flat motor, IP44 | P24C |
| 3 000/7-5 | 2 000/13-8 | 1 000/26-19 | 24 VDC, flat motor, low speed, IP44 | C24CW |

| | | |
|---|---|---|
| 1 | 2 | 4 |
|---|---|---|

Type

Motor assembly
 R Right
 L Left

Stroke [S]
 100 100 mm
 200 200 mm
 300 300 mm
 400 400 mm

Rear attachment
 A1 Fork ear, Ø12,0 mm
 A2 Fork ear, Ø12,7 mm
 K1 Single ear, Ø12,0 mm
 K2 Single ear, Ø12,7 mm

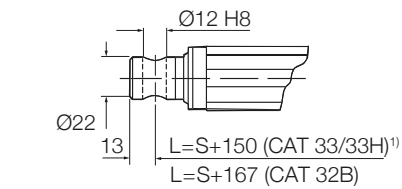
Front attachment
 G1 Hole, Ø12,0 mm
 G2 Hole, Ø12,7 mm
 G3 Male thread, M12
 G4 Female thread, M12
 G5 Fork ear, Ø10,1 mm

Option
 F Friction clutch

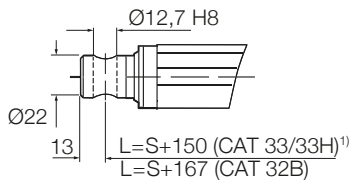
Cable option for C24C[W] motors
 T2 Straight, 2,0 m
 T6 Straight cable, 6,0 m, no plug

Detailed drawings of front and rear attachments for CAT and CAP 43 and motor options for CAT

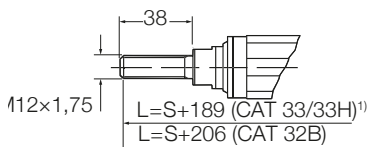
Front attachments and retracted length



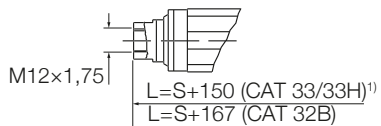
G1



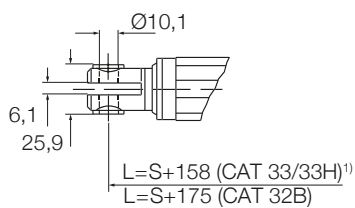
G2



G3



G4



G5

Legend:

S = stroke

L = retracted length

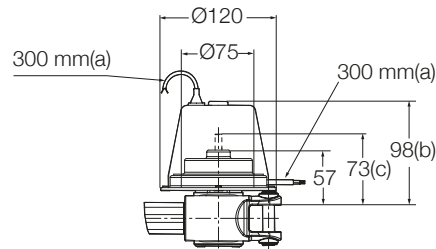
(a) = cable length

(b) = cover for brake

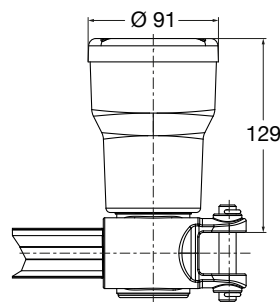
(c) = extended shaft

¹⁾ If S = 400, add 50 mm to retracted length.

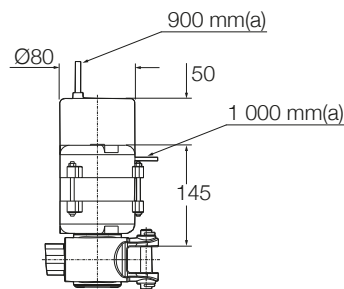
Motor options for CAT



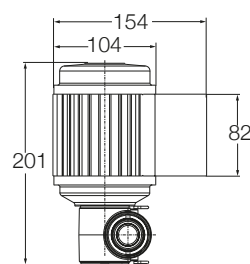
P12C, P24C, P24CB, P24CS, P24CW



C12XX/C24XX

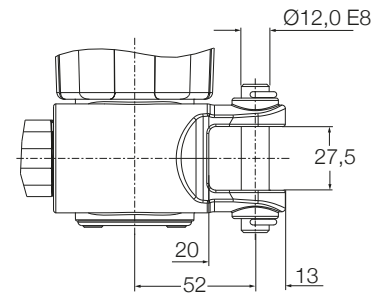


E110C, E110CB, E220C, E220CB

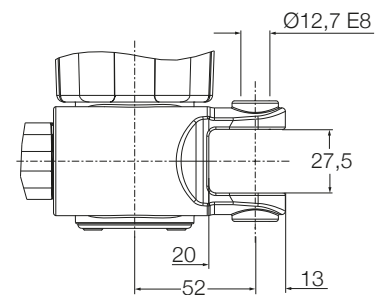


E380C

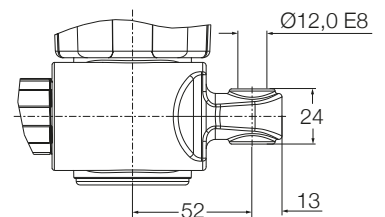
Rear attachments



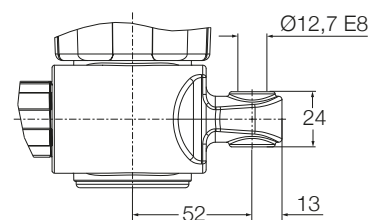
A1



A2



K1



K2



CAT 33H

Linear actuator

Benefits

- Compact
- Robust
- Modular
- Lubricated for service life
- High efficiency
- Digital encoder feedback



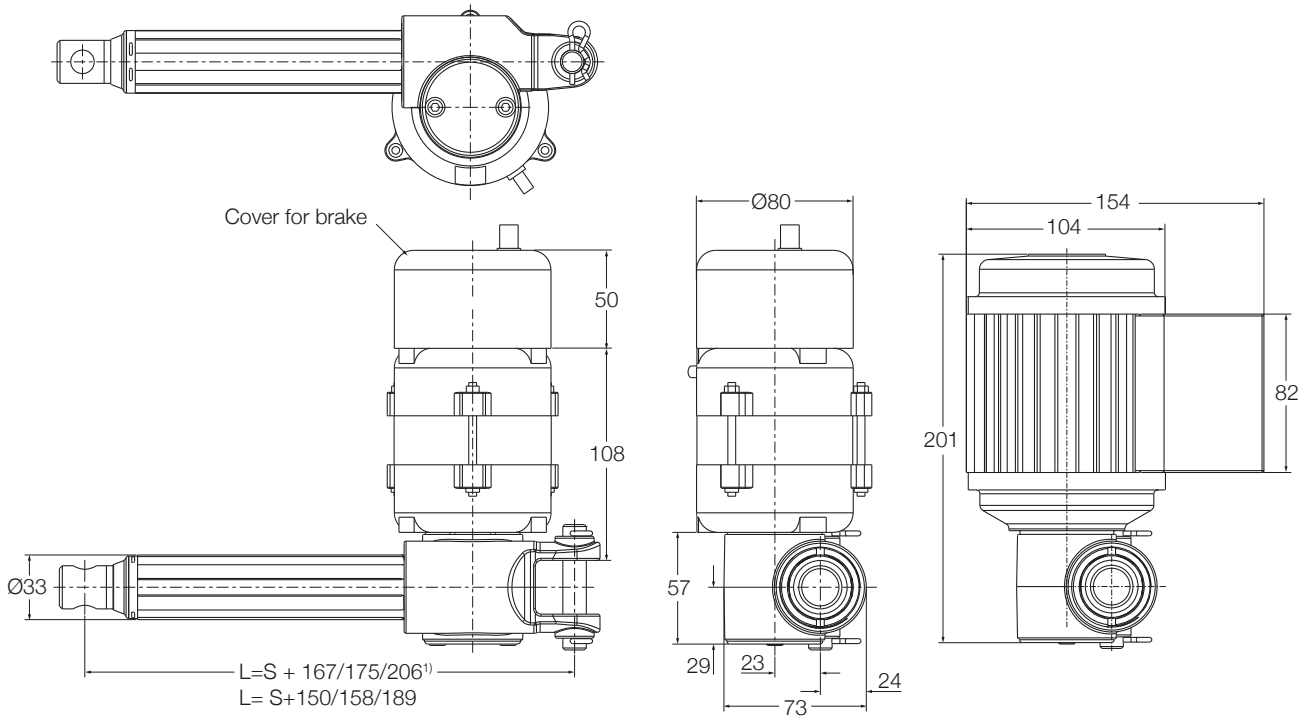
Technical data

| | | Unit | CAT 33H – AC version | CAT 33H – DC version |
|----------------------|---------------|------|-----------------------------|--------------------------------|
| Rated push load | | N | 500 to 1 200 | 400 to 1 200 |
| Rated pull load | | N | 500 to 1 200 | 400 to 1 200 |
| Speed (at full load) | | mm/s | 20 to 90 ¹⁾ | 17 to 193 ¹⁾ |
| Stroke | | mm | 100 to 400 | 100 to 400 |
| Retracted length | | mm | S+150/158/189 ²⁾ | S+150/158/189 ²⁾ |
| Voltage | | V AC | 120, 230 or 400 | – |
| | | V DC | – | 12 or 24 |
| Power consumption | 120 V AC | W | 98 (brake 133,2 W) | – |
| | 230 V AC | W | 92 (brake 117,3 W) | – |
| | 400 V AC | W | 80 | – |
| | 12 or 24 V DC | W | – | N/A |
| Current consumption | 120 V AC | A | 0,82 (brake +0,29 A) | – |
| | 230 V AC | A | 0,4 (brake +0,11 A) | – |
| | 400 V AC | A | 0,2 | – |
| | 12 V DC | A | – | 18 |
| | 24 V DC | A | – | 9 |
| | 24 V DC | A | – | 5 (for motors C24CW and P24CW) |
| Duty cycle | | % | 30 | 20 |
| Ambient temperature | | °C | –20 to +50 | –20 to +50 |
| Degree of protection | | IP | 20/54/55 | 20/44/66 ¹⁾ |
| Weight | | kg | 2 to 2,7 | 2 to 2,7 |

¹⁾ Depending on selected motor

²⁾ Dimension depends on selected front attachment

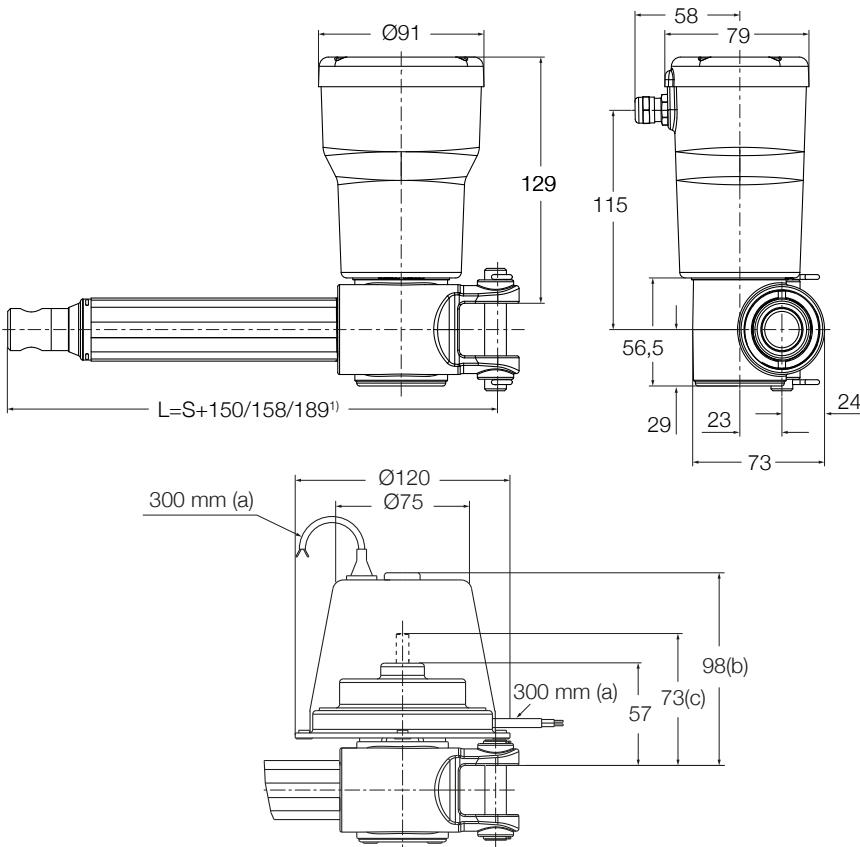
Dimensional drawing – AC version



Legend:
 S = stroke
 L = retracted length

¹⁾ Dimension depends on selected front attachment

Dimensional drawing – DC version



Legend:
 S = stroke
 L = retracted length
 (a) = cable length
 (b) = cover for brake (P24CB)
 (c) = extended shaft (P24CS)

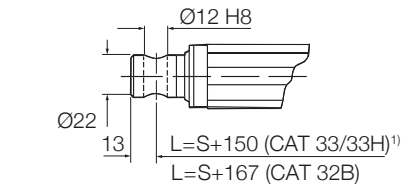
¹⁾ Dimension depends on selected front attachment

P12C, P24C, P24CB, P24CS, P24CW

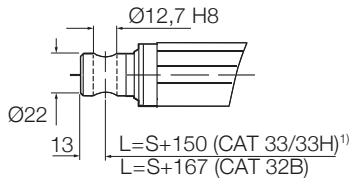


Detailed drawings of front and rear attachments for CAT and CAP 43 and motor options for CAT

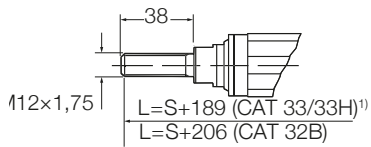
Front attachments and retracted length



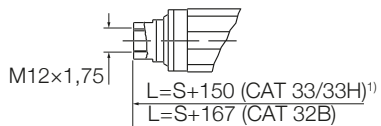
G1



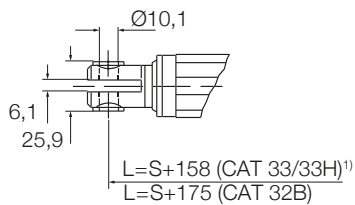
G2



G3

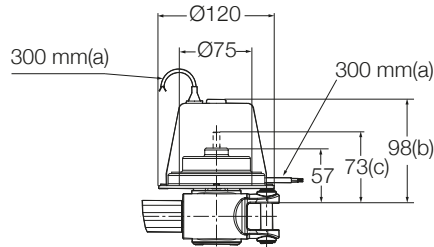


G4

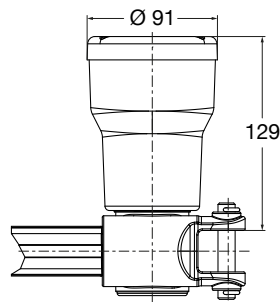


G5

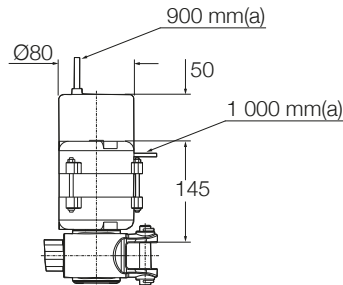
Motor options for CAT



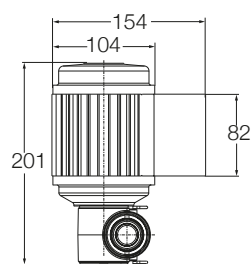
P12C, P24C, P24CB, P24CS, P24CW



C12XX/C24XX

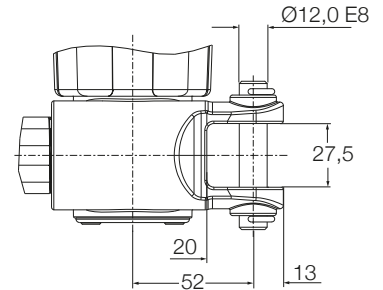


E110C, E110CB, E220C, E220CB

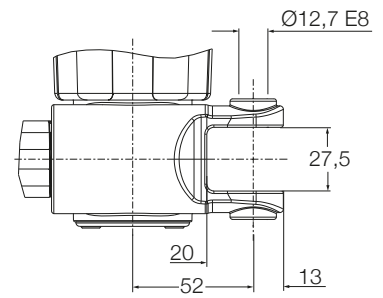


E380C

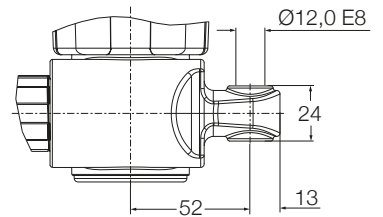
Rear attachments



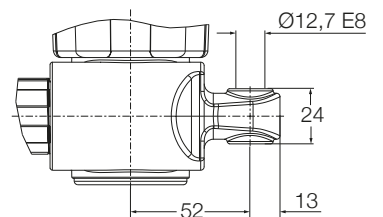
A1



A2



K1



K2

Legend:

S = stroke

L = retracted length

(a) = cable length

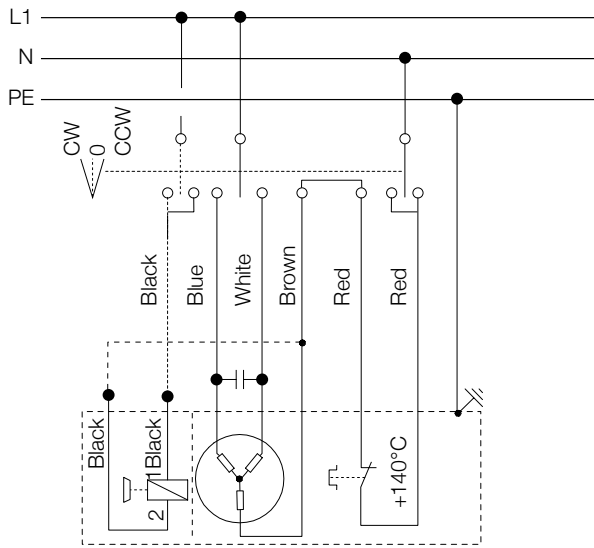
(b) = cover for brake

(c) = extended shaft

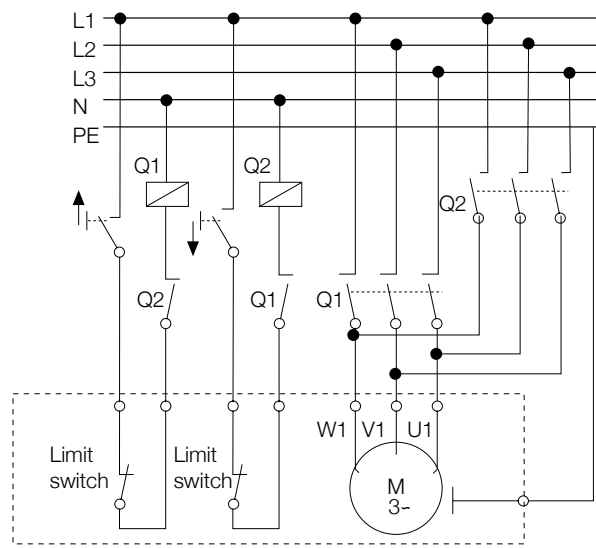
¹⁾ If S = 400, add 50 mm to retracted length.

Connecting diagrams – AC version

120/230 V AC

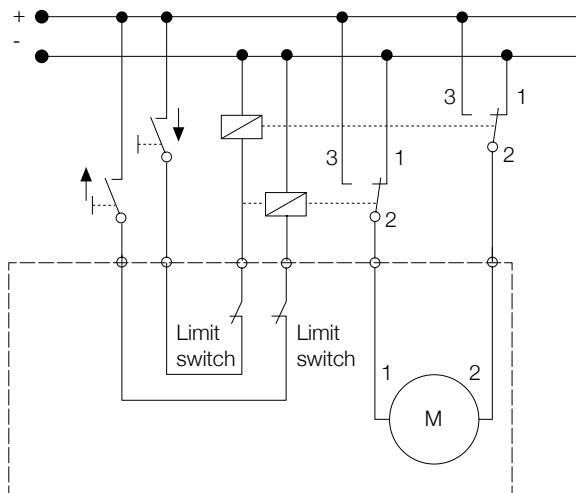


400 V AC



Connecting diagrams – DC version

12/24 V DC



**Suitable control units and accessories
AC version**

| | Encoder |
|--------|---------|
| | E2 |
| E110C | • |
| E110CB | • |
| E220C | • |
| E220CB | • |
| E380C | • |

**Suitable control units and accessories
DC version**

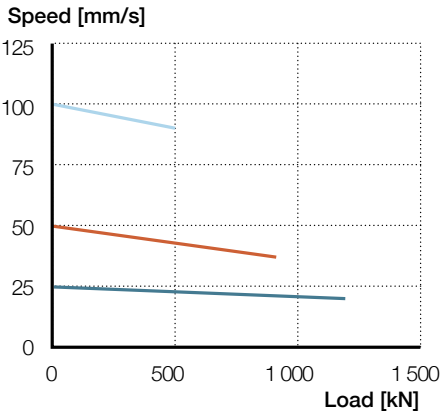
| | Encoder |
|-------|---------|
| | E2 |
| C12C | • |
| P12C | • |
| C24C | • |
| C24CW | • |
| P24C | • |
| P24CB | • |
| P24CS | • |
| P24CW | • |

CAT 33H – Type codes for accessories and spare parts

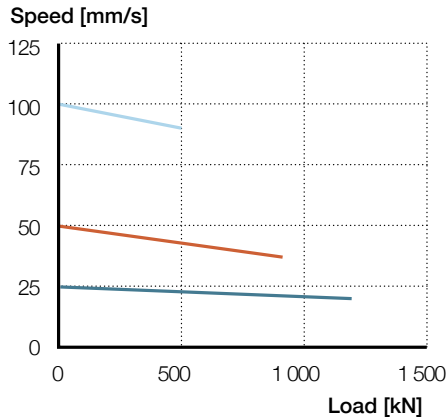
| Item code | Type code | Order N° |
|---|-----------------|---------------|
| 12 V DC motor (cylindrical motor) | C12C | M/0405535 |
| 12 V DC motor (flat motor) | P24C | M/0405518-V01 |
| 24 V DC motor (cylindrical motor) | C24C | M/0405536 |
| 24 V DC motor (cylindrical with low speed) | C24CW | M/0405537 |
| 24 V DC motor (flat motor) | P24C | M/0405519-V01 |
| 24 V DC motor (flat motor with brake) | P24CB | M/0405523-V01 |
| 24 V DC motor (flat motor with extended shaft) | P24CS | M/0405522-V01 |
| 24 V DC motor (flat motor with low speed) | P24CW | M/0405521-V01 |
| 120 V AC motor (cylindrical motor) | E110C | M/0405533 |
| 120 V AC motor (cylindrical motor with brake) | E110CB | M/0405534 |
| 230 V AC motor (cylindrical motor) | E220C | M/0405531 |
| 230 V AC motor (cylindrical motor with brake) | E220CB | M/0405532 |
| 400 V AC motor (cylindrical motor) | E380C | M/0411607 |
| Capacitor value 25 µF (120 V AC) | Capacitor 25 µF | M/0430670-16 |
| Capacitor value 6 µF (230 V AC) | Capacitor 6 µF | M/0430670-03 |
| Front mounting attachments type Rod-end | 575-32 | M/0430575-32 |
| Front mounting attachments type Clevis | 576-32 | M/0430576-32 |
| Rear mounting attachments type Single ear bracket | 580-32 | M/0430580-32 |
| Rear mounting attachments type Universal joint | 582-32 | M/0431780-32 |

Performance diagrams – AC version

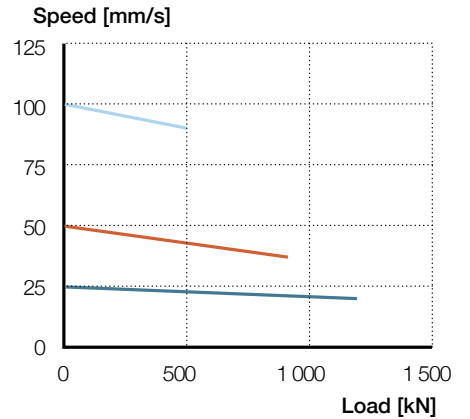
Speed-load diagram CAT 33H ... 120 V AC



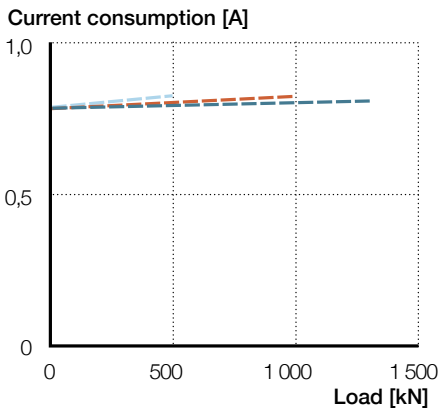
Speed-load diagram CAT 33H ... 230 V AC



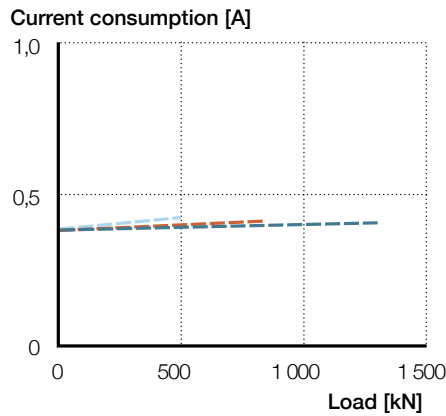
Speed-load diagram CAT 33H ... 400 V AC



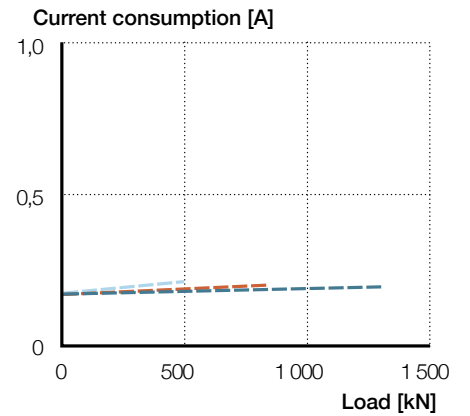
Current-load diagram CAT 33H ... 120 V AC



Current-load diagram CAT 33H ... 230 V AC



Current-load diagram CAT 33H ... 400 V AC



Gear 1 — V (mm/s) — I (A)

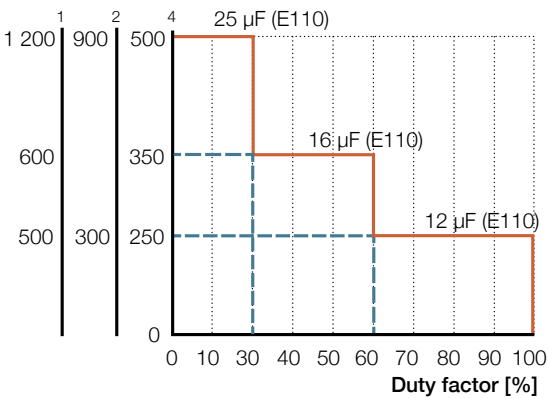
Gear 2 — V (mm/s) — I (A)

Gear 4 — V (mm/s) — I (A)

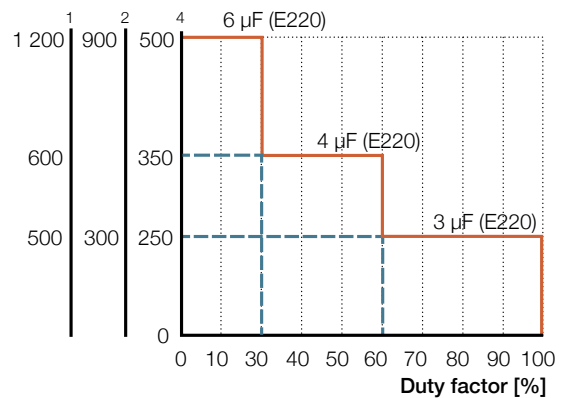
*There may be deviations of +/-10% from the values in the chart.

Duty cycle

F [N] Gear

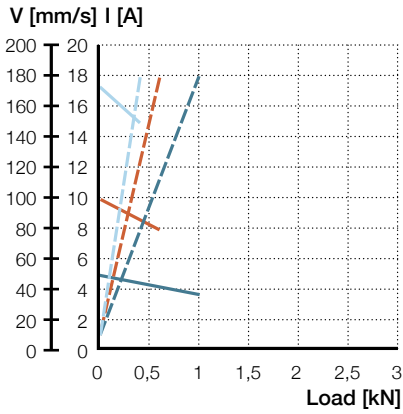


F [N] Gear

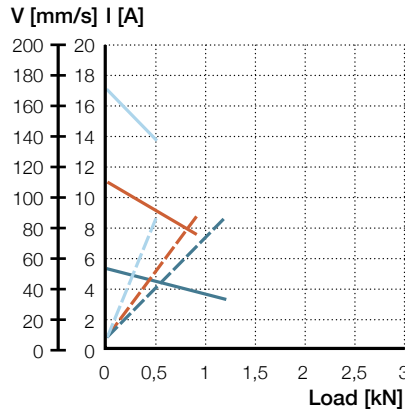


Performance diagrams – DC version

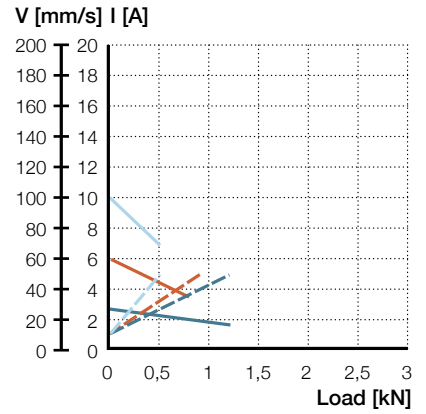
CAT 33H.../C12C



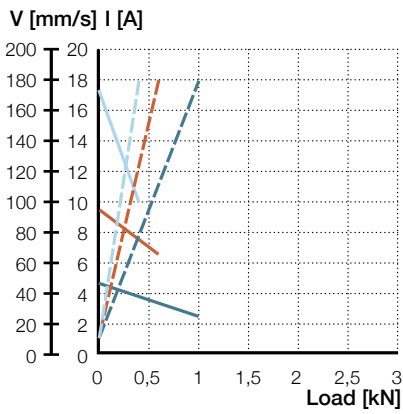
CAT 33H.../C24C



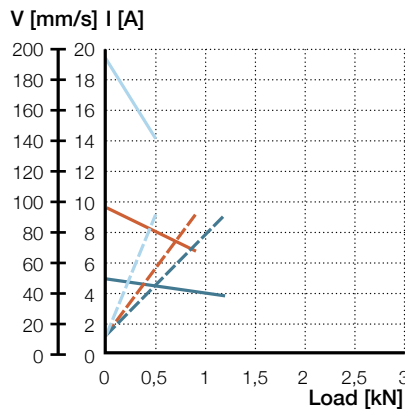
CAT 33H.../C24CW



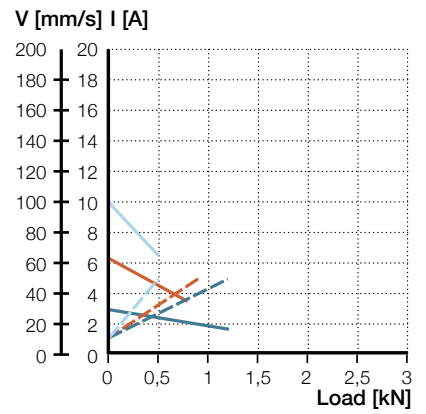
CAT 33H.../P12C



CAT 33H.../P24C/P24CB/P24CS



CAT 33H.../P24CW



Gear 1 — V (mm/s) — I (A)

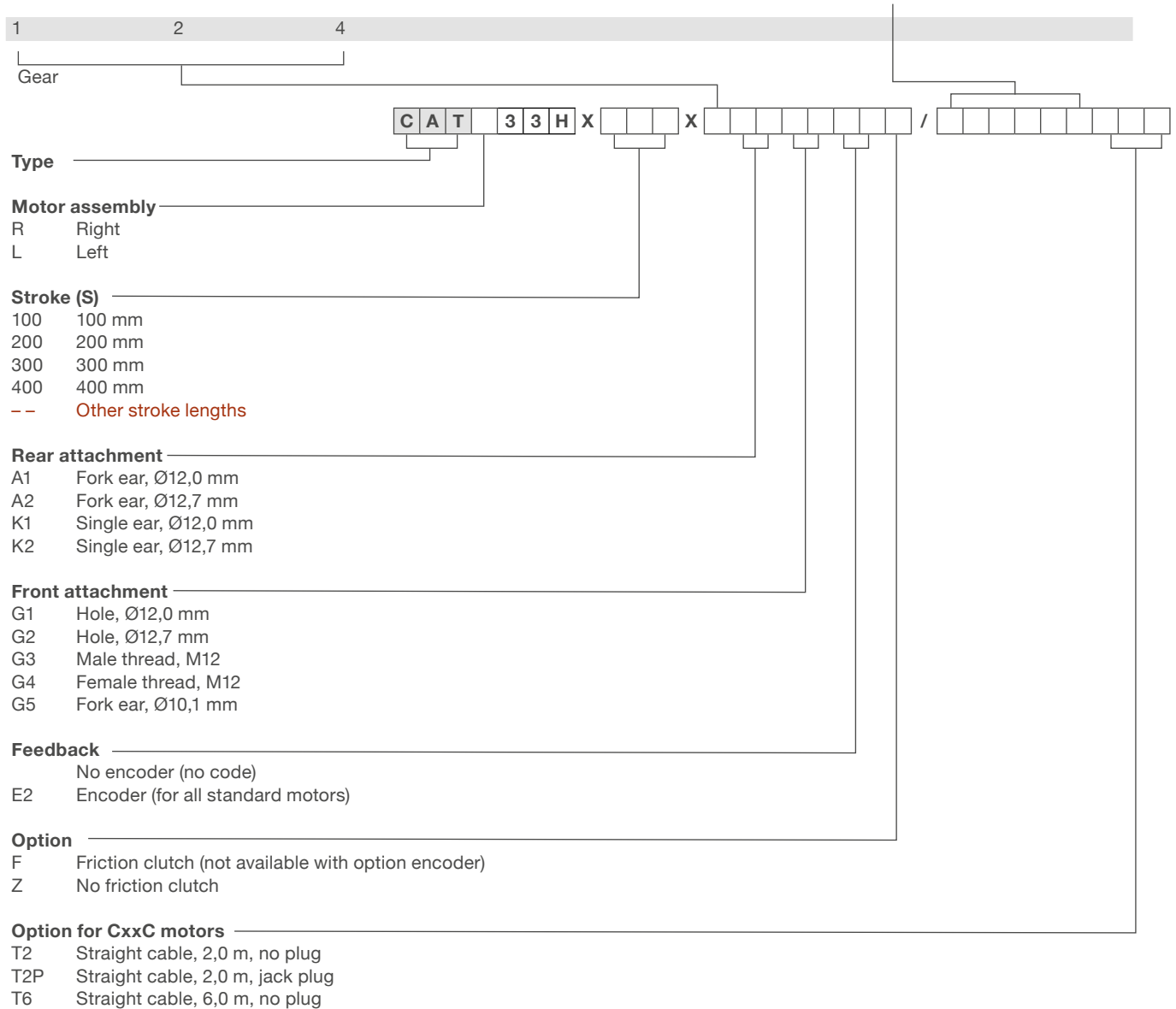
Gear 2 — V (mm/s) — I (A)

Gear 4 — V (mm/s) — I (A)

*There may be deviations of +/-10% from the values in the chart.

Ordering key

| Load [N] / Full Load Speed [mm/s] | | | Motor options | |
|-----------------------------------|------------|-------------|--------------------------------------|--------|
| 1 200/xx | 900/xx | 600/xx | No motor | 0000 |
| 1 200/20 | 900/37 | 500/90 | 120 V AC/60 Hz, 1-phase, IP54 | E110C |
| 1 200/20 | 900/37 | 500/90 | 120 V AC/60 Hz, 1-phase, brake, IP20 | E110CB |
| 1 200/20 | 900/37 | 500/90 | 230 V AC/50 Hz, 1-phase, IP54 | E220C |
| 1 200/20 | 900/37 | 500/90 | 230 V AC/50 Hz, 1-phase, brake, IP20 | E220CB |
| 1 200/20 | 900/37 | 500/90 | 400 V AC/50 Hz, 3-phase, IP55 | E380C |
| 1 200/xx | 900/xx | 600/xx | No motor | 0000 |
| 1 200/50-38 | 600/100-80 | 400/174-150 | 12 V DC, IP666 | C12C |
| 1 200/47-25 | 600/95-65 | 400/170-100 | 12 V DC, flat motor, IP44 | P12C |
| 1 200/56-36 | 900/113-79 | 500/174-140 | 24 V DC, IP66 | C24C |
| 1 200/27-17 | 900/60-35 | 500/100-69 | 24 V DC, low speed motor, IP66 | C24CW |
| 1 200/48-37 | 900/95-65 | 500/193-140 | 24 V DC, flat motor, IP44 | P24C |
| 1 200/48-37 | 900/95-65 | 500/193-140 | 24 V DC, flat motor, brake, IP20 | P24CB |
| 1 200/48-37 | 900/95-65 | 500/193-140 | 24 V DC, flat motor, ext.shaft, IP44 | P24CS |
| 1 200/30-17 | 900/63-35 | 500/100-65 | 24 V DC, flat motor, low speed, IP44 | P24CW |



Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

CAR 40

Linear actuator



Benefits

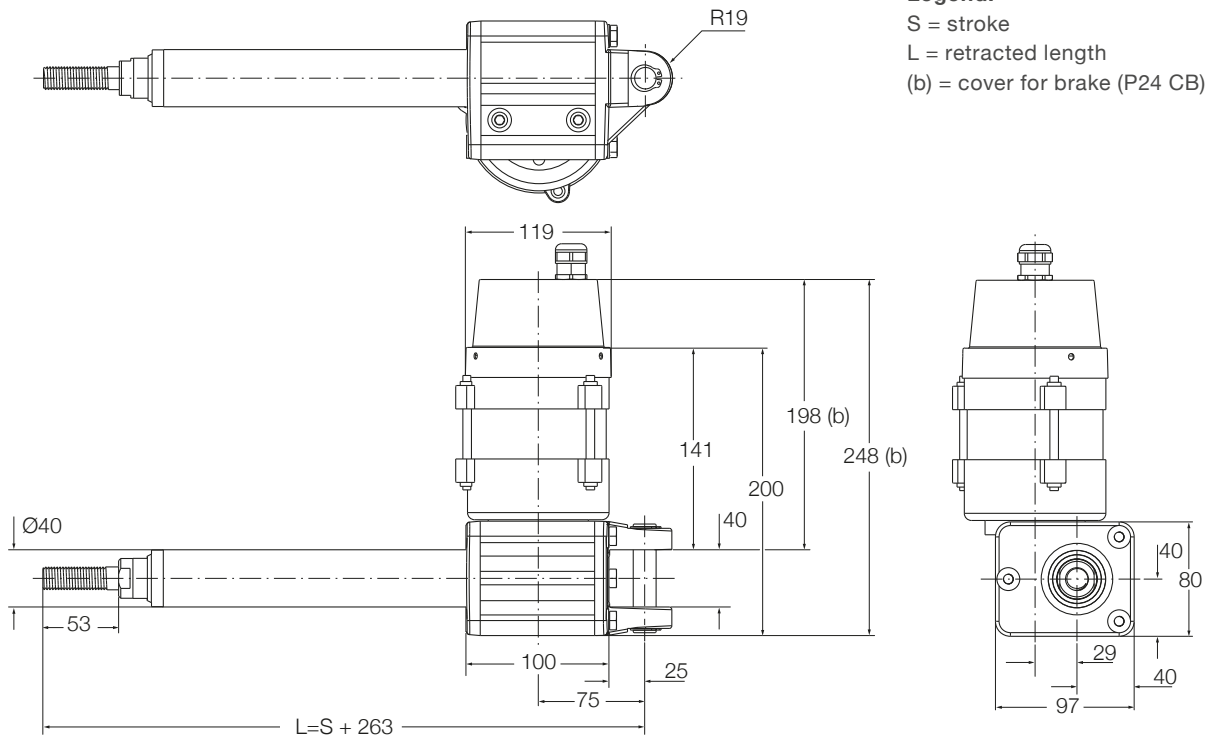
- Reliable and robust industrial actuator
- Wide range of components
- Right- and left-hand version

Technical data - AC version

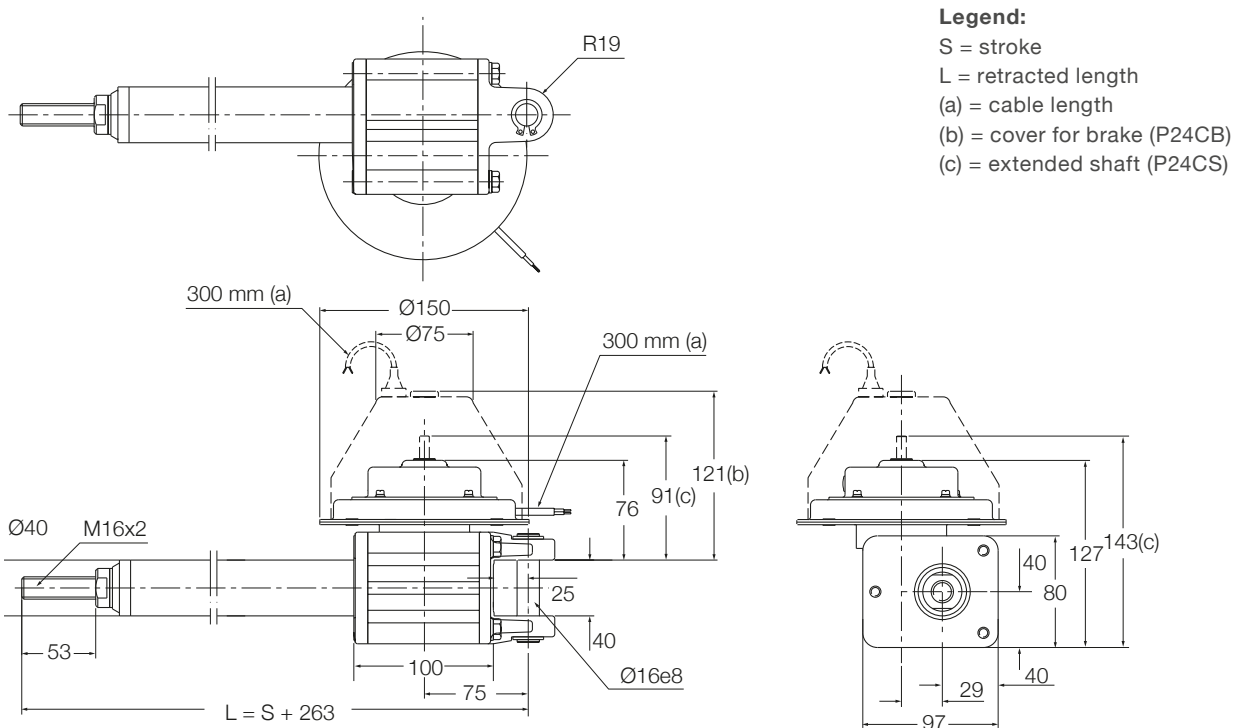
| | Unit | CAR 40 - AC version | CAR 40 - DC version |
|----------------------|------------|-----------------------|---------------------|
| Rated push load | N | 2 000 to 6 000 | 2 000 to 6 000 |
| Rated pull load | N | 2 000 to 6 000 | 2 000 to 6 000 |
| Speed (at full load) | mm/s | 9 to 40 ¹⁾ | 8 to 50 |
| Stroke | mm | 100 to 700 | 100 to 700 |
| Retracted length | mm | S+263 | S+263 |
| Voltage | V AC | 120 or 230 | – |
| | V DC | – | 24 |
| Power consumption | 120 V AC W | 360 | – |
| | 230 V AC W | 299 | – |
| | 24 V DC W | – | N/A |
| Current consumption | 120 V AC A | 3 (brake +0,29 A) | – |
| | 230 V AC A | 1,3 (brake +0,11 A) | – |
| | 24 V DC A | – | 16 |
| Duty cycle | % | 40 | 25 |
| Ambient temperature | °C | –20 to +70 | –20 to +70 |
| Degree of protection | IP | 20/54 | 20/44 |
| Weight | kg | 5,8 to 8,4 | 5,8 to 8,4 |

¹⁾ Depending on selected motor

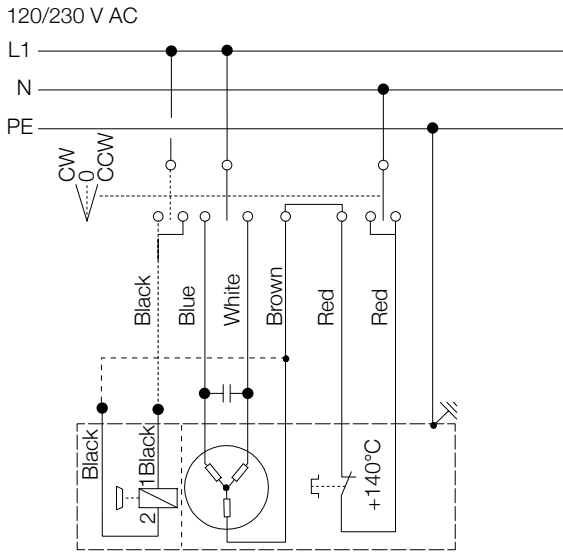
Dimensional drawing – AC version



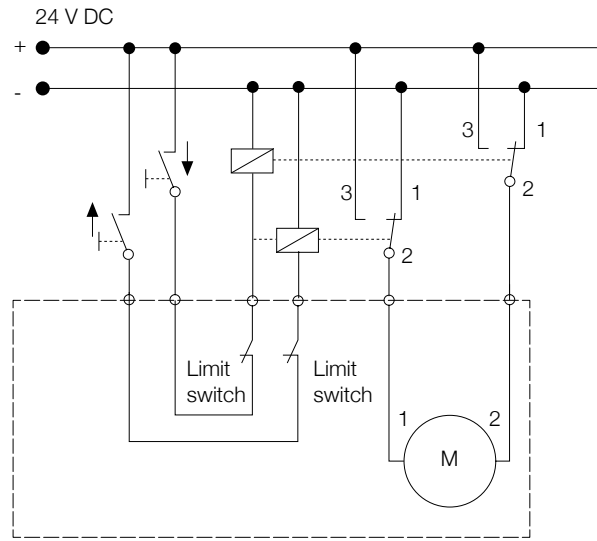
Dimensional drawing – DC version



Connecting diagrams – AC version



Connecting diagrams – DC version



Suitable control unit and accessories AC version

| | Limit switch |
|--------|--------------|
| | CAXE40 |
| E110D | • |
| E110DB | • |
| E220D | • |
| E220DB | • |

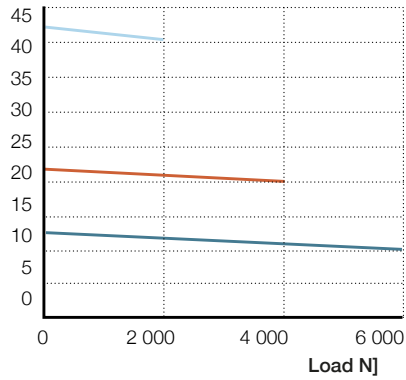
Suitable control unit and accessories DC version

| | Limit switch |
|-------|--------------|
| | CAXE40 |
| P24D | • |
| P24DS | • |
| P24DB | • |

Performance diagrams – AC version

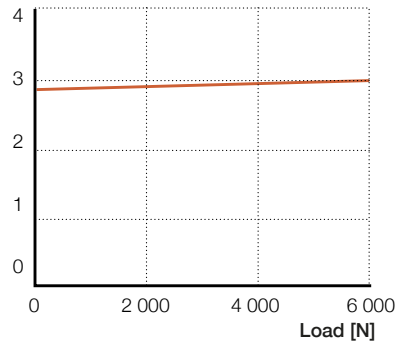
Speed-load diagram CAR 40 ... 120 V AC

Duty factor [%] at 20 °C



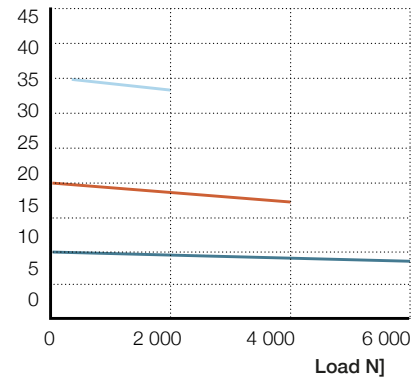
Speed-load diagram CAR 40 ... 230 V AC

Speed [mm/s]



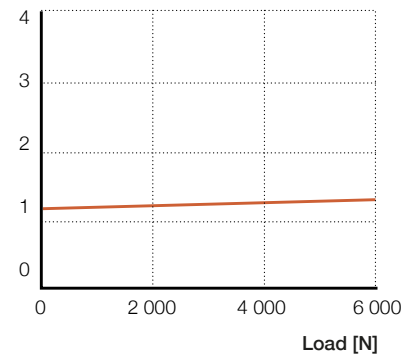
Current-load diagram CAR 40 ... 120 V AC

Current consumption [A]



Current-load diagram CAR 40 .. 230 V AC

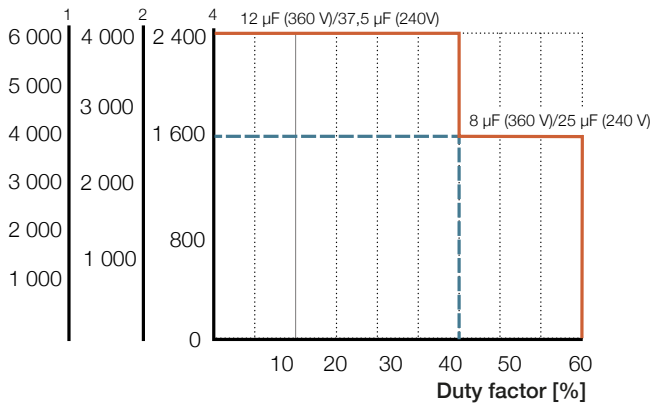
Current consumption [A]



*There may be deviations of +/-10% from the values in the chart.

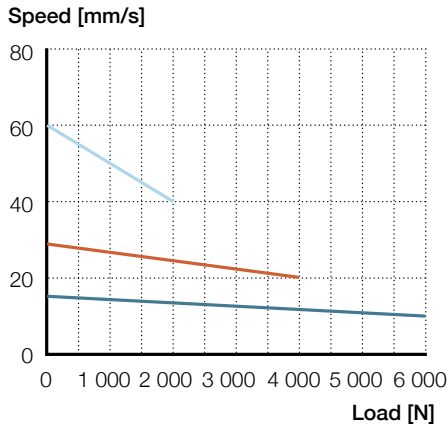
Duty cycle – AC version

F [N] Gear

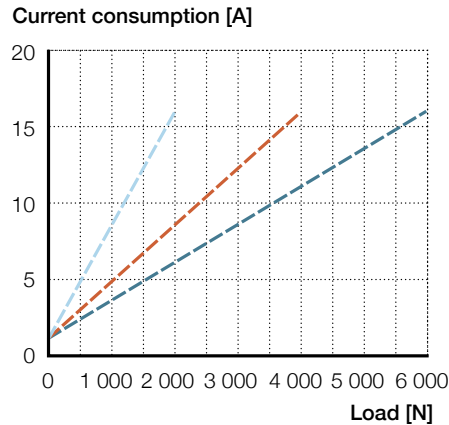


Performance diagrams – DC version

Speed-load diagram CAR 40 ... 24 V DC



Current-load diagram CAR 40 ... 24 V DC

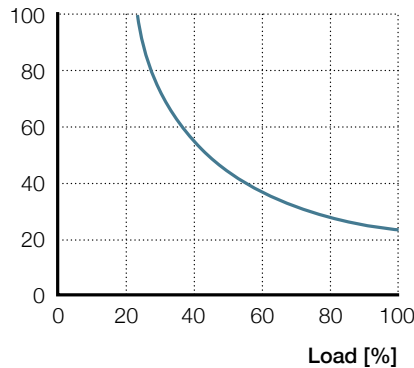


Gear 1 — V (mm/s) — I (A) Gear 2 — V (mm/s) — I (A) Gear 4 — V (mm/s) — I (A)

*There may be deviations of +/-10% from the values in the chart.

Duty cycle – DC version

Duty factor [%] at 20 °C

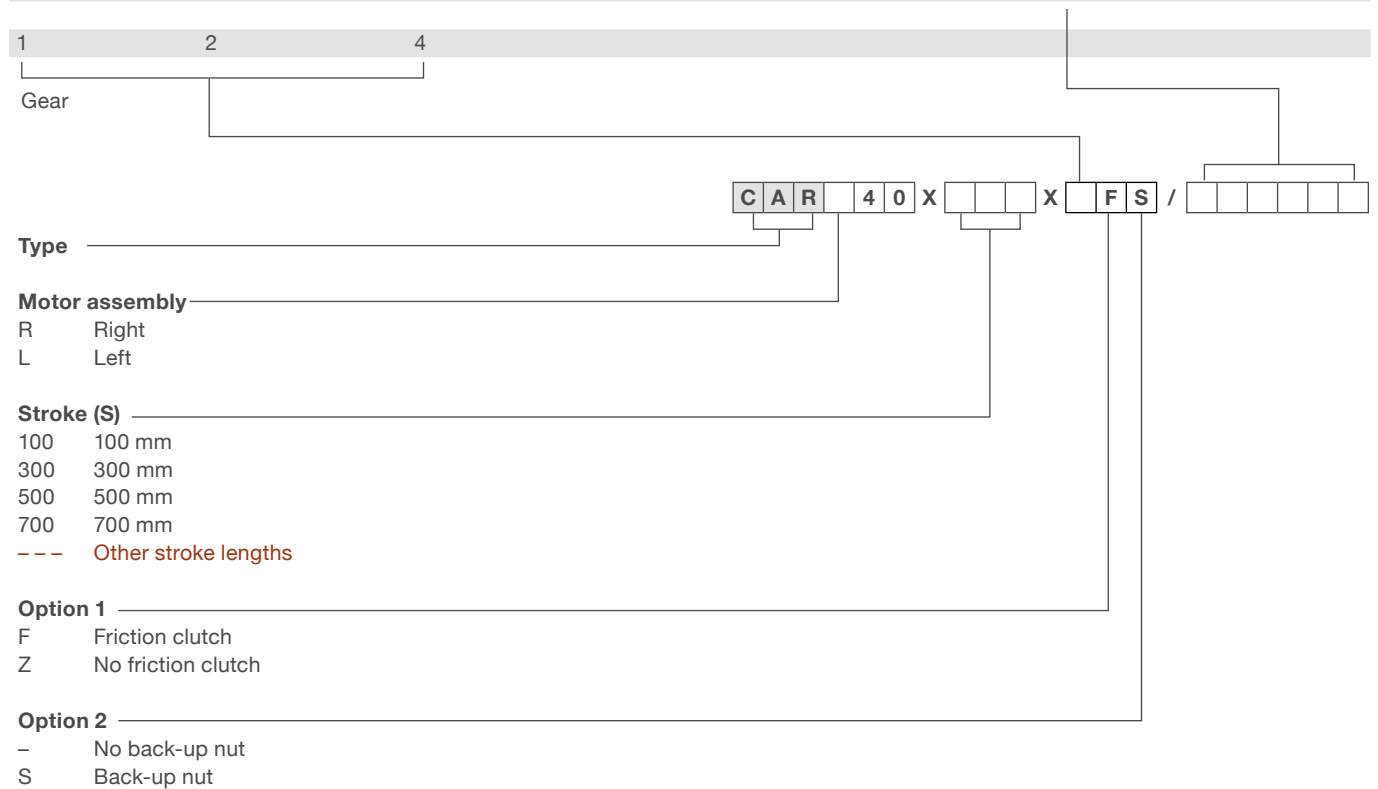


CAR 40 – Type codes for accessories and spare parts

| Item code | Type code | Order N° |
|---|-----------------------|---------------|
| 24 V DC motor (flat motor) | P24D | M/0405524-V01 |
| 24 V DC motor (flat motor with extended shaft) | P24DS | M/0405526-V01 |
| 24 V DC motor (flat motor with brake) | P24DB | M/0405525-V01 |
| 120 V AC motor (cylindrical motor) | E110D | M/0405529 |
| 120 V AC motor (cylindrical motor with brake) | E110DB | M/0405530 |
| 230 V AC motor (cylindrical motor) | E220D | M/0405527 |
| 230 V AC motor (cylindrical motor with brake) | E220DB | M/0405528 |
| Capacitor value 12 µF (230 VAC-motor) | Capacitor 12 µF | M/0430670-04 |
| Limit switch for stroke =100 mm | CAXE 40 × 100 | M/0412051 |
| Limit switch for stroke =300 mm | CAXE 40 × 300 | M/0412054 |
| Limit switch for stroke =500 mm | CAXE 40 × 500 | M/0412056 |
| Limit switch for stroke =700 mm | CAXE 40 × 700 | M/0412057 |
| Proximity switch for CAXE | CAXE Proximity switch | M/0432369 |
| Front mounting attachments type Rod-end | 575-40 | M/0430575-40 |
| Front mounting attachments type Clevis | 576-40 | M/0430576-40 |
| Rear mounting attachments type Single ear bracket | 590-40 | M/0430590-40 |
| Rear mounting attachments type Ball-joint bracket | 581-40 | M/0430581-40 |

Ordering key

| Dynamic load [N] / Speed [mm/s] | | | Motor options | |
|---------------------------------|-------------|-------------|---|--------|
| 6 000/xx | 4 000/xx | 2 000/xx | No motor | 0000 |
| 6 000/10 | 4 000/20 | 2 000/40 | 120 V AC/60 Hz, 1-phase, IP54 | E110D |
| 6 000/10 | 4 000/20 | 2 000/40 | 120 V AC/60 Hz, 1-phase, brake, IP20 | E110DB |
| 6 000/9 | 4 000/17 | 2 000/34 | 230 V AC/50 Hz, 1-phase, IP54 | E220D |
| 6 000/9 | 4 000/17 | 2 000/34 | 230 V AC/50 Hz, 1-phase, brake, IP20 | E220DB |
| 6 000/xx | 4 000/xx | 2 000/xx | No motor | 0000 |
| 6 000/13-8 | 4 000/25-18 | 2 000/50-38 | 24 V DC, flat motor, IP44 | P24D |
| 6 000/15-10 | 4 000/30-20 | 2 000/60-40 | 24 V DC, flat motor, extended shaft, IP44 | P24DS |
| 6 000/15-10 | 4 000/30-20 | 2 000/60-40 | 24 V DC, flat motor, brake, IP20 | P24DB |



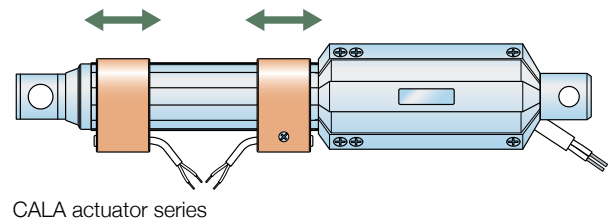
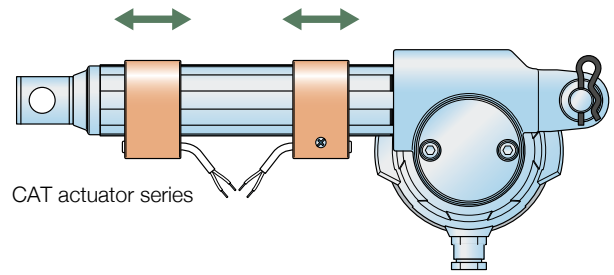
Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

Spare parts

CAXD 33 limit switch

Limit switches, combined with Ewellix control units, make it possible to set the stroke to any desired length.

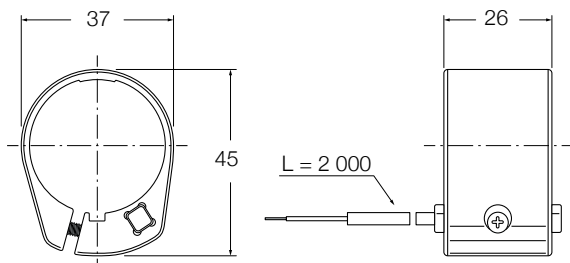
- CAXD 33 – designed for the following actuators:
 - CAT 33
 - CALA 36A
- One CAXD is needed for each limit position
- Use of limit switches reduce the effective stroke by 20 mm for CAT 33 and 25 mm for CALA 36A (retracted position is affected)



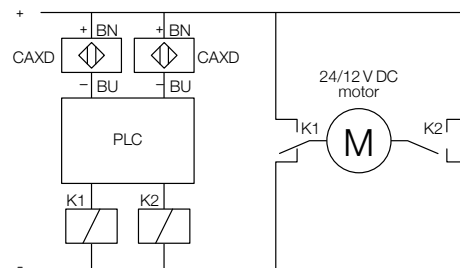
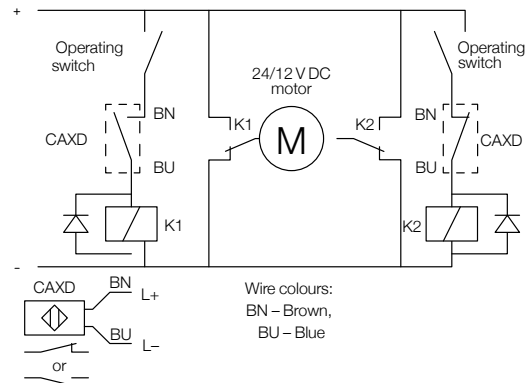
Technical data

| CAXD 33 | |
|--------------------------|---|
| Operating voltage | 5 to 30 V DC |
| Max. current | 100 mA DC |
| Voltage drop | < 5 V |
| Voltage drop | < 5 V |
| Electrical function | Normally closed or normally open |
| Make/fall time | 0,3 ms / 0,6 ms |
| Operating temperature | -20 °C to +50 °C |
| Ingress protection | IP 67 (sensor element) |
| Vibration/shock | According to IEC 90947-5-2 (sensor element) |
| Cable dimensions (L x D) | 2 m x 3 mm (PUR) |
| Cable area | 2 x 0,14 mm ² |
| Housing colour | Black |

Dimensional drawing



Connecting diagrams



Important! For DC-supply only

Ordering key

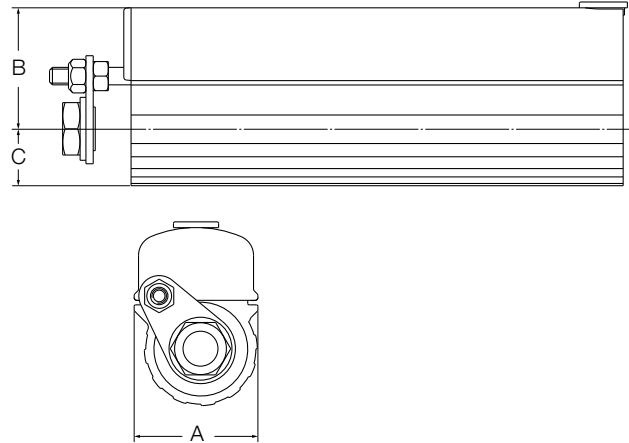
| Code | Description |
|--------------------------|-----------------|
| CAXD 33 LIMIT SWITCH, NC | Normally Closed |
| CAXD 33 LIMIT SWITCH, NO | Normally Open |

CAXE limit switch

Limit switches, combined with Ewellix control units, make it possible to set the stroke to any desired length.

- CAXE - designed for the following actuators:
 - CAR 22
 - CAR 32
 - CAR 40
 - CAT 32B
 - CARN 32
- It is recommended to place the limit switch at least 10 mm from the end stop to avoid mechanical failure
- Front attachment G3 must be selected for this option

Dimensional drawing



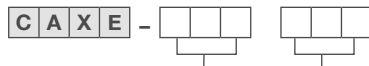
| | A | B | C |
|-------------|------|----|----|
| CAXE 22 | 42,5 | 37 | 14 |
| CAXE 32/32B | 47,5 | 40 | 20 |
| CAXE 40 | 46 | 46 | 23 |

Technical data

| CAXE | |
|--------------------------|---|
| Operating voltage | 5 to 30 V DC |
| Max. current | 100 mA DC |
| Protection class | III |
| Voltage drop | < 5 V |
| Electrical function | Normally Closed (NC) and Normally Open (NO) |
| Make/break time | 0,3 ms / 0,6 ms |
| Operating temperature | -20 to +70 °C |
| Degree of protection | IP 67 (sensor element) |
| Vibration/shock | According to IEC 60947-5-1 (sensor element) |
| Cable dimensions (L x D) | 2 000 x 3 mm (PUR) |
| Cable area | 3 x 0,14 mm ² |

Important! The sensor has no overload protection and no reverse polarity protection.

Ordering key



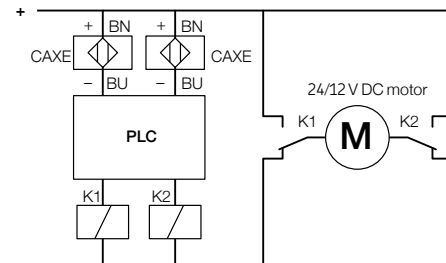
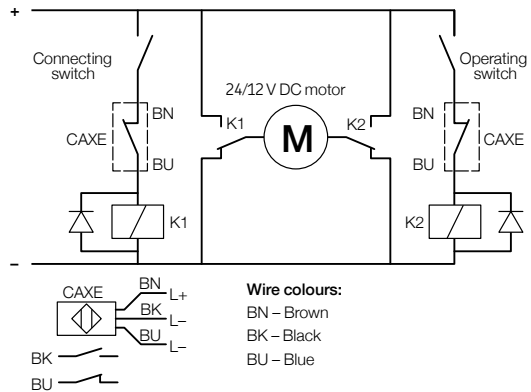
Type

| | | |
|-----|---------|-----------------|
| 022 | CAXE32 | CAR 22 |
| 032 | CAXE32 | CAR 32, CARN 32 |
| 32B | CAXE32B | CAT 32B |
| 040 | CAXE40 | CAR 40 |

Actuators stroke (mm)

| | | |
|-----|-----|-------------------------------------|
| 050 | 050 | CAR 22, 32 CARN 32 and CAT 32B |
| 100 | 100 | CAR 22, 32, 40, CARN 32 and CAT 32B |
| 150 | 150 | CAR 22 |
| 200 | 200 | CAR 22, 32 CARN 32 and CAT 32B |
| 300 | 300 | CAR 22, 32, 40, CARN 32 and CAT 32B |
| 400 | 400 | CAT 32B |
| 500 | 500 | CAR 32, 40, CARN 32 and CAT 32B |
| 700 | 700 | CAR 32, 40, CARN 32 and CAT 32B |

Connecting diagrams



Important! For DC-supply only

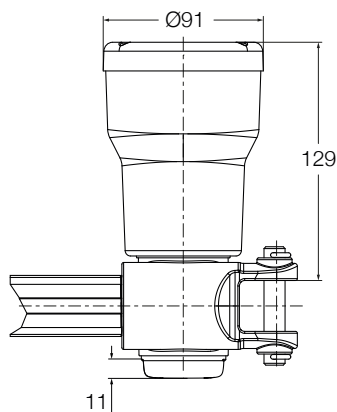
Feedback for CAT series – Encoder E2

- Can be fitted to all standard motors
- Hall effect, two channels with 90° displacement
- Located on gear housing, see drawing
- 2 pulses/channel and motor revolution
- Supply voltage: 5–24 V DC
- Final resolution according to gear ratio and actuator basic type (see table)

Feedback

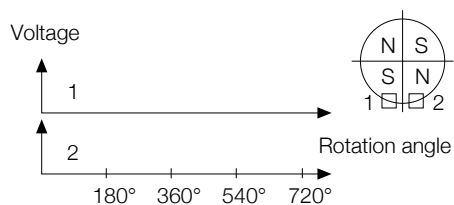
| | Gear | Pulses at 1mm stroke | Resolution (mm) per pulse |
|---------|------|----------------------|---------------------------|
| CAT 33 | 1 | 16,67 | 0,06 |
| | 2 | 8,33 | 0,12 |
| | 4 | 4,17 | 0,24 |
| CAT 33H | 1 | 4,00 | 0,25 |
| | 2 | 2,00 | 0,50 |
| | 4 | 1,00 | 1,00 |
| CAT 32B | 1 | 12,50 | 0,08 |
| | 2 | 6,25 | 0,16 |
| | 4 | 3,13 | 0,32 |

Dimensional drawing

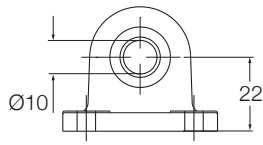


Encoder option E2

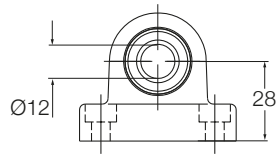
Connecting diagrams



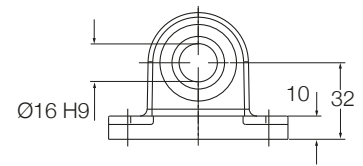
Attachments



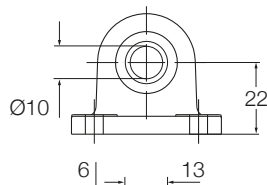
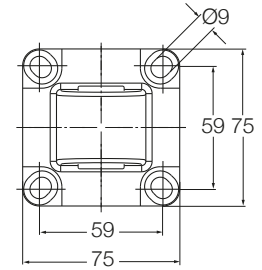
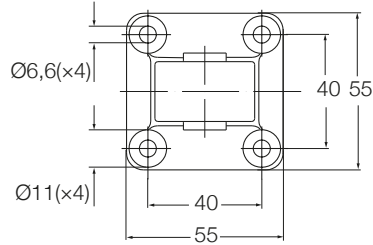
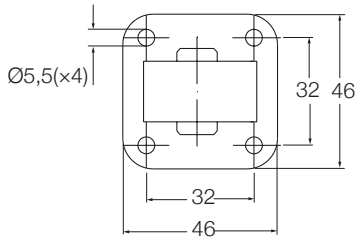
580-22



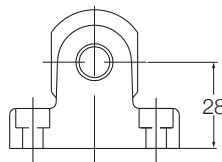
580-32



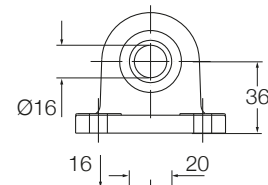
590-40



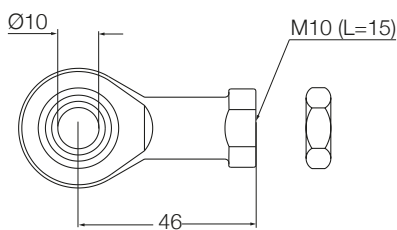
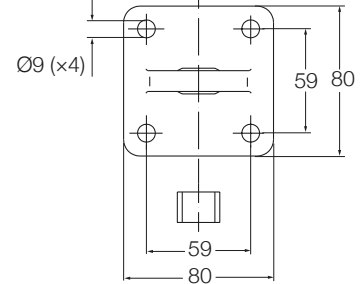
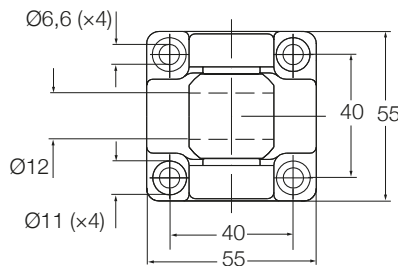
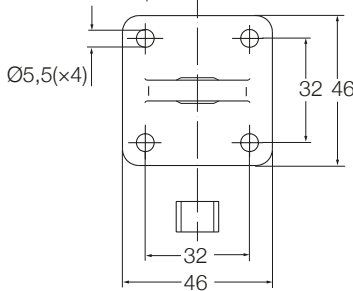
581-22



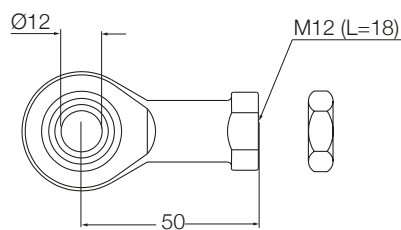
582-32



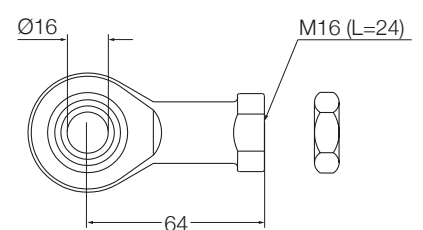
581-40



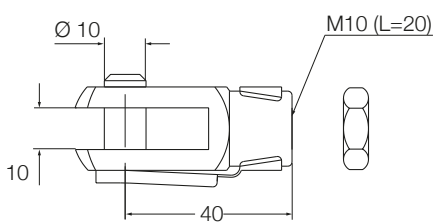
575-22



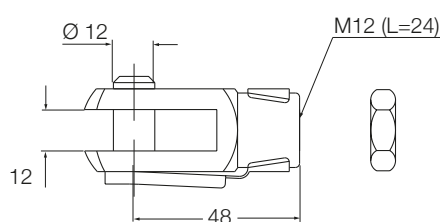
575-32



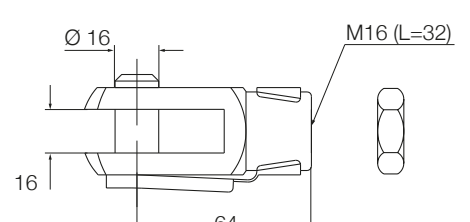
575-40



576-22



576-32



576-40





CAHM series

The CAHM series consists of spindle lifting actuators with worm gears. They fulfil the highest demands for industrial and other applications. The actuators are available in several different motor versions. CAHM series offers strong (up to 50 000 N), fast and quiet movements with high safety and duty cycle. The actuators include many interface options as hall encoder, end-switch, extended shaft etc.



Features

- Ideal for heavy load applications
- Wide speed/force range
- Robust design

All complete datasheet are available on ewellix.com.

If you request higher force than 12 kN, refer to **High performance actuator catalogue (PUB NUM IL-05001/3-EN-June 2022)**.

Benefits

- Modular
- Robust
- Reliable
- High speed and/or high load
- All metal design



Technical data

12 and 24 V DC

| | Unit | CAHM-31XX-D1 | CAHM-31XX-D3 | CAHM-35XX-D2 |
|--------------------------|------|----------------|----------------|------------------|
| Voltage | V DC | 12 | 24 | 24 |
| Screw type | – | LN and LS | LN and LS | LN and LS |
| Max rated push load | N | 1 000 to 4 000 | 1 000 to 4 000 | 10 000 to 15 000 |
| Max rated pull load | N | 1 000 to 4 000 | 1 000 to 4 000 | 10 000 to 15 000 |
| Max speed (at full load) | mm/s | 5 to 50 | 5 to 45 | 3 to 27 |
| Stroke | mm | 100 to 700 | 100 to 700 | 100 to 700 |
| Retracted length | mm | S+230 | S+230 | – |
| Power consumption | W | 168 to 192 | 144 to 192 | 528 to 840 |
| Current consumption | A | 14 to 16 | 6 to 8 | 22 to 35 |
| Duty cycle | % | 10 | 10 | 10 |
| Ambient temperature | °C | –10 to +40 | –10 to +40 | –10 to +40 |
| Degree of protection | IP | 44 | 44 | 54 |

230 V AC

| | Unit | CAHM-31XX-A2 | CAHM-35XX-A2 |
|--------------------------|------|--------------|-----------------|
| Voltage | V AC | 230 | 230 |
| Screw type | – | LN and LS | LS |
| Max rated push load | N | 500 to 2 600 | 5 000 to 15 000 |
| Max rated pull load | N | 500 to 2 600 | 5 000 to 15 000 |
| Max speed (at full load) | mm/s | 5 to 50 | 2 to 12 |
| Stroke | mm | 100 to 700 | 100 to 700 |
| Retracted length | mm | S+230 | – |
| Power consumption | W | 200 to 230 | 700 to 750 |
| Current consumption | A | 1 to 11 | 3,3 to 3,5 |
| Duty cycle | % | 25 | 10 to 15 |
| Ambient temperature | °C | –10 to +40 | –10 to +40 |
| Degree of protection | IP | 54 | 54 |

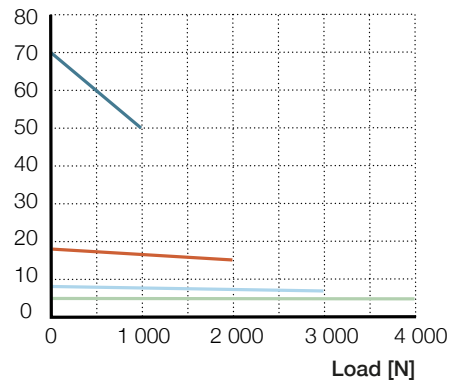
3x400 V AC

| | Unit | CAHM-31XX-A4 | CAHM-35XX-A4 | CAHM-50XX-A4 | CAHM-65XX-A4 |
|--------------------------|------|----------------|------------------|------------------|------------------|
| Voltage | V AC | 3x400 | 3x400 | 3x400 | 3x400 |
| Screw type | – | LN and LS | LS and BN | BN | BN |
| Max rated push load | N | 1 000 to 4 500 | 10 000 to 15 000 | 15 000 to 30 000 | 18 000 to 50 000 |
| Max rated pull load | N | 1 000 to 4 500 | 10 000 to 15 000 | 15 000 to 30 000 | 18 000 to 50 000 |
| Max speed (at full load) | mm/s | 5 to 50 | 2 to 25 | 9 to 45 | 9 to 74 |
| Stroke | mm | 100 to 700 | 100 to 700 | 100 to 700 | 100 to 700 |
| Retracted length | mm | S+230 | – | S+465 | S+446 |
| Power consumption | W | 210 to 280 | 500 to 920 | 1 200 to 1 650 | 1 900 to 3 000 |
| Current consumption | A | 0,5 to 0,6 | 1,4 to 1,8 | 2,8 to 3,5 | 3,6 to 3,9 |
| Duty cycle | % | 40 | 10 to 25 | 10 | 10 |
| Ambient temperature | °C | –10 to +40 | –10 to +40 | –10 to +40 | –10 to +40 |
| Degree of protection | IP | 54 | 54 | 54 | 54 |

Performance diagrams

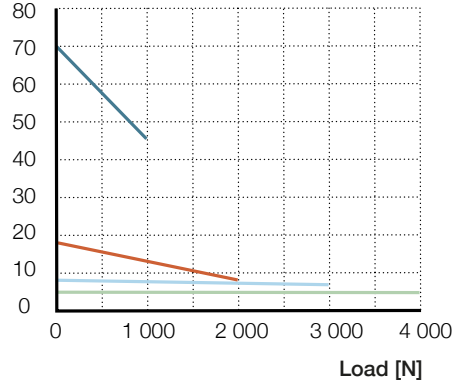
CAHM-31 - DC version

Motor: D1 - 12 V DC
Speed [mm/s]



Speed load diagram

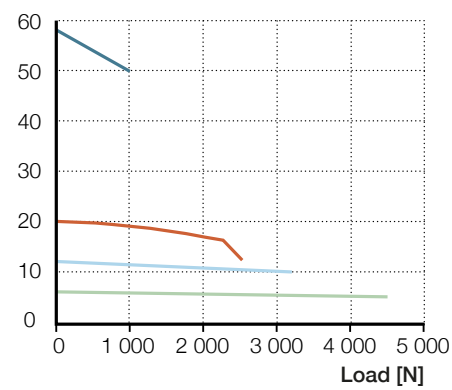
Motor: D2 - 24 V DC
Speed [mm/s]



Speed load diagram

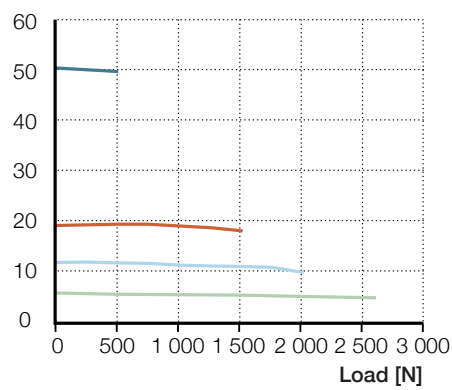
CAHM-31 - AC version

Motor: A4 - 3x400 V AC
Speed [mm/s]



Speed load diagram

Motor: A2 - 230 V AC
Speed [mm/s]



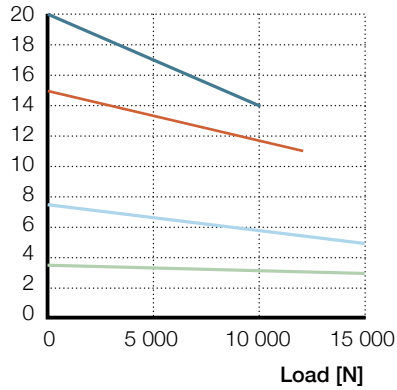
Speed load diagram

— CAHM 3110-LN — CAHM 3130-LN — CAHM 3110-LS — CAHM 3150-LS

CAHM-35 - DC version

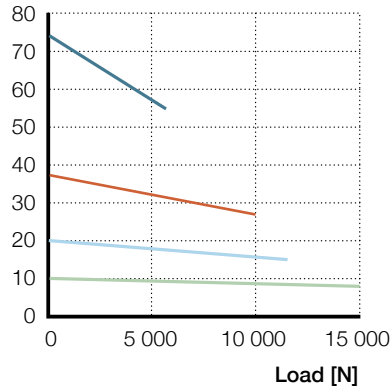
Motor: D2 - 24 V DC
LS - Lead screw 20x4

Speed [mm/s]



Motor: D2 - 24 V DC
BN - Ball screw 25x10

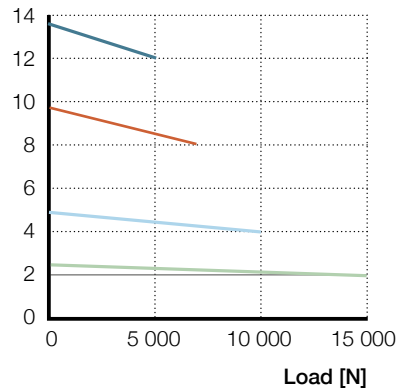
Speed [mm/s]



CAHM-35 - AC version

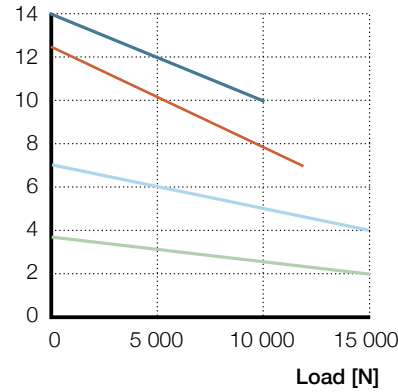
Motor: A2 - 230 V AC
LS - Lead screw 20x4

Speed [mm/s]



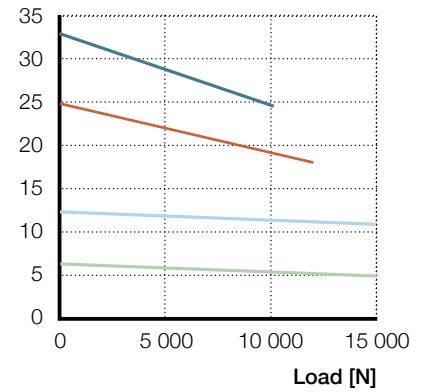
Motor: A4 - 3x400 V AC
LS - Lead screw 25x10

Speed [mm/s]



Motor: A4 - 3x400 V AC
BN - Ball screw 25x10

Speed [mm/s]

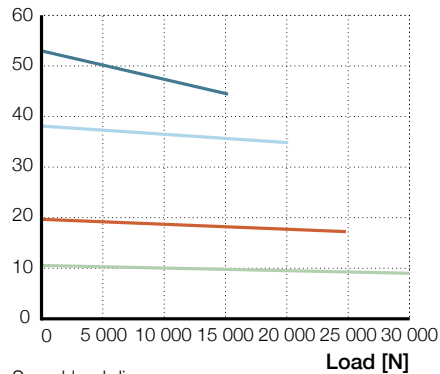


— CAHM-3507 — CAHM-3510 — CAHM-3520 — CAHM-3540

CAHM-50 - AC version

Motor: A4 - 3x400 V AC

Speed [mm/s]



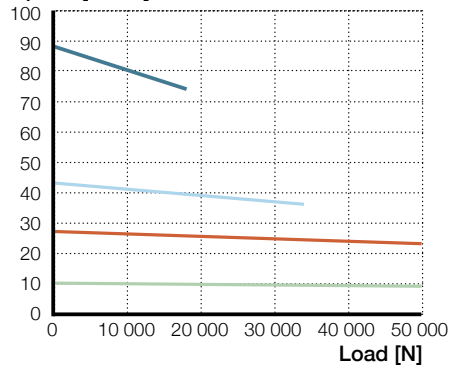
Speed-load diagram

— CAHM-5004 — CAHM-5012
— CAHM-5006 — CAHM-5023

CAHM-65 - AC version

Motor: A4 - 3x400 V AC

Speed [mm/s]



Speed-load diagram

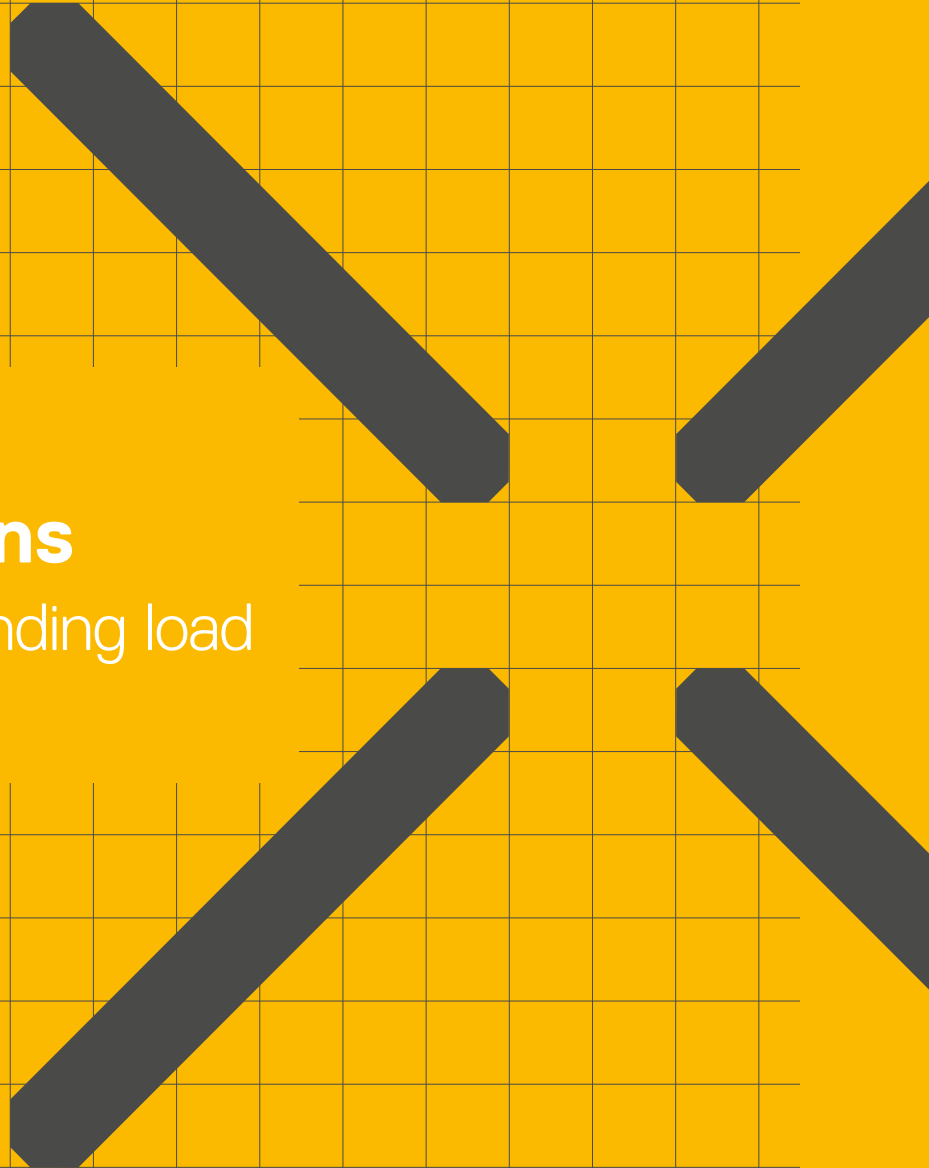
— CAHM-6506 — CAHM-6520
— CAHM-6513 — CAHM-6550



4

Lifting columns

Up to 2,8 kNm bending load



Chapter contents

| | |
|------------|-----|
| CPMA | 194 |
| CPMB | 202 |
| CPMT | 210 |
| TFG | 216 |
| THG | 220 |
| TLC | 224 |
| TLG | 228 |
| TLT | 232 |
| TXG | 236 |
| FRE | 240 |

CPMA

For ophthalmic equipment



Benefits

- Universal power supply
- Plug and play
- Soft start and stop control
- Multiple outlet socket accessories
- Cable through column

Standards

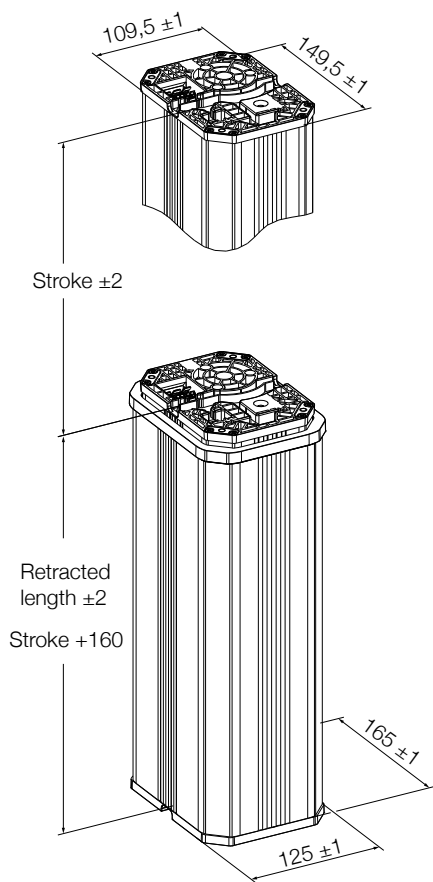
- IEC 60601-1:2005
(3rd edition) compliant

Technical data

| | Unit | CPMA1-1 | CPMA1-2 | CPMA2-2 |
|-------------------------------------|--------------|-------------------------|-------------------------|-------------------------|
| Rated push load (with self locking) | N | 1 000 | 2 000 | 2 000 |
| Rated pull load | N | 0 | 0 | 0 |
| Bending moment (dynamic) | Nm | up to 115 ¹⁾ | up to 250 ¹⁾ | up to 250 ¹⁾ |
| Speed (full load to no load) | mm/s | 14 to 15 | 11 to 15 | 11 to 15 |
| Lifting column version | # of section | 2-section | 2-section | 2-section |
| Stroke | mm | 230 to 400 | 230 to 400 | 200 to 400 |
| Retracted length | mm | S+160 | S+160 | S+160 |
| Static Load (Max) in push way | N | 8 000 | 8 000 | 8 000 |
| Static bending moment (Max) | Nm | 500 | 500 | 500 |
| Voltage (rated) | V | 100–240 AC 50/60 Hz | 100–240 AC 50/60 Hz | 24 DC |
| Input current (rated) | A | 1,5 | 1,6 | 5 |
| Duty cycle: intermittent operation | on/off | 1 min./9 min. | 1 min./9 min. | 1 min./9 min. |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | 30 | 30 | 30 |
| Protection class | – | I | I | – |
| Type of control | – | electrical | electrical | electrical |
| Noise level (Max) | dB(A) | 45 | 45 | 45 |
| Weight | kg | 8 to 11 | 9 to 12 | 8 to 11 |
| Standby power (Max) | W | 2,1 | 1,9 | – |

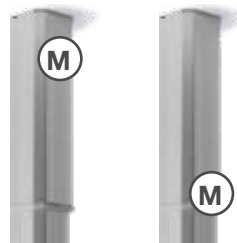
¹⁾ For details, see offset load diagrams (→ page 196)

Dimensional drawing



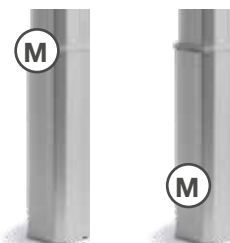
More flexibility with Series CPMA design options

Built-in with outer tube on top
More hygienic and easy-to-clean design



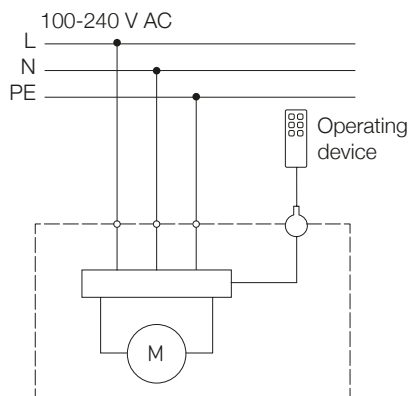
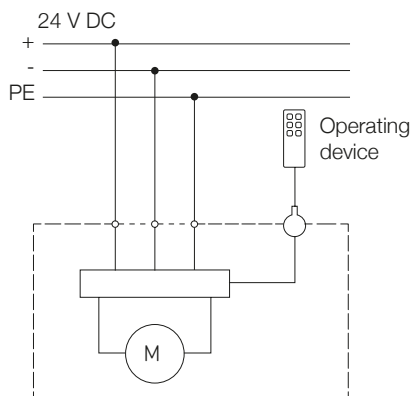
Motor orientation B Motor orientation A

Built-in with outer tube on bottom
More aesthetic design
























Motor orientation A Motor orientation B

Connecting diagrams

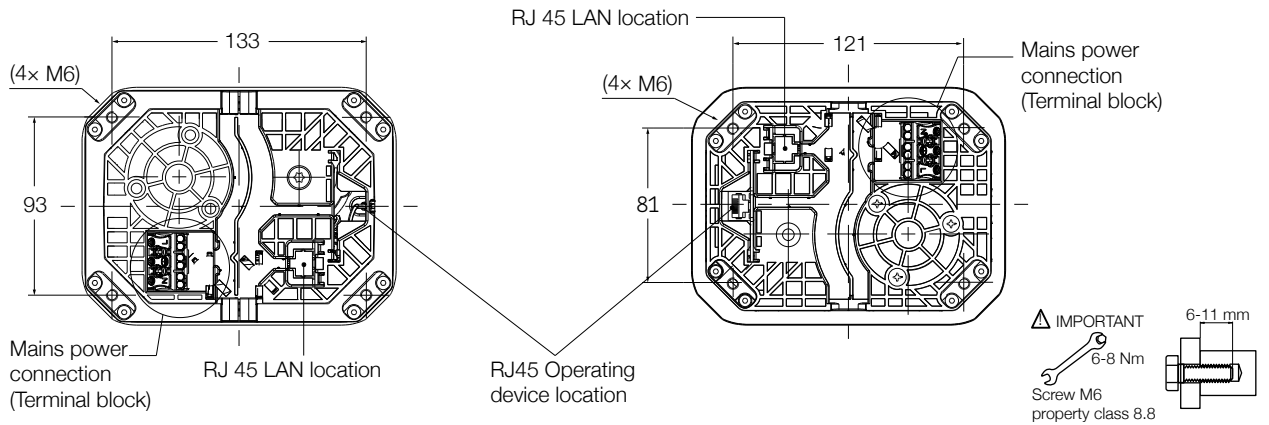


Suitable products

| | External power supply 24 V DC |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
|---------|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| | EHA4 | STL | STK | ZDV-348220-002 | ZDV-348221-002 | ZKA-140449-2500 | ZKA-140450-2500 | ZKA-140451-2500 | ZKA-140452-2500 | ZKA-140458-2500 | ZKA-140460-2500 | ZKA-140453-2500 | ZKA-140454-2500 | ZKA-140455-2500 | ZKA-140456-2500 | ZKA-140459-2500 | ZKA-140461-2500 |
| CPMA1-1 | • | • | • | • | • | • | • | • | • | • | • | | | | | | |
| CPMA1-2 | • | • | • | • | • | • | • | • | • | • | • | | | | | | |
| CPMA2-2 | • | • | • | | | | | | | | | | | | | | |

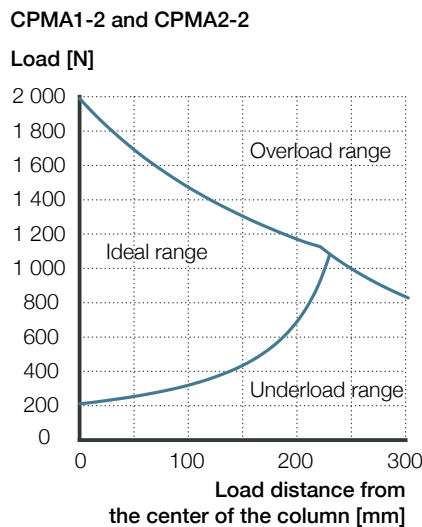
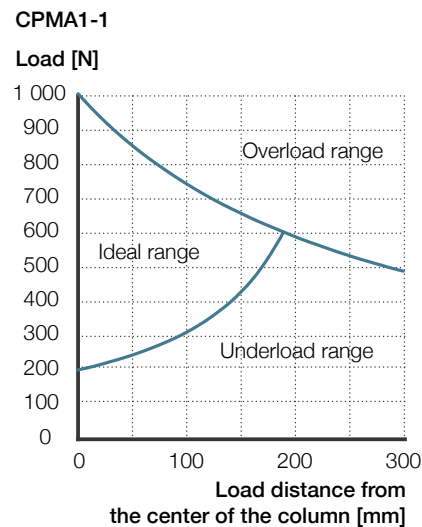
 Hand switch
  Foot switch
  Desk switch
  Socket box
  Mains cable
  Detachable mains cord

Connections and fastening

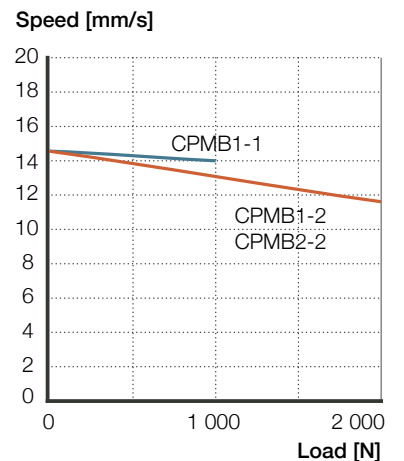


Column must be attached on plane and rigid surface by 4 screws M6 with a depth of 6 to 11 mm in the column. The total length of the screw must be adjusted to the height of the fixture.

Offset load diagrams



Performance diagram



Offset load at full extension in the best axis

Offset load at full extension in the best axis

— CPMA1-1 — CPMA1-2, CPMA2-2

Inlet socket box – ZDV



Benefits

- Multifunction plug and play accessory
- Detachable mains power cord
- Replaceable fuses
- LAN Connector
- Easy to use
- Cord strain relief

Standards

- IEC 60601-1:2005 (3rd edition) compliant

Outlet socket box – ZDV



Benefits

- Multifunction plug and play accessory
- 3 IEC outlet sockets
- Replaceable fuses
- Integrated mounting plate
- LAN Connector
- Easy to use

Standards

- IEC 60601-1:2005 (3rd edition) compliant

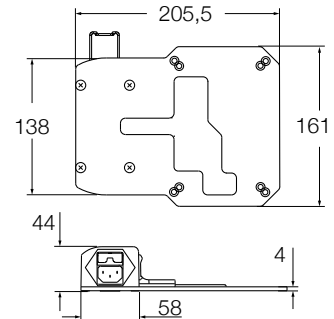
Suitable operating devices

| | Columns | Hand switches | Foot switches | Desk switches | Mains cables | Detachable mains cords |
|----------------|-------------------------------|------------------|-------------------|--|--|--|
| | CPMA1-1 CPMA1-2 CPMA2-2 | EHA41-13N10N-000 | STL01-GW1000-X190 | STK01-SW3000-X100 STK01-UW3000-X100 | ZKA-140449-2500 ZKA-140450-2500 ZKA-140451-2500 ZKA-140452-2500 ZKA-140458-2500 ZKA-140460-2500 | ZKA-140453-2500 ZKA-140454-2500 ZKA-140455-2500 ZKA-140456-2500 ZKA-140459-2500 ZKA-140461-2500 |
| ZDV-348220-002 | • | • | • | • | | • |

Technical data

- IEC inlet mains power socket with retainer
- 1 RJ45 for operating device
- 1 RJ45 for LAN
- 2 replacable fuses 8 A
- Plate with holes as the plates of the column CPMA
- Can be fastened on inner and outer tube

Dimensional drawing



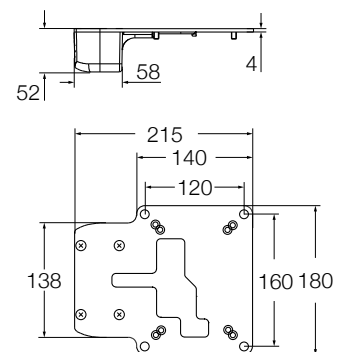
Suitable operating devices

| | Columns | Hand switches | Foot switches | Desk switches | Mains cables | Detachable mains cords |
|----------------|-------------------------------|------------------|-------------------|--|--|--|
| | CPMA1-1 CPMA1-2 CPMA2-2 | EHA41-13N10N-000 | STL01-GW1000-X190 | STK01-SW3000-X100 STK01-UW3000-X100 | ZKA-140449-2500 ZKA-140450-2500 ZKA-140451-2500 ZKA-140452-2500 ZKA-140458-2500 ZKA-140460-2500 | ZKA-140453-2500 ZKA-140454-2500 ZKA-140455-2500 ZKA-140456-2500 ZKA-140459-2500 ZKA-140461-2500 |
| ZDV-348221-002 | • | • | • | • | | • |

Technical data

- 3 IEC mains power outlet sockets
- 1 RJ45 for operating device
- 1 RJ45 for LAN
- 2 replacable fuses 8 A
- Integrated mounting plate with 4 holes 9 mm diameter
- 4 screws to fasten on column CPMA
- Can be fastened on inner and outer tube

Dimensional drawing



Mounting plate – ZPL



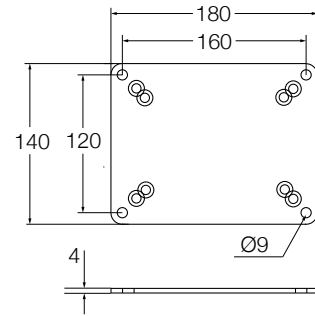
Benefits

- Easy to use

Suitable operating devices

| | Columns | | |
|------------|---------|---------|---------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 |
| ZPL-348382 | • | • | • |

Dimensional drawing



Technical data

- Can be fastened on inner and outer tube
- Mounting plate with 4 holes 9 mm diameter

Mains cable and detachable mains cord – ZKA

Mains cable



Detachable mains cord



Mains cable

| | Columns | | | Socket boxes | |
|-----------------|---------|---------|---------|----------------|----------------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 | ZDV-348220-002 | ZDV-348221-002 |
| ZKA-140449-2500 | • | • | | | |
| ZKA-140450-2500 | • | • | | | |
| ZKA-140451-2500 | • | • | | | |
| ZKA-140452-2500 | • | • | | | |
| ZKA-140458-2500 | • | • | | | |
| ZKA-140460-2500 | • | • | | | |

Detachable mains cord

| | Columns | | | Socket boxes | |
|-----------------|---------|---------|---------|----------------|----------------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 | ZDV-348220-002 | ZDV-348221-002 |
| ZKA-140453-2500 | • | • | | | |
| ZKA-140454-2500 | • | • | | | |
| ZKA-140455-2500 | • | • | | | |
| ZKA-140456-2500 | • | • | | | |
| ZKA-140459-2500 | • | • | | | |
| ZKA-140461-2500 | • | • | | | |

Benefits

- Easy to use
- Identification by a product label

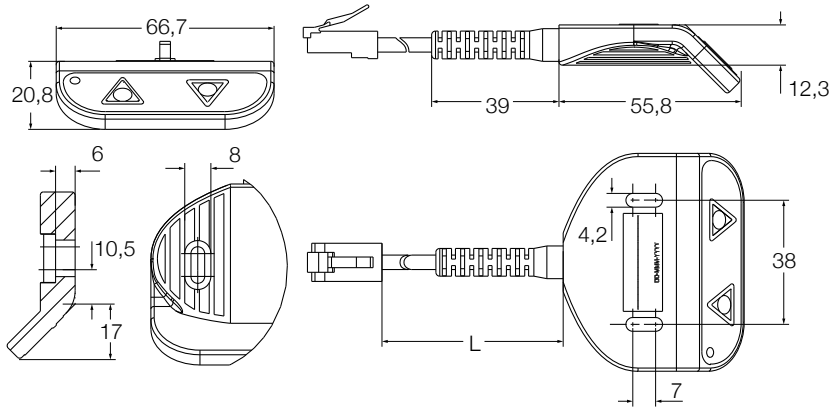
Standards

- IEC 60601-1:2005 (3rd edition) compliant

Desk switch – STK



Dimensional drawing



Benefits

- Easy and precise
- Stylish design
- Tactile buttons with finger guide
- 2 colors LED for power and feedback status

Standards

- IEC 60601-1:2005 (3rd edition) compliant

Suitable operating devices

| | Columns | | | Socket boxes | |
|-------------------|---------|---------|---------|----------------|----------------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 | ZDV-348220-002 | ZDV-348221-002 |
| STK01-SW3000-X100 | • | • | • | • | • |
| STK01-UW3000-X100 | • | • | • | • | • |

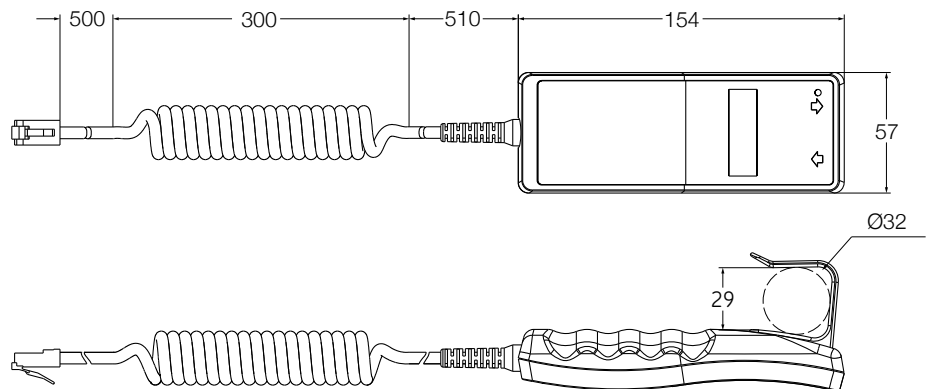
| Designation | L [mm] |
|-------------------|--------|
| STK01-SW3000-X100 | 500 |
| STK01-UW3000-X100 | 1 000 |

See page 200 and 201 for technical data and ordering key

Hand switch – EHA



Dimensional drawing



Suitable operating devices

| | Columns | | | Socket boxes | |
|-----|---------|---------|---------|----------------|----------------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 | ZDV-348220-002 | ZDV-348221-002 |
| EHA | • | • | • | • | • |

See page 200 and 201 for technical data and ordering key



Foot switch – STL



Benefits

- Easy to use
- Ergonomic design

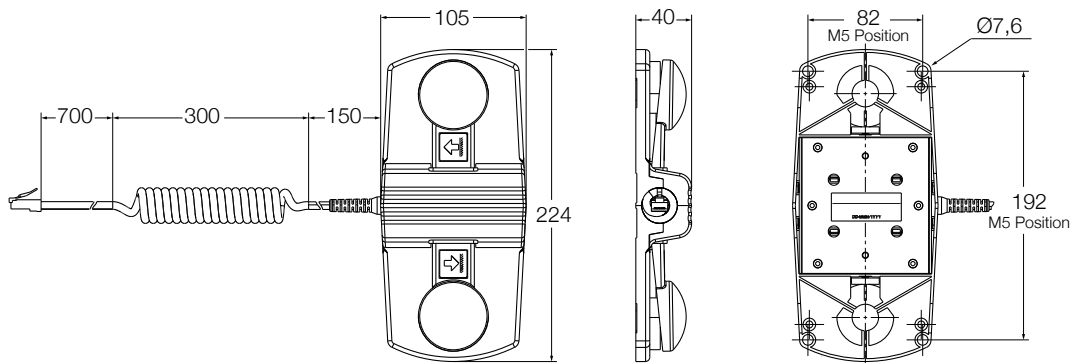
Standards

- IEC 60601-1:2005 (3rd edition) compliant

Suitable operating devices

| | Columns | | | Socket boxes | |
|-------|---------|---------|---------|----------------|----------------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 | ZDV-348220-002 | ZDV-348221-002 |
| STL01 | • | • | • | • | • |

Dimensional drawing



Switches technical data

| | Unit | EHA4 | STL | STK |
|-------------------------|---------|--|---------------------|--|
| Max. operating channels | n° | 1 | 1 | 1 |
| Operating power | V DC/mA | 5/20 | 5/20 | 5/20 |
| Degree of protection | IP | 67 | x2 | – |
| Color | – | Grey | Grey and anthracite | Grey |
| Indicator | – | LED 2 colors for power and feedback status | – | LED 2 colors for power and feedback status |
| Plug | – | RJ45 | RJ45 | RJ45 |
| Hook | – | with hook | – | – |
| Symbols | – | with arrows up/down | with arrows up/down | with arrows up/down |

Accessories

| Description | Plug | Country | Part number | Order Number |
|---|--------------------------------------|----------------------|-------------------|--------------|
| Mains cable straight 2,5 m | Schuko | Germany, France, ... | ZKA-140449-2500 | 130015 |
| | Typ-L | Italy | ZKA-140450-2500 | 130016 |
| | British standard | UK | ZKA-140451-2500 | 130017 |
| | NEMA | USA, Japan, ... | ZKA-140452-2500 | 130018 |
| | SEV | CH | ZKA-140458-2500 | 130256 |
| Detachable mains cord straight 2,5 m (to plug in socket box Inlet) | AS 3112 | PRC, Australia, ... | ZKA-140460-2500 | 130391 |
| | Schuko | Germany, France, ... | ZKA-140453-2500 | 130019 |
| | Typ-L | Italy | ZKA-140454-2500 | 130020 |
| | British standard | UK | ZKA-140455-2500 | 130021 |
| | NEMA | USA, Japan, ... | ZKA-140456-2500 | 130022 |
| Desk switch with LED, cable 0,5 m | SEV | CH | ZKA-140459-2500 | 130257 |
| | AS 3112 | PRC, Australia, ... | ZKA-140461-2500 | 130392 |
| | Desk switch with LED, cable 1,0 m | | STK01-SW3000-X100 | 130025 |
| | Handset with LED, cable coiled 1,3 m | | STK01-UW3000-X100 | 130026 |
| | Foot switch, cable coiled 1,3 m | | EHA41-13N00N-000 | 131033 |
| Mounting plate | | | STL01-GW1000-X100 | 131873 |
| | | | ZPL-348382 | 130024 |
| Socket box inlet: IEC, RJ45 LAN, RJ45 op. device | | | ZDV-348220-002 | 130030 |
| Socket box outlet: 3xIEC, RJ45 LAN, RJ45 op. device | | | ZDV-348221-002 | 130032 |

Ordering key

C P M A - 2 - - - - - - - - - 0 0 0

Type _____

Voltage _____

1 100–240 V AC 50/60 Hz

2 24 V DC

Load _____

Push

1 1 000 N Only for AC version

2 2 000 N

Tube set _____

2 2-section

Stroke length _____

200 200 mm Only for DC version

230 230 mm

250 250 mm

300 300 mm

400 400 mm

--- Other per 10 mm from 200 mm or 230 mm for AC version up to 400 mm

Motor orientation ¹⁾ _____

A Motor in inner tube

B Motor in outer tube

Operating device orientation _____

A Operating device socket as the motor

B Operating device socket at both sides

LAN cable through _____

0 No

1 LAN cable through Not compatible with op. device socket at both sides

¹⁾ Column can be placed with outer tube on the top or bottom (↳ page 195)

■ Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional cost.

CPMB

For infant care



Benefits

- Universal power supply
- Plug and play
- Soft start and stop control
- Low noise level
- Cable through column
- Grounding continuity

Standards

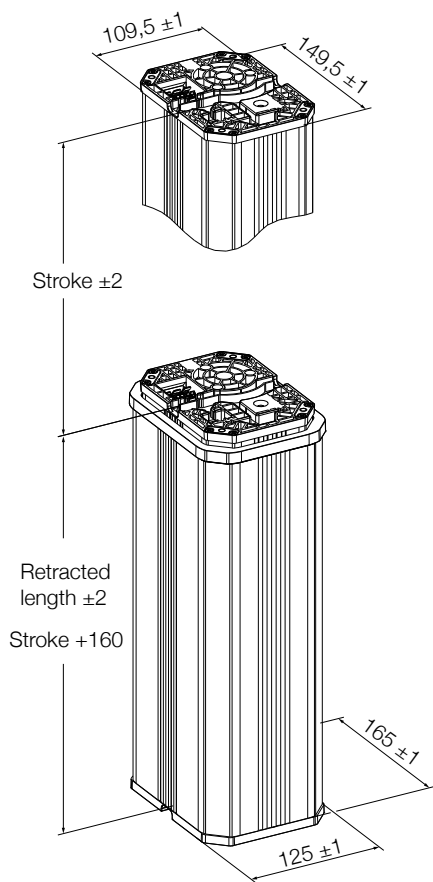
- IEC 60601-1:2005 (3rd edition) compliant

Technical data

| | Unit | CPMB1-1 | CPMB1-2 | CPMB2-2 |
|-------------------------------------|--------------|-------------------------|-------------------------|-------------------------|
| Rated push load (with self locking) | N | 1 000 | 2 000 | 2 000 |
| Rated pull load | N | 0 | 0 | 0 |
| Bending moment (dynamic) | Nm | up to 115 ¹⁾ | up to 250 ¹⁾ | up to 250 ¹⁾ |
| Speed (full load to no load) | mm/s | 14 to 15 | 11 to 15 | 11 to 15 |
| Lifting column version | # of section | 2-section | 2-section | 2-section |
| Stroke | mm | 230 to 400 | 230 to 400 | 200 to 400 |
| Retracted length | mm | S+160 | S+160 | S+160 |
| Static Load (Max) in push way | N | 8 000 | 8 000 | 8 000 |
| Static bending moment (Max) | Nm | 500 | 500 | 500 |
| Voltage (rated) | V | 100–240 AC 50/60 Hz | 100–240 AC 50/60 Hz | 24 DC |
| Input current (rated) | A | 1,5 | 1,6 | 5 |
| Duty cycle: intermittent operation | on/off | 1 min./9 min. | 1 min./9 min. | 1 min./9 min. |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | 30 | 30 | 30 |
| Protection class | – | I | I | – |
| Type of control | – | electrical | electrical | electrical |
| Noise level (Max) | dB(A) | 45 | 45 | 45 |
| Weight | kg | 8 to 11 | 9 to 12 | 8 to 11 |

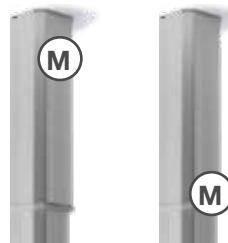
¹⁾ For details, see offset load diagrams (→ page 204)

Dimensional drawing



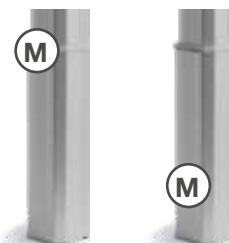
More flexibility with Series CPMB design options

Built-in with outer tube on top
More hygienic and easy-to-clean design



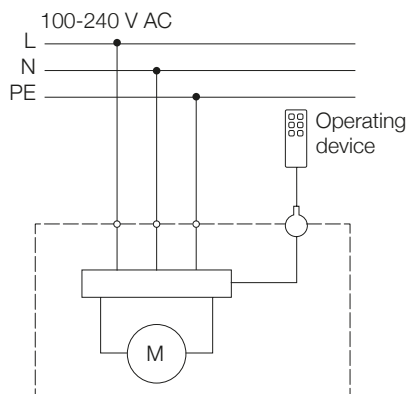
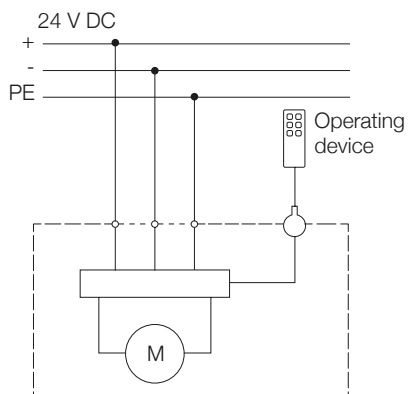
Motor orientation B Motor orientation A

Built-in with outer tube on bottom
More aesthetic design



Motor orientation A Motor orientation B

Connecting diagrams

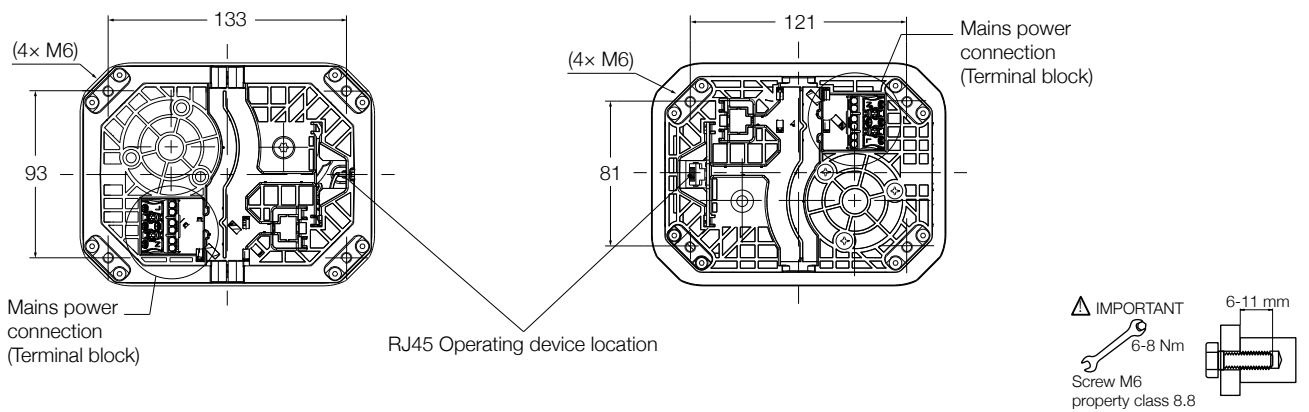


Suitable operating devices

| | External power supply 24 V DC | EHA4 | STL | STK |
|---------|-------------------------------|------|-----|-----|
| CPMB1-1 | | • | • | • |
| CPMB1-2 | | • | • | • |
| CPMB2-2 | • | • | • | • |

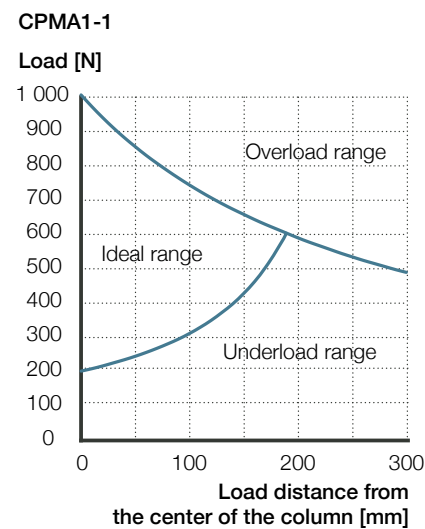
Hand switch
 Foot switch
 Desk switch

Connections and fastening

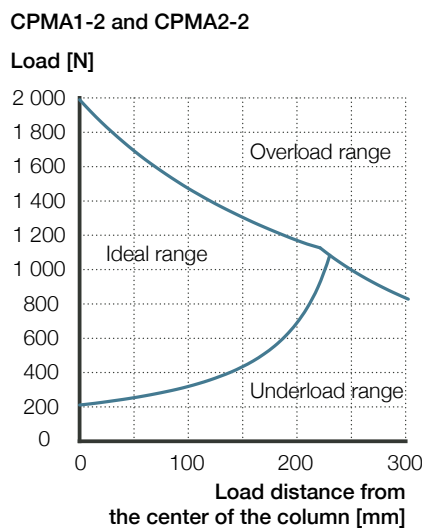


Column must be attached on plane and rigid surface by 4 screws M6 with a depth of 6 to 11 mm in the column. The total length of the screw must be adjusted to the height of the fixture.

Offset load diagrams

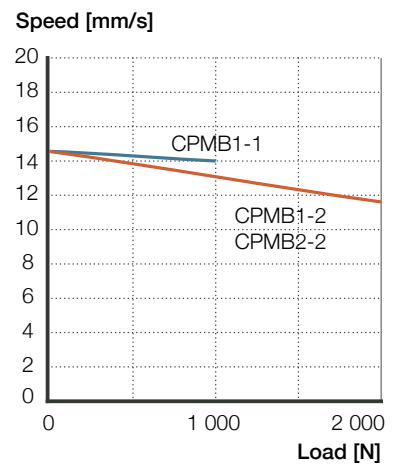


Offset load at full extension in the best axis



Offset load at full extension in the best axis

Performance diagram



— CPMA1-1 — CPMA1-2, CPMA2-2

Inlet socket box – ZDV



Benefits

- Multifunction plug and play accessory
- Detachable mains power cord
- Replaceable fuses
- LAN Connector
- Easy to use
- Cord strain relief

Standards

- IEC 60601-1:2005 (3rd edition) compliant

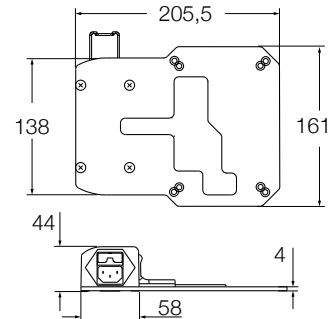
Suitable operating devices

| | Columns | Hand switches | Foot switches | Desk switches | Mains cables | Detachable mains cords |
|----------------|-------------------------------|------------------|-------------------|--|--|--|
| | CPMB1-1 CPMB1-2 CPMB2-2 | EHA41-13N10N-000 | STL01-GW1000-X190 | STK01-SW3000-X100 STK01-UW3000-X100 | ZKA-140449-2500 ZKA-140450-2500 ZKA-140451-2500 ZKA-140452-2500 ZKA-140458-2500 ZKA-140460-2500 | ZKA-140453-2500 ZKA-140454-2500 ZKA-140455-2500 ZKA-140456-2500 ZKA-140459-2500 ZKA-140461-2500 |
| ZDV-348220-002 | • | • | • | • | | • |

Technical data

- IEC inlet mains power socket with retainer
- 1 RJ45 for operating device
- 1 RJ45 for LAN
- 2 replaceable fuses 8 A
- Plate with holes as the plates of the column CPMA
- Can be fastened on inner and outer tube

Dimensional drawing



Outlet socket box – ZDV



Benefits

- Multifunction plug and play accessory
- 3 IEC outlet sockets
- Replaceable fuses
- Integrated mounting plate
- LAN Connector
- Easy to use

Standards

- IEC 60601-1:2005 (3rd edition) compliant

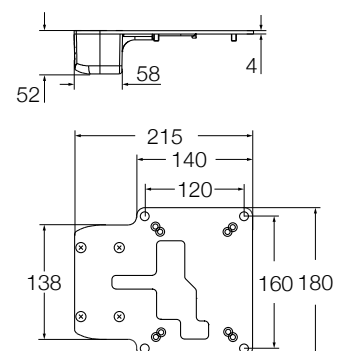
Suitable operating devices

| | Columns | Hand switches | Foot switches | Desk switches | Mains cables | Detachable mains cords |
|----------------|-------------------------------|------------------|-------------------|--|--|--|
| | CPMB1-1 CPMB1-2 CPMB2-2 | EHA41-13N10N-000 | STL01-GW1000-X190 | STK01-SW3000-X100 STK01-UW3000-X100 | ZKA-140449-2500 ZKA-140450-2500 ZKA-140451-2500 ZKA-140452-2500 ZKA-140458-2500 ZKA-140460-2500 | ZKA-140453-2500 ZKA-140454-2500 ZKA-140455-2500 ZKA-140456-2500 ZKA-140459-2500 ZKA-140461-2500 |
| ZDV-348221-002 | • | • | • | • | | • |

Technical data

- 3 IEC mains power outlet sockets
- 1 RJ45 for operating device
- 1 RJ45 for LAN
- 2 replaceable fuses 8 A
- Integrated mounting plate with 4 holes 9 mm diameter
- 4 screws to fasten on column CPMA
- Can be fastened on inner and outer tube

Dimensional drawing



Mounting plate – ZPL



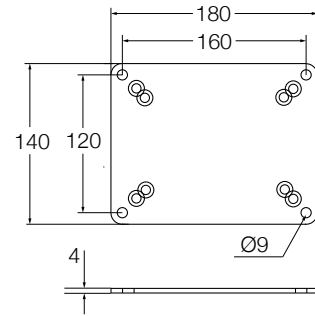
Benefits

- Easy to use

Suitable operating devices

| | Columns | | |
|------------|---------|---------|---------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 |
| ZPL-348382 | • | • | • |

Dimensional drawing



Technical data

- Can be fastened on inner and outer tube
- Mounting plate with 4 holes 9 mm diameter

Mains cable and detachable mains cord – ZKA

Mains cable



Detachable mains cord



Mains cable

| | Columns | | | Socket boxes | |
|-----------------|---------|---------|---------|----------------|----------------|
| | CPMB1-1 | CPMB1-2 | CPMB2-2 | ZDV-348220-002 | ZDV-348221-002 |
| ZKA-140449-2500 | • | • | | | |
| ZKA-140450-2500 | • | • | | | |
| ZKA-140451-2500 | • | • | | | |
| ZKA-140452-2500 | • | • | | | |
| ZKA-140458-2500 | • | • | | | |
| ZKA-140460-2500 | • | • | | | |

Detachable mains cord

| | Columns | | | Socket boxes | |
|-----------------|---------|---------|---------|----------------|----------------|
| | CPMB1-1 | CPMB1-2 | CPMB2-2 | ZDV-348220-002 | ZDV-348221-002 |
| ZKA-140453-2500 | • | • | | | |
| ZKA-140454-2500 | • | • | | | |
| ZKA-140455-2500 | • | • | | | |
| ZKA-140456-2500 | • | • | | | |
| ZKA-140459-2500 | • | • | | | |
| ZKA-140461-2500 | • | • | | | |

Benefits

- Easy to use
- Identification by a product label

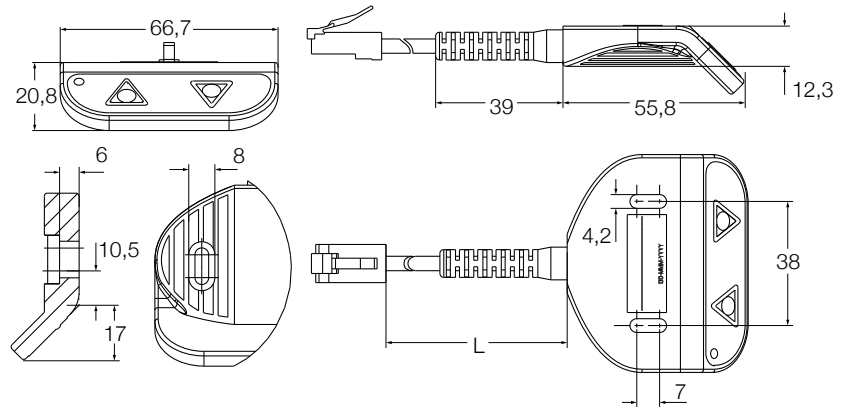
Standards

- IEC 60601-1:2005 (3rd edition) compliant

Desk switch – STK



Dimensional drawing



Benefits

- Easy and precise
- Stylish design
- Tactile buttons with finger guide
- 2 colors LED for power and feedback status

Standards

- IEC 60601-1:2005 (3rd edition) compliant

Suitable operating devices

| | Columns | | | Socket boxes | |
|-------------------|---------|---------|---------|----------------|----------------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 | ZDV-348220-002 | ZDV-348221-002 |
| STK01-SW3000-X100 | • | • | • | • | • |
| STK01-UW3000-X100 | • | • | • | • | • |

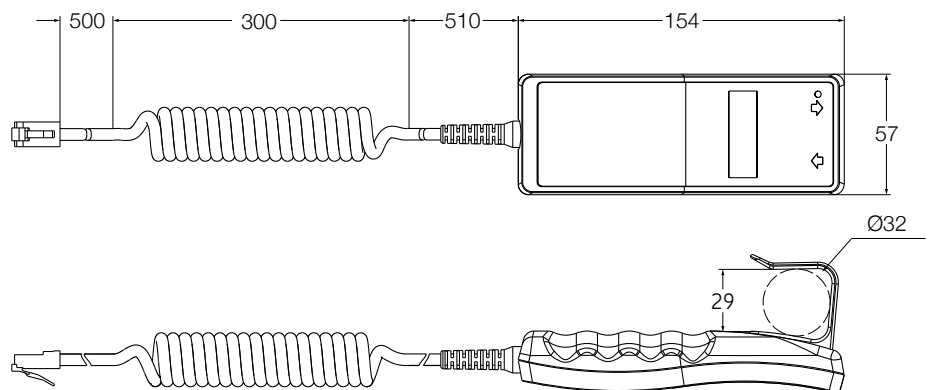
| Designation | L [mm] |
|-------------------|--------|
| STK01-SW3000-X100 | 500 |
| STK01-UW3000-X100 | 1 000 |

See page 208 and 209 for technical data and ordering key

Hand switch – EHA



Dimensional drawing



Benefits

- Robust ergonomic design
- Tactile buttons
- Easy mountable fastening hook
- 2 colors LED for power and feedback status

Standards

- IEC 60601-1:2005 (3rd edition) compliant

Suitable operating devices

| | Columns | | | Socket boxes | |
|-----|---------|---------|---------|----------------|----------------|
| | CPMB1-1 | CPMB1-2 | CPMB2-2 | ZDV-348220-002 | ZDV-348221-002 |
| EHA | • | • | • | • | • |

See page 208 and 209 for technical data and ordering key



Foot switch – STL



Benefits

- Easy to use
- Ergonomic design

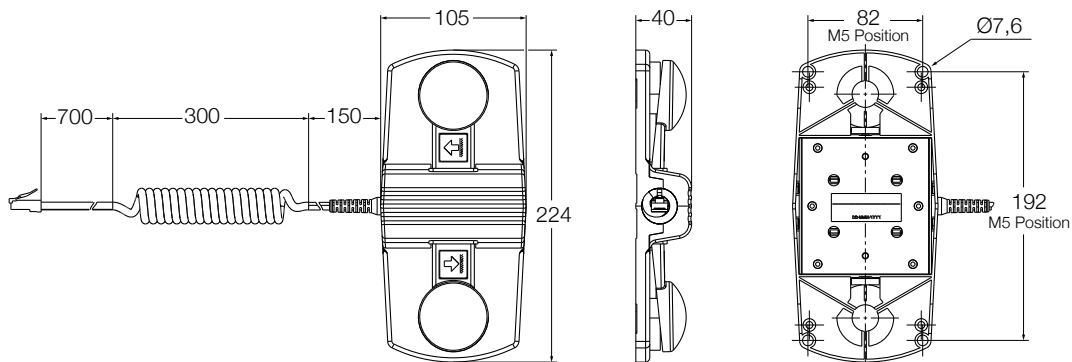
Standards

- IEC 60601-1:2005 (3rd edition) compliant

Suitable operating devices

| | Columns | | | Socket boxes | |
|-------|---------|---------|---------|----------------|----------------|
| | CPMB1-1 | CPMB1-2 | CPMB2-2 | ZDV-348220-002 | ZDV-348221-002 |
| STL01 | • | • | • | • | • |

Dimensional drawing



Switches technical data

| | Unit | EHA4 | STL | STK |
|-------------------------|---------|--|---------------------|--|
| Max. operating channels | n° | 1 | 1 | 1 |
| Operating power | V DC/mA | 5/20 | 5/20 | 5/20 |
| Degree of protection | IP | 67 | x2 | – |
| Color | – | Grey | Grey and anthracite | Grey |
| Indicator | – | LED 2 colors for power and feedback status | – | LED 2 colors for power and feedback status |
| Plug | – | RJ45 | RJ45 | RJ45 |
| Hook | – | with hook | – | – |
| Symbols | – | with arrows up/down | with arrows up/down | with arrows up/down |

Accessories

| Description | Plug | Country | Part number | Order Number |
|---|---------------------|----------------------|-------------------|--------------|
| Mains cable straight 2,5 m | Schuko | Germany, France, ... | ZKA-140449-2500 | 130015 |
| | Typ-L | Italy | ZKA-140450-2500 | 130016 |
| | British standard | UK | ZKA-140451-2500 | 130017 |
| | NEMA | USA, Japan, ... | ZKA-140452-2500 | 130018 |
| | SEV | CH | ZKA-140458-2500 | 130256 |
| Detachable mains cord straight 2,5 m (to plug in socket box Inlet) | AS 3112 | PRC, Australia, ... | ZKA-140460-2500 | 130391 |
| | Schuko | Germany, France, ... | ZKA-140453-2500 | 130019 |
| | Typ-L | Italy | ZKA-140454-2500 | 130020 |
| | British standard | UK | ZKA-140455-2500 | 130021 |
| | NEMA | USA, Japan, ... | ZKA-140456-2500 | 130022 |
| SEV | CH | ZKA-140459-2500 | 130257 | |
| AS 3112 | PRC, Australia, ... | ZKA-140461-2500 | 130392 | |
| Desk switch with LED, cable 0,5 m | | | STK01-SW3000-X100 | 130025 |
| Desk switch with LED, cable 1,0 m | | | STK01-UW3000-X100 | 130026 |
| Handset with LED, cable coiled 1,3 m | | | EHA41-13N00N-000 | 131033 |
| Foot switch, cable coiled 1,3 m | | | STL01-GW1000-X100 | 131873 |
| Mounting plate | | | ZPL-348382 | 130024 |
| Socket box inlet: IEC, RJ45 LAN, RJ45 op. device | | | ZDV-348220-002 | 130030 |
| Socket box outlet: 3xIEC, RJ45 LAN, RJ45 op. device | | | ZDV-348221-002 | 130032 |

Ordering key

C P M B - 2 - - - - 0 - 0 0 0

Type _____

Voltage _____

1 100–240 V AC 50/60 Hz

2 24 V DC

Load _____

Push

1 1 000 N Only for AC version

2 2 000 N

Tube set _____

2 2-section

Stroke length _____

200 200 mm Only for DC version

230 230 mm

250 250 mm

300 300 mm

400 400 mm

--- Other per 10 mm from 200 mm or a mm for AC version up to 400 mm

Motor orientation ¹⁾ _____

A Motor in inner tube

B Motor in outer tube

Operating device orientation _____

A Operating device socket as the motor

B Operating device socket at both sides

¹⁾ Column can be placed with outer tube on the top or bottom (↳ page 203)

■ Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional cost.

CPMT

For medical procedure equipment



Benefits

- Low retracted height
- High stroke
- High load capacity
- High safety and reliability
- Design flexibility

Standards

- IEC 60601-1:2005
- ANSI/AAMI ES60601-1:2005
- IEC 60601-1-2:2007

Technical data

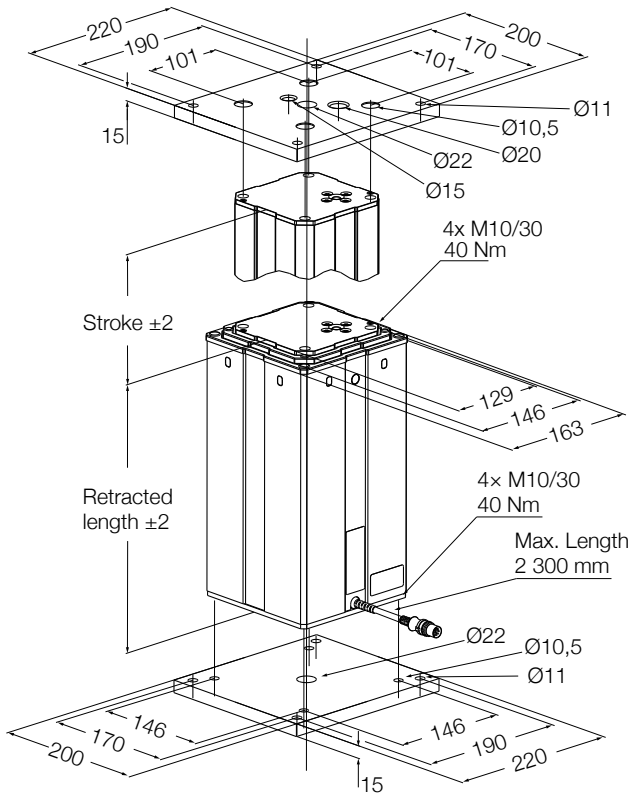
| | Unit | CPMT1-1S | CPMT1-1M | CPMT1-2S | CPMT1-2M |
|---|--------|-------------------------|---------------------------|-------------------------|---------------------------|
| Rated push load | N | 5 000 | 5 000 | 6 000 | 6 000 |
| Rated pull load | N | 4 000 | 4 000 | 4 000 | 4 000 |
| Static load (push) ¹⁾ | N | 15 000 | 15 000 | 15 000 | 15 000 |
| Safety factor on rated load ²⁾ | | 4 | 4 | 4 | 4 |
| Dynamic bending moment | Nm | up to 450 ³⁾ | up to 1 200 ³⁾ | up to 550 ³⁾ | up to 1 400 ³⁾ |
| Static bending moment (max.) | Nm | 1 000 | 3 000 | 1 000 | 3 000 |
| Retracted length | mm | stroke/2 + 120 mm | stroke/2 + 240 mm | stroke/2 + 120 mm | stroke/2 + 240 mm |
| Stroke (S) | mm | 400 to 600 | 300 to 600 | 400 to 600 | 300 to 600 |
| Speed | mm/s | 14 to 34 | 14 to 34 | 12 to 26 | 12 to 26 |
| Voltage | V DC | 24 to 30 | 24 to 30 | 24 to 30 | 24 to 30 |
| Current (push, max.) | A | 12 | 12 | 10 | 10 |
| Current (pull, max.) | A | 10 | 10 | 7 | 7 |
| Duty cycle | on/off | 1 min./9 min. | 1 min./9 min. | 1 min./9 min. | 1 min./9 min. |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | | 20 | 20 | 20 | 20 |
| Weight | kg | 16,5 to 20 | 19 to 23,5 | 16,5 to 20 | 19 to 23,5 |

¹⁾ Compliant with static load according to IEC 60601-2-46:2010

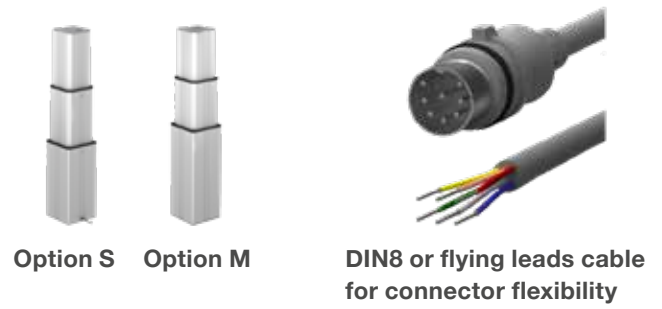
²⁾ Static tensile safety factor to prevent mechanical hazard according to IEC 60601-1:2005

³⁾ For details, see offset load diagrams (→ page 211)

Dimensional drawing



Configuration options



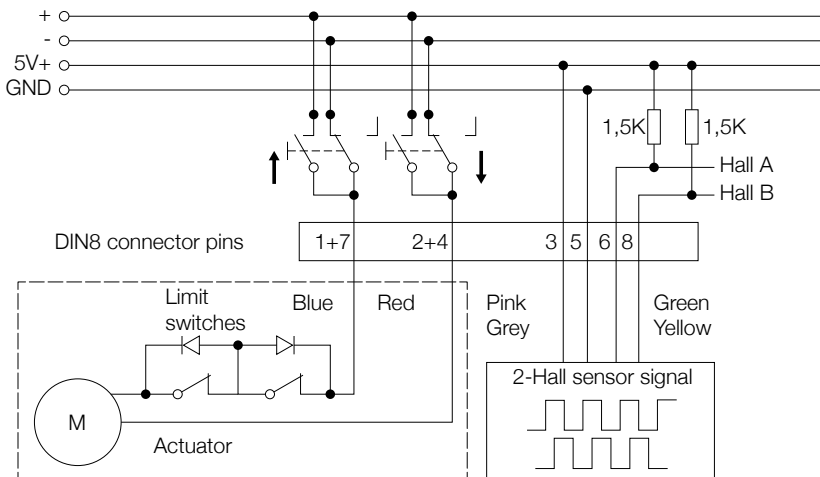
Suitable control units and accessories

| | Control units | | |
|---------------------------|---------------|-------------|-------------------|
| | SCU | VCU | BCU ¹⁾ |
| CPMT | • | • | • |
| Operating switches | | | |
| EHA 3 | • | • | • |
| STJ | • | • | • |
| STE | • | • | • |
| Hand switch | | Foot switch | Desk switch |

¹⁾ Reduced load capacity:
 CPMT1-1 up to 3 000 N
 CPMT1-2 up to 4 000 N

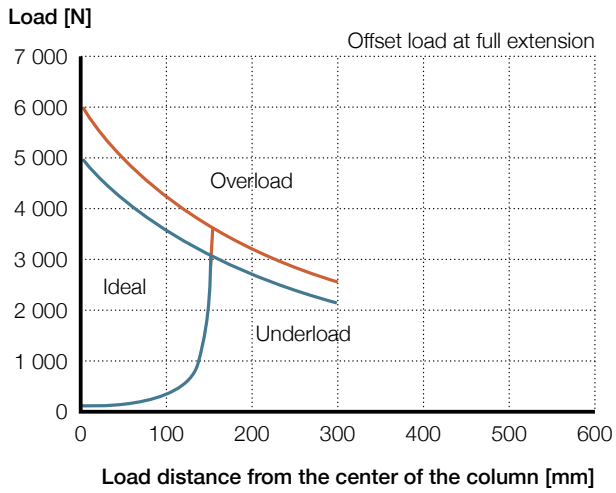
Connecting diagrams

24–30 V DC

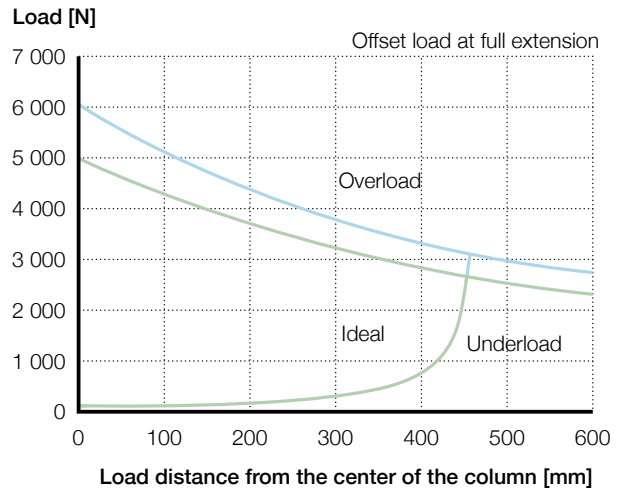


Offset load diagrams

CPMT1-1S, -2S



CPMT1-1M, -2M



— CPMT1-1S

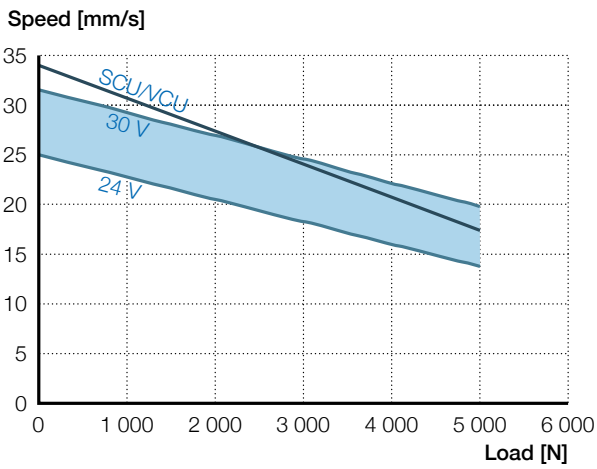
— CPMT1-2S

— CPMT1-2M

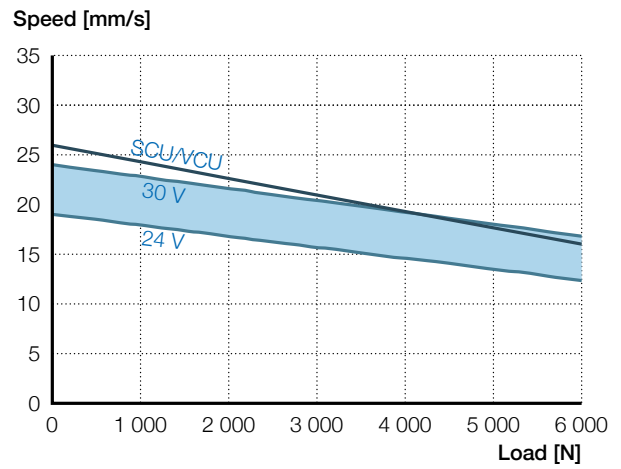
— CPMT1-1M

Speed-load diagrams

CPMT1-1

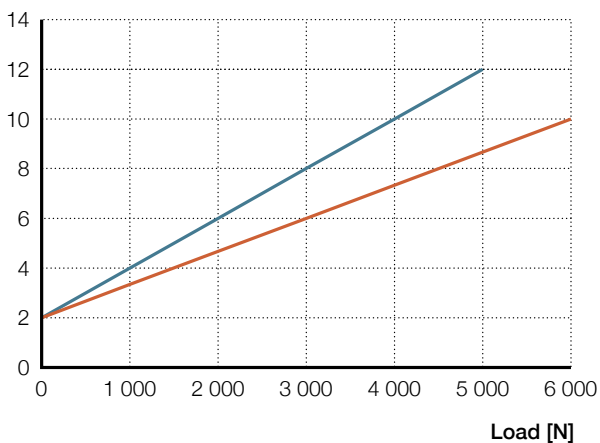


CPMT1-2



Current-load diagram

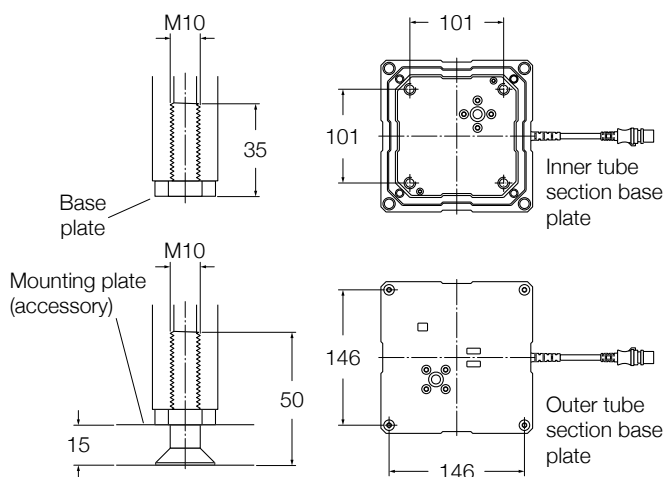
Current consumption [A]



— CPMT1-1

— CPMT1-2

Mounting details



The column must be mounted on a plane and rigid surface by 4 screws M10 (accessory) with a screw in depth of 25 to 35 mm in the column.

Additional attachment options

Optional threads on outer tube section can be configured for additional attachment options. Please contact Ewellix for more details.

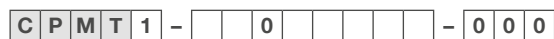
- Choice in size and position
- High strength to support attached actuators



Accessories

| Description | Part number |
|------------------------------------|-------------------|
| Control Unit SCU (3 or 6 ports) | SCUXX-003XXX-000 |
| Control Unit VCU (3 or 5 ports) | VCUXX-003XX0-000 |
| Control Unit BCU (3 ports) | BCUX3-XX3100-0000 |
| Foot switch STJ (1-3 channels) | STJ0X-XXXXXX-XX00 |
| Hand switch EHA3 (1-5 channels) | EHA3X-23MXXN-000 |
| Top mounting plate | ZPL-290268 |
| Bottom mounting plate | ZPL-290265 |
| Screw (4/plate) for mounting plate | ZBE-510707 |

Ordering key



Type

Voltage

1 24–30 V DC

Load

| | Push (N) | Pull (N) |
|---|----------|----------|
| 1 | 5 000 | 4 000 |
| 2 | 6 000 | 4 000 |

Retracted length

S Stroke/2 + 120 mm
M Stroke/2 + 240 mm

Stroke length (mm)

| | | |
|-----|--------|--|
| 300 | 300 mm | Only for retracted length M |
| 350 | 350 mm | Only for retracted length M |
| 400 | 400 mm | |
| 450 | 450 mm | |
| 500 | 500 mm | |
| 550 | 550 mm | |
| 600 | 600 mm | |
| --- | Other | per 10 mm from 300 mm (or 400 mm for retracted length S) to 600 mm |

Electrical options

F 2-Hall encoder, end limit switches

Cable options

- 1 1 m DIN8 cable
- 2 2,3 m DIN8 cable
- 3 2,3 m flying leads cable

Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional cost.



TFG

Telemag



Benefits

- Push or pull load
- Compact design
- Fast movement
- Powerful
- Plug and play

Standards

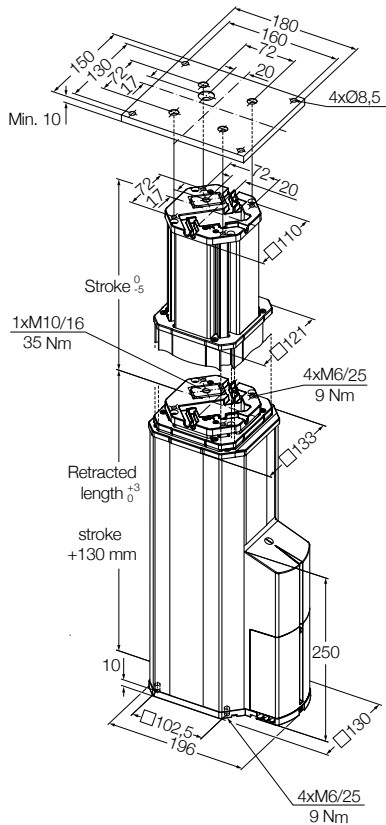
- EN/IEC 60601-1
- UL 60601-1

Technical data

| | Unit | TFG 10 | TFG 50 | TFG 90 |
|------------------------------------|--------------|---------------|-------------------------|-------------------------|
| Rated push load | N | 2 500 | 2 500 | 2 500 |
| Rated pull load | N | 2 500 | 2 500 | 2 500 |
| Bending load | Nm | up to 500 | up to 500 ¹⁾ | up to 500 ¹⁾ |
| Speed (full load to no load) | mm/s | 15 to 19 | 15 to 19 | 15 to 19 |
| Lifting column version | # of section | 3-section | 3-section | 3-section |
| Stroke | mm | 200 to 700 | 200 to 700 | 200 to 700 |
| Retracted length | mm | S+130 | S+130 | S+130 |
| Voltage | V AC | 24 | 120 | 230 |
| Power | W | 120 | 160 | 160 |
| Current | 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 |
| Degree of protection | IP | 30 | 30 | 30 |
| Protection class | - | SELV | I | I |
| Type of control | - | electrical | electrical | electrical |
| Weight | kg | 8 to 19 | 8 to 19 | 8 to 19 |

¹⁾ For details, please see bending load diagrams (↳ page 218)

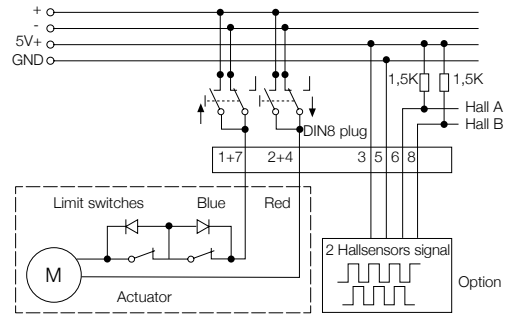
Dimensional drawing



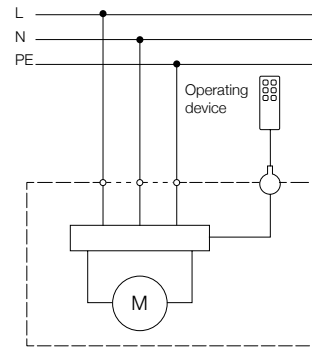
Note: mounting plates are not included.
To be ordered separately.

Connecting diagrams

24 V DC (TFG10 only)



120/230 V AC

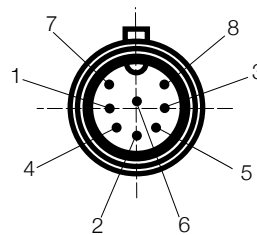


Suitable control units and accessories

| TFG1 | Control units | | | | |
|--------------------|---------------|-----|-----|---------|-----|
| | SCU | VCU | BCU | COMPACT | SEM |
| Operating switches | | | | | |
| EHA 3 | • | • | • | | |
| EHE | | | | | • |
| STJ | • | • | • | | |
| STE | • | • | • | | |
| HSM | | | | • | |
| HSF | | | | • | |

Hand switch
 Foot switch
 Desk switch

TFG10: pin assignment for DIN 8 plug fixed assembled cable with a length of 1,5 m

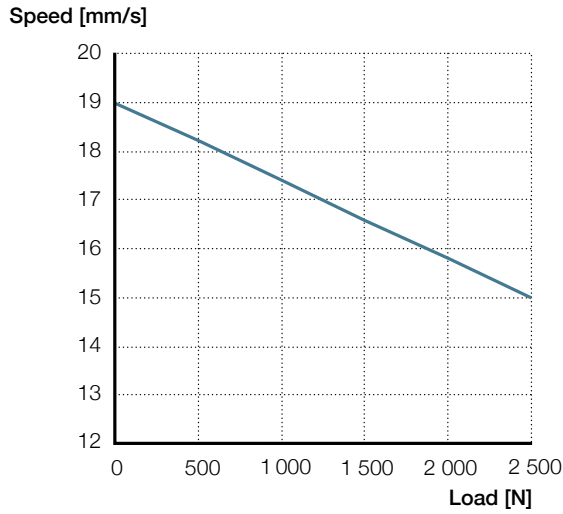


| | Polarity (24 V DC) | |
|---|--------------------|-----------|
| | Extended | Retracted |
| 1 | (+) | (-) |
| 2 | (-) | (+) |
| 3 | (+) 4,5 - 24 V DC | |
| 5 | (GND) Grounding | |
| 6 | Hallsensor 1 | |
| 8 | Hallsensor 2 | |

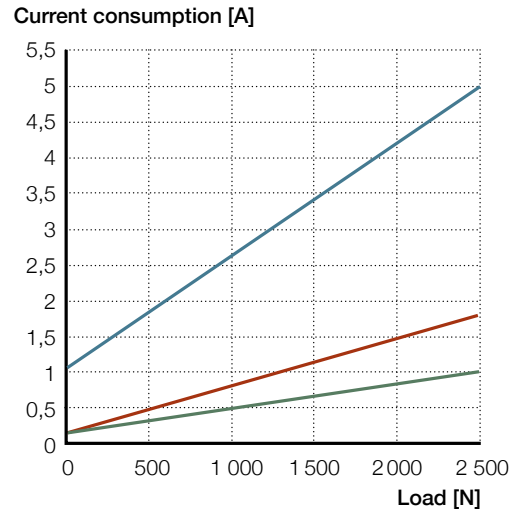


Performance diagrams

Speed-load diagram



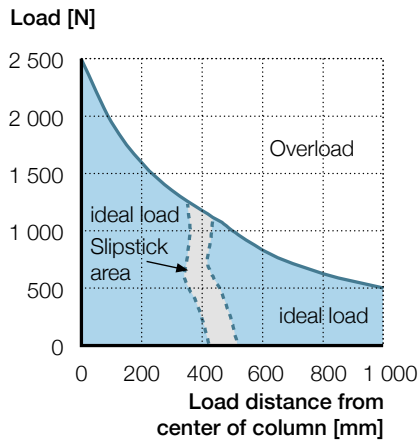
Current-load diagram



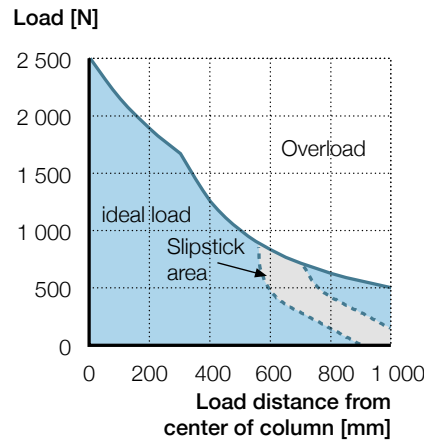
— TFG 10 — TFG 50 — TFG 90

Bending load diagrams

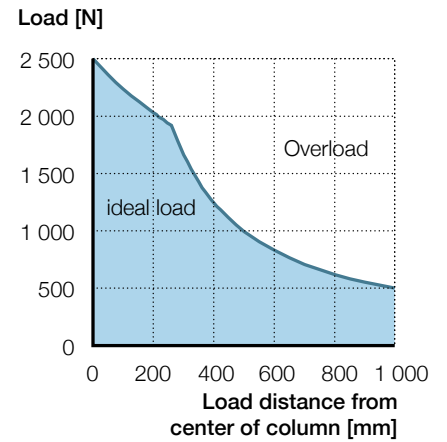
200 mm stroke



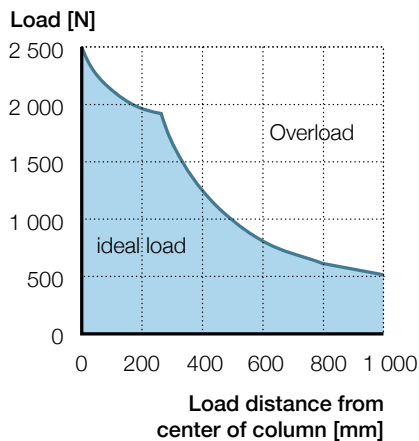
300 mm stroke



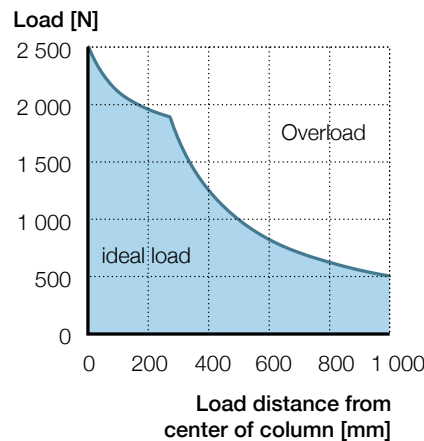
400 mm stroke



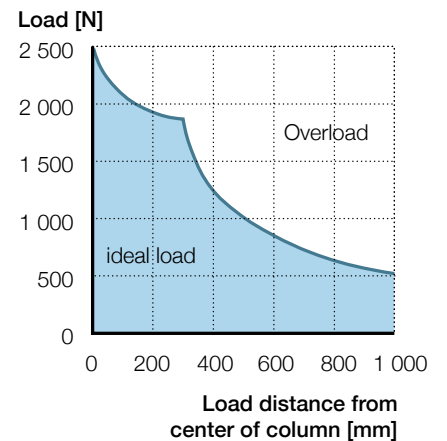
500 mm stroke



600 mm stroke



700 mm stroke



Accessories

| | Designation | Order N° |
|---|-----------------|----------|
| Top mounting plate Bore 72 × 72 mm | ZPL-333360 | 0124808 |
| Bottom mounting plate Bore 102,5 × 102,5 mm | ZPL-264363 | 0124814 |
| Screw for top mounting plate M10 × 25 (1 screw required) | ZBE-510978 | 0125359 |
| Screw for top mounting plate M6 × 30 (4 screws required) | ZBE-510709 | 0125560 |
| Screw for bottom mounting plate M6 × 30 (4 screws required) | ZBE-510709 | 0125560 |
| Mains cable SEV plug 3 000 mm, black, 3 × 0.75 mm ² | ZKA-304345-3000 | 0128699 |
| Mains cable Schuko plug 3 000 mm, black, 3 × 0.75 mm ² | ZKA-304346-3000 | 0121729 |
| Mains cable US plug 3 000 mm, black, 3 × 0.75 mm ² | ZKA-304347-3000 | 0121762 |
| Mains cable British Standard plug 3 000 mm, black, 3 × 0.75 mm ² | ZKA-304355-3000 | 0121755 |

Ordering key

T F G 0 - 2 3 - 0 0 0

Type

Voltage

- 1 24 V DC
- 5 120 V AC (50/60 Hz)
- 9 230 V AC (50 Hz)

Stroke [S]

- 200 200 mm
- 250 250 mm
- 300 300 mm
- 350 350 mm
- 400 400 mm
- 500 500 mm
- 700 700 mm

Option

- 000 No option
- E_ _ With 2-Hall encoder, 14 pulses per 9 mm travel
- _C_ With mains cable feedthrough (3xAWG16)
- _ _H With control cable feedthrough (10xAWG28)



THG

Telemag lifting column



Benefits

- Compact design
- Robust

Standards

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

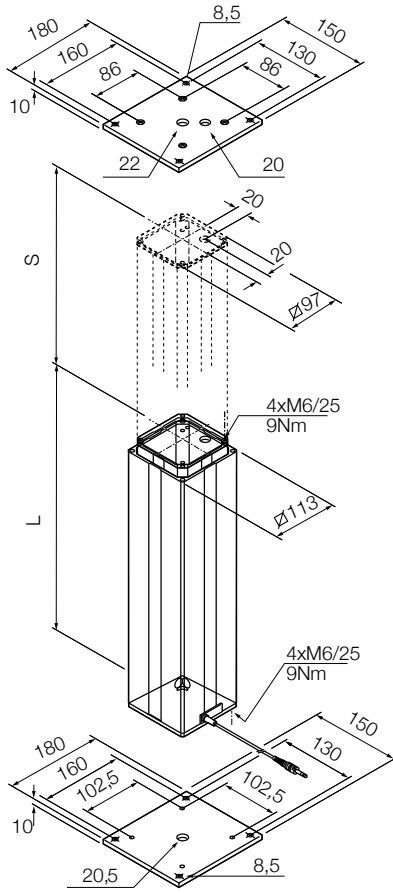
Technical data

| | Unit | THG 10/11-BA | THG 10/11-CA | THG 10/11-BD | THG 10/11-CD |
|------------------------------------|--------------|-------------------------|-------------------------|---------------------------|-------------------------|
| Rated push load | N | 2 000 | 1 000 | 2 000 | 1 000 |
| Rated pull load | N | 0 | 0 | 0 | 0 |
| Bending load | Nm | up to 250 ¹⁾ | up to 120 ¹⁾ | up to 1 000 ¹⁾ | up to 450 ¹⁾ |
| Speed (full load to no load) | mm/s | 5 to 7 | 12 to 15 | 5 to 7 | 12 to 15 |
| Lifting column version | # of section | 2-section | 2-section | 3-section | 3-section |
| Stroke | mm | 200 to 700 | 200 to 700 | 200 to 700 | 200 to 700 |
| Retracted length | mm | S+270 | S+270 | S+180 | S+180 |
| Voltage | V DC | 24 | 24 | 24 | 24 |
| Power | W | 120 | 120 | 120 | 120 |
| Current | A | 5 | 5 | 5 | 5 |
| Duty cycle: intermittent operation | min. | 1 min./9 min | 1 min./9 min | 1 min./9 min | 1 min./9 min |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | 30 | 30 | 30 | 30 |
| Protection class | - | SELV | SELV | SELV | SELV |
| Type of control | - | electrical | electrical | electrical | electrical |
| Weight | kg | 8 to 14 | 8 to 14 | 8 to 14 | 8 to 14 |

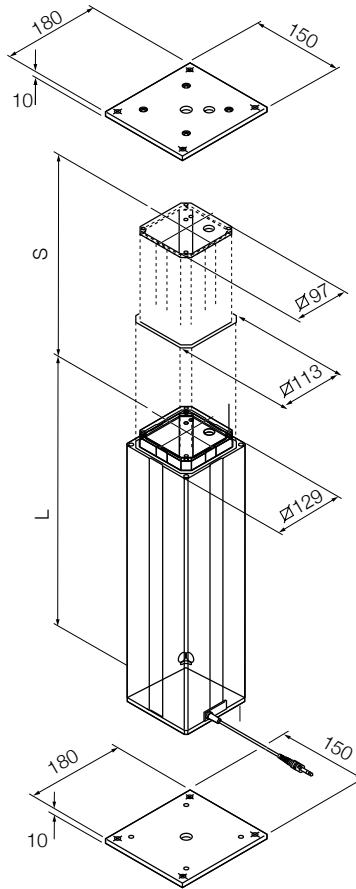
¹⁾ For details, please see bending load diagrams (↳ page 222)

Dimensional drawing

2-section



3-section

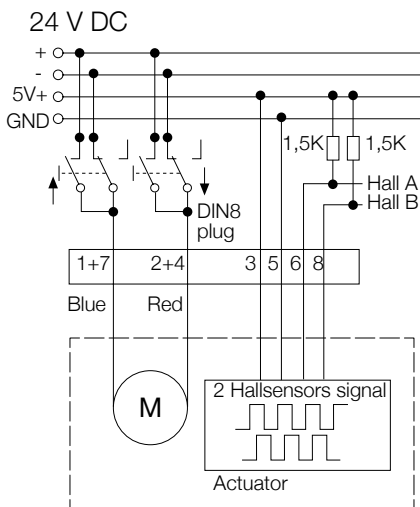


Note: mounting plates are not included. To be ordered separately.

Legend:
S = stroke
L = retracted length



Connection diagram ¹⁾



¹⁾ Only valid with THG11. THG10 must be operated by a BCU, SCU or VCU control unit.

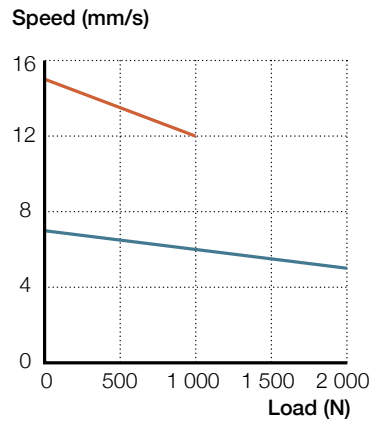
Suitable control units and accessories

| | Control units | | | |
|---------------------------|---------------|-----|-----|-----|
| | SCU | VCU | BCU | MCU |
| THG | • | • | • | • |
| Operating switches | | | | |
| EHA 1 | • | • | • | • |
| EHA 3 | • | • | • | • |
| STF | • | • | • | • |
| STJ | • | • | • | • |
| STA | • | • | • | • |
| STE | • | • | • | • |

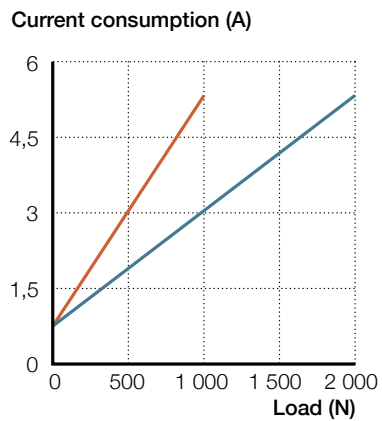
Hand switch Foot switch Desk switch

Performance diagrams

Speed-load diagram

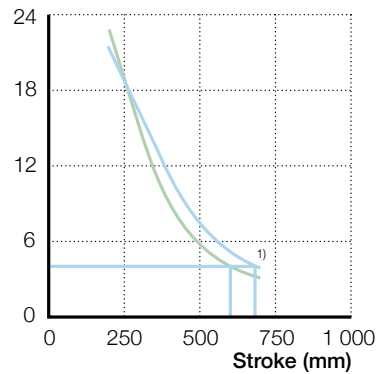


Current-load diagram



Safety factor load conditions

Safety factor (screw buckling)



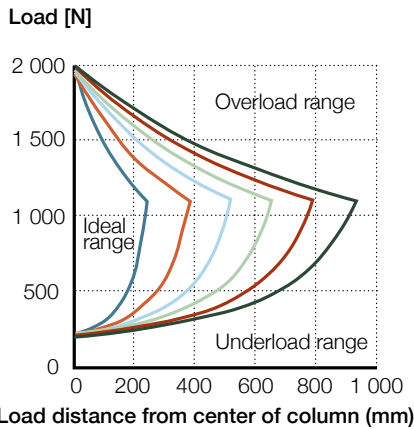
1) Safety factor = 4

— THG...B. — THG...C.

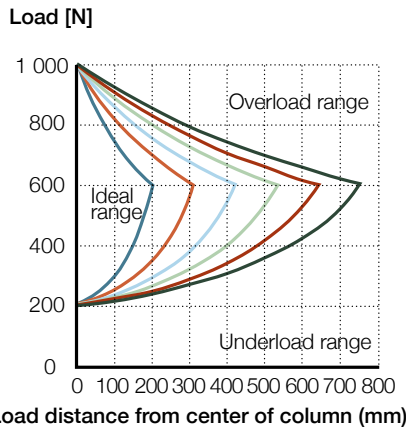
— B/Tr 15x5 — C/Tr 12,5x5

Bending load diagrams

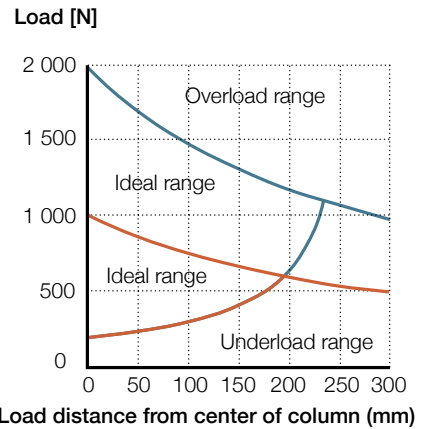
Bending load diagram THG...BD



Bending load diagram THG...CD



Bending load diagram THG...BA/CA



Stroke: — 200 — 300 — 400 — 500 — 600 — 700

— THG...BA — THG...CA

Accessories

| | Designation | Order number |
|--|-------------|--------------|
| Top mounting plate for 2× tube set | SPL-264265 | 0125688 |
| Bottom mounting plate for 2× tube set | SMT-264363 | 0124814 |
| Top mounting plate for 3× tube set | SPL-264265 | 0125688 |
| Bottom mounting plate for 3× tube set | SPL-264237 | 0125622 |
| Screw M6x30 (4/plate) for mounting plate | ZBE-510709 | 0125560 |

Ordering key

T H G 1 - - - - - 0 0 0

Type

Voltage

0 24 V DC

1 24 V DC with integrated current cut-off

Load

B 2 000 N

C 1 000 N

Tube set

A Tube set 2×

D Tube set 3×

Stroke (S)

2 200 mm

3 300 mm

4 400 mm

5 500 mm

6 600 mm

7 700 mm

Cable / connecting plug

1 Straight, 1,0 m / jack plug

2 Straight, 2,3 m / jack plug

A Coiled, 0,6 m / jack plug

3 Straight, 1,0 m / DIN8 plug

4 Straight, 2,3 m / DIN8 plug

B Coiled, 0,6 m / DIN8 plug

Option

0 No option 0

A 1-Hall encoder, 8 pulses, cable with jack plug

B Potentiometer, 1 k, 2 Watt, 0,25 % linearity, 10 turns (tube set 3 × only)

C Cable feedthrough, 5 × 0,75 mm², top +160 mm, bottom +800 mm

D Cable feedthrough, 1-Hall encoder, 8 pulses, cable with jack plug

E Cable feedthrough, potentiometer (tube set 3 × only)

F 2-Hall encoder, cable with DIN8 plug

G Cable feedthrough, 2-Hall encoder, cable with DIN8 plug

■ Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional cost.

TLC

Telemag lifting column



Benefits

- Push or pull load
- High bending load
- Quiet
- Powerful
- Plug and play

Standards

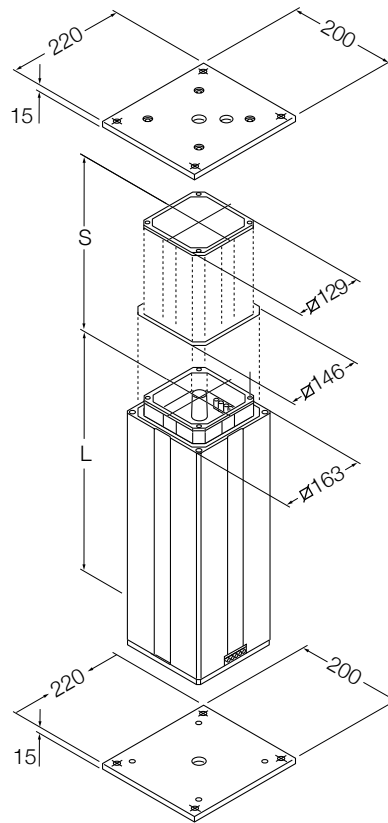
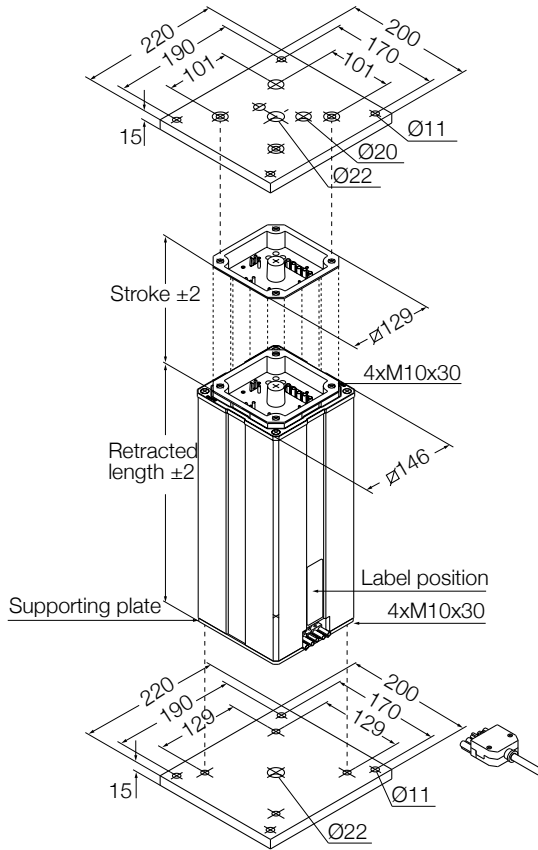
- EN/IEC 60601-1
- UL 60601-1

Technical data

| | | Unit | TLC 12ZWAS | TLC 12ZWAK | TLC 12ZWDS | TLC 12ZWDK |
|------------------------------------|----------|--------------|-------------------------|-------------------------|---------------------------|---------------------------|
| Rated push load | | N | 4 000 | 4 000 | 4 000 | 4 000 |
| Rated pull load | | N | 4 000 | 4 000 | 4 000 | 4 000 |
| Bending load | | Nm | up to 630 ¹⁾ | up to 630 ¹⁾ | up to 2 100 ¹⁾ | up to 2 100 ¹⁾ |
| Speed (full load to no load) | 120 V AC | mm/s | 16 to 22 | 16 to 22 | 16 to 22 | 16 to 22 |
| | 230 V AC | mm/s | 11 to 17 | 11 to 17 | 11 to 17 | 11 to 17 |
| Lifting column version | | # of section | 2-section | 2-section | 3-section | 3-section |
| Stroke | | mm | 100 to 700 | 100 to 700 | 255 to 700 | 255 to 700 |
| Retracted length (push version) | | mm | S+175 | S+175 | S+60 | S+60 |
| Retracted length (pull version) | | mm | S+185 | S+185 | S+70 | S+70 |
| Voltage | | V AC | 120 or 230 | 120 or 230 | 120 or 230 | 120 or 230 |
| Power | 120 V AC | W | 1 200 | 1 200 | 1 200 | 1 200 |
| | 230 V AC | W | 890 | 890 | 890 | 890 |
| Current | 120 V AC | A | 10 | 10 | 10 | 10 |
| | 230 V AC | A | 4,1 | 4,1 | 4,1 | 4,1 |
| Duty cycle: intermittent operation | 120 V AC | min. | 0,8 min./37 min. | 0,8 min./37 min. | 0,8 min./37 min. | 0,8 min./37 min. |
| | 230 V AC | min. | 1 min./37 min. | 1 min./37 min. | 1 min./37 min. | 1 min./37 min. |
| Duty cycle: short-time operation | 120 V AC | min. | 1,2 | 1,2 | 1,2 | 1,2 |
| | 230 V AC | min. | 2 | 2 | 2 | 2 |
| Ambient temperature | | °C | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | | IP | 20/30 | 20/30 | 20/30 | 20/30 |
| Protection class | | – | I | I | I | I |
| Type of control | | – | electrical | pneumatic | electrical | pneumatic |
| Weight | | kg | 15,2-24,5 | 15,2-24,5 | 18,3-30,5 | 18,3-30,5 |

¹⁾ For details, please see bending load diagrams (↳ page 226)

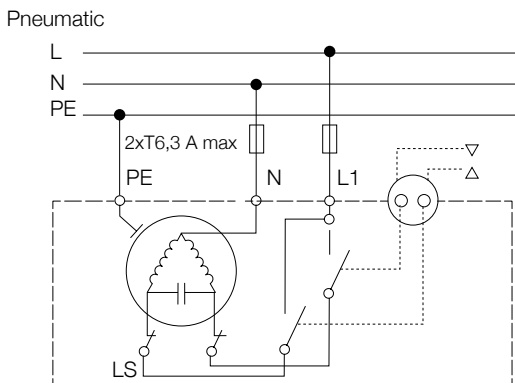
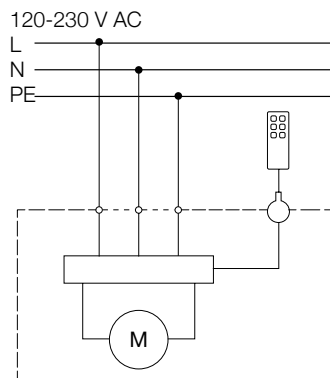
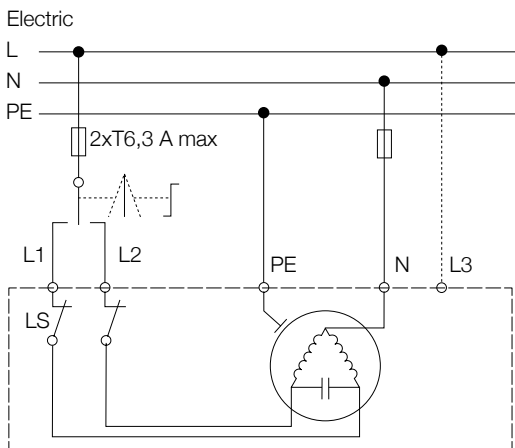
Dimensional drawing



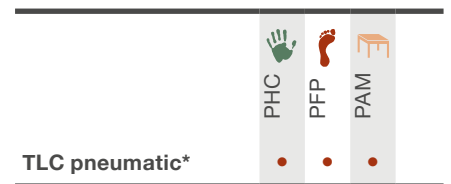
Note: mounting plates are not included. To be ordered separately.

Legend:
S = stroke
L = retracted length

Connecting diagrams



Suitable control units and accessories



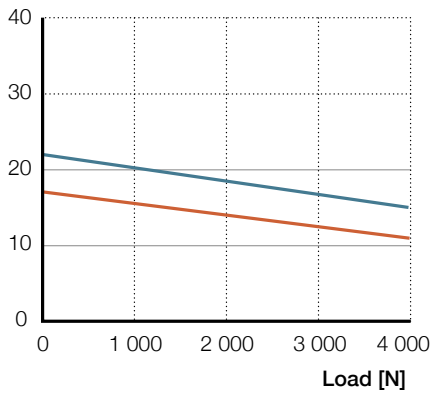
* Integrated control unit

- Hand switch
- Foot switch
- Desk switch

Performance diagram

Speed-load diagram

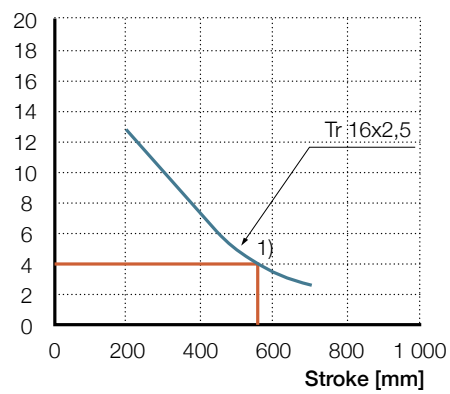
Speed [mm/s]



— 120 V AC version — 230 V AC version

Safety factor load conditions

Safety factor [screw buckling]

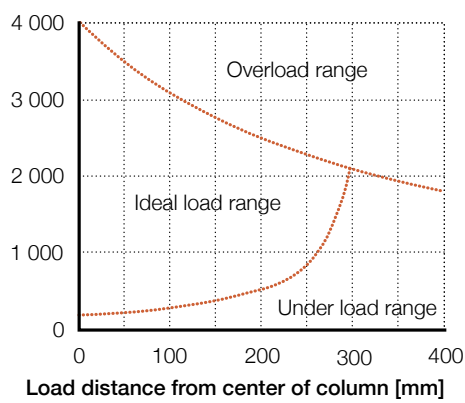


¹⁾ Safety factor =4

Bending load diagrams

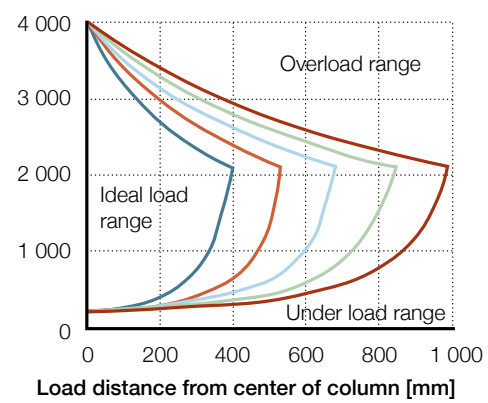
Bending load diagram 2-section

Load [N]



Bending load diagram 3-section

Load [N]



— 300 — 400 — 500 — 600 — 700

Accessories

| | Designation | Order number |
|---------------------------------------|-------------|--------------|
| Top mounting plate for 2x tube set | ZPL-290268 | 0125624 |
| Bottom mounting plate for 2x tube set | ZPL-290351 | 0125625 |
| Top mounting plate for 3x tube set | ZPL-290268 | 0125624 |
| Bottom mounting plate for 3x tube set | ZPL-290265 | 0125623 |
| Screw (4/plate) for mounting plate | ZBE-510707 | 0125360 |
| Plug AC Telemag 3 pin | ZEL-265518 | 0124866 |
| Plug AC Telemag 5 pin | ZEL-265519 | 0124864 |

Ordering key

T L C 1 2 W - 0

Type _____

Load _____

Z 4 000 N

Tube set _____

A Tube set 2x
D Tube set 3x

Control _____

S Electrical control
K Pneumatic control
N **Low-voltage control**

Voltage _____

- 230 V AC/50 Hz (no code)
2U 120 V AC/60 Hz

Construction _____

0 Push load
1 **Customer-specific**
3 Pull load

Stroke [S] _____

1 100 mm, only for tube set 2x, push
1 255 mm, only for tube set 3x, push
2 200 mm, only for tube set 2x
3 300 mm
4 400 mm
5 500 mm
6 600 mm
7 700 mm



Options shown in red are only available on demand. Contact Ewellix for more information on minimum quantities and additional cost.

TLG

Telemag lifting column



Benefits

- High bending load
- Powerful

Standards

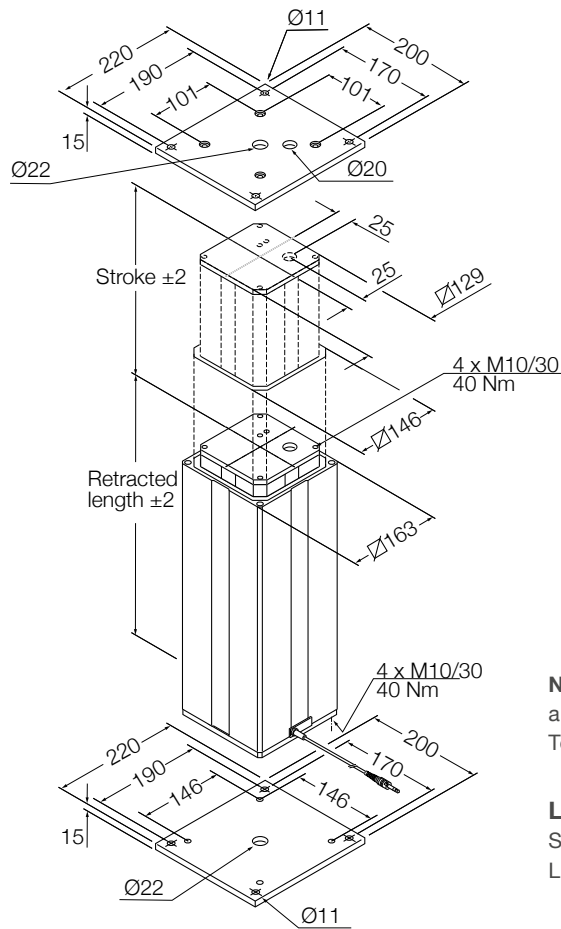
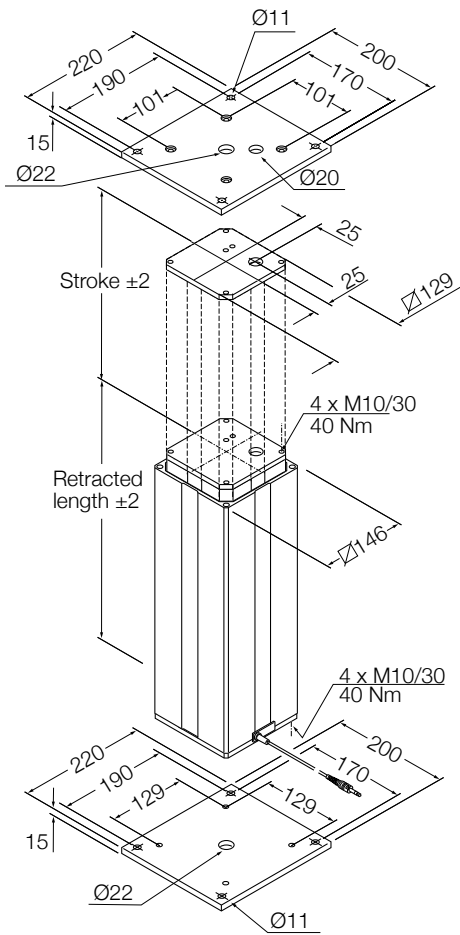
- EN/IEC 60601-1
- UL 60601-1

Technical data

| | Unit | TLG 10/11-A | TLG 10-B | TLG 10/11-C |
|------------------------------------|--------------|---------------------------|---------------------------|-------------------------|
| Rated push load | N | 4 000 | 2 500 | 1 500 |
| Rated pull load | N | 0 | 0 | 0 |
| Bending load | Nm | up to 2 800 ¹⁾ | up to 1 750 ¹⁾ | up to 950 ¹⁾ |
| Speed (full load to no load) | mm/s | 10 to 14 | 13 to 17 | 25 to 33 |
| Lifting column version | # of section | 2 or 3-section | 2 or 3-section | 2 or 3-section |
| Stroke | mm | 200 to 700 | 200 to 700 | 200 to 700 |
| Retracted length | mm | S+180 | S+180 | S+180 |
| Voltage | V DC | 24 | 24 | 24 |
| Power | W | 156 | 156 | 156 |
| Current | A | 6 | 6 | 6 |
| Duty cycle: intermittent operation | min. | 1 min./9 min | 1 min./9 min | 1 min./9 min |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | 30 | 30 | 30 |
| Protection class | - | SELV | SELV | SELV |
| Type of control | - | electrical | electrical | electrical |
| Weight | kg | 15 to 30 | 15 to 30 | 15 to 30 |

¹⁾ For details, please see bending load diagrams (↳ page 230)

Dimensional drawing

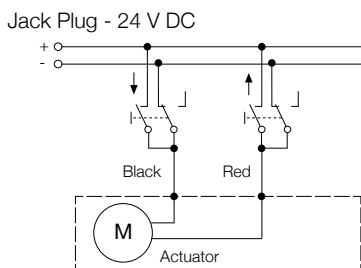
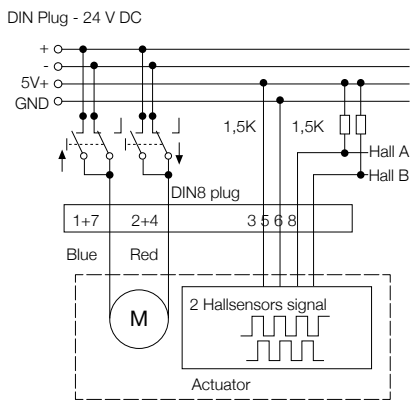


Note: mounting plates are not included. To be ordered separately.

Legend:
S = stroke
L = retracted length



Connecting diagrams



Suitable control units and accessories

| | Control units | | | |
|---------------------------|---------------|-----|-----|-----|
| | SCU | VCU | BCU | MCU |
| TLG | • | • | • | • |
| Operating switches | | | | |
| EHA 1 | | | | • |
| EHA 3 | • | • | • | |
| STF | | | | • |
| STJ | • | • | • | |
| STA | | | | • |
| STE | • | • | • | |

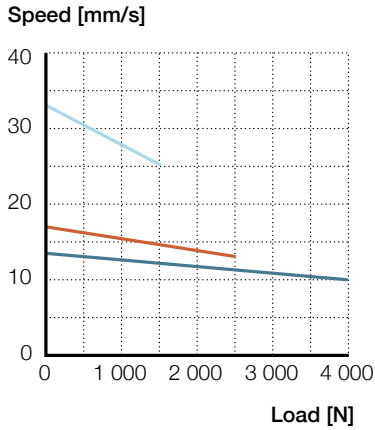
Hand switch
 Foot switch
 Desk switch

¹⁾ Only valid with TLG11. TLG10 must be operated by a BCU, MCU, SCU or VCU control unit.

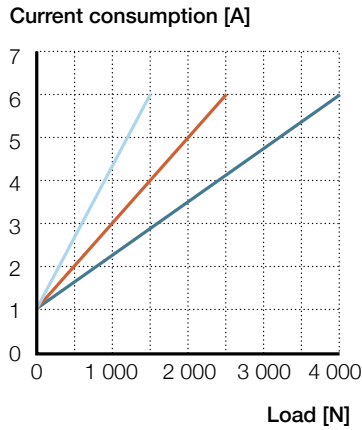
Performance diagrams

Safety factor load conditions

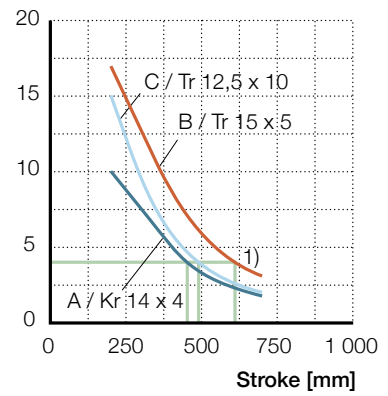
Speed-load diagram



Current-load diagram



Safety factor

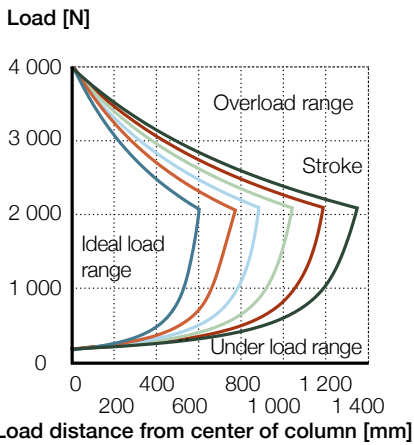


— A — B — C

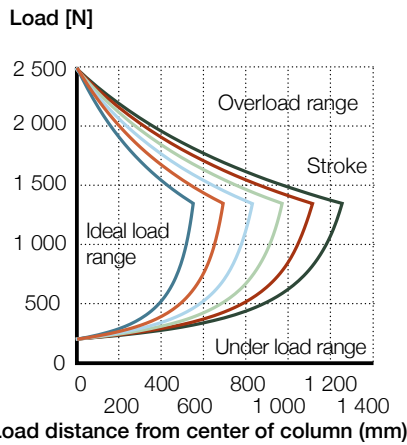
1) Safety factor =4

Bending load diagrams

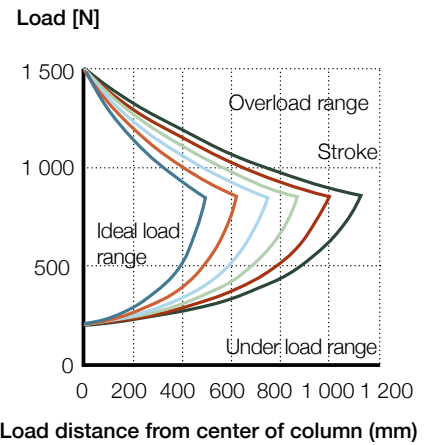
Bending load diagram TLG ...AD



Bending load diagram TLG ...BD

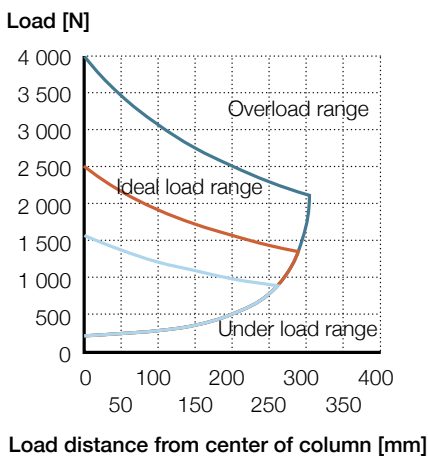


Bending load diagram TLG ...CD



Stroke: — 200 — 300 — 400 — 500 — 600 — 700

Bending load diagram TLG...AA/BA/CA



— TLG1-AA
— TLG1-BA
— TLG1-CA

Accessories

| | Designation | Order number |
|--|-------------|--------------|
| Top mounting plate for 2 × tube set | ZPL-290268 | 0125624 |
| Bottom mounting plate for 2 × tube set | ZPL-290351 | 0125625 |
| Top mounting plate for 3 × tube set | ZPL-290268 | 0125624 |
| Bottom mounting plate for 3 v tube set | ZPL-290265 | 0125623 |
| Screw (4/plate) for mounting plate | ZBE-510707 | 0125360 |

Ordering key

T L G 1 - - - - - 0 0 0

Type

Voltage

0 24 V DC

1 24 V DC with integrated current cut-off (only for 4 000 N and 1 500 N load version)

Load

A 4 000 N

B 2 500 N

C 1 500 N

Tube set

A Tube set 2×

D Tube set 3×

Stroke [S]

2 200 mm

3 300 mm

4 400 mm

5 500 mm

6 600 mm

7 700 mm

Cable / connecting plug

1 Straight, 1,0 m / jack plug

2 Straight, 2,3 m / jack plug

A Coiled, 0,6 m / jack plug

3 Straight, 1,0 m / DIN8 plug

4 Straight, 2,3 m / DIN8 plug

B Coiled, 0,6 m / DIN8 plug

Option

0 No option

A 1-Hall encoder, 8 pulses, cable with jack plug

B Potentiometer, 1 kΩ, 2 Watt, 0,25 % linearity, 10 turns

C Cable feedthrough, 5 × 0,75 mm², led out, top +160 mm, bottom +800 mm

D Cable feedthrough, 1-Hall encoder, 8 pulses, cable with jack plug

E Cable feedthrough, potentiometer

F 2-Hall encoder, cable with DIN8 plug

G Cable feedthrough, 2-Hall encoder, cable with DIN8 plug

TLT

Telemag lifting column

Benefits

- Very small built-in dimension
- Powerful

Standards

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

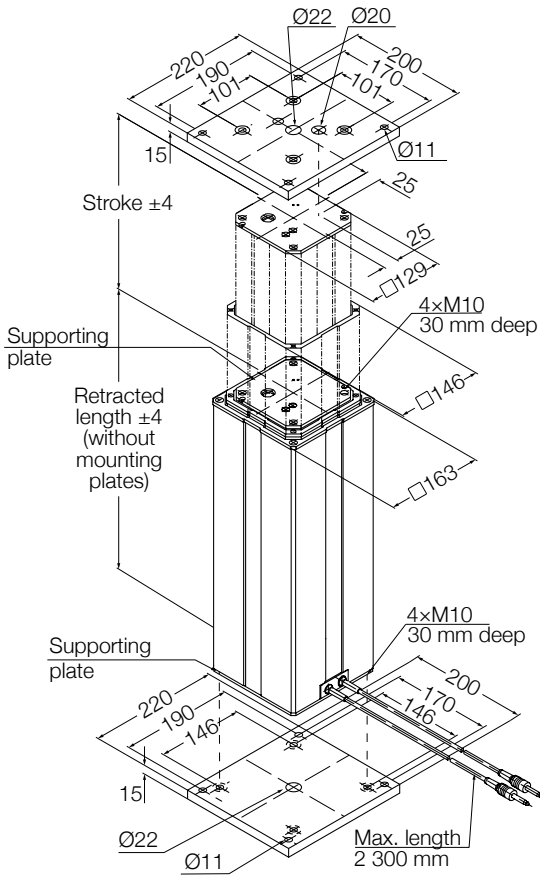


Technical data

| | Unit | TLT10-A1 | TLT10-A2 | TLT10-B1 | TLT10-C1 | TLT10-C2 |
|------------------------------------|--------------|-------------------------|---------------------------|-------------------------|-------------------------|-------------------------|
| Rated push load | N | 3 000 | 4 000 | 2 000 | 1 000 | 2 000 |
| Rated pull load | N | 0 | 0 | 0 | 0 | 0 |
| Bending load | Nm | up to 400 ¹⁾ | up to 1 000 ¹⁾ | up to 250 ¹⁾ | up to 110 ¹⁾ | up to 480 ¹⁾ |
| Speed (full load to no load) | mm/s | 11 to 16 | 13 to 19 | 13 to 19 | 25 to 36 | 25 to 42 |
| Lifting column version | # of section | 3-section | 3-section | 3-section | 3-section | 3-section |
| Stroke | mm | 300 to 700 | 300 to 700 | 300 to 700 | 300 to 700 | 300 to 700 |
| Retracted length | mm | 0,5 × S+170 | 0,5 × S+240 | 0,5 × S+170 | 0,5 × S+170 | 0,5 × S+240 |
| Voltage | V DC | 24 | 24 | 24 | 24 | 24 |
| Power | W | 168 | 168 | 192 | 192 | 216 |
| Current | A | 2×3,5 | 2×3,5 | 2×4,5 | 2×4,5 | 2×4,5 |
| Duty cycle: intermittent operation | min. | 1 min./9 min | 1 min./9 min | 1 min./9 min | 1 min./9 min | 1 min./9 min |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | 40 | 40 | 40 | 40 | 40 |
| Protection class | – | SELV | SELV | SELV | SELV | SELV |
| Type of control | – | electrical | electrical | electrical | electrical | electrical |
| Weight | kg | 15 to 30 | 15 to 30 | 15 to 30 | 15 to 30 | 15 to 30 |

¹⁾ For details, please see bending load diagrams (↳ page 234)

Dimensional drawing



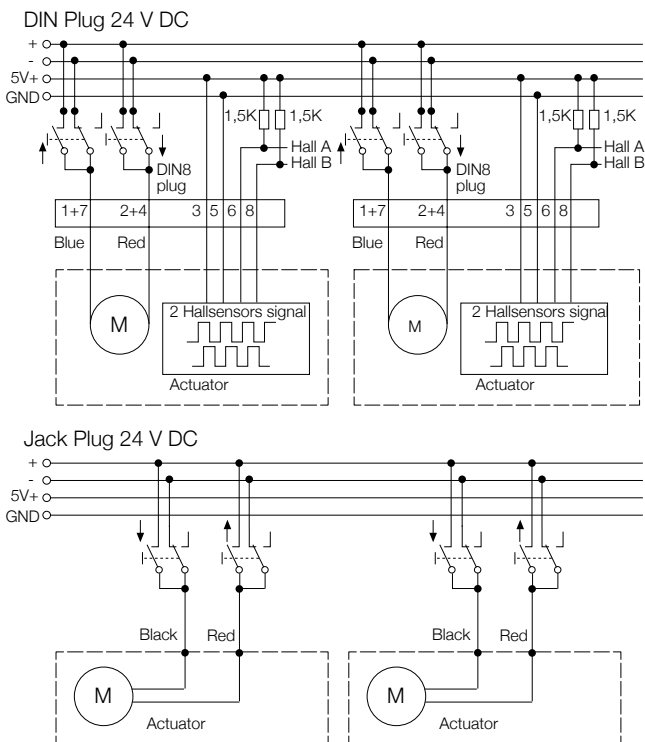
Note: mounting plates are not included. To be ordered separately.

Legend:

S = stroke
L = retracted length



Connecting diagrams



Suitable control units and accessories

| | Control units | | | |
|---------------------------|---------------|-----|-----|-----|
| | SCU | VCU | BCU | MCU |
| TLT | • | • | • | • |
| Operating switches | | | | |
| EHA 1 | | | | • |
| EHA 3 | • | • | • | |
| STF | | | | • |
| STJ | • | • | • | |
| STA | | | | • |
| STE | • | • | • | |

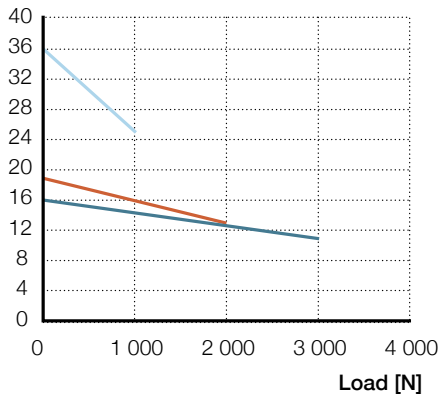
Hand switch Foot switch Desk switch

¹⁾ Only valid with TLG11. TLG10 must be operated by a BCU, MCU, SCU or VCU control unit.

Performance diagrams

Speed-load diagram

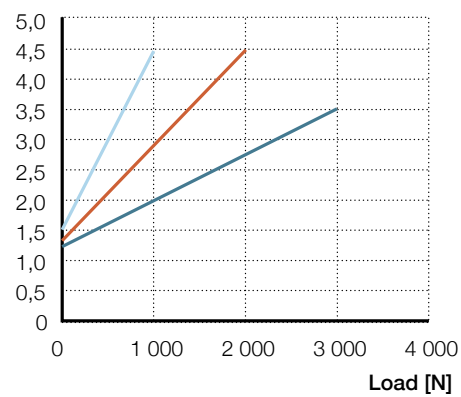
Speed [mm/s]



— A1 — B1 — C1

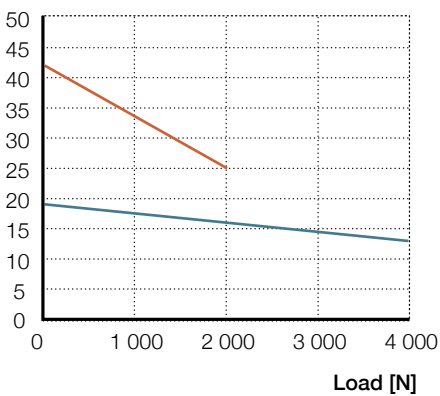
Current-load diagram

Current consumption [A]



Speed-load diagram

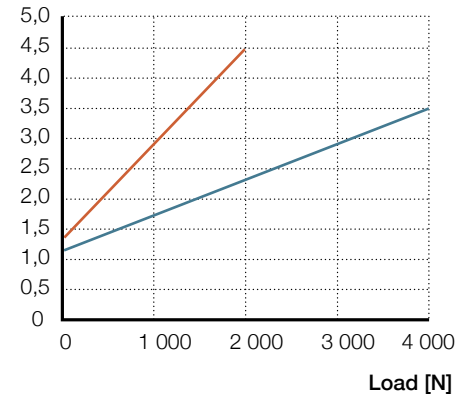
Speed [mm/s]



— A2 — C2

Current-load diagram

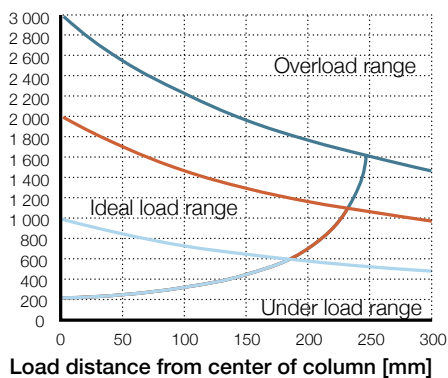
Current consumption [A]



Bending load diagrams

Bending load diagram A1, B1, C1

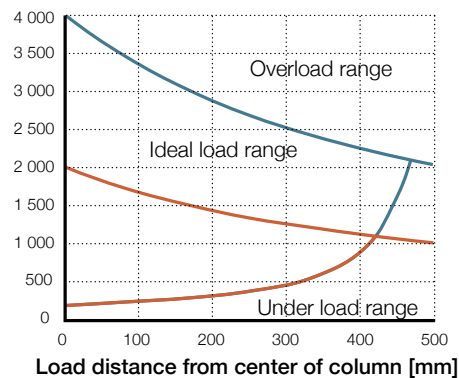
Load [N]



— TLT1 A-1 — TLT1 B-1 — TLT1 C-1

Bending load diagram A2, C2

Load [N]



— TLT1 A-2 — TLT1 C-2

Accessories

| | Designation | Order number |
|------------------------------------|-------------|--------------|
| Top mounting plate | ZPL-290268 | 0125624 |
| Bottom mounting plate | ZPL-290265 | 0125623 |
| Screw (4/plate) for mounting plate | ZBE-510707 | 0125360 |

Ordering key

T L T 1 - - - - - 0 0 0

Type

Voltage

0 24 V DC

1 24 V DC with integrated current cut-off (only for A2 and C2)

Load / Speed

A2 4 000 N

A1 3 000 N

B1 2 000 N / 19 to 13 mm/s

C2 2 000 N / 42 to 25 mm/s

C1 1 000 N

Stroke [S]

3 300 mm

4 400 mm

5 500 mm

6 600 mm ¹⁾

7 700 mm ¹⁾

Cable / connecting plug

1 Straight, 1,0 m / jack plug

2 Straight, 2,3 m / jack plug

A Coiled, 0,6 m / jack plug

3 Straight, 1,0 m / DIN8 plug

4 Straight, 2,3 m / DIN8 plug

B Coiled, 0,6 m / DIN8 plug

Option

0 No option

A 1-Hall encoder, 8 pulses, cable with jack plug

C Cable feedthrough, 3x1,5 mm², top +160 mm, bottom +800 mm

D Cable feedthrough, 1-Hall encoder, 8 pulses, cable with jack plug

F 2-Hall encoder, cable with DIN8 plug

¹⁾ Reduced safety factor

■ Options shown in red are only available on demand. Contact Ewellix for more information on minimum quantities and additional cost.

TXG

Telesmart lifting column



Benefits

- Powerful and fast lifting
- Aesthetic design

Standards

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

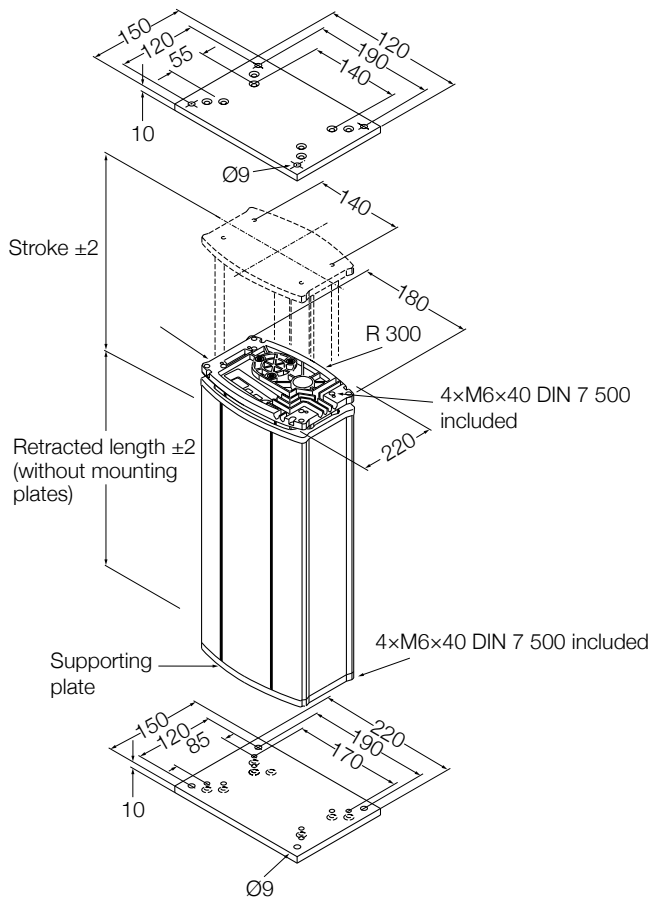
Technical data

| | Unit | TXG1 | TXG4/5 | TXG8/9 |
|------------------------------------|--------------|-------------------------|-------------------------|-------------------------|
| Rated push load | N | 1 500 | 1 500 | 1 500 |
| Rated pull load | N | 0 | 0 | 0 |
| Bending load | Nm | up to 210 ¹⁾ | up to 210 ¹⁾ | up to 210 ¹⁾ |
| Speed (full load to no load) | mm/s | 17 to 23 | 17 to 23 | 17 to 23 |
| Lifting column version | # of section | 2-section | 2-section | 2-section |
| Stroke | mm | 200 to 600 | 200 to 600 | 200 to 600 |
| Retracted length | mm | S+180 | S+180 | S+180 |
| Voltage | – | 24 V DC | 120 V AC | 230 V AC |
| Power | W | – | N/A | N/A |
| Current | A | 5 | 1,8 | 0,9 |
| Duty cycle: intermittent operation | min. | 1 min./9 min. | 1 min./9 min. | 1 min./9 min. |
| Duty cycle: short-time operation | min. | – | N/A | N/A |
| Ambient temperature | °C | +10 to +40 | +10 to +40 | +10 to +40 |
| Degree of protection | IP | 30 | 30 | 30 |
| Protection class | – | SELV | II/(I)2 | II/(I)2 |
| Type of control | – | electrical | electrical | electrical |
| Weight | kg | 8 to 13 | 9 to 14 | 9 to 14 |

¹⁾ For details, please see bending load diagrams (↳ page 238)

²⁾ Mandatory for cable feedthrough option

Dimensional drawing

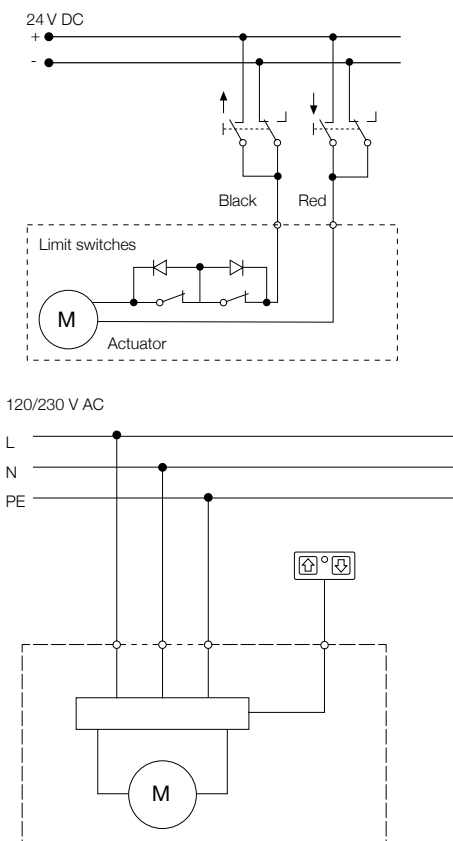


Note: mounting plates are not included. To be ordered separately.

Legend:

S = stroke
L = retracted length

Connecting diagrams



Suitable control units and accessories

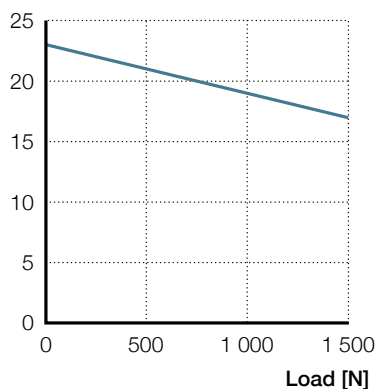
| | | Control units |
|---------------------------|--|---------------|
| TXG 10 | | COMPACT |
| Operating switches | | |
| EHA | | |
| HSM | | |
| HSF | | |

Hand switch
 Foot switch
 Desk switch

Performance diagram

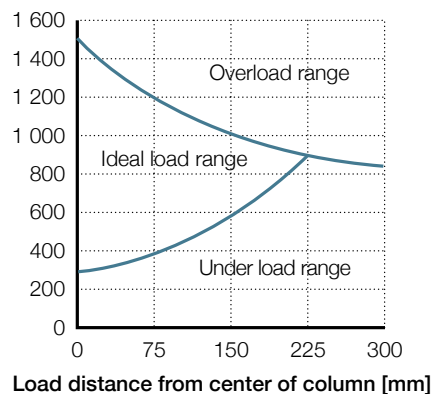
Speed-load diagram

Speed [mm/s]



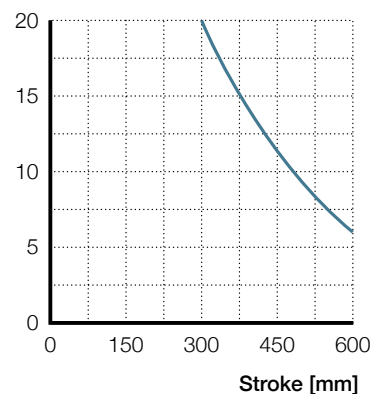
Bending load diagram

Load [N]



Safety factor load conditions

Safety factor (screw buckling)



Accessories

| Mains cable | Plug | Country | Order number | Comment |
|------------------------------|--------|-------------|--------------|---------|
| Straight cable 3 m | Euro | General | 0121730 | 2-pole |
| Straight cable 3 m | Schuko | General | 0121729 | 3-pole |
| Straight cable 3 m | UL | USA | 0126322 | 2-pole |
| Straight cable 3 m | SEV | Switzerland | 0128699 | 3-pole |
| Straight cable 3 m | UL | USA | 0121762 | 3-pole |
| Top or bottom mounting plate | | | 0124874 | |

Mounting screws are included in the TXG.

Ordering key

| | | T X G 0 | | | | - | | 0 0 | | - | | 0 0 | |
|---|--|---------|--|--|--|---|--|-----|--|---|--|-----|--|
| Type | | | | | | | | | | | | | |
| Voltage | | | | | | | | | | | | | |
| 1 | 24 V DC (slave actuator) | | | | | | | | | | | | |
| 4 | 120 V AC, 50/60 Hz, class II | | | | | | | | | | | | |
| 5 | 120 V AC, 50/60 Hz, class I (mandatory for cable feedthrough option) | | | | | | | | | | | | |
| 8 | 230 V AC, 50 Hz, class II | | | | | | | | | | | | |
| 9 | 230 V AC, 50 Hz, class I (mandatory for cable feedthrough option) | | | | | | | | | | | | |
| Color | | | | | | | | | | | | | |
| 5 | Natural anodized coating | | | | | | | | | | | | |
| Option | | | | | | | | | | | | | |
| 000 | None | | | | | | | | | | | | |
| EYX | Control connection feedthrough | | | | | | | | | | | | |
| EYF | Mains cable feedthrough | | | | | | | | | | | | |
| EYS | 1-Hall encoder for Compact/slave use | | | | | | | | | | | | |
| 2AA | Control connection feedthrough, mains cable feedthrough | | | | | | | | | | | | |
| EXG | Connection of TXG to BCU/VCU | | | | | | | | | | | | |
| KKK | Customer-specific | | | | | | | | | | | | |
| Stroke (S) / Retr. length (L=S+180 or L= S+160 mm) | | | | | | | | | | | | | |
| L=S+180 | L=S+160 | | | | | | | | | | | | |
| 200 | 4CY | 200 mm | | | | | | | | | | | |
| 300 | 4DY | 300 mm | | | | | | | | | | | |
| 400 | 4EY | 400 mm | | | | | | | | | | | |
| 500 | 4FY | 500 mm | | | | | | | | | | | |
| 600 | 4GY | 600 mm | | | | | | | | | | | |

Options shown in red are only available on demand. Contact Ewellix for more information on minimum quantities and additional cost.

FRE

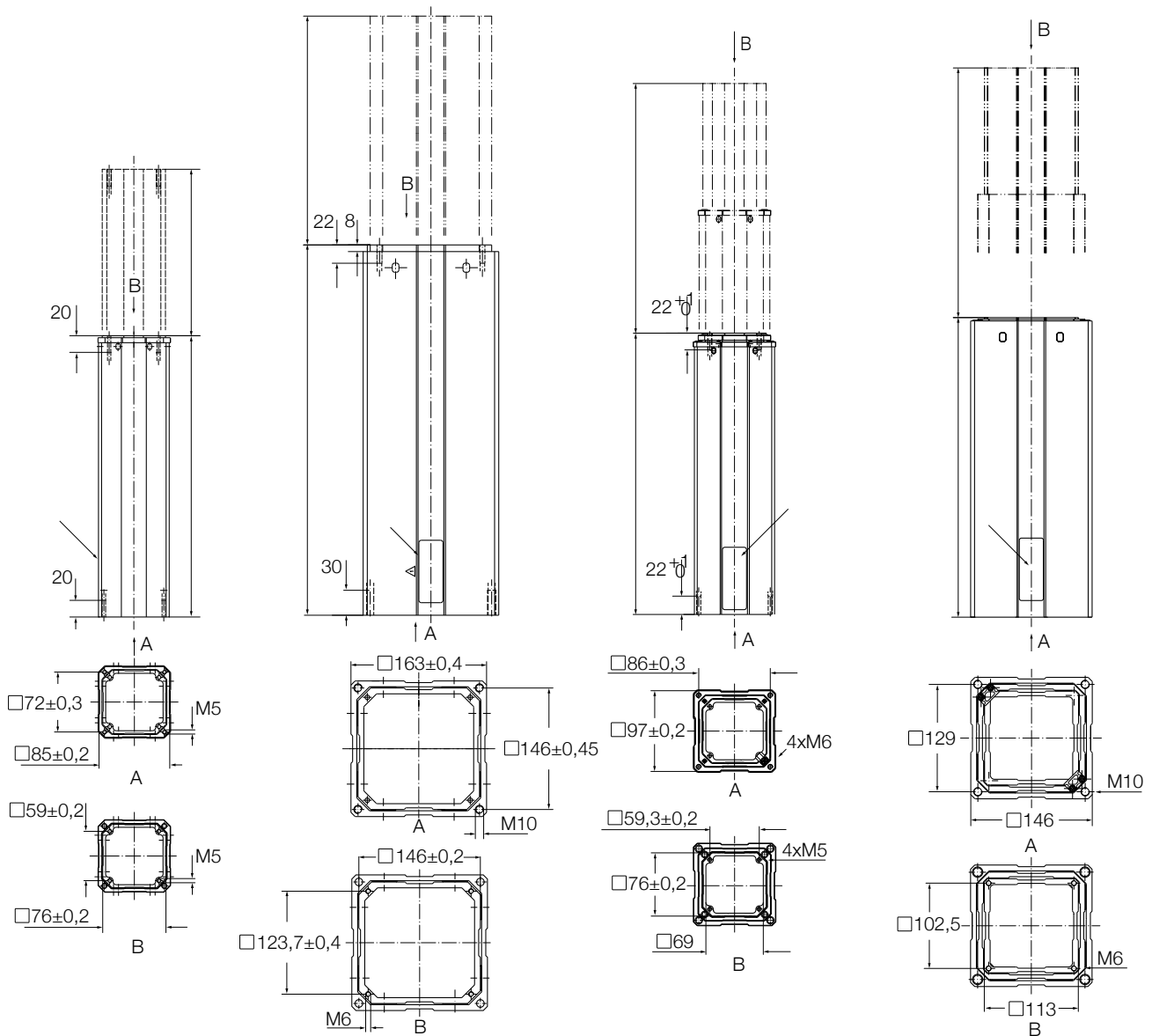
Lifting column

Benefits

- Attractive design
- Stable
- Universal use



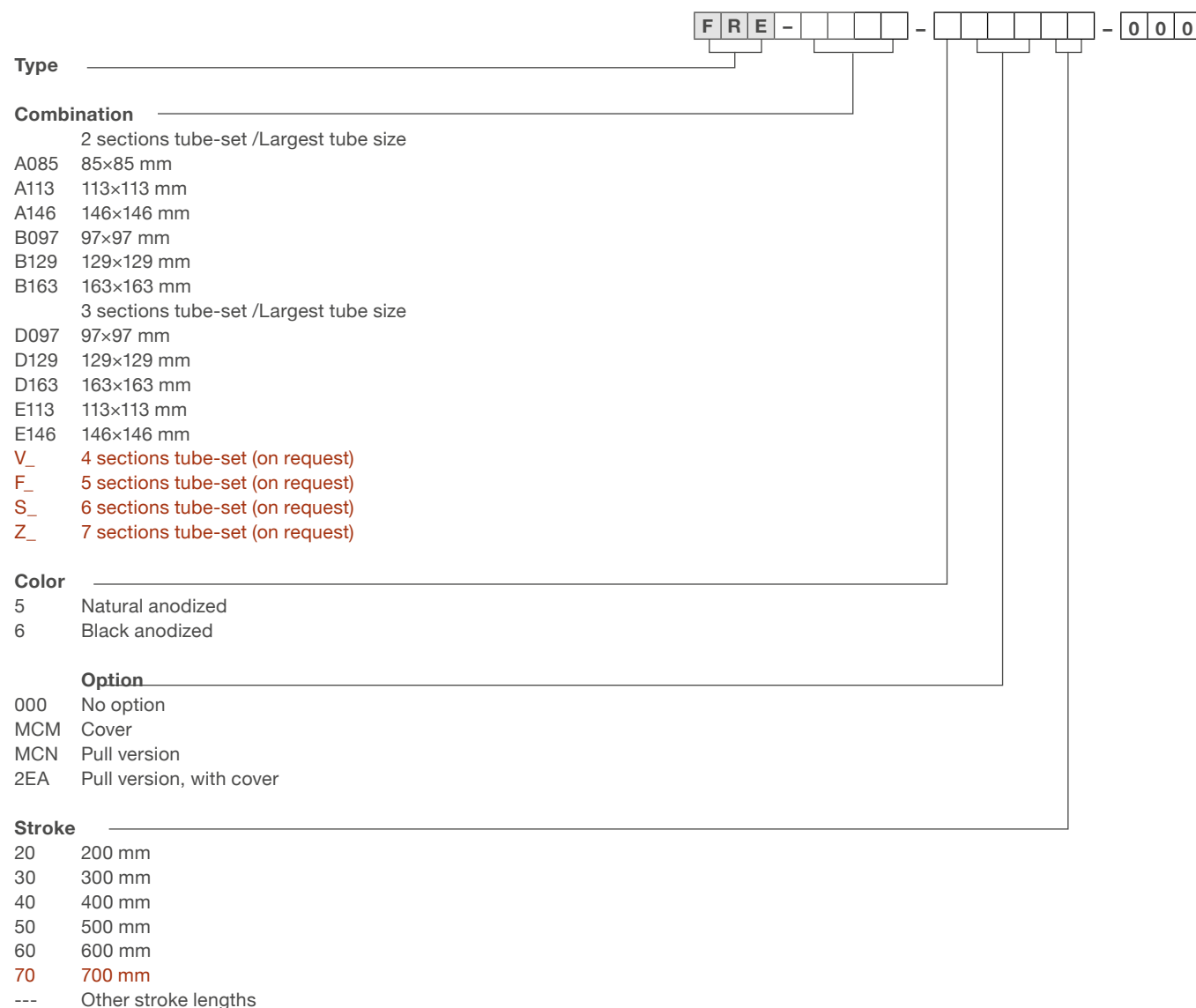
Dimensional drawing



| Type | Sections | | Profile dimensions in mm | | | | | | | Retracted length in mm |
|----------|------------|------------|--------------------------|---------|---------|-----------|-----------|-----------|-----------|------------------------|
| | 2 sections | 3 sections | 76 x 76 | 85 x 85 | 97 x 97 | 113 x 113 | 129 x 129 | 146 x 146 | 163 x 163 | |
| FRE-A085 | • | | █ | | | | | | | Stroke + 138 |
| FRE-A113 | • | | | █ | | | | | | Stroke + 148 |
| FRE-A146 | • | | | | █ | | | | | Stroke + 168 |
| FRE-D097 | | • | █ | | | | | | | Stroke + 38 |
| FRE-D129 | | • | | █ | | | | | | Stroke + 53 |
| FRE-D163 | | • | | | █ | | | | | Stroke + 53 |
| FRE-B097 | • | | | █ | | | | | | N/A |
| FRE-B129 | • | | | | █ | | | | | N/A |
| FRE-B163 | • | | | | | █ | | | | N/A |
| FRE-E113 | | • | █ | | | | | | | N/A |
| FRE-E146 | | • | | █ | | | | | | N/A |

Options shown in red are only available on demand. Please contact Ewellix.

Ordering key

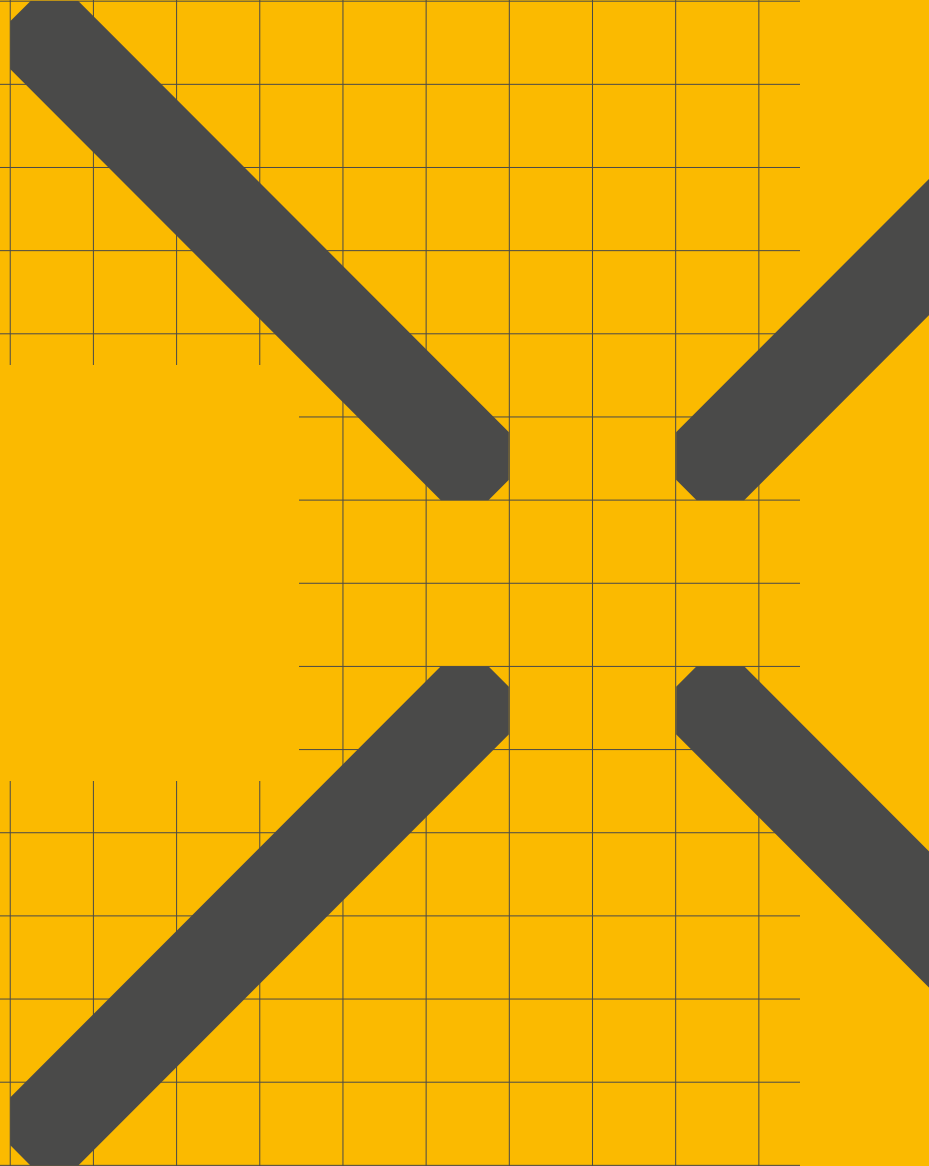


Options shown in red are only available on demand. Contact Ewellix for more information on minimum quantities and additional cost.

5

Control units

Up to 6 channels



Chapter contents

| | |
|--------------|-----|
| BCU..... | 244 |
| VCU..... | 248 |
| SCU..... | 252 |
| MCU..... | 256 |
| COMPACT..... | 260 |
| SEM..... | 264 |

BCU

Control unit



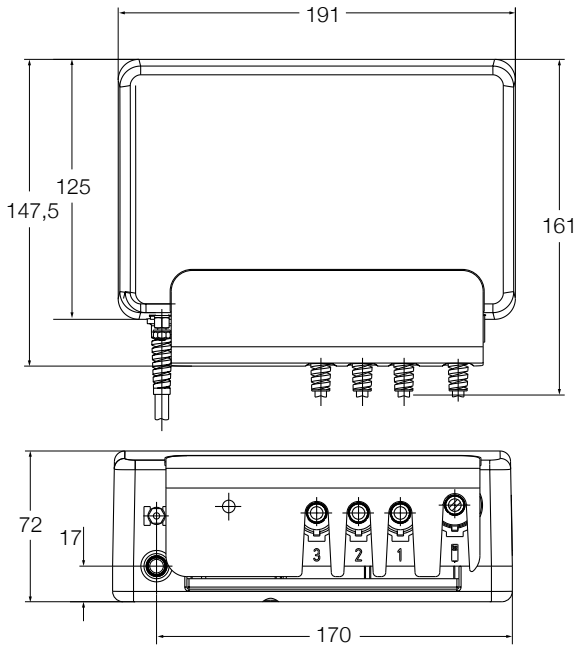
Benefits

- Compact 3-channel actuator control unit
- Single fault safety
- Overload and over-temperature protection
- Approved for medical applications
- Easy to clean
- Low standby current

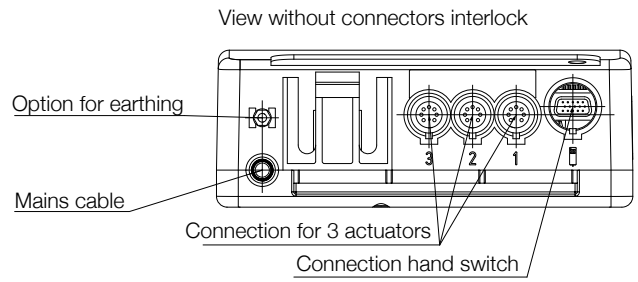
Technical data

| | Unit | BCU 5 | BCU 8 |
|-------------------------------|--------|-------------------|-------------------|
| Motor ports (DIN8) | # | 3 | 3 |
| Operating device ports (HD15) | # | 1 | 1 |
| Battery ports | # | 0 | 0 |
| Limit switch ports | # | 0 | 0 |
| 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 | 1,2 | 1,5 |
| Output voltage | V DC | 24 | 24 |
| Output current (max) | A | 7 | 7 |
| Duty cycle: intermittent | min. | 1 min./9 min. | 1 min./9 min. |
| 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 | ×4 | ×4 |
| Approvals | | IEC 60601-1(ed.3) | IEC 60601-1(ed.3) |
| Weight | kg | 2,3 | 2,3 |

Dimensional drawing



Connecting diagrams

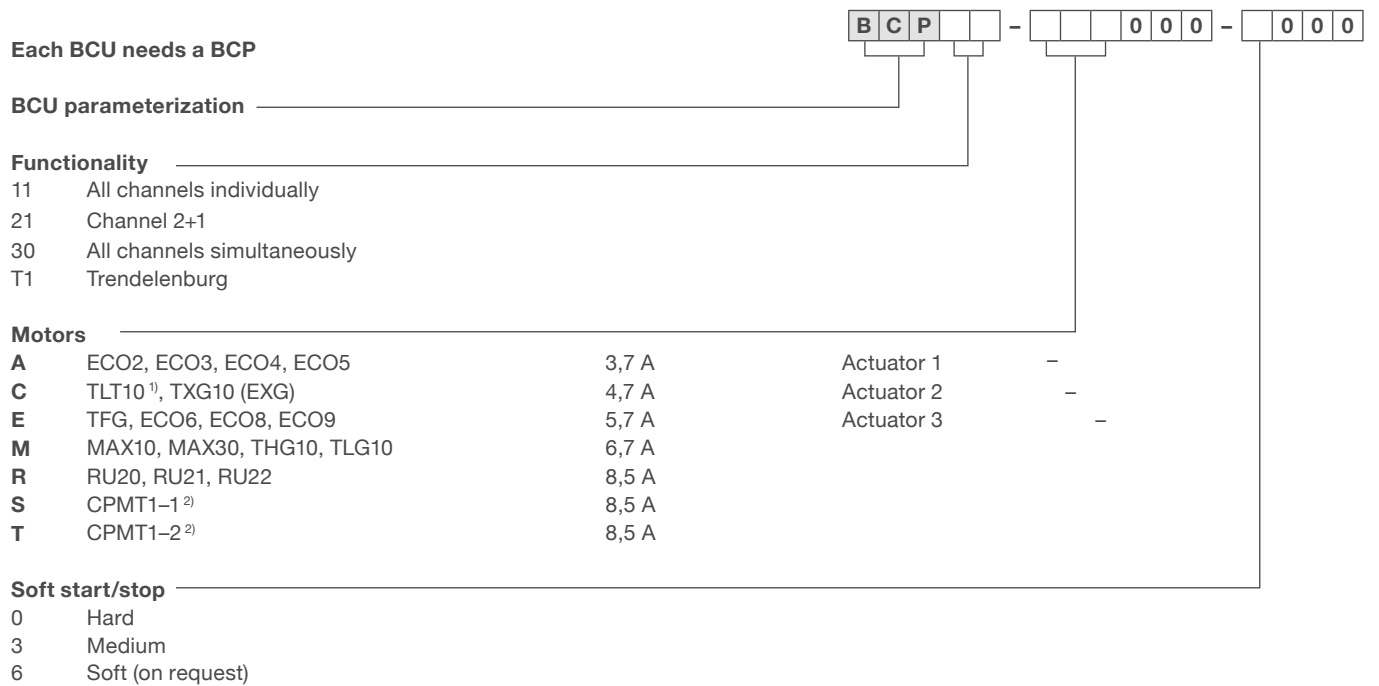
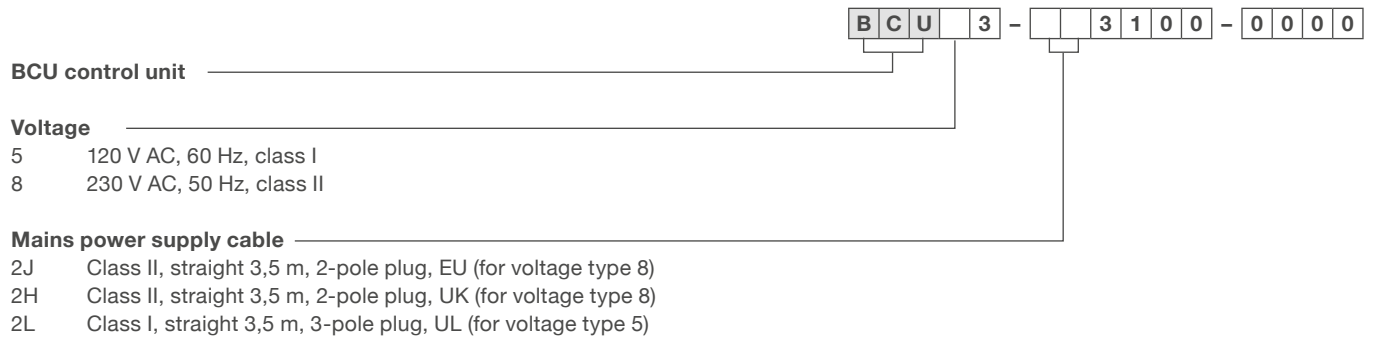


Suitable control units and accessories

| | Columns | | | | | | | Operating switches | | | | |
|-------|------------------|----------------|--------|--------|--------|--------|--------|--------------------|--------|------|-----|-----|
| | RU20, RU21, RU22 | MAX 10, MAX 30 | ECOMAG | THG 10 | TLG 10 | TLT 10 | TFG 10 | CPMT1 | TXG 10 | EHA3 | STJ | STE |
| BCU 5 | • | • | • | • | • | • | • | • | • | • | • | • |
| BCU 8 | • | • | • | • | • | • | • | • | • | • | • | • |

Hand switch
 Foot switch
 Desk switch

Ordering key



¹⁾ TLT is a 2-motor actuator. If simultaneous run is needed, BCP21-CC... is recommended.

²⁾ Reduced lift capability : CPMT1-1 up to 3 000 N, CPMT1-2 up to 4 000 N



VCU

Control unit



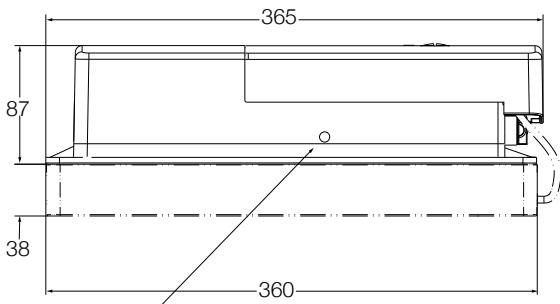
Benefits

- Compact 5-channel actuator control unit
- Single fault safety
- Overload and over-temperature protection
- Approved for medical applications
- Easy to clean
- Low standby current

Technical data

| | Unit | VCU 5 | VCU 8 | VCU 9 |
|-------------------------------|--------|--------------------------|--------------------------|--------------------------|
| Motor ports (DIN8) | # | 3 or 5 | 3 or 5 | 3 or 5 |
| Operating device ports (HD15) | # | 2 | 2 | 2 |
| Battery ports (DSub9) | # | 1 | 1 | 1 |
| Limit switch ports (HD15) | # | 2 | 2 | 2 |
| Single fault safety | yes/no | yes | yes | yes |
| Encoder processing | yes/no | no | no | no |
| Input voltage | V AC | 120 | 230 | 230 |
| Frequency | Hz | 60 | 50 | 50 |
| Input current (max) | A | 2,5 resp. 6,5 | 1,3 resp. 3,3 | 1,3 resp. 3,3 |
| Standby power | W | 2,6 resp. 3,9 | 2,6 resp. 3,9 | 2,6 resp. 3,9 |
| Output voltage | V DC | 24 | 24 | 24 |
| Output current (max) | A | 7 resp. 18 | 7 resp. 18 | 7 resp. 18 |
| Duty cycle: intermittent | min. | 1 min./9 min. | 1 min./9 min. | 1 min./9 min. |
| Duty cycle: short time | min. | 2 | 2 | 2 |
| Ambient temperature | °C | +5 to +40 | +5 to +40 | +5 to +40 |
| Humidity | % | 5 to 85 | 5 to 85 | 5 to 85 |
| Degree of protection | IP | ×4 | ×4 | ×4 |
| Approvals | EN/UL | EN 60601-1 UL 60601-1 | EN 60601-1 UL 60601-1 | EN 60601-1 UL 60601-1 |
| Weight without battery | kg | 2,4 resp. 3,8 | 2,4 resp. 3,8 | 2,4 resp. 3,8 |
| Weight with battery | kg | 5,4 resp. 8,8 | 5,4 resp. 8,8 | 5,4 resp. 8,8 |

Dimensional drawing



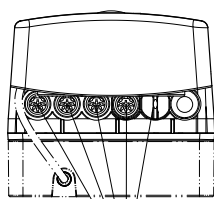
Operating voltage display (LED)

Suitable control units and accessories

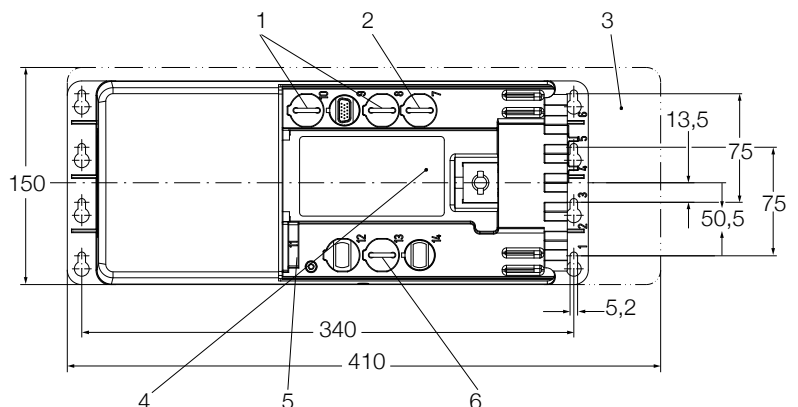
| | Columns | | | | | Operating switches | | | | | | | |
|-------|------------------|------------------|----------------|--------|--------|--------------------|--------|--------|--------|-------|------|-----|-----|
| | RU20, RU21, RU22 | RU23, RU24, RU25 | MAX 10, MAX 30 | ECOMAG | THG 10 | TLG 10 | TLT 10 | TFG 10 | TXG 10 | CPMT1 | EHA3 | STJ | STE |
| VCU 5 | • | • | • | • | • | • | • | • | • | • | • | • | • |
| VCU 8 | • | • | • | • | • | • | • | • | • | • | • | • | • |
| VCU 9 | • | • | • | • | • | • | • | • | • | • | • | • | • |

Hand switch
 Foot switch
 Desk switch

Connecting diagrams



Bis zu 5 Anschlüsse mit DIN8 Stecker



1. Two connections for HD15 operating devices
2. HD15 limit switch connection
3. Additional space for mounting
4. Data plate software
5. Mains connection
6. D-Sub 9 battery connection (optional)

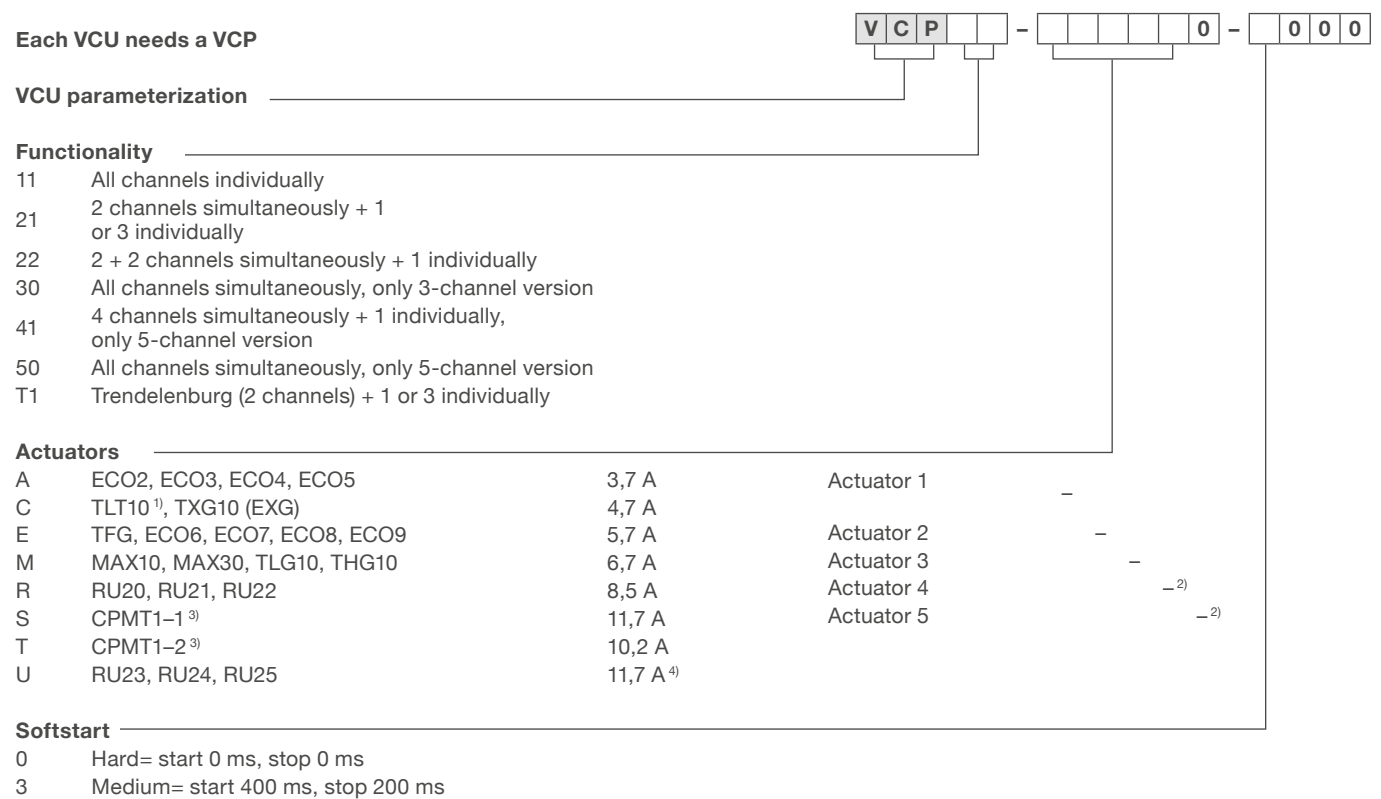
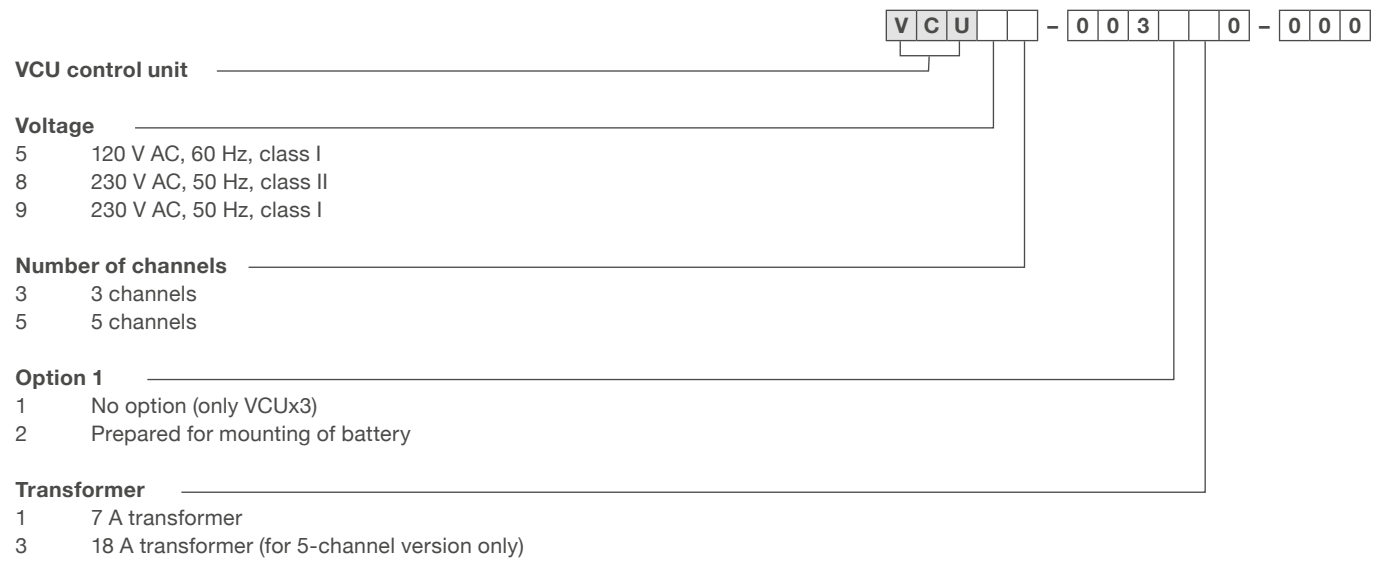
Pinning of HD15 limit switch connection

| Function | Pin | Wire color (ZKA-160627-2500) | Connecting diagram |
|------------------------|-----------------|---|--------------------|
| 24 V DC (common) | 1,3,5,7,9 | white/yellow, white/green, grey-pink, black, blue | |
| Switch 1 | 2 | brown-green | |
| Switch 2 | 4 | red-blue | |
| NC | 6,8,10,11,12,14 | violet, red, pink, grey, yellow, brown | |
| 20-40 V DC, max. 50 mA | 13 | green | |
| GND | 15 | white | |

Accessories

| | Plug | Designation | Order number |
|---------------------------|--------------------|-----------------|--------------|
| Mains cable, 2 pole | Euro | ZKA-160608-3500 | 0105726 |
| Mains cable, 3 pole | Schuko | ZKA-160637-3500 | 0118821 |
| Mains cable, 3 pole | SEV | ZKA-160638-3500 | 0118822 |
| Mains cable, 3 pole | UL | ZKA-160639-3500 | 0105588 |
| Mains cable, 3 pole | UK | ZKA-160609-3500 | 0105631 |
| Mains cable, 3 pole | UL, hospital grade | ZKA-160640-3500 | 0118823 |
| Mains cable, 3 pole | Australian, China | ZKA-160661-3500 | 0129953 |
| Battery pack 2,7 Ah | | ZBA-160208-0400 | 0118806 |
| Rack for 4,5 Ah battery | | ZBA-160207-1000 | 0121266 |
| Detachable battery 4,5 Ah | | ZBA-160209 | 0119846 |

Ordering key



The SCU solution offers many more possibilities than those given in the type keys. Please feel free to ask for more functions like “virtual limit switches”, “external limit switches” and so on.

¹⁾ TLT is a 2-motor actuator. If simultaneous run is needed, VCP21-CC... is recommended

²⁾ for VCUx3: insert zero

³⁾ Reduced lift capability: CPMT-1 up to 3 000 N, CPMT-2 up to 4 000 N when using transformer with 7A

⁴⁾ Reduced lift capability: only 8.5A when using transformer with 7A

SCU

Control unit



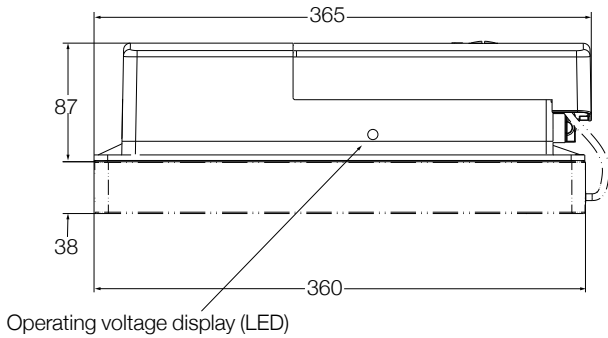
Benefits

- Compact 6-channel actuator control unit
- Single fault safety
- Overload and over-temperature protection
- Approved for medical applications
- Easy to clean
- Low standby current
- Remote control RS232

Technical data

| | Unit | SCU 1 | SCU 5 | SCU 9 |
|-------------------------------|--------|--------------------------|--------------------------|--------------------------|
| Motor ports (DIN8) | # | 6 | 3 or 6 | 3 or 6 |
| Operating device ports (HD15) | # | 3 | 3 | 3 |
| Battery ports (DSub9) | # | 1 | 1 | 1 |
| Limit switch ports (HD15) | # | 4 | 4 | 4 |
| Single fault safety | yes/no | yes | yes | yes |
| Encoder processing | yes/no | yes | yes | yes |
| Input voltage | V | 24 DC | 120 AC | 230 AC |
| Frequency | Hz | N/A | 60 | 50 |
| Input current (max) | A | 30 | 6,5 | 3,3 |
| Standby power | W | 0,8 | 4,3 | 4,3 |
| Output voltage | V DC | 24 | 24 | 24 |
| Output current (max) | A | 30 | 18 | 18 |
| Duty cycle: intermittent | min. | 1 min./9 min. | 1 min./9 min. | 1 min./9 min. |
| Duty cycle: short time | min. | 2 | 2 | 2 |
| Ambient temperature | °C | +5 to +40 | +5 to +40 | +5 to +40 |
| Humidity | % | 5 to 85 | 5 to 85 | 5 to 85 |
| Degree of protection | IP | ×4 | ×4 | ×4 |
| Approvals | EN/UL | EN 60601-1 UL 60601-1 | EN 60601-1 UL 60601-1 | EN 60601-1 UL 60601-1 |
| Weight without battery | kg | 1,2 | 3,8 | 3,8 |
| Weight with battery | kg | 4,2 | 6,8 | 6,8 |

Dimensional drawing

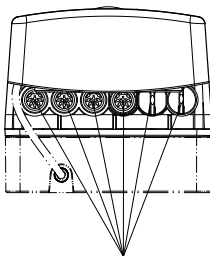


Suitable control units and accessories

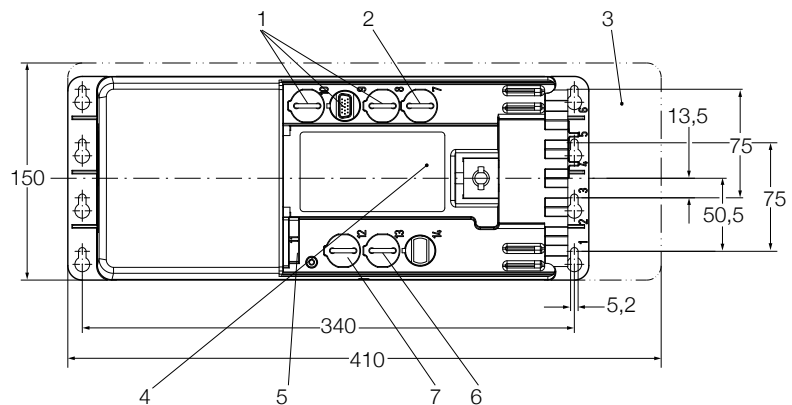
| | Columns | | | | | | | | | | Operating switches | | |
|-------|------------------|------------------|----------------|----------------------------|---------|--------|--------|--------|--------|-------|--------------------|-----|-----|
| | RU20, RU21, RU22 | RU23, RU24, RU25 | MAX 10, MAX 30 | ECO4F, ECO5F, ECO8F, ECO9F | CAJA35C | THG 10 | TLG 10 | TLT 10 | TFG 10 | CPMT1 | EHA3 | STJ | STE |
| SCU 1 | • | • | • | • | • | • | • | • | • | • | • | • | • |
| SCU 5 | • | • | • | • | • | • | • | • | • | • | • | • | • |
| SCU 9 | • | • | • | • | • | • | • | • | • | • | • | • | • |

Hand switch
 Foot switch
 Desk switch

Connecting diagrams



Up to 6 connections with DIN8 plug



1. Two connections for HD15 operating devices
2. HD15 limit switch connection
3. Additional space for mounting
4. Data plate software
5. Mains connection
6. D-Sub 9 battery connection (optional)
7. Communication interface (optional)

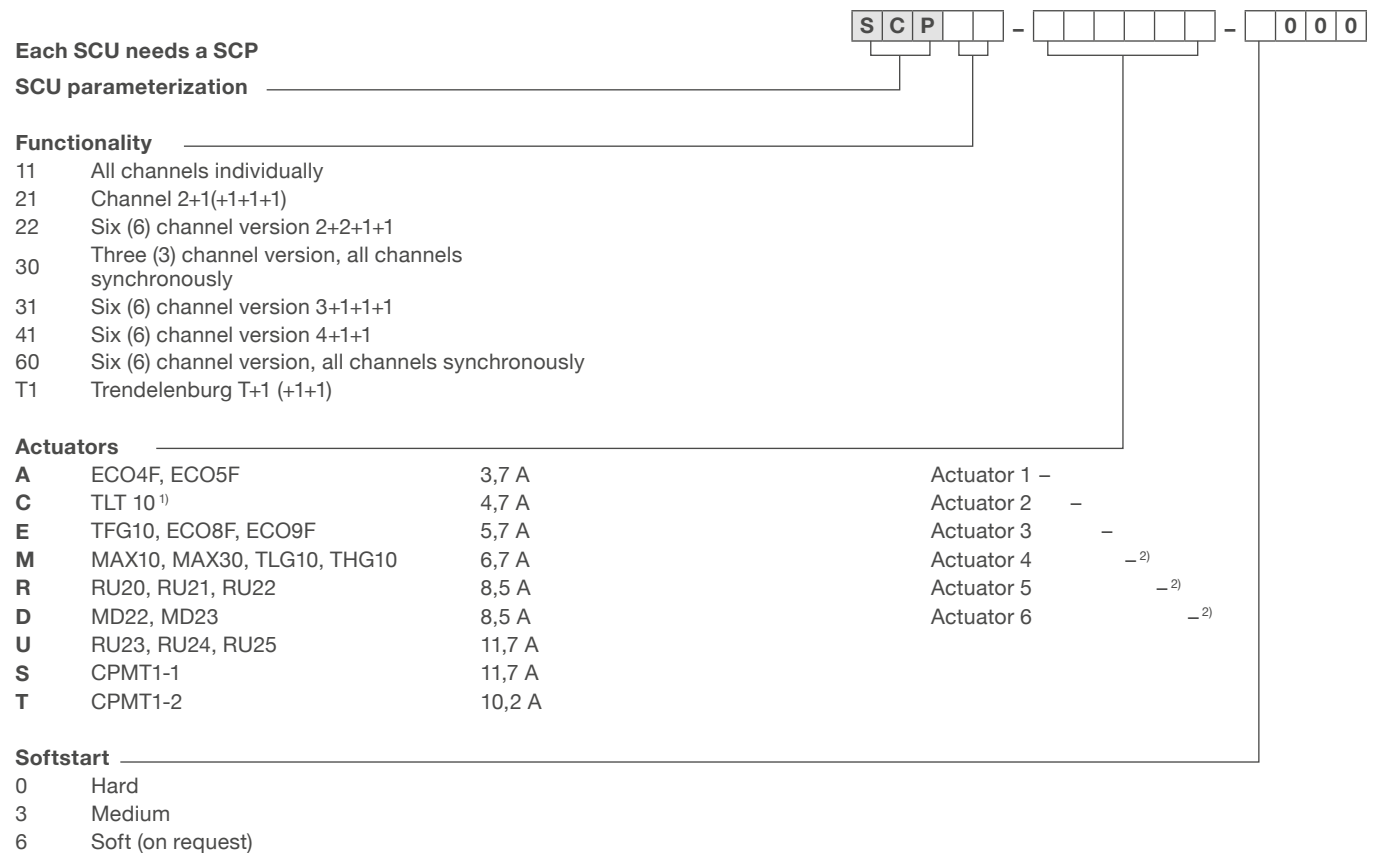
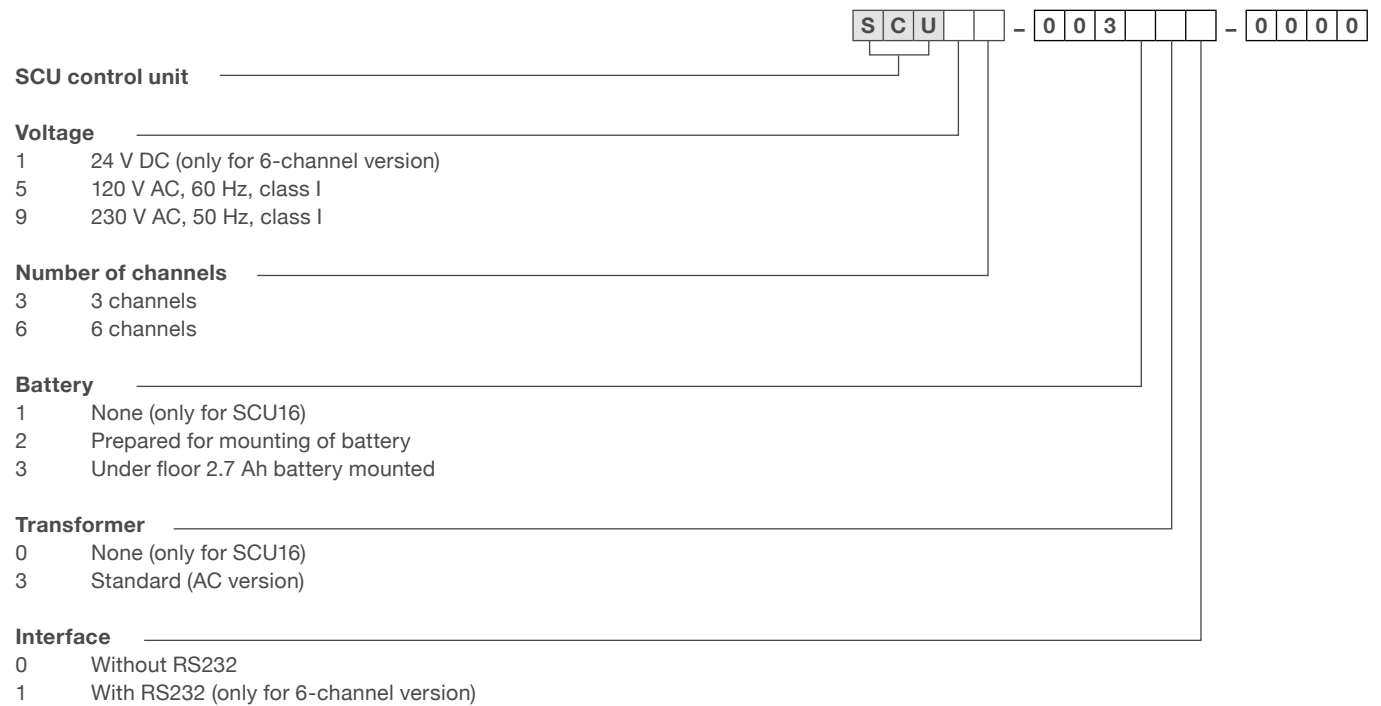
Pinning of HD15 limit switch connection on request (needs a customized SCP)

| Function | Pin | Wire color (ZKA-160627-2500) | Connecting diagram |
|---|------------|---|--------------------|
| Switch 1 | 2 | brown/green | |
| Switch 2 | 4 | red/blue | |
| Switch 3 | 6 | violet | |
| Switch 4 | 8 | red | |
| 24 V DC (com) | 1, 3, 5, 7 | white/yellow, white/green, grey/pink, black | |
| Optional external power supply for binary outputs | | | |
| Binary output 1 (22-40 V DC/1 A) | 9 | blue | Pin 1 |
| Binary output 2 (22-40 V DC/1 A) | 10 | pink | Pin 2 |
| GND for binary outputs | 11 | grey | Pin 3 |
| 20-24 V DC, max. 50 mA | 12 | yellow | Pin 4 |
| 5 V DC pulsed | 13 | green | Pin 5 |
| GND | 14 | brown | Pin 6 |
| | 15 | white | Pin 7 |
| | | | Pin 8 |

Accessories

| | Plug | Designation | Order number |
|---------------------------|--------------------|-----------------|--------------|
| Mains cable, 3 pole | Schuko | ZKA-160637-3500 | 0118821 |
| Mains cable, 3 pole | SEV | ZKA-160638-3500 | 0118822 |
| Mains cable, 3 pole | UL | ZKA-160639-3500 | 0105588 |
| Mains cable, 3 pole | UK | ZKA-160609-3500 | 0105631 |
| Mains cable, 3 pole | UL, hospital grade | ZKA-160640-3500 | 0118823 |
| Mains cable, 3 pole | Australian, China | ZKA-160661-3500 | 0129953 |
| Battery pack 2,7 Ah | | ZBA-160208-0400 | 0118806 |
| Rack for 4,5 Ah battery | | ZBA-160207-1000 | 0126155 |
| Detachable battery 4,5 Ah | | ZBA-160209 | 0126154 |

Ordering key



The SCU solution offers many more possibilities than those given in the type keys. Please feel free to ask for more functions like “virtual limit switches”, “external limit switches” and so on.

¹⁾ TLT is a 2-motor actuator. If simultaneous run is needed, VCP21-CC... is recommended

²⁾ For SCUx3: insert zero

MCU

Control unit

Benefits

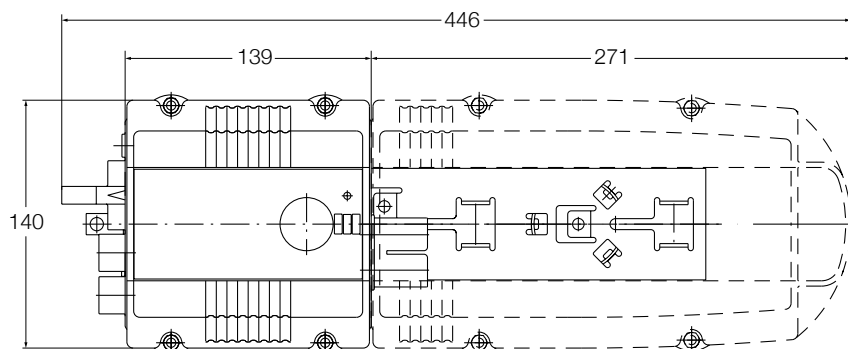
- Suitable for mobile applications
- LED indication for battery charge level
- Audible signal for low charge condition



Technical data

| | Unit | MCU |
|--------------------------|--------|--|
| Motor ports | # | 2 |
| Operating device ports | # | 1 |
| Battery ports | # | 1 |
| Limit switch ports | # | 0 |
| Single fault safety | yes/no | no |
| Encoder processing | yes/no | no |
| Input voltage | V DC | 28 |
| Frequency | Hz | N/A |
| Input current (max) | A | 0,5 |
| Standby power | W | N/A |
| Output voltage | V DC | 24 |
| Output current (max) | A | 9,5 |
| Duty cycle: intermittent | min. | 1 min./9 min. |
| Duty cycle: short time | min. | N/A |
| Ambient temperature | °C | +10 to +40 |
| Humidity | % | 85 |
| Degree of protection | IP | TM4 |
| Approvals | EN/UL | EN 60601-1/EN 60601-1-2/ UL 2601/EN ISO 10535 |
| Weight | kg | 4,9 |

Dimensional drawing

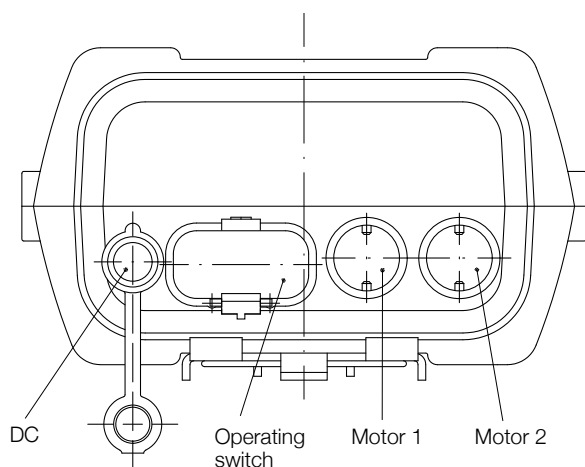


Suitable control units and accessories

| | Linear actuators | | Columns | Operating switches | | | | |
|-----|------------------|------|---------|--------------------|-----|-------|-----|-----|
| | MAX1 | MAX3 | ECOMAG | THG | TLG | EHA 1 | STF | STA |
| MCU | • | • | • | • | • | • | • | • |

Hand switch
 Foot switch
 Desk switch

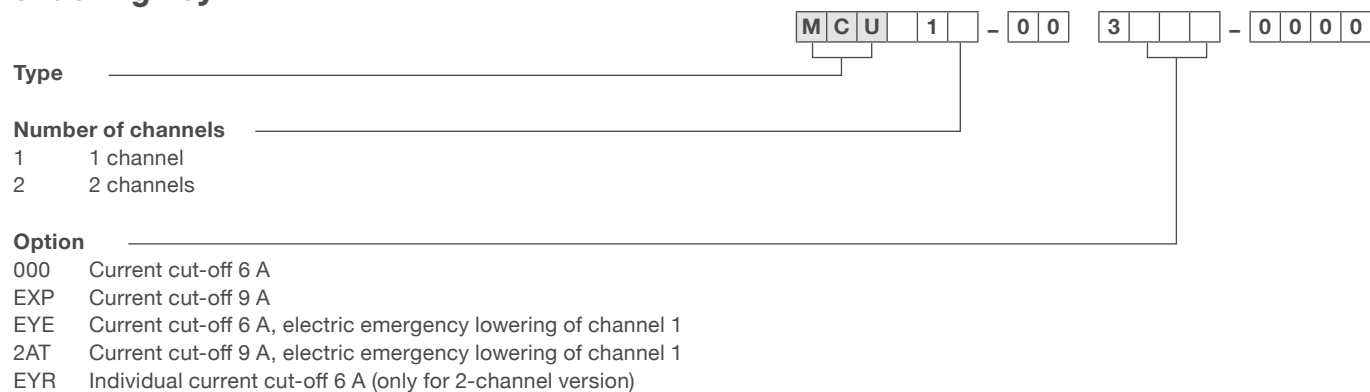
Connecting diagrams



Accessories

| Description | Plug | Designation | Order number |
|--|------|-----------------|--------------|
| Battery unit 4,5 Ah | | ZBA-142211 | 0100667 |
| Mains adapter 100-240 V AC | Euro | ZDV-142378-2500 | 0132841 |
| Mains adapter 100-240 V AC | UL | ZDV-142381-2500 | 0132843 |
| Mains adapter 100-240 V AC | UK | ZDV-142380-4000 | 0132842 |
| Wall charging station | | ZLA-142221 | 0126159 |
| Tool for connectors (Jack/D-Sub/Mains) | | ZWS-140375 | 0125322 |

Ordering key





COMPACT

Control unit



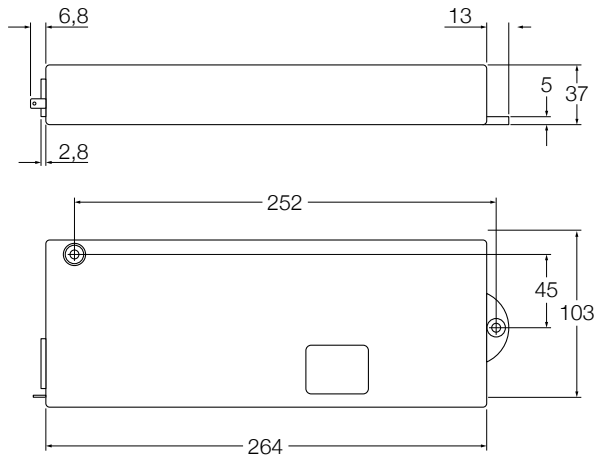
Benefits

- Synchronized movement of 3 actuators possible
- Up to 4 memory positions (depending on handset)
- Linking possibility of up to 4 control boxes
- Enhanced drive comfort
- Adjustable container – and shelf-stop positions
- Low speed area
- High efficient switch mode power supply (SMPS)
- Low standby power consumption, low field emission

Technical data

| | Unit | COMPACT |
|--|---------|---|
| Motor ports (DIN8) | # | 3 |
| Operating device ports (DIN7) | # | 1 |
| Battery ports | # | 0 |
| Limit switch ports (LogicConnector DATA) | # | 1 |
| Single fault safety | yes/no | no |
| Encoder processing | yes/no | yes |
| Supply voltage / Frequency | V AC/Hz | EU: 207 - 254,4 / 50 US: 90 -127 / 50-60 |
| Nominal voltage / Frequency | V AC/Hz | EU: 230 / 50 US: 120 / 60 |
| Input current (max) | | |
| 120 V AC | A | 10 |
| 230 V AC | A | 5 |
| Standby power | W | 0,5 |
| Output voltage (rated) | V DC | 24 |
| Output sum current (rated) | A | 15 |
| Output current per channel (max) | A | 8 |
| Ambient temperature | °C | 0 to +30 |
| Humidity | % | 5 to 85 |
| Degree of protection | IP | 20 |
| Protection class | – | I |
| Approvals | EN/UL | EN 60335-1 / UL 60950-1 |
| Weight | kg | 0,5 |

Dimensional drawing



Suitable control units and accessories

| | Operating switches | | | | |
|---------|--------------------|-------|---------------------|-------------|----------------|
| | TFG10 | TXG10 | TOUCH-JD-MDF-4M2-LD | HSM-OD-2-LD | HSF-MDF-4M4-LD |
| COMPACT | • | • | • | • | • |

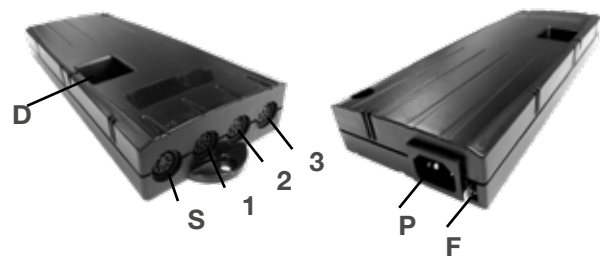
Hand switch

Foot switch

Desk switch

Switching cycles

| | | |
|-------------------|------------|--------------------|
| High-Power cycle: | 20 s Up | 19 A @20 V, 380 W |
| | 20 s Down | 7 A @33 V, 231 W |
| | Pause: | 9 min |
| Normal cycle 1/9: | 30 s Up: | 15 A @ 24 V, 360 W |
| | 30 s Down: | 7 A @ 33 V, 231 W |
| | Pause: | 9 min |
| Normal cycle 2/18 | 2 min run: | 7 A @ 33 V, 231 W |
| | Pause: | 18 min |



- 1 Motor socket 1 (M1)
- 2 Motor socket 2 (M2)
- 3 Motor socket 3 (M3)
- S Handswitch socket (HS)
- P Mains socket
- F Functional earth
- D LogicConnector DATA for sensors, squeeze lines and cascading

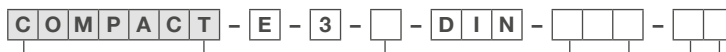
Desk switches

| Description | Designation | Order number |
|---|---------------------|--------------|
| Extra simple desk switch (up/down) | HSM-OD-2-LD | 123247 |
| Desk switch with display for 2 motorgroups (up/down and memory) | HSF-MDF-4M4-LD | 123246 |
| Desk switch with smart touch display (up/down and memory) | TOUCH-UD-MDF-4M2-LD | 131740 |

Accessories

| Description | Designation | Order number |
|--|-----------------------|--------------|
| Mains cable straight 3 m, Schuko plug (Germany, France, ...) | LOG-CBL-PWK | 131665 |
| Mains cable straight 3 m, UK plug (UK) | LOG-CBL-PWK-UK | 131825 |
| Mains cable straight 3 m, UL plug (US) | LOG-CBL-PWK-US-SJT | 131666 |
| Cascading cable 0,5 m length | LOG-CBL-HT-SYNC-500 | 131678 |
| Cascading cable 1,5 m length | LOG-CBL-HT-SYNC-1500 | 132061 |
| Split cable for LogicConnector DATA | LOG-CBL-HT-LC-DATA-Y | 132062 |
| Connection cable (squeeze bar to control box) | LOG-CBL-HT-MOLEX-RJ45 | 132063 |

Ordering key



Type

Number of used motors (optional, depending on parameter)

- 3 motors (no additional designation required)
- 2 2 motors
- 1 1 motor

Actuator type

- TFG TFG10
- TXG TXG10

Voltage

- US 120 VAC, 60 Hz, class I
- EU 230 VAC, 50 Hz, class I



SEM

Control unit



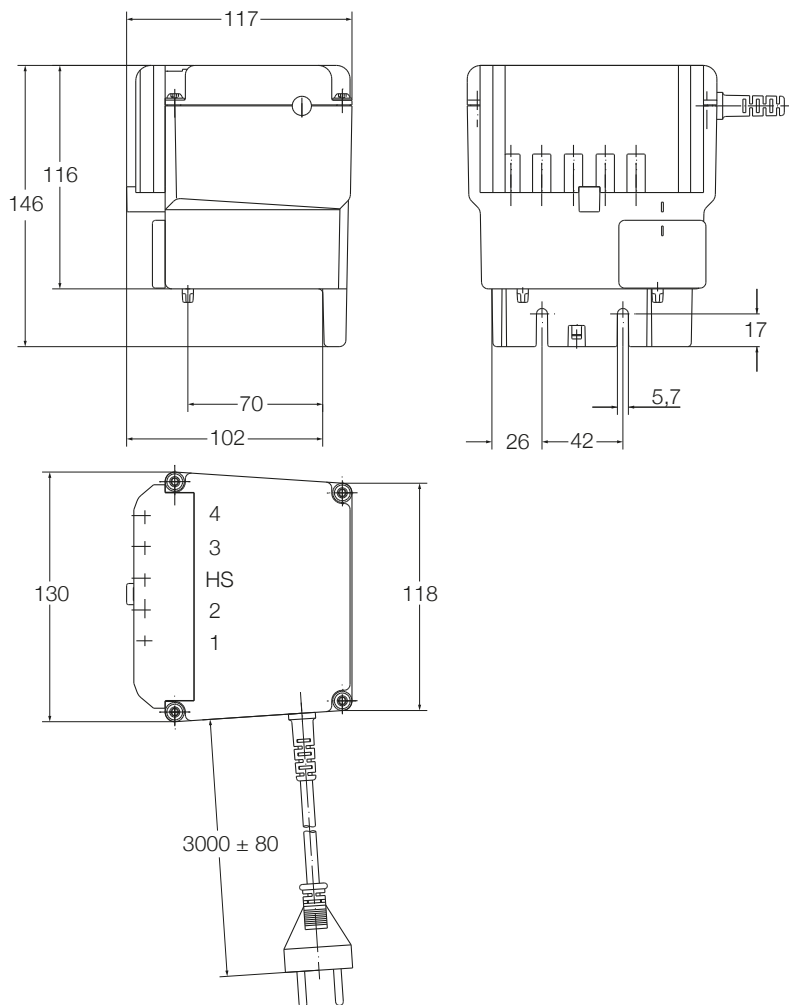
Benefits

- Controls up to 4 actuators
- Suitable for homecare and nursing beds

Technical data




| | Unit | SEM1 |
|-------------------------|--------|-------------------------|
| Motor ports | # | 4 |
| Operating device ports | # | 1 |
| Input voltage/Frequency | V AC | 230/50 HZ |
| | V AC | 120/60 HZ |
| Output voltage rating | V DC | 24 |
| Output current (max) | A (DC) | 5 |
| Duty cycle | min. | 1 min./9 min. |
| Ambient temperature | °C | +10 to +40 |
| Degree of protection | IP | ×4 |
| Approvals | UL | UL60601-1 (1st edition) |
| Weight | kg | 1,8 |

Dimensional drawing

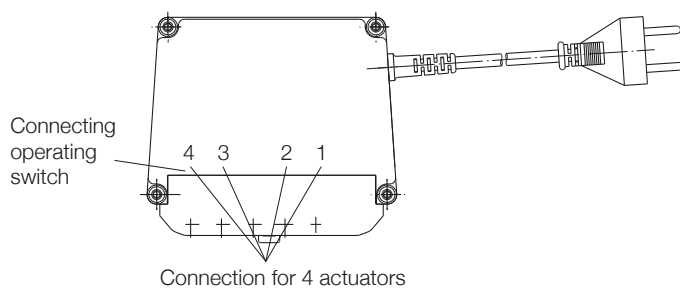


Suitable control units and accessories

| | Linear Actuators | Operating switches |
|-------------|------------------|--------------------|
| | ECOMAG | EHE1 |
| SEM1 | • | • |

-  Hand switch
-  Foot switch
-  Desk switch

Connecting diagrams



Ordering key

S E M 1 - - - - - 0 0 0

Type

Number of channels

- 2 2 channel
- 4 4 channels

Voltage / Frequency

- 1 230V / 50Hz
- 2 120V / 60Hz

Mains plug

- 1 Protection class II 2-pin mains plug (Euro standard)
- 2 Protection class II 2-pin mains plug (British standard)
- 3 Protection class II 2-pin mains plug (US)
- B Protection class I 3-pin mains plug (Schuko)
- E Protection class I 3-pin mains plug (US)

Colours

- A Black
- B Grey RAL 7035

Options, electrical

- 0 None

Fastening

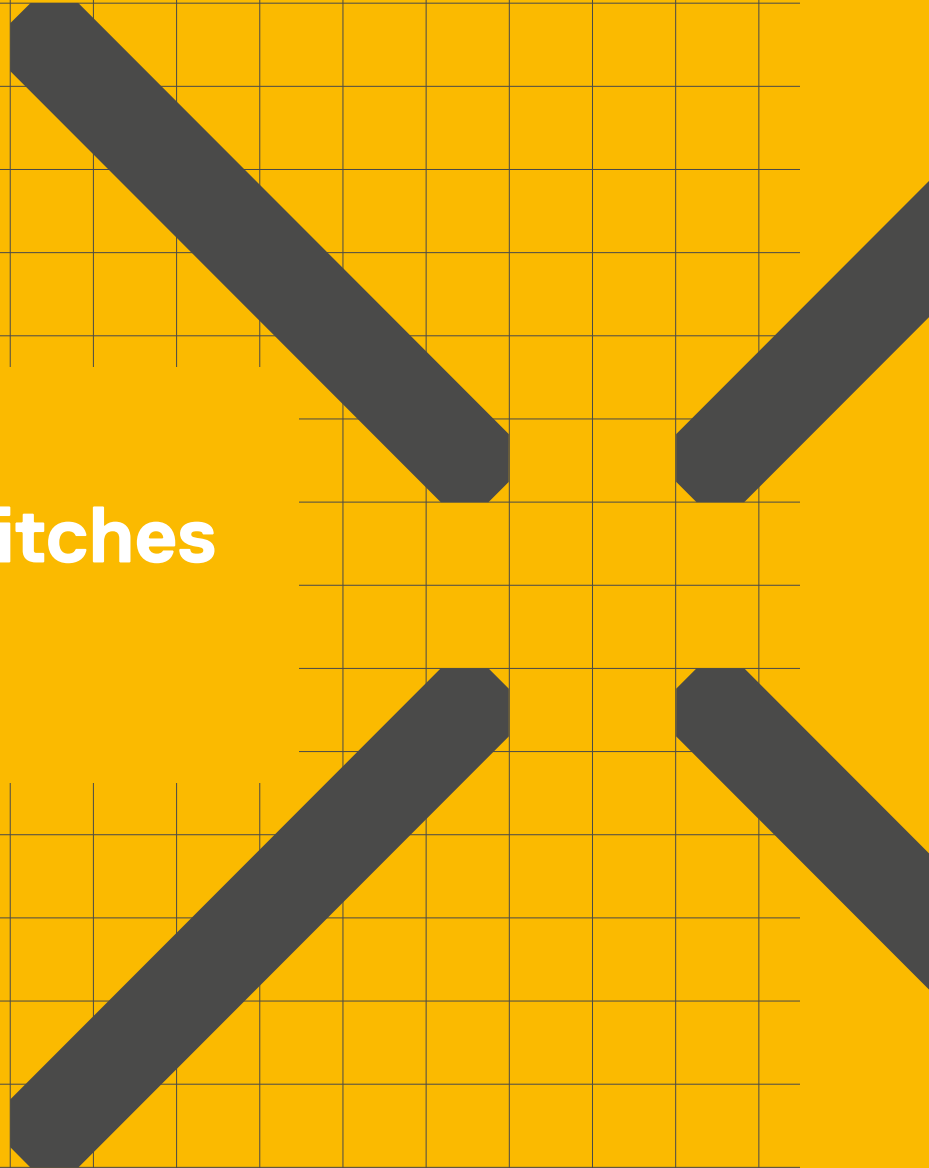
- 0 Piggyback on Ecomag



6

Operating switches

Up to 10 keys



Chapter contents

| | |
|----------------|-----|
| CAES | 270 |
| EHA1 | 272 |
| EHA3 | 274 |
| EHE1 | 276 |
| HSM, HSF | 278 |
| PHC | 280 |
| PFP | 282 |
| ST | 284 |
| ST | 286 |
| STK | 288 |
| PAM | 290 |

CAES

Hand switch

Benefits

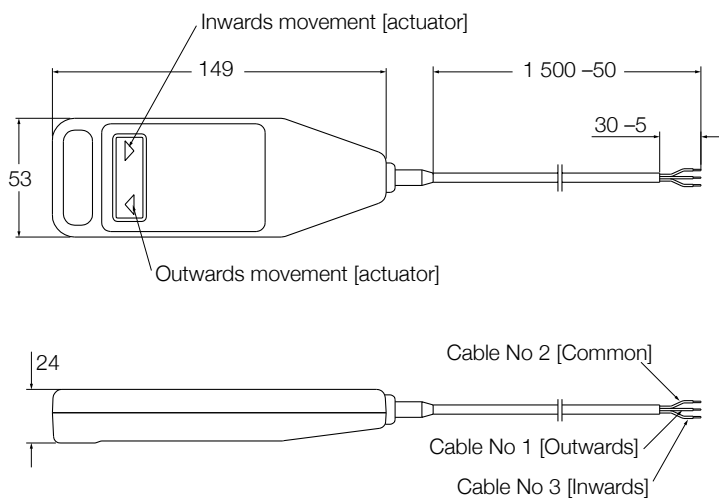
- Robust ergonomic design
- Membrane keyboard
- Clearly marked keys



Technical data

| | Unit | CAES 31C |
|-------------------------|---------|----------|
| Max. operating channels | n° | 1 |
| Operating power | V DC/mA | 30/33 |
| Degree of protection | IP | 54 |
| Color | - | Black |

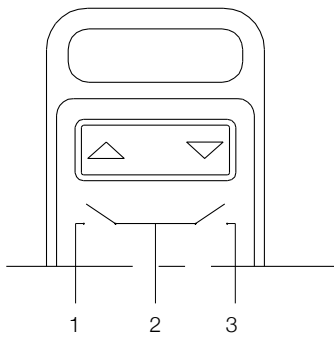
Dimensional drawing



Suitable control units

| | Control units | | | |
|----------|---------------|------------|------------|--------------|
| | CAED 3-24R | CAED 5-24R | CAED 9-24R | CAEV 110/220 |
| CAES 31C | • | • | • | • |

Connecting diagrams



Ordering key

| |
|------------------------------------|
| CAES 31C (No connector, 2 buttons) |
|------------------------------------|

EHA1

Hand switch

Benefits

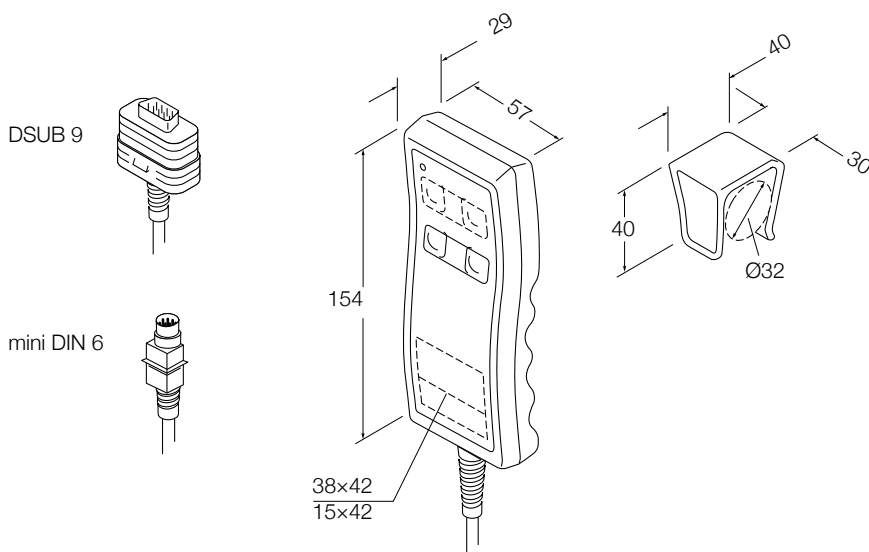
- Robust ergonomic design
- Tactile buttons, clearly marked
- Easy mountable fastening hook



Technical data

| | Unit | EHA 1 |
|-------------------------|---------|-------|
| Max. operating channels | n° | 2 |
| Operating power | V DC/mA | 12/50 |
| Degree of protection | IP | 67 |
| Color | - | Grey |

Dimensional drawing



Suitable control units and linear actuators

| | Linear actuators | Control units |
|------|------------------|---------------|
| | MAX7 | MCU |
| EHA1 | • | • |

Accessories

| Description | Designation | Order number |
|-------------------|----------------|--------------|
| Hook with sticker | ZBG-145361-000 | 0125538 |

Ordering key

E H A 1 - 1 - N - 0 0 0

Type

Number of channels

- 1 1 channel
- 2 2 channels

Hook

- 1 Yes mounted with hook
- 2 Hook supplied separately

Cable / connecting plug

- B Coiled, 1,3 m/2,5 m / D-sub 9-pin plug
- C Straight 2,5 m (min DIN 6-pin plug)
- D Coiled 1,0 m/2,0 m (min DIN 6-pin plug)
- F Coiled 2,5 m/3,5 m / D-sub 9-pin plug

Symbols

- 00 None
- 10 1 channel: Head
- 20 2 channels: Arrow up/down

EHA3

Hand switch

Benefits

- Robust ergonomic design
- Tactile buttons, clearly marked
- Easy mountable fastening hook

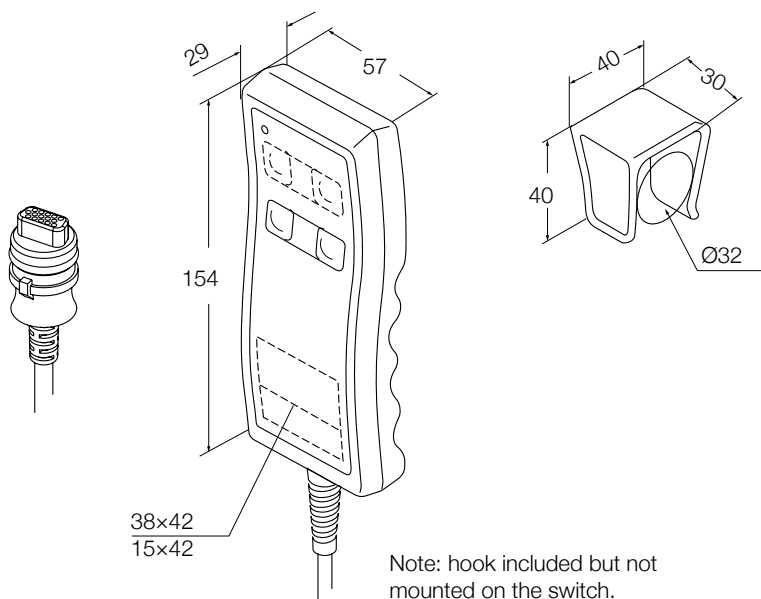


Technical data

| | Unit | EHA 3 |
|---------------------------|---------|--------------|
| Max. operating channels | n° | 5 |
| Operating power | V DC/mA | 12/50 |
| Degree of protection | IP | 67 |
| Color | - | Grey |
| Cable: Coiled 1,3 m/2,5 m | - | D-sub 15-pin |

Dimensional drawing

High density
D-Sub 15



Suitable control units and columns

| | Columns | | Control units | | | | | | | |
|------|---------|--------|---------------|-------|-------|-------|-------|-------|-------|-------|
| | TFG 50 | TFG 90 | SCU 1 | SCU 5 | SCU 9 | VCU 5 | VCU 8 | VCU 9 | BCU 5 | BCU 8 |
| EHA3 | • | • | • | • | • | • | • | • | • | • |

Accessories

| Description | Designation | Order number |
|-------------------|----------------|--------------|
| Hook with sticker | ZBG-145361-000 | 0125538 |

Ordering keys

E H A 3 - 2 3 M - N - 0 0 0

Type

Number of channels

- 1 1 channel
- 2 2 channels
- 3 3 channels
- 4 4 channels
- 5 5 channels
- A 1 channel with 3 memory positions (only for SCU)
- B 2 channels with 3 memory positions (only for SCU)
- C 3 channels with 3 memory positions (only for SCU)

Symbols

- 00 None
- 10 1 channel: 2nd row from top Arrow up/down
- 11 Head
- 12 Foot
- 13 Level
- 14 Anti-Trendelenburg
- 20 2 channels: 1st-2nd row from top Arrow up/down
- 21 Head/foot
- 22 Head/level
- 23 Level/head
- 29 Level/Anti-Trendelenburg
- 30 3 channels: 1st-3rd row from top Arrow up/down
- 31 Head/foot/level
- 32 Level/head/foot
- 39 Level/Anti-Trendelenburg/Head
- 40 4 channels: 1st-4th row from top Arrow up/down
- 47 Level/Anti-Trendelenburg/Head/Foot
- 50 5 channels: 1st-5th row from top Arrow up/down

Options shown in red are only available on demand. Please contact Ewellix.

EHE1

Hand switch

Benefits

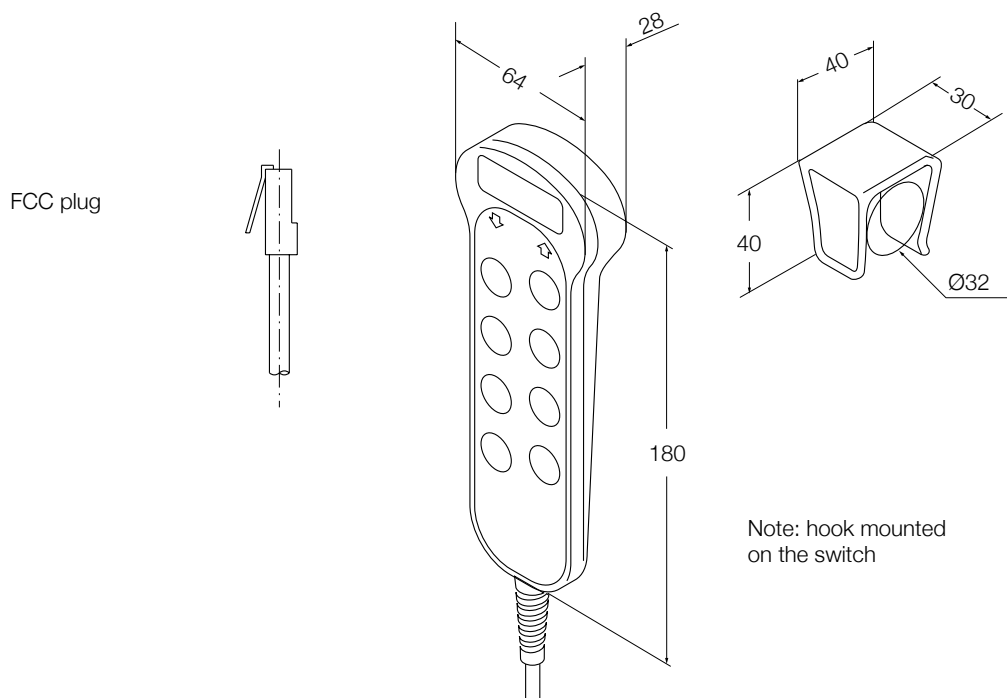
- Easy and precise
- Flexible and remote operation
- Ergonomic design



Technical data

| | Unit | EHE 1 |
|---------------------------|---------|----------|
| Max. operating channels | n° | 2 |
| Operating power | V DC/mA | 38/50 |
| Degree of protection | IP | ×67 |
| Color | - | Grey |
| Cable: Coiled 1,1 m/2,5 m | - | FCC plug |

Dimensional drawing



Suitable control units and columns

| | Columns | | | | Control units | |
|------|---------------------|---------------------|---------------------|---------------------|---------------|--------|
| | TXG 4 ¹⁾ | TXG 5 ¹⁾ | TXG 8 ¹⁾ | TXG 9 ¹⁾ | SEM1 2 | SEM1 4 |
| EHE1 | • | • | • | • | • | • |

¹⁾ Only with FCC plug

Accessories

| Description | Designation | Order number |
|-------------|----------------|--------------|
| Hook | ZBG-145361-000 | 0125538 |

Ordering key



Type

Number of channels

- 1 1 channel
- 2 2 channels

Symbols

- 10 1 channel: Arrow up/down
- 20 2 channels: Arrow up/down

HSM, HSF

Hand switch

Benefits

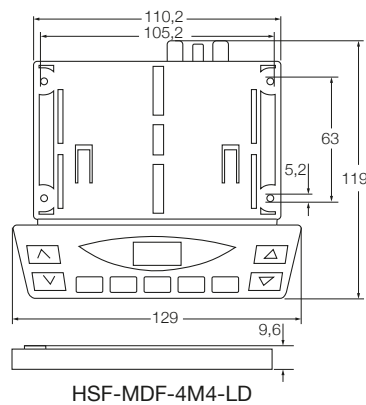
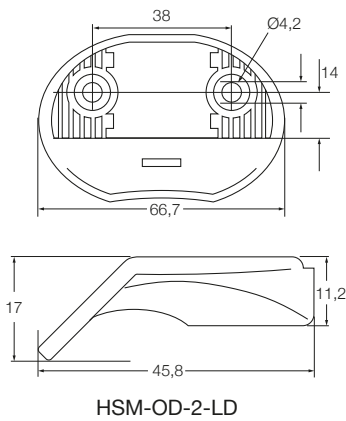
- Easy and precise
- Stylish design
- Different functions



Technical data

| | Unit | HSM-OD-2-LD | HSF-MDF-4M4-LD |
|-------------------------|---------|-------------|----------------|
| Max. operating channels | n° | 1 | 1 or 2 |
| Operating power | V DC/mA | 5/50 | 5/50 |
| Degree of protection | IP | 32 | 32 |
| Color | - | Black | Black |

Dimensional drawing



Suitable control units and columns

| | Control units |
|----------------|---------------|
| | COMPACT |
| HSM-OD-2-LD | • |
| HSF-MDF-4M4-LD | • |

Ordering key

HSM-OD-2-LD (DIN7 plug)
HSF-MDF-4M4-LD (DIN7 plug)

PHC

Hand switch

Benefits

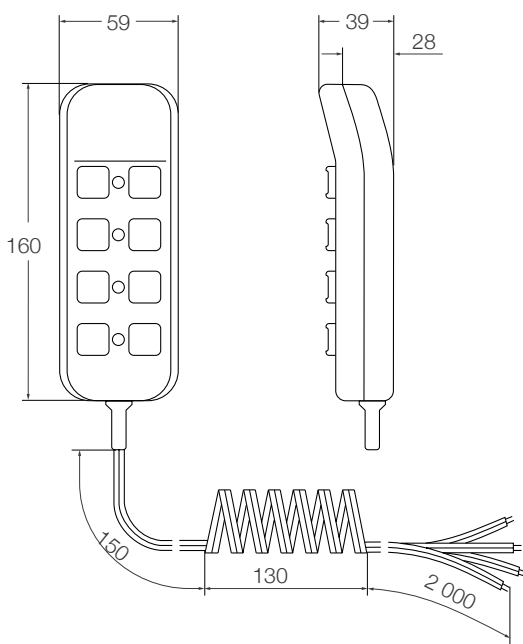
- Easy and precise
- Flexible and remote operation
- Ergonomic design



Technical data

| | Unit | PHC |
|-------------------------|---------|------|
| Max. operating channels | n° | 4 |
| Operating power | V DC/mA | N/A |
| Degree of protection | IP | 66 |
| Color | - | Grey |

Dimensional drawing



Suitable linear actuators and columns

| | Linear actuators | | Columns | | |
|-----|------------------|-------|---------------|---------------|---------------|
| | MAX 7 | MAX 7 | TLC pneumatic | TGC pneumatic | THC pneumatic |
| PHC | • | • | • | • | • |

Ordering key

- PHC 1 – 130517 (1 channel with arrows up/down, without hook)
- PHC 2 – 130625 (2 channels with arrows up/down, without hook)
- PHC 3 – 130756 (3 channels with arrows up/down, without hook)
- PHC 4 – 130955 (4 channels with arrows up/down, without hook)

Other symbols / with hook on demand.

PFP

Foot switch

Benefits

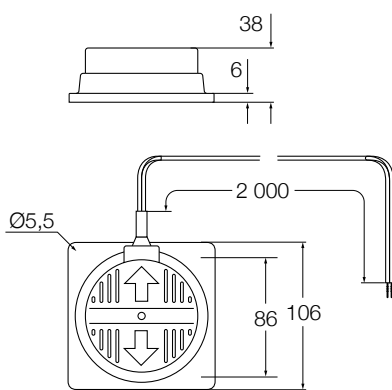
- Robust ergonomic design
- Easy and precise
- Flexible and remote operation



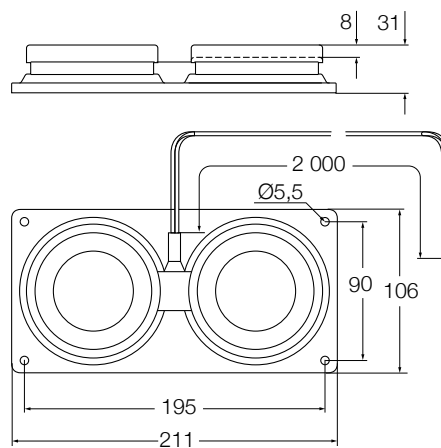
Technical data

| | Unit | PFP 1K | PFP 1 |
|-------------------------|----------|--------|------------|
| Max. operating channels | n° | 1 | 1 |
| Operating power | V DC/ mA | N/A | N/A |
| Degree of protection | IP | 21 | 21 |
| Color | - | Grey | Anthracite |

Dimensional drawing



PFP 1K-130652



PFP 1-121545

Suitable linear actuators and columns

| | Linear actuators | | Columns | | |
|-----|------------------|-------|---------------|---------------|---------------|
| | MAX 7 | MAX 7 | TLC pneumatic | TGC pneumatic | THC pneumatic |
| PFP | • | • | • | • | • |

Ordering key

PFP 1K – CAES 31C (No connector, 2 buttons) 130652
 PFP 1 – 121545

Other versions on request.

ST

Foot switch

Benefits

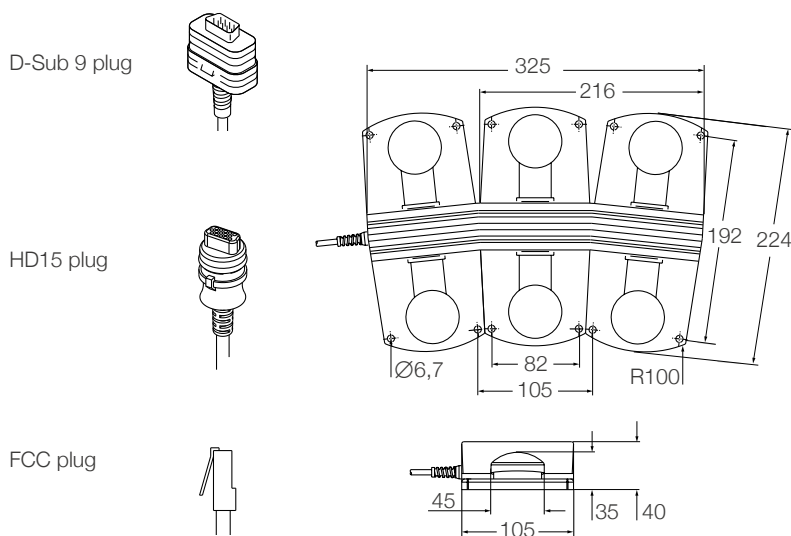
- Easy and precise
- Ergonomic design
- Different plug options



Technical data

| | Unit | ST |
|-------------------------|---------|-----------------|
| Max. operating channels | n° | 3 |
| Operating power | V DC/mA | 12/50 |
| Degree of protection | IP | ×5 |
| Color | – | Blue/anthracite |

Dimensional drawing



Suitable columns, linear actuators and control units

| | Columns | | Linear Actuators | Control units | | | | | | | | |
|-----|-----------|---------------------------|------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-----|
| | TFG 50/90 | TXG 4/5/8/9 ¹⁾ | MAX 7 | SCU 1 | SCU 5 | SCU 9 | VCU 5 | VCU 8 | VCU 9 | BCU 5 | BCU 8 | MCU |
| STJ | • | | | • | • | • | • | • | • | • | • | |
| STF | | • | • | | | | | | | | | • |

¹⁾ Only with FCC plug

Accessories

| Description | Designation | Order number |
|------------------------|-----------------|--------------|
| Rubber feet (100 pcs.) | ZBE-135310 | 0102879 |
| Sticker arrow up | ZKL-135309-0001 | 0124871 |
| Sticker arrow down | ZKL-135309-0002 | 0124870 |

Ordering key



Type

Product group:

- F Classic, D-Sub9 or FCC plug
- J Standard, single-fault safety, HD15 plug

Number of channels:

- 1 One (1) channel
- 2 Two (2) channels
- 3 Three (3) channels

Cable / connecting plug:

- LU Coiled cable 1,3-2,5 m / D-sub plug
- LW Coiled cable 1,3-2,5 m / HD15 plug
- OU Straight cable 2,5 m / D-sub plug
- OV Straight cable 2,5 m / FCC plug (only for STF01 and STF02)
- OW Straight cable 2,5 m / HD15 plug

Color:

- 1 Anthracite
- 4 Blue

Option:

- 000 None
- MAY Mounted with rubber feet

Symbols:

- X1 Arrow up/down (on each pair of buttons), 1–3 channels
- 37 Arrow up/down, M/1, 2/3 (3 memory buttons) only for STJ03



ST

Desk switch

Benefits

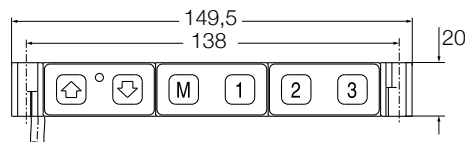
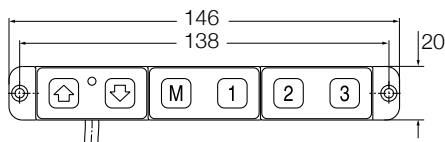
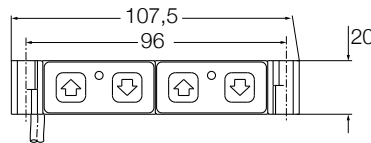
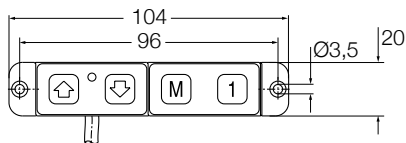
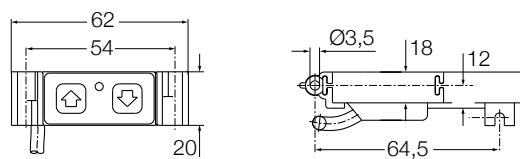
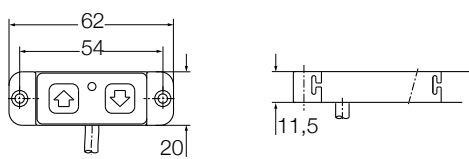
- Easy and precise
- Stylish design
- Memory position



Technical data

| | Unit | ST |
|-------------------------|---------|-------|
| Max. operating channels | n° | 3 |
| Operating power | V DC/mA | 12/50 |
| Degree of protection | IP | x0 |
| Color | - | Black |

Dimensional drawing



STA straight

STA 90°

Suitable columns, linear actuators and control units

| | Columns ¹⁾ | | Linear Actuators ¹⁾ | Control units | | | | | | | | |
|-----|-----------------------|---------------------------|--------------------------------|---------------|-------|-------|-------|-------|-------|-------|-------|-----|
| | TFG 50/90 | TXG 4/5/8/9 ²⁾ | MAX 7 | SCU 1 | SCU 5 | SCU 9 | VCU 5 | VCU 8 | VCU 9 | BCU 5 | BCU 8 | MCU |
| STA | | • | • | | | | | | | | | • |
| STE | • | | | • | • | • | • | • | • | • | • | |

¹⁾ With integrated control units

²⁾ Only with FCC plug

Ordering key

Type _____

Product group: _____

A Classic, D-Sub9 or FCC plug
E Standard, single-fault safety wiring, HD15 plug

Number of channels: _____

1 One (1) channel
2 Two (2) channels
3 Three (3) channels

Cable / connecting plug: _____

0U Straight cable 2,5 m / D-sub plug
WV Straight cable 1,5 m / FCC plug
0W Straight cable 2,5 m / HD15 plug

Option: _____

000 No option
MAU Mounted on or underneath desktop, at a 90° angle

Symbols: _____

X1 Up/down arrow on each pair of keys (1-3 channels)
37 Up/down arrow, 3 memory functions M/1, M/2, M/3 (3 channels)

STK

Desk switch

Benefits

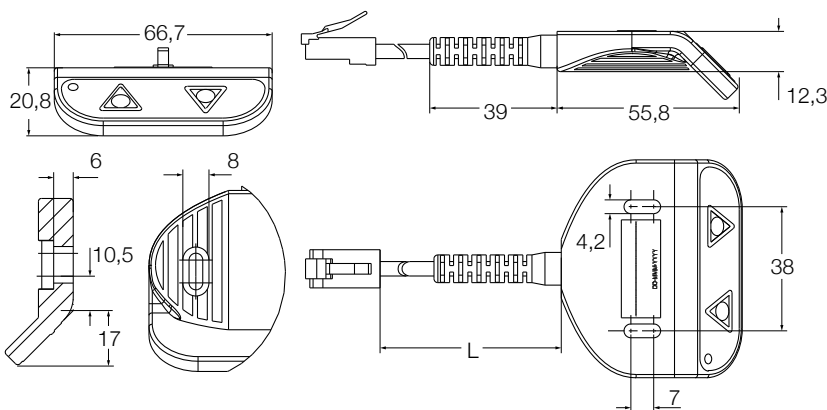
- Easy and precise
- Stylish design
- Tactile buttons with finger guide
- 2 colors LED for power and feedback status



Technical data

| | Unit | STK |
|-------------------------|---------|--|
| Max. operating channels | n° | 1 |
| Operating power | V DC/mA | 12/50 |
| Color | - | Grey |
| Indicator | - | 2 colors LED for power and feedback status |
| Plug | - | RJ45 |
| Symbols | - | with arrows up/down |

Dimensional drawing



| | STK01-SW3000-X100 | STK01-UW3000-X100 |
|--------|-------------------|-------------------|
| L [mm] | 500 | 1 000 |

Suitable columns and accessories

| | Columns | | Socket boxes | | |
|-------------------|---------|---------|--------------|----------------|----------------|
| | CPMA1-1 | CPMA1-2 | CPMA2-2 | ZDV-348220-002 | ZDV-348221-002 |
| STK01-SW3000-x100 | • | • | • | • | • |
| STK01-UW3000-x100 | • | • | • | • | • |

Ordering key

| Description | Part number | Order number |
|-----------------------------------|-------------------|--------------|
| Desk switch with LED, cable 0,5 m | STK01-SW3000-x100 | 130025 |
| Desk switch with LED, cable 1 m | STK01-UW3000-x100 | 130026 |

PAM

Pneumatic desk switch

Benefits

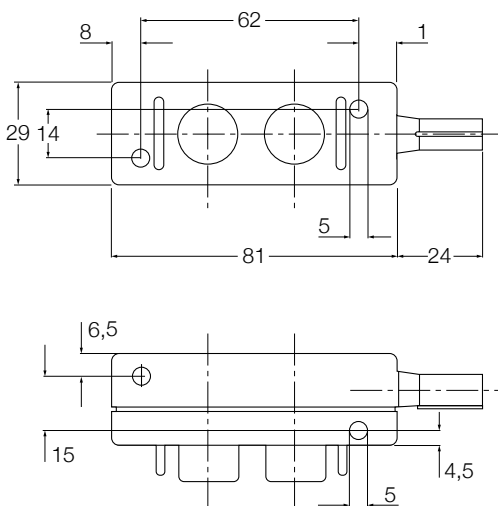
- Operation with air (no electricity)
- Stylish design



Technical data

| Unit | PAM -130256 | |
|-------------------------|-------------|------------------|
| Max. operating channels | n° | 1 |
| Operating power | V DC/ mA | N/A |
| Degree of protection | IP | N/A |
| Tube | - | Straight, 1,50 m |
| Color | - | Anthracite |

Dimensional drawing

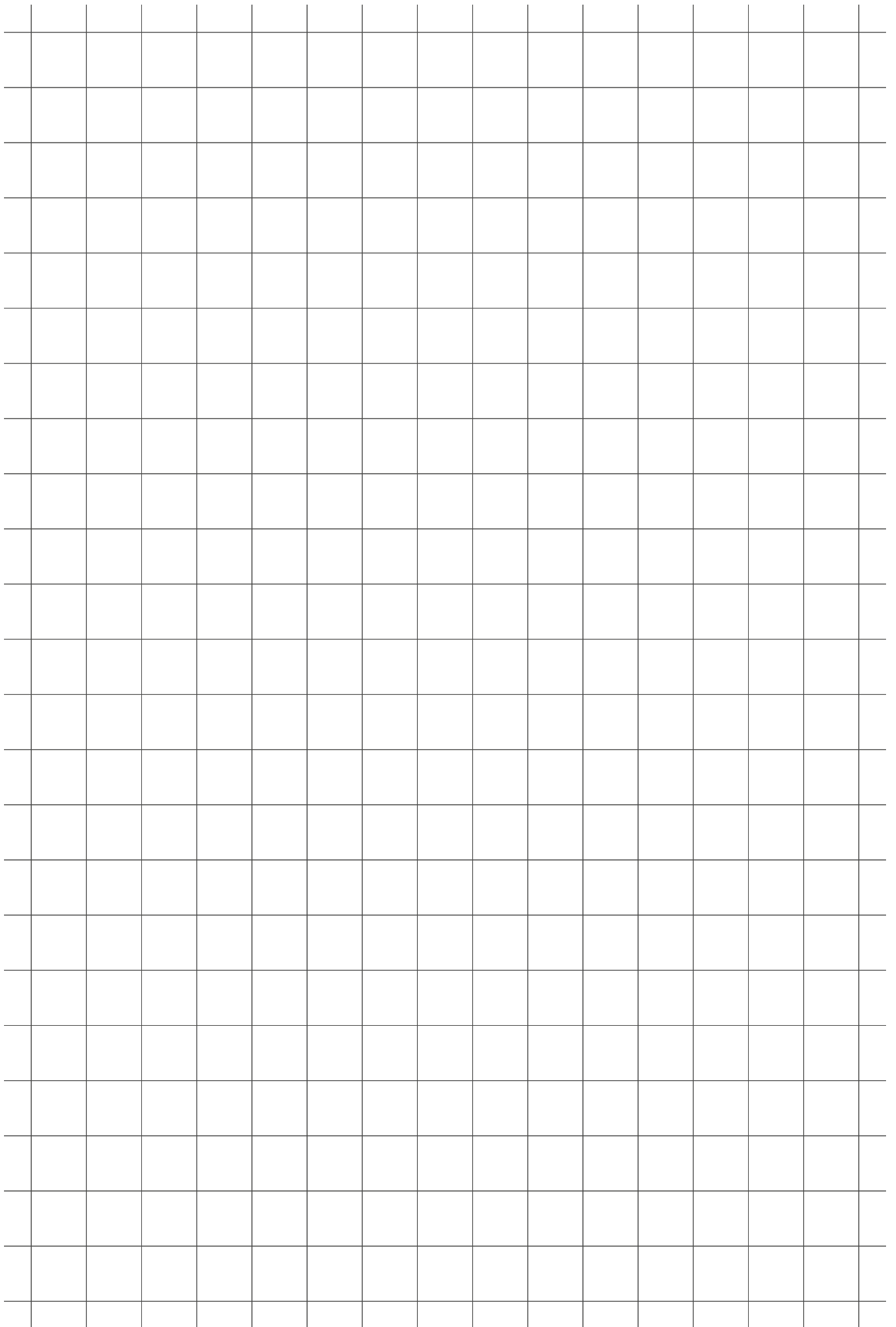


Suitable linear actuators and control units

| | Linear actuators | | Control units | | |
|-----|------------------|------|---------------|---------------|---------------|
| | MAX7 | MAX7 | TLC pneumatic | TGC pneumatic | THC pneumatic |
| PAM | • | • | • | • | • |

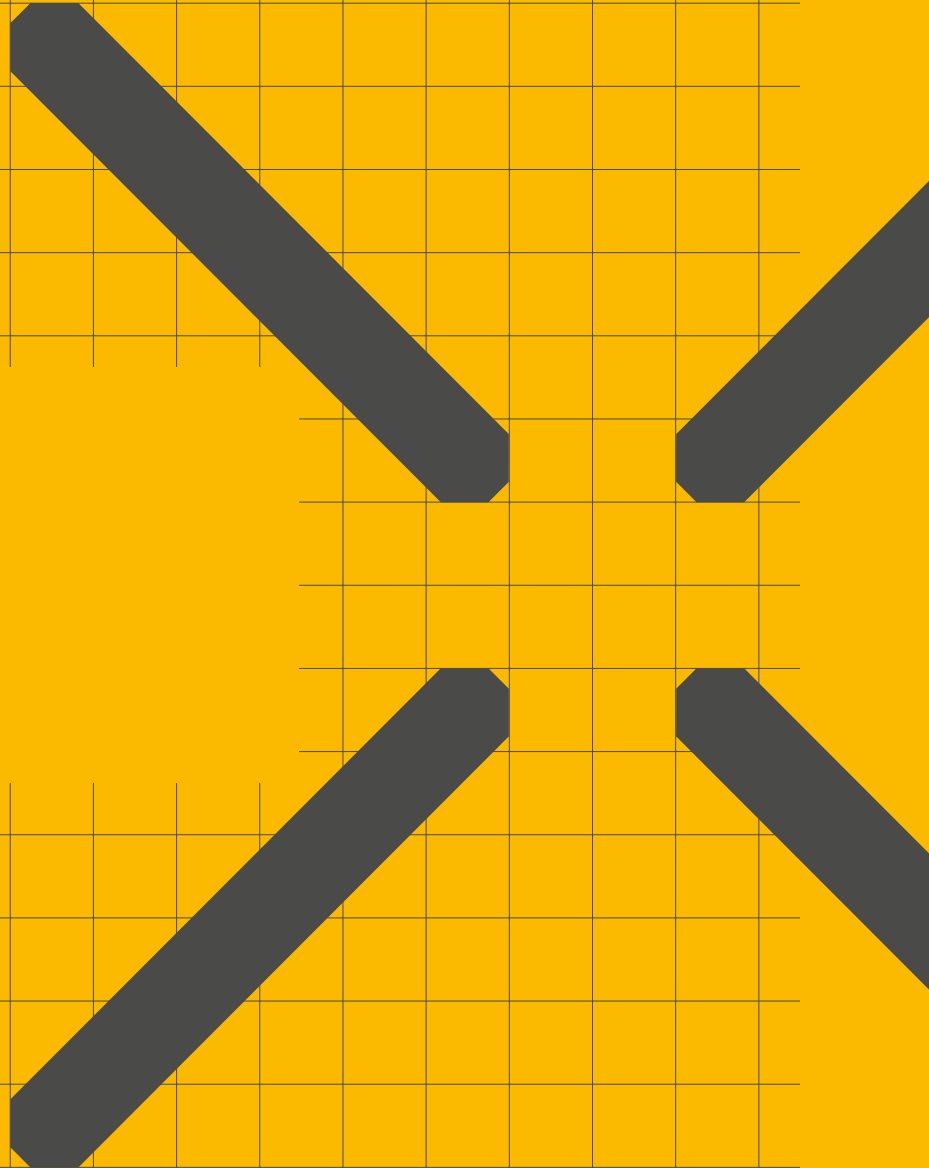
Ordering key

PAM-130256



7

**New medical
solution**



CAMT

Linear actuator for surgical tables and procedure chairs

Benefits

- Play free motion
- Easy installation
- Compact design

Standards

- IEC/UL 60601-1 (Edition 3.1)
- IEC/UL 60601-1-2 (Edition 4)



Technical data

| | Unit | CAMT20 |
|--|------|------------------|
| Rated push load | N | 6 000 |
| Rated pull load | N | 6 000 |
| Static load (push/pull) ¹⁾ | N | 13 200 |
| Safety factor on rated load ^{2) 3)} | – | 4 |
| Speed (full load to no load) ⁴⁾ | mm/s | 5 to 6,5 |
| Stroke | mm | 50 to 250 |
| Voltage | VDC | 24 |
| Current consumption | A | 10 |
| Duty cycle | % | 10 (1/9 minutes) |
| Ambient temperature | °C | +10 to +40 |
| Degree of protection | – | IP20 |
| Noise level (max) | dB | ≤ 55 |
| Weight ⁵⁾ | Kg | 5,8 |

¹⁾ Compliant with static load according to IEC/UL 60601-2-46

²⁾ Static safety factor to prevent mechanical hazards according to IEC/UL 60601-1

³⁾ Depending on stroke and attachment type, safe work load in push direction is reduced. For details, see diagram **Safety factor load conditions**

⁴⁾ Speed with 24 V DC, speed with V/SCU is higher. For details, see diagram **Load-Speed**

⁵⁾ For stroke 250 mm, without attachment

Product benefits

Play free motion – Extra comfort

Feel the smooth movement introduced by CAMT because all parts are play-free. Unlike common actuators which shake when the load direction changes, CAMT keeps the movement smooth throughout the whole process (↳ diagram 1).

Easy installation – Simplicity

It is easy to install thanks to the new design with extra front and rear attachment with 1 or 2 DOF in motion (↳ fig. 1 and 2).

Compact design – Perfect system integration

The compact design enables a perfect system integration. It can be installed as a single actuator or be combined with other CAMT actuators and a column (e.g. CPMT) to achieve combined motion in any direction (↳ fig. 3).

Fig. 1

Front attachment: play-free



Fig. 2

Rear attachment: play-free

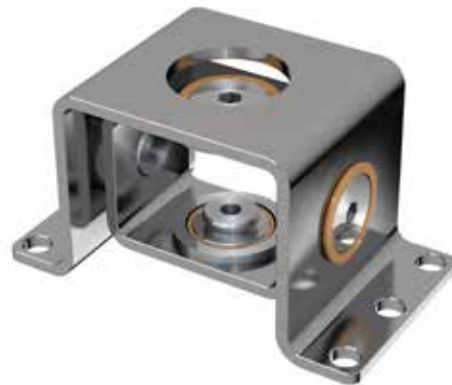


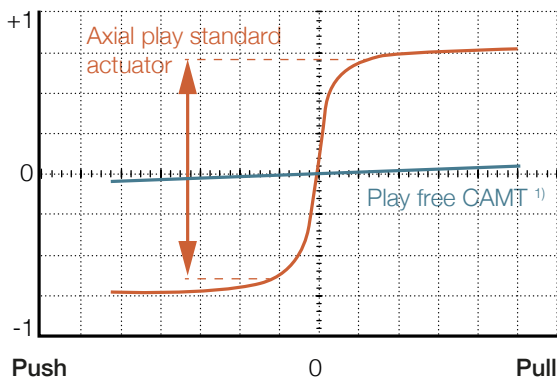
Diagram 1

Fig. 3

Surgical module



Displacement [mm]

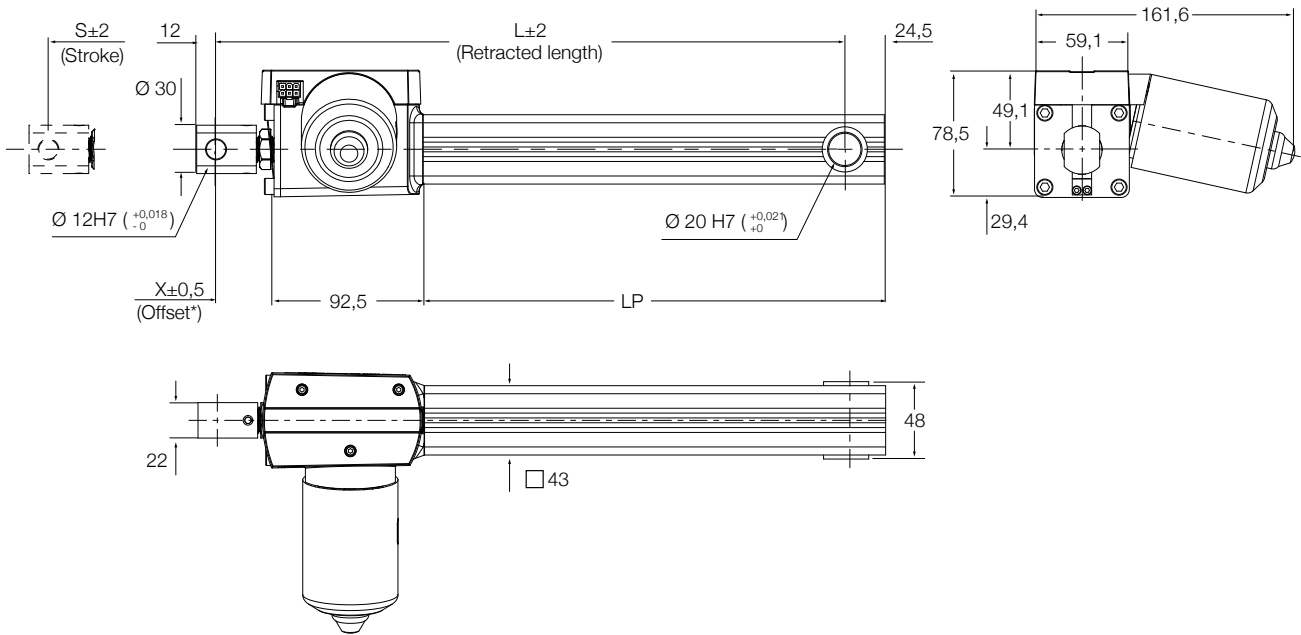


CAMT actuator — Standard actuator —

¹⁾ Actuator after service life of 10 years in a typical medical procedure equipment application, with the meaning of 60 000 cycles at average load of 3 000 N and average stroke of 100 mm.

Dimensional drawing

Clevis attachment (CAMT20-xxxxx-00L-AA-AFx-000)

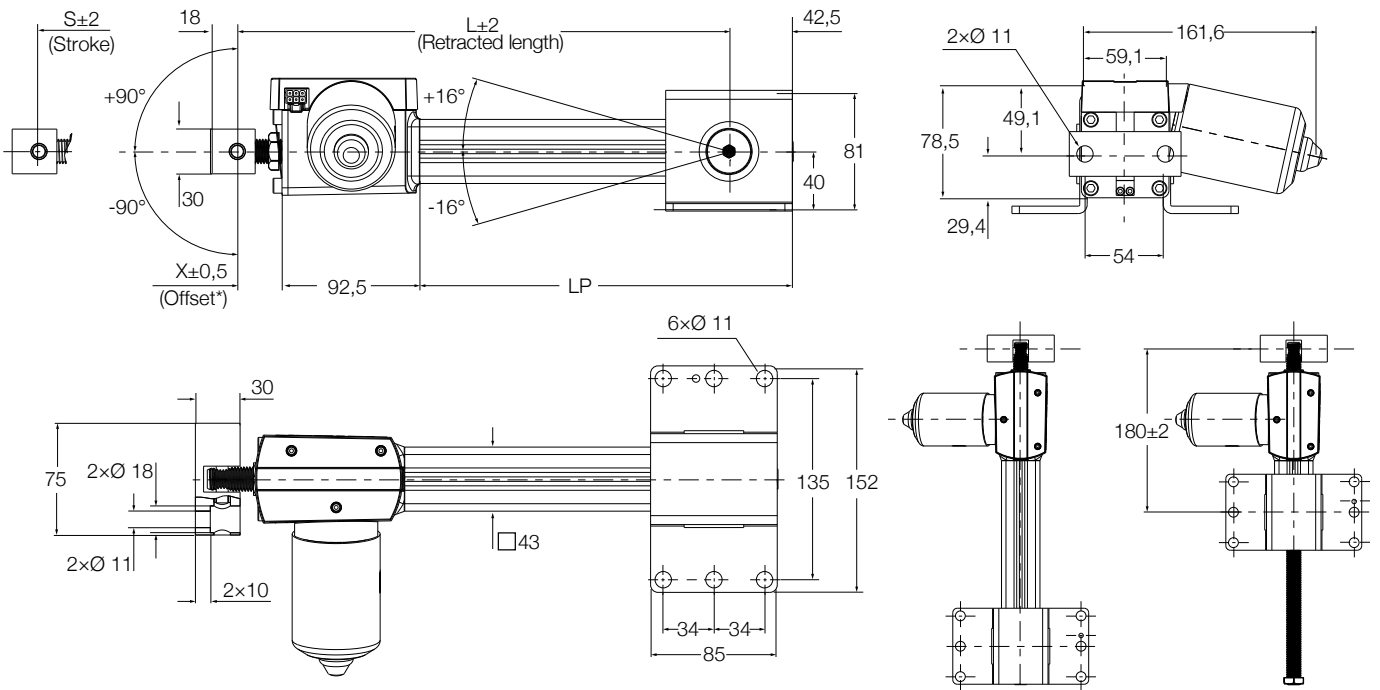


Retracted length:

$L = \text{Stroke (S)} + \text{Offset (X)} + 104$

* Standard Offset = 36

1 DOF attachment (CAMT20-xxxxx-00x-BB-AFx-000)



Retracted length:

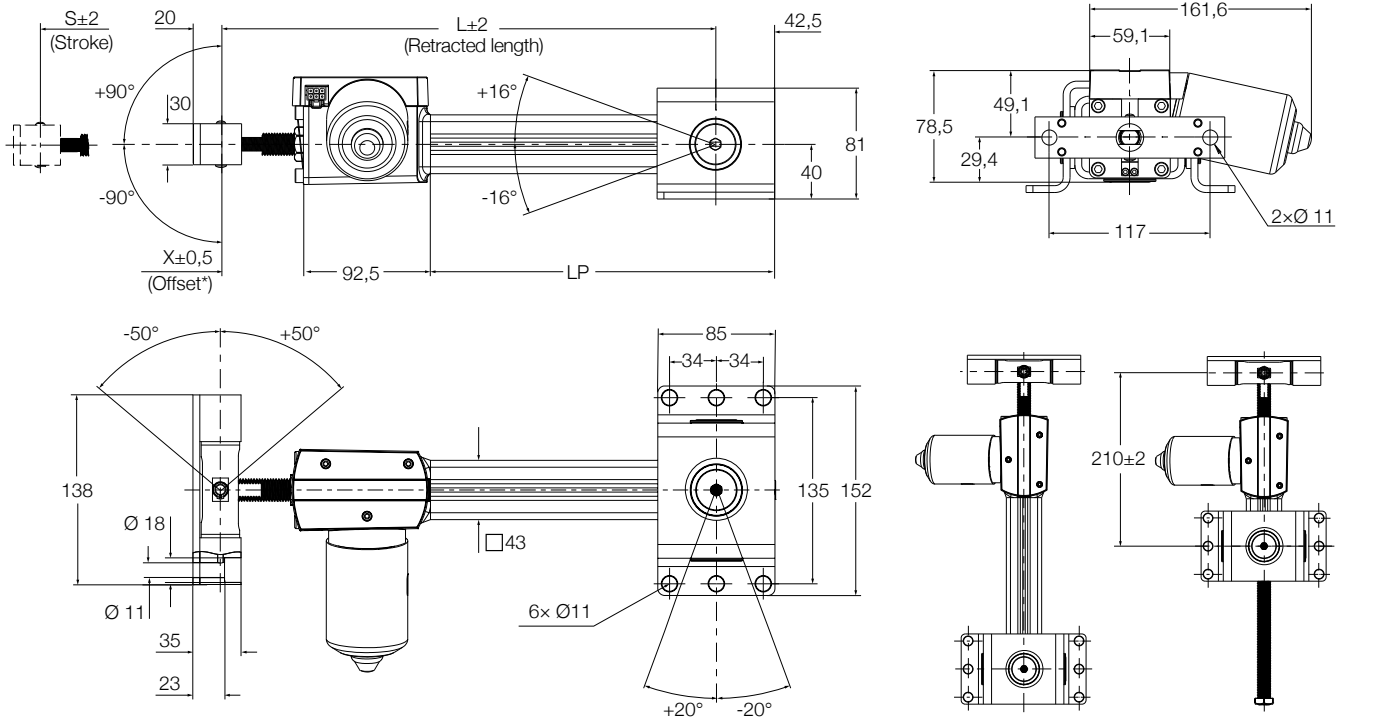
$L = \text{Stroke (S)} + \text{Offset (X)} + 50$ (long protection tube)

$L = \text{Offset (X)} + 150$ (short protection tube)

* Standard Offset = 30

Long protection tube Short protection tube

2 DOF attachment (CAMT20-xxxxx-00x-CC-AFx-000)

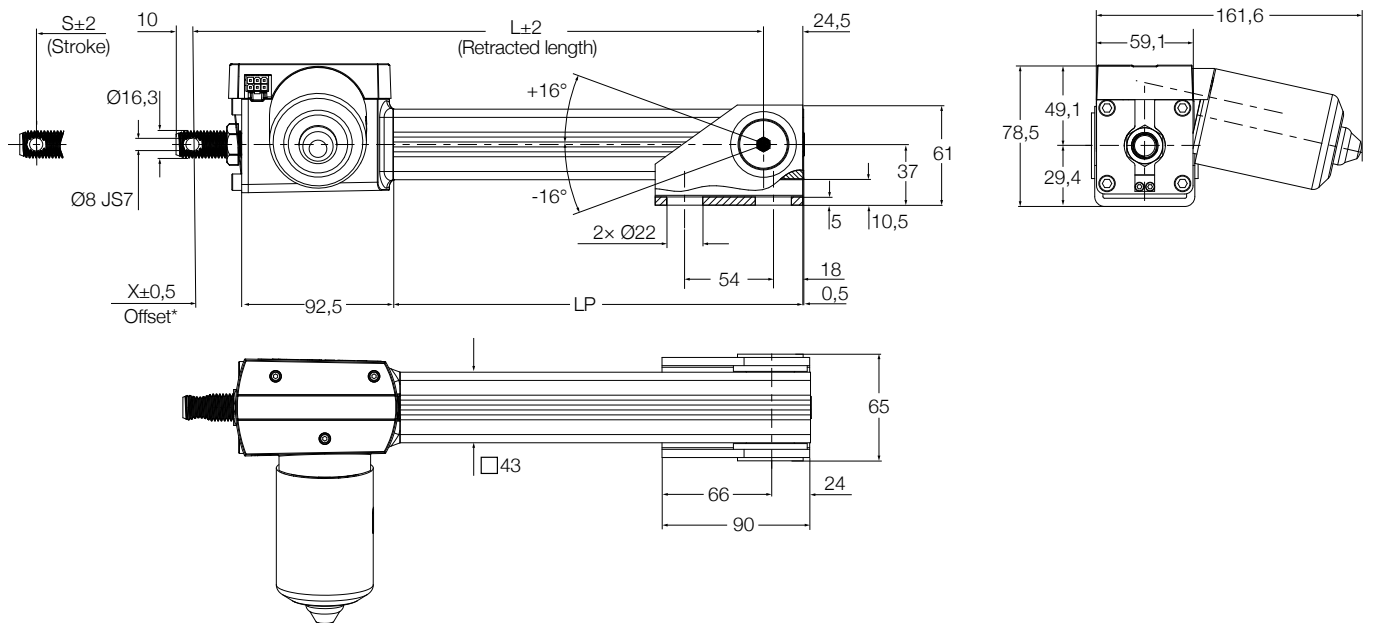


Retracted length:
 L = Stroke (S) + Offset (X) + 50 (long protection tube)
 L = Offset (X) + 150 (short protection tube)

* Standard Offset = 60

Long protection tube Short protection tube

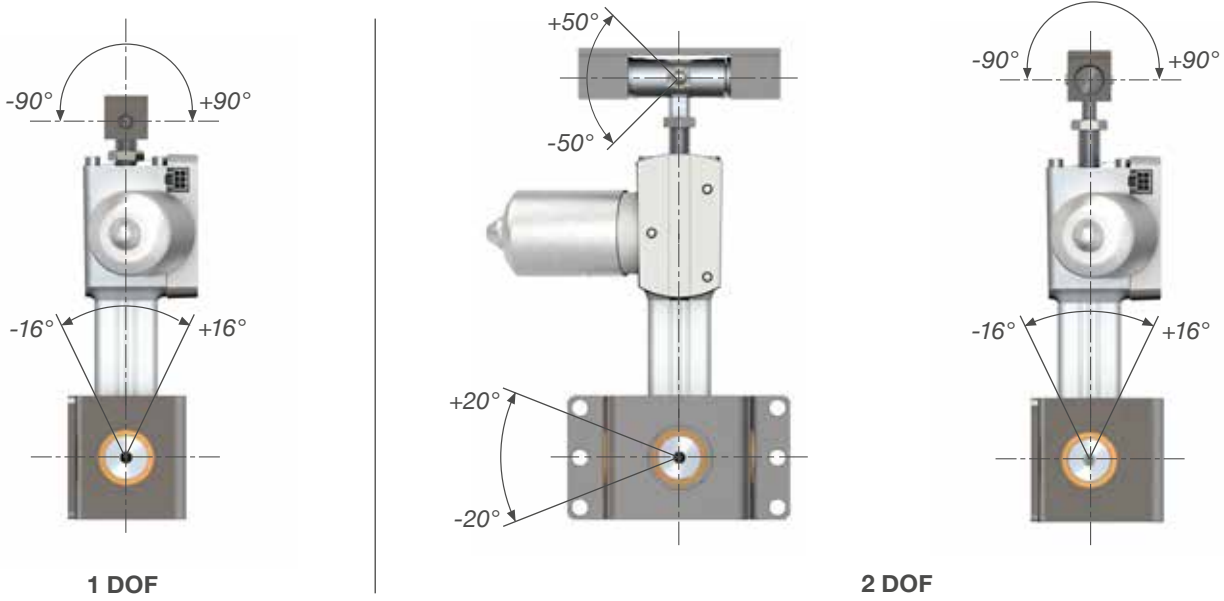
Rod with D8 JS7 bore (CAMT20-xxxxx-00x-DF-AFx-000)



Retracted length:
 L = Stroke (S) + Offset (X) + 68 (long protection tube)
 L = Offset (X) + 168 (short protection tube)

* Standard Offset = 30

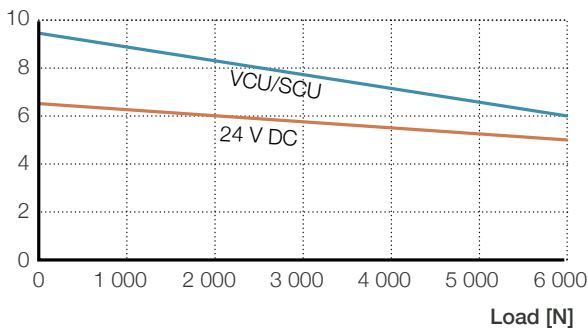
Motion angles of play front and rear attachments



Performance diagrams

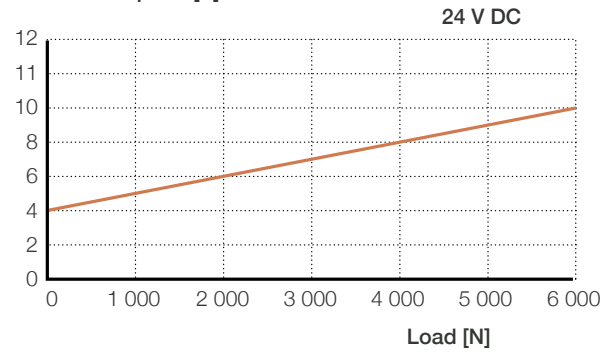
Speed-load diagram

Speed [mm/s]



Current-load diagram

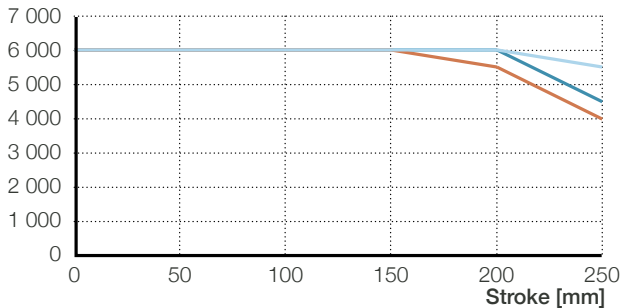
Current consumption [A]



Safety factor load conditions

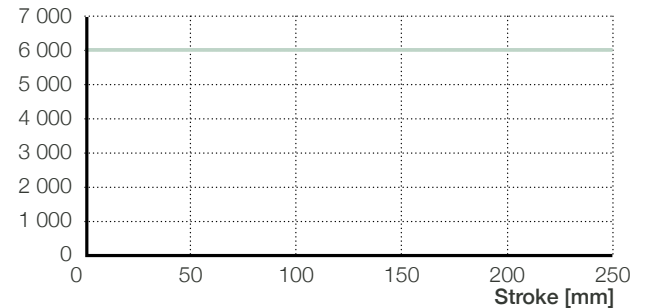
Push load reduction for static safety factor S=4 (IEC/UL 60601-1)

Load [N]



Safe push and pull load for static safety factor S=2.2 (IEC/UL 60601-2-46)

Load [N]



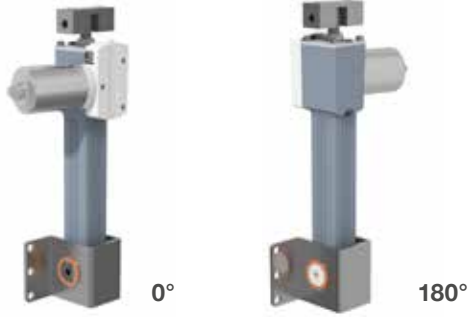
— Clevis attachment
 — 1 DOF attachment, with long protection tube ¹⁾²⁾

— 2 DOF attachment, with long protection tube ¹⁾
 — Valid for all CAMT configurations

¹⁾ No load reduction with short protection tube

²⁾ No load reduction for 1DOF U-bracket

Rear attachment orientation



Standard bracket (1 DOF and 2 DOF)

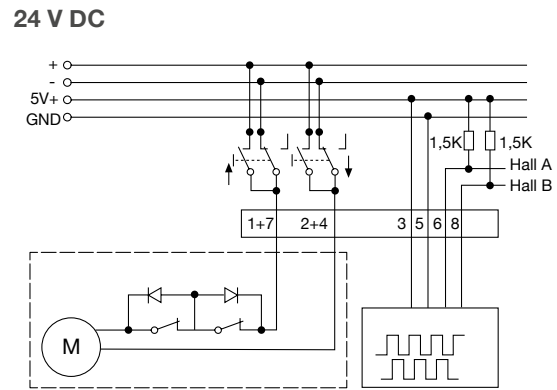


U-bracket (1 DOF)

Suitable control units and accessories

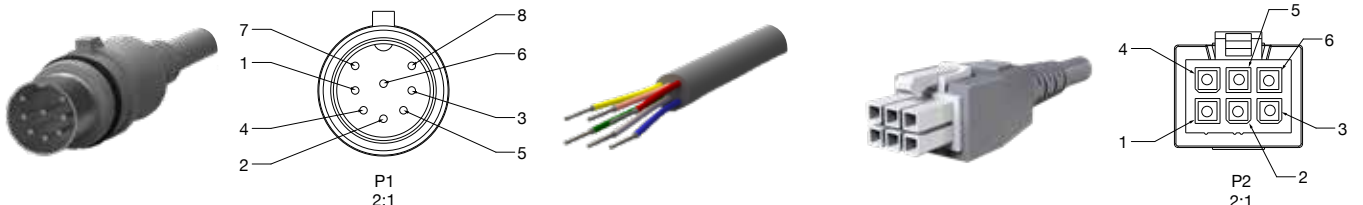
| | Control units | | | | | | | |
|---------------------------|---------------|-------|-------|-------|-------|-------|--------|-------------|
| | SCU 1 | SCU 5 | SCU 9 | VCU 5 | VCU 8 | VCU 9 | *BCU 5 | *BCU 8 |
| CAMT | • | • | • | • | • | • | • | • |
| Operating switches | | | | | | | | |
| EHA 3 | • | • | • | • | • | • | • | • |
| STJ | • | • | • | • | • | • | • | • |
| STE | • | • | • | • | • | • | • | • |
| Hand switch | Foot switch | | | | | | | Desk switch |

Connecting diagram



Encoder resolution 0,02127 mm/edge

Electrical connection



Plug P1: DIN-8 connector

Flying leads

Plug P2: Molex Mini-fit Jr. 6-pole

| Plug P1 | Wire color | Section | Function | Plug P2 |
|---------|------------|---------|----------------------|---------|
| 1+7 | Blue | AWG 16 | - on, + off | 4 |
| 2+4 | Red | AWG 16 | + on, - off | 1 |
| 3 | Pink | AWG 24 | + 5 V | 2 |
| 5 | Grey | AWG 24 | gnd | 5 |
| 6 | Yellow | AWG 24 | hall sensor 1 signal | 3 |
| 8 | Green | AWG 24 | hall sensor 2 signal | 6 |

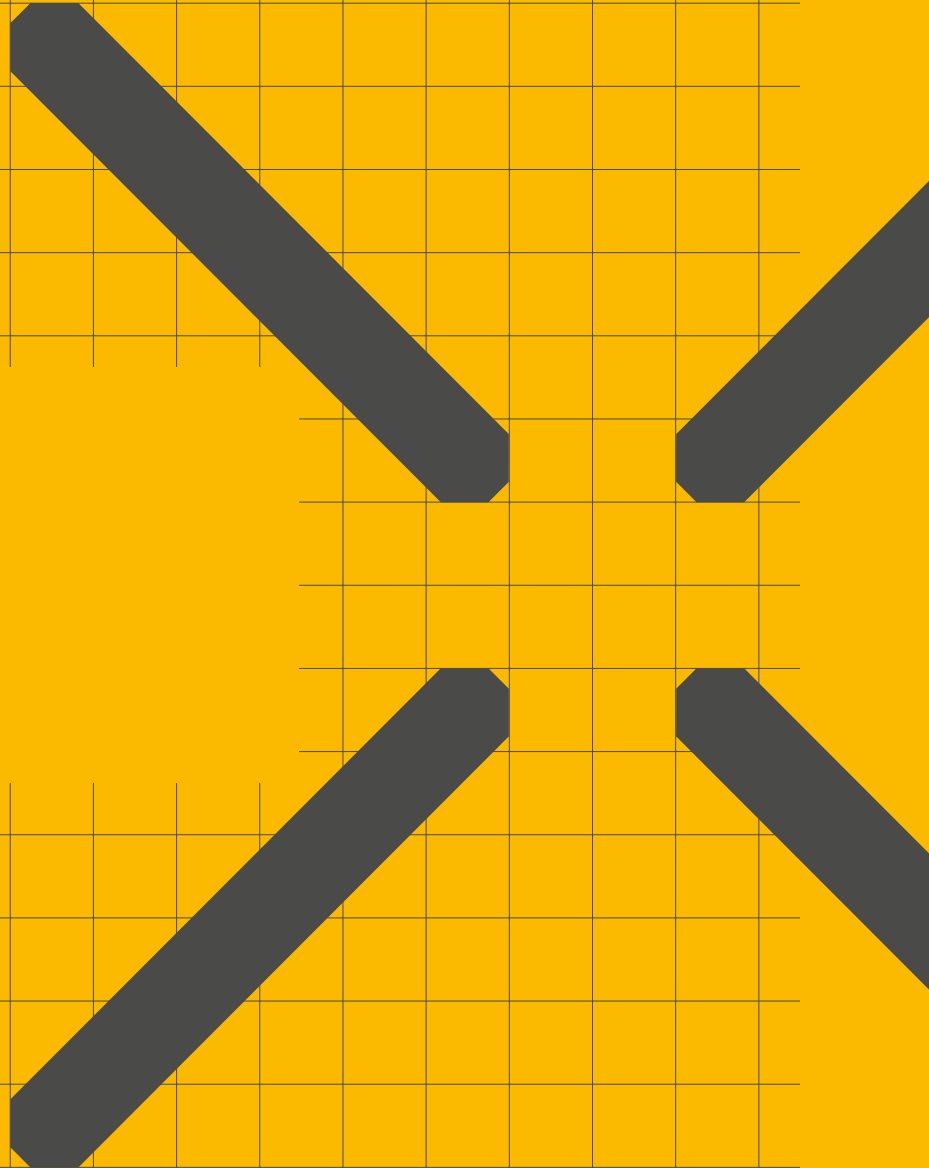
Ordering key

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|---|---|---|---|---|---|--|--|--|--|--|--|--|--|--|---|---|--|--|--|
| | | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">C</td> <td style="padding: 2px;">A</td> <td style="padding: 2px;">M</td> <td style="padding: 2px;">T</td> <td style="padding: 2px;">2</td> <td style="padding: 2px;">0</td> </tr> </table> - <table border="1" style="display: inline-table; border-collapse: collapse; width: 40px; height: 20px;"> <tr><td style="width: 10px; height: 10px;"></td><td style="width: 10px; height: 10px;"></td><td style="width: 10px; height: 10px;"></td></tr> </table> - <table border="1" style="display: inline-table; border-collapse: collapse; width: 40px; height: 20px;"> <tr><td style="width: 10px; height: 10px;"></td><td style="width: 10px; height: 10px;"></td><td style="width: 10px; height: 10px;"></td></tr> </table> - <table border="1" style="display: inline-table; border-collapse: collapse; width: 40px; height: 20px;"> <tr><td style="width: 10px; height: 10px;"></td><td style="width: 10px; height: 10px;"></td><td style="width: 10px; height: 10px;"></td></tr> </table> - <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">A</td> <td style="padding: 2px;">F</td> </tr> </table> - <table border="1" style="display: inline-table; border-collapse: collapse; width: 40px; height: 20px;"> <tr><td style="width: 10px; height: 10px;"></td><td style="width: 10px; height: 10px;"></td><td style="width: 10px; height: 10px;"></td></tr> </table> | C | A | M | T | 2 | 0 | | | | | | | | | | A | F | | | |
| C | A | M | T | 2 | 0 | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| A | F | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| Type | | | | | | | | | | | | | | | | | | | | | | |
| Load 2 6 000 N | | | | | | | | | | | | | | | | | | | | | | |
| Voltage 0 24 VDC | | | | | | | | | | | | | | | | | | | | | | |
| Stroke length 0 5 0 50 mm 1 0 0 100 mm 1 5 0 150 mm 2 0 0 200 mm 2 5 0 250 mm x x x Customised (10 mm steps) | | | | | | | | | | | | | | | | | | | | | | |
| Distance between front pivot and gear box (Offset "X", see dimensional drawing) 0 0 Standard x x Customised (10 mm steps) | | | | | | | | | | | | | | | | | | | | | | |
| Protection tube length (LP, see dimensional drawing) 0 0 S Short (shortest possible length) 0 0 L Long (lead screw covered when retracted) x x x Customised (10 mm steps) | | | | | | | | | | | | | | | | | | | | | | |
| Front attachment A Rod clevis D12 H7 bore B 1 DOF attachment C 2 DOF attachment D Rod with D8 JS7 bore | | | | | | | | | | | | | | | | | | | | | | |
| Rear attachment A Rear clevis D20 H7 bore 0° (only with long protection tube) B 1 DOF attachment 0° C 2 DOF attachment 0° D Rear clevis D20 H7 90° (only with long protection tube) E 1 DOF attachment 180° F 1 DOF U-bracket attachment 0° G 1 DOF U-bracket attachment 90° H 1 DOF U-bracket attachment 180° I 2 DOF attachment 180° | | | | | | | | | | | | | | | | | | | | | | |
| Mechanical options A Backup nut | | | | | | | | | | | | | | | | | | | | | | |
| Electrical options F End limit switches | | | | | | | | | | | | | | | | | | | | | | |
| Cable options A 1 m straight with DIN8 plug B 2,3 m straight with DIN8 plug C 2,3 m straight with flying leads 0 Without cable | | | | | | | | | | | | | | | | | | | | | | |

■ Options shown in red are only available on request. Contact Ewellix for more information on minimum quantities and additional costs.

8

Glossary and symbols



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 |
| IP | Degrees of protection provided by enclosures, according with IEC standard 60529 |
| 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 Max. linear speed | The linear speed is the change in position as a function of time. 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 |

| 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 characterized 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 sinking 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 first 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 |

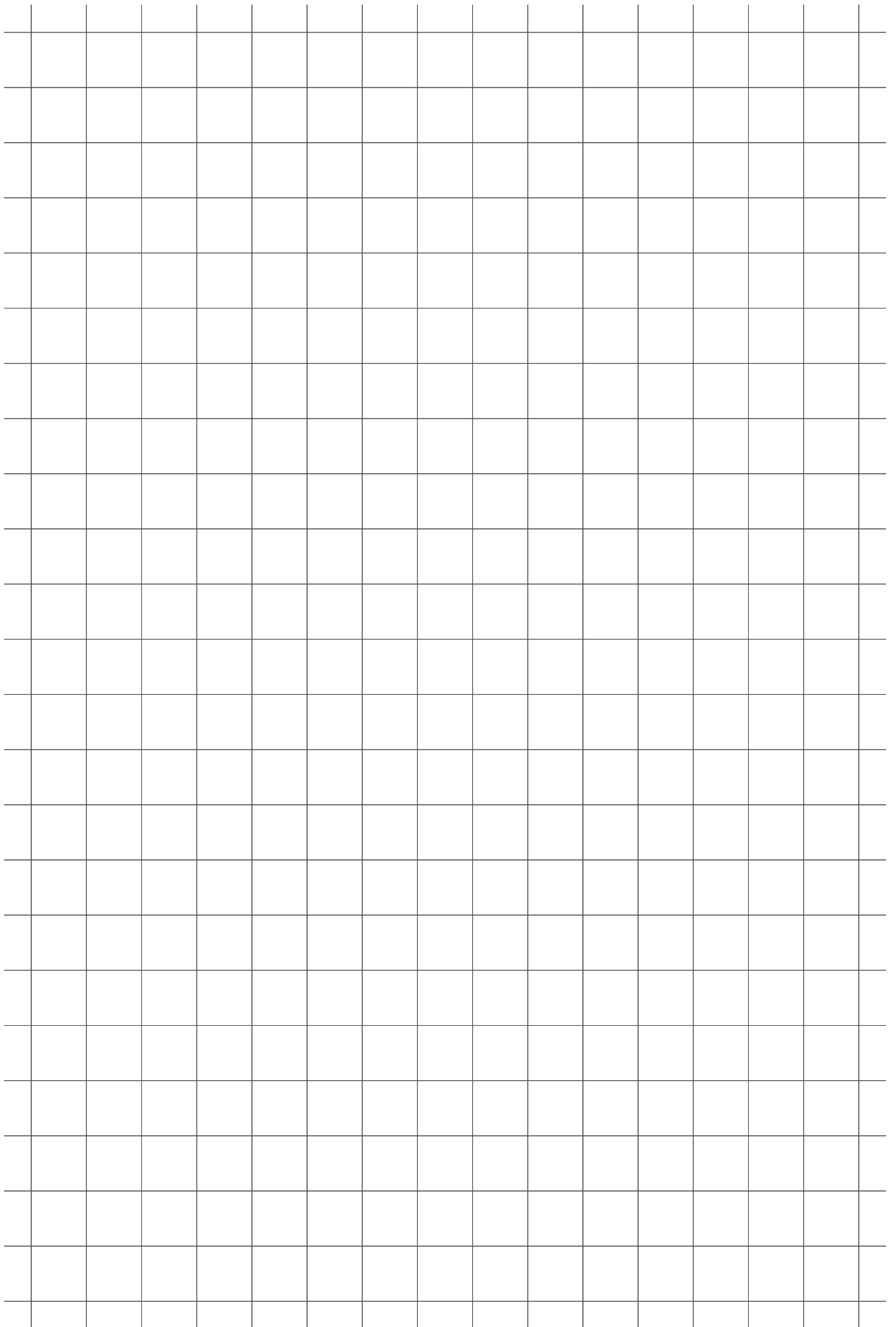
| | |
|-----------------------|---|
| T | |
| Thermal load | The thermal load describes the force which the actuator can permanently move without overheating. The thermal load is calculated by a formula in respect of changing load conditions over different time phases of a full motion cycle. |
| Torque | 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 |

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 _{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 |
| 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} | $^{\circ}\text{C}$ | 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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