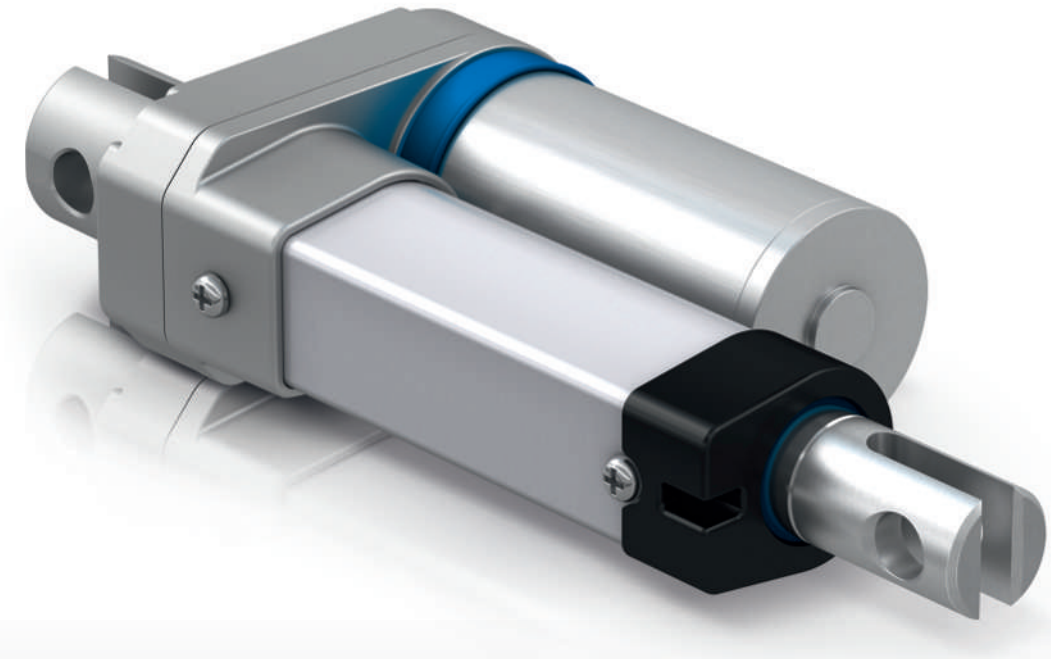


EWELLIX

EWELLIX Linear Actuator

CAHB-10

User Manual

We pioneer motion

SCHAEFFLER

Contents

1 About the manual

1.1 Information in this user manual

This manual provides important information on how to work with the device safely and efficiently.

The manual is part of the device, must always be kept in the device's direct proximity and should be available for personnel to read at any time. All personnel working with the device must read and understand this manual before starting any work. Strict compliance with all specified safety notes and instructions is a basic requirement for safety at work.

Moreover, the accident prevention guidelines and general safety regulations applicable at the place of use of the device must also be complied with.

1.2 Symbols

Safety precautions are identified by symbols and signal words as shown. The signal words indicate the severity of the hazard and the chance it could occur. Follow these safety precautions and act cautiously in order to avoid accidents, personal injury and damage to property.

The warning and hazard symbols are defined in accordance with ANSI Z535.6-2011.

1 Warning and hazard symbols

Signs and descriptions	
⚠ DANGER	In case of non-compliance, death or serious injury will occur.
⚠ WARNING	In case of non-compliance, death or serious injury may occur.
⚠ CAUTION	In case of non-compliance, minor or moderate injury may occur.
NOTICE	In case of non-compliance, damage or malfunctions in the product or the adjacent construction may occur.

1.3 Signs

The warning, prohibition, and mandatory signs are defined in accordance with DIN EN ISO 7010 or DIN 4844-2.

2 Warning, prohibition, and mandatory signs

Signs and descriptions	
	General warning
	Electrical voltage warning
	Hand injury warning
	General mandatory sign

1.4 Availability

A current version of this manual is available at:
https://www.schaeffler.de/std/2243

Ensure that this manual is always complete and legible and is available to all persons engaged in transporting, fitting, dismantling, commissioning, operating, or maintaining the product.

Keep the manual in a safe place for immediate reference.

1.5 Legal notices

The information in this manual reflects the status at the time of publication.

Unauthorized modifications to or improper use of the product are not permitted. Schaeffler accepts no liability in these cases.

1.6 Limitation of liability

All information and notes in this manual were compiled with due consideration given to applicable standards and regulations, the present state of technology and our years of knowledge and experience.

The manufacturer is not liable for any damage resulting from:

- disregarding this manual
- unintended use
- employment of untrained personnel
- unauthorized conversions
- technical changes
- manipulation or removal of the screws on the drive
- use of unapproved spare parts.

Where the device has been customized, the actual product delivered may be different from what is described in this manual. In this case, ask Schaeffler for any additional instructions or safety precautions relevant to these devices.

We reserve the right to make technical modifications to the device to improve usability.

1.7 Warranty terms

The manufacturer's warranty terms apply.

1.8 Customer service

Schaeffler Customer Service is available at any time to assist with technical information and inquiries. The responsible contact person can be reached by telephone, e-mail, or via the Internet, see manufacturer's address on the back cover. Our employees are also always interested in receiving new information and practical experience. This information and experience helps us improve our products.

1.9 Images

The images in this manual may be schematic diagrams and differ from the supplied device.

2 General safety regulations

This chapter provides an overview of important safety measures and information necessary for safe and trouble-free installation, operation and maintenance.

Disregarding this manual and safety precautions specified therein may result in considerable danger and possible serious injury or death.

2.1 Intended use

The actuator has been developed and manufactured exclusively for the purpose described in this manual.

Safety information

⚠ WARNING

Misuse

Any use of this device beyond its intended purpose may result in a potentially hazardous situation. Therefore:

- Strictly adhere to all safety information and instructions in this manual.
- Avoid the following ambient conditions: strong UV rays, corrosive or explosive air media, and other aggressive media.
- Do not manipulate, retool or modify components of the device.
- Always use the device within the technical application limits and operating limits.

⚠ WARNING

Incorrect installation, operation or maintenance

Any use of this device beyond its intended purpose may result in a potentially hazardous situation. Therefore:

- Only use qualified, instructed and trained personnel who have read, understood and will follow the instructions in this manual.

2.2 Responsibility of the owner and user

The device is designed for commercial applications by its owner or processor.

The processor is the contracting partner of the reseller or the manufacturer. The processor installs the device in a complete system. The owner of the system is the user and therefore subject to the requirements of the German Occupational Health and Safety Act.

In addition to the safety instructions in this manual, the owner or processor must do the following concerning these safety guidelines, accident prevention guidelines and environmental protection regulations applicable to the site of the system's installation:

- Provide information about the applicable safety regulations.
- Use a risk assessment to determine additional hazards that are present due to the conditions at the site of use.
- Create appropriate work instructions based on the risk assessment to avoid the additional hazards.
- Check whether the work instructions created correspond to the current legal requirements and adapt them if necessary.
- Clearly set out responsibilities for installation, operation, maintenance and cleaning.
- Ensure that all employees working with the device have read and understood this manual.
- Provide employees with the necessary protective equipment.

The owner must train and inform employees about the hazards at regular intervals. Also, the owner or processors must ensure that the device is in good working condition. They must do the following:

- Ensure that the maintenance intervals outlined in this manual are observed.
- Have all safety devices regularly checked for correct functioning and completeness.

Any injury, damage or loss caused by a failure to follow the instructions in this manual will be the responsibility of the owner.

2.3 Personnel requirements

Operator duties:

- Ensure that only qualified and authorized personnel carry out the activities described in these instructions.
- Ensure that personal protective equipment is used.

Only persons who can be expected to reliably perform their tasks are permitted. Persons whose ability to react is impaired, e.g., due to drugs, alcohol, or medication, are not permitted.

2.3.1 Qualifications

The following qualifications are required for the various areas of activity listed in the manual:

Operator

The operator (a trained person) has been instructed by the customer on the assigned tasks and possible hazards in the event of improper conduct.

Qualified personnel

Qualified personnel meet the following criteria:

- product knowledge, e.g. by receiving training on how to use the device
- are fully familiar with the contents of this manual and, in particular, with all of the safety instructions
- are familiar with the relevant country-specific regulations

Qualified personnel are individuals who, due to their technical training, knowledge, and experience, as well as knowledge of the applicable standards and regulations are capable of performing the tasks assigned to them and independently recognizing and avoiding potential hazards.

Qualified electrician

An electrically skilled person, on the basis of their technical training, knowledge, and experience as well as familiarity with the applicable standards and regulations, is capable of performing work on electrical systems and of independently recognizing and avoiding potential hazards.

The electrically skilled person is trained for the specific place of use and is familiar with the applicable standards and regulations.

2.4 Hazards

This section lists the residual risks determined by the risk assessment.

Observe the safety instructions listed here and the warnings in the subsequent chapters of this manual to reduce health hazards and to avoid dangerous situations.

Danger to life caused by electric current

Touching conductive parts poses an immediate danger to life. Damage to insulation or individual components pose a danger to life. Therefore, observe the following:

- If the insulation is damaged, immediately switch off the power supply and have the parts repaired.
- Only qualified electricians are permitted to work on electrical systems.
- Before performing any work on the electrical system, disconnect the machine from the power supply.
- Before maintenance, cleaning or repair work, disconnect the power supply and secure it against reconnection.
- Do not bypass or disable fuses. When replacing fuses, ensure the correct current rating is used.
- Keep moisture away from conductive parts to prevent short circuits.

Danger of injury caused by moving components

Rotating or linearly moving components can cause severe injury. Therefore, observe the following:

- Do not work on moving components.
- Keep the entire body, hands and arms away from moving components.

2.5 Safety equipment

Safety information

The processor decides whether the application requires the installation of an emergency shut-off system:

Integration of an emergency shut-off system

Some applications require the integration of an emergency shut-off system. The device is intended exclusively for installation in an application system. It does not have its own operating control elements and does not have an independent emergency shut-off function. Observe the following:

- Install the device so that it is part of an emergency shut-off system and can be stopped if necessary.
- The emergency shut-off equipment must be connected in such a way that an interruption of the power supply or the reconnection of the power supply after an interruption cannot cause any danger to persons or property.
- Emergency shut-off equipment must always be freely accessible.

Safety function

In the standard version, the device has a thermal protection circuit integrated in the motor housing. This switch protects the motor from overheating.

NOTICE

Excessive temperature inside the actuator

Damage to the electronics and actuator failure

- Only operate the control switch if the temperature is lower than +95 °C / +203 °F)

2.6 Modifications to the device

To avoid hazardous situations and to ensure optimal performance, do not make any changes or modifications to the device that have not been specifically authorized by Schaeffler.

3 Scope of delivery

The scope of delivery comprises:

- Actuator
- Operating manual

3.1 Check for damage during transit

1. Check the product immediately upon delivery for any damage during transit.
2. Do not accept delivery, or only accept it with reservation, if transport damage is found.
3. Record the extent of damage on the transport documents or the carrier's delivery note.
4. Report any damage during transit promptly as a complaint to the carrier.

Report any damage as soon as it is discovered. Claims for damages can only be made within the applicable claim period stipulated by the transport company.

3.2 Check for defects

1. Check the product immediately upon delivery for any visible defects.
2. Check the product for completeness immediately upon delivery.
3. Report any defects promptly to the distributor of the product.
4. Do not put damaged products into operation.

4 Product description

The actuator should be used only for dynamic centric compression or tensile-loaded lifting of a load.

Benefits

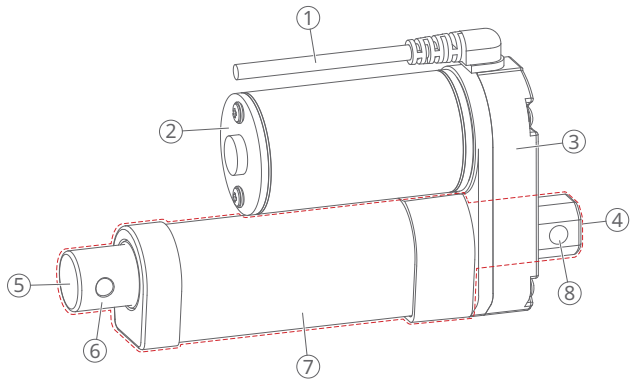
- designed and tested under demanding conditions
- reliable and cost-effective
- reduced overall set time
- virtually maintenance-free

4.1 Function

Operating principle

The actuator principle is based on push or pull functions. The push tube is used to perform a pushing or pulling movement.

1 Components



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1	Cable	2	Motor
3	Gearbox	4	Linear unit
5	Front attachment	6	Push tube
7	Guiding tube	8	Rear attachment

Components

The actuator consists of a motor and a linear unit, which are connected to each other by a gearbox. The motor and the linear unit are attached to the gearbox with screws.

Motor

The motor is operated with 12 V or 24 V DC voltage. A single spur gear is attached to the motor shaft. The lift speed depends on the load. The motor is enclosed in a metal housing. The metal housing cannot be opened.

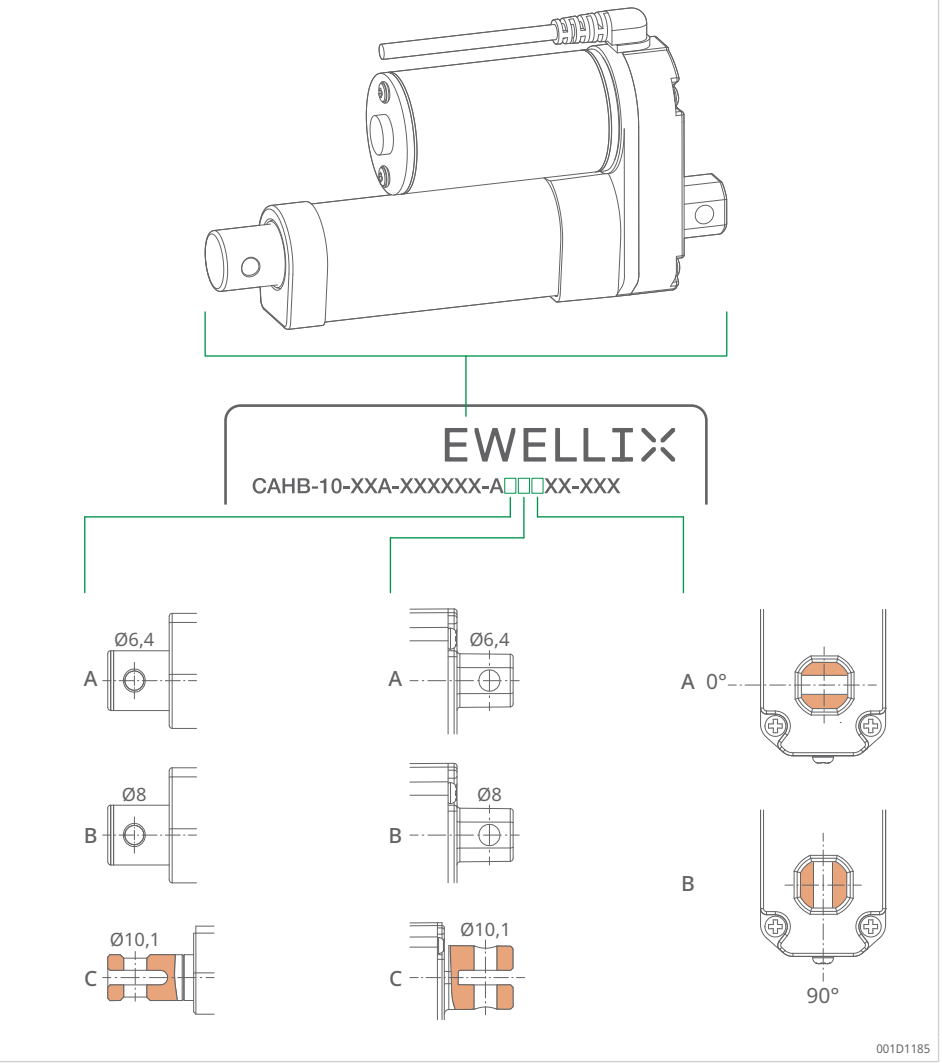
Gearbox

The motor shaft drives a spur gear that is connected to a trapezoidal spindle nut. The spindle nut on the sliding spindle converts the rotation into a linear movement. Different gear ratio options are available. The speed and linear force that can be achieved depend on the selected gear ratio.

Linear unit

The motor drives the push tube via the gearbox. The push tube of the linear unit and thus the front attachment extends and retracts. The inside of the linear unit is surrounded and protected by a guiding tube. The linear unit is attached to the gearbox with several screws. These screws must not be loosened or removed.

2 Actuator attachments



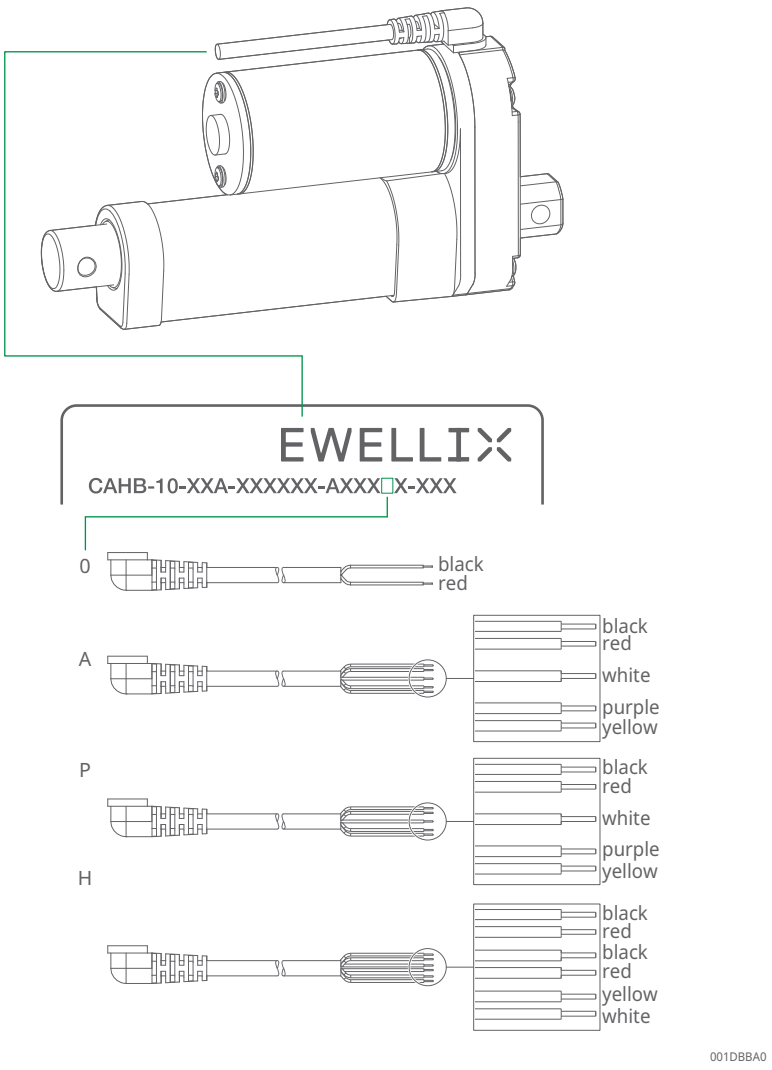
An actuator can be ordered with different actuator attachments. The front and rear attachments do not need to be identical. An actuator attachment is either a rod end with hole or a fork head with hole. Customer-specific actuator attachments are identified with an X in the type key.

An actuator is supplied with the actuator attachment holes aligned at either 0° or 90°. The alignment cannot be changed and must be specified at the time of ordering.

Connections

The actuator is connected to the application by means of the movable front attachment and the rigid rear attachment.

3 Cable



0	Basic configuration	A	Absolute analog position sensor
P	Potentiometer	H	2-Hall encoder

The cable type is determined by whether or not a sensor is fitted. The red and black stranded wires with a cross-section of 0.5 mm^2 (20 AWG) for connection to the power supply are always present. If a absolute analog position sensor, potentiometer or 2-Hall encoder is fitted, stranded wires with a cross-section of 0.14 mm^2 (26 AWG) are also present.

4.2 Special characteristics

Unless otherwise specified, the listed options are available for the entire device series:

- compact and robust design according IP66S/IP69K, wide temperature range and corrosion resistant
- integrated limit switches
- thermal protection due to integrated thermal switch
- optional: potentiometer
- optional: 2-Hall encoder
- optional: absolute analog position sensor

4.2.1 Limit switches

The limit switches in the linear unit stop the movement of the actuator at the end positions. The end positions can be set to a value lower than the default value at the factory. To request this, please contact Schaeffler before placing your order.

4.2.2 Thermal switch

The thermal switch in the motor prevents thermal overload by switching off the motor when the temperature is too high.

Safety instructions

NOTICE

Excessive temperature inside the actuator

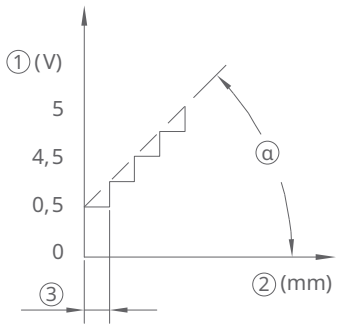
Damage to the electronics and actuator failure

- Only actuate the actuator if the temperature inside the actuator is less than +95 °C / +203 °F.

4.2.3 Absolute analog position sensor

The absolute analog position sensor is a contactless magnetic sensor for multi-pole ring magnets. It provides a signal indicating the position of the actuator. The DC voltage of the output is between 0 V and 5 V with a current of max. 5 mA. The electrical data and the resolution are available in the *Technical Information* chapter ➤32|13. Information on connecting the stranded wires is available in the connection plan in the *Technical Information* chapter ➤32|13.

4 Dependency of the output signal from the position

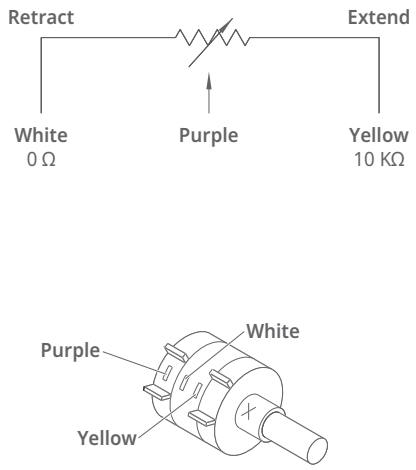


1	Output signal	2	Position
3	Resolution	α	tan (alpha) = Ratio of output signal to position in V/mm

4.2.4 Potentiometer

The potentiometer provides a signal indicating the position of the actuator. When connecting the actuator to the potentiometer, the stranded wire colors must be taken into account. The stranded wire colors are white, purple and yellow.

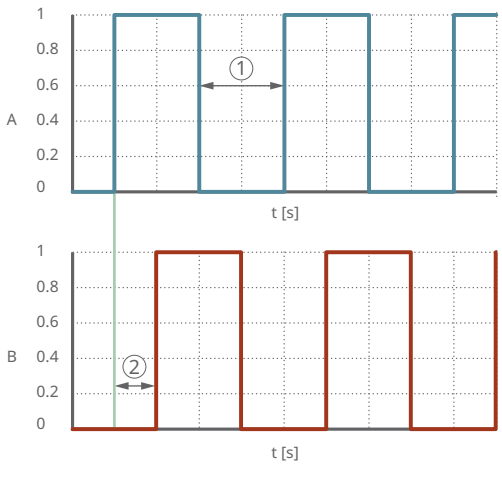
5 Potentiometer



4.2.5 2-Hall encoder

The optional 2-Hall encoder provides a signal indicating the position of the actuator. This encoder is equipped with two Hall sensors with an electrical shift of 45°. The sensors are located on a printed circuit board and read a 4 poles magnetic ring. Hall sensors have an open collector output. Hall sensors must provide two signal outputs with the following characteristics:

6 Encoder signal



1	Duty cycle	2	Phase difference

5 Transport and storage

Safety information

⚠ CAUTION

Damage due to improper transport

Significant property damage

- Proceed with caution when unloading the packaged goods, during delivery and during transport to the destination.
- Observe the symbols and instructions on the packaging.
- Do not remove the device from the packaging until immediately before assembly.
- Observe the ambient conditions for return transport to the manufacturer.

5.1 Transport

Safety instructions

NOTICE

Delayed reporting of damage

Rejection of claims for damages. Claims for damages can only be asserted within the carrier's complaint time limit.

- Report all damage immediately after detection.

On delivery, check immediately for completeness and transport damage. Return the device to the manufacturer if cracks have formed in the housing during transport.

To check that the delivery is complete, perform the following:

- Inspect the exterior of the device.

If the device has been damaged during transport, proceed as follows:

- Reject acceptance or only accept the product subject to reservations.
- Document the extent of the damage on the shipping documents or the delivery note provided by the shipping company.
- Submit a complaint.

Safety instructions

If you are intending to dispose of the packaging:

⚠ CAUTION

Improper disposal

Environmental damage

- Dispose of packaging material in an environmentally friendly manner
- Observe the local disposal regulations

The original packaging is intended to protect the parts from transport damage, corrosion and other damage until they are ready for installation. Therefore, do not destroy the packaging and only remove the device shortly prior to installation.

Keep the packaging in case of return shipment to the manufacturer. If the original packaging is no longer available, package the parts according to the expected transport conditions.

5.2 Storage

Observe the following during storage:

- Pack the device in its original packaging. Take ambient conditions into account ➤35|13.3.

5.3 Return shipment to the manufacturer

Proceed as follows for the return transport:

- If necessary, remove the actuator ➤30|12.
- Pack the actuator in its original packaging.
- Return to the manufacturer. Contact Schaeffler for the delivery address.

6 Assembly

Authorized personnel

Only qualified persons may carry out assembly and initial commissioning. Only qualified electricians are permitted to work on electrical systems.

Safety information

DANGER

Touching live electrical components

Electric shock

- Ensure that the power supply is switched off before starting the assembly

WARNING

Unexpected movements of the actuator

- Ensure that the actuator is locked out before starting the assembly process.

WARNING

Switching on the power supply without authorization

Electric shock during troubleshooting. Switching on the power supply is life-threatening for people in the danger zone.

- Switch off the power supply before starting work and secure it against being switched on again.

CAUTION

Incorrect installation of the optional devices

- If optional devices are installed or components have been retrofitted, they may only be installed in accordance with the circuit diagram in the respective manual.
- Electromagnetic compatibility during installation must be checked and the measures described in the respective manual must be taken.

6.1 Site

Observe the operating conditions, see *Technical Information* ➤32|13. During installation, ensure that the device is not exposed to strong UV rays or corrosive or explosive air media.

6.2 Installation

The actuator is attached as follows: by means of the front attachment and the rear attachment.

Safety instructions

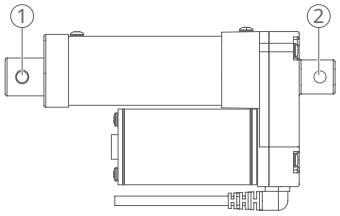
For the dimensions of the mounting holes for fastening bolts, see *Technical Information* ➤33|13.1.

Please note the following during assembly:

- Ensure that side impacts or torques are avoided during assembly.
- Screws must not be used.
- Select the fastening bolt material in accordance with the load exerted by the application.
- Never loosen or manipulate screws on the actuator or on optional devices.

To attach the actuator, perform the following:

7 Attachment



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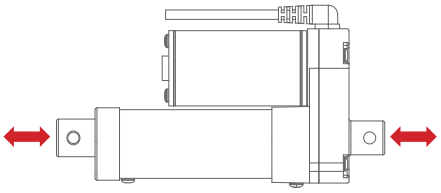
1	Front attachment	2	Rear attachment

1. Connect the front attachment and the rear attachment to the corresponding elements of the application.
2. Properly secure the fastening bolts.
3. Align the actuator so that the force applied always has a concentric effect on the shaft.



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4. Ensure that the actuator is not blocked in its movement during the entire stroke.
5. Ensure that the cable is not squeezed, clamped or pulled.
6. Connect the actuator to the power supply ➤21|7.2.
7. Ensure that none of the stranded supply wires nor the stranded wires for potentiometer or 2-Hall encoder or absolute analog position sensor are clamped by the application's sequences of movements or during extension and retraction of the actuator.

7 Commissioning

7.1 Inspections prior to initial commissioning

Before initial commissioning, a qualified electrician must carry out the following checks and determine measured values and document both:

1. visual inspection
2. functional testing of operating functions and safety functions
3. measured value of the protective conductor resistance
4. leakage currents check
5. measured values of the insulation resistance.

For information on maintenance, see the chapter entitled *Maintenance* ➤27 | 11.

7.2 Connecting the power supply

Safety instructions

⚠ DANGER

Improper installation

Electric shock

- Only qualified electricians are permitted to work on electrical systems.

To be performed by a qualified electrician

To connect the actuator to the power supply:

1. Note that the stranded supply wires have a cross-section of 0.5 mm² (20 AWG). Stranded wires for the 2-Hall encoder are also red and black, but have a cross-section of 0.14 mm² (26 AWG).
2. Connect the stranded supply wires to the power supply.

Depending on the polarity, the actuator extends or retracts.

▦3 Connecting the power supply

	Wire, red	Wire, black	Actuator, action
I	-	+	Extend
II	+	-	Retract

8 Operation

Safety information

⚠ CAUTION

Moving actuator

Hand injuries due to crushing

- Ensure that there are no persons in the stroke area of the actuator during operation.
- Observe the information on the product label.
- Never manipulate the elements connected to the actuator while the actuator is in operation.

⚠ CAUTION

Contact with actuator attachments

Crushing wounds

- Ensure that neither objects nor body parts come into contact with the actuator attachments.

NOTICE

Static and dynamic overload

Damage to the device

- Observe the maximum permissible values, see *Technical Information*.
- Do not exceed the nominal value.
- Never manipulate the elements connected to the actuator during operation.

NOTICE

Ingress of fluids

Damage to the device if fluids penetrate during retraction or extension

- Keep fluids away.

NOTICE

Overheating

Device failure due to damage to the electronics

- Only use the integrated thermal switch of the control system.
- Never exceed the rated load, see *Technical Information*.
- Observe the max. operating time and break until the next operation sequence, see *Technical Information*.

8.1 Before operation

Before operating the device, ensure that there are no persons or objects in the stroke area of the actuator.

8.2 Normal operation

In normal operation, the actuator raises and lowers elements that are connected to the actuator via the actuator attachments.

The actuator can be connected directly to the electric grid or controlled via a control element.

The actuator is extended or retracted as long as voltage is supplied or until the actuator is fully extended or retracted.

Prevent the actuator from fully extending or retracting by turning off the power supply before the end of the stroke or by setting the external limit switch accordingly. The external limit switch has to cut off the power supply to the actuator immediately when the limit switch is activated before the actuator is fully extended or retracted.

Any component that can perform the function described above can be used.

Safety instructions

DANGER

Improper installation

Electric shock due to contact with live electrical components

- Only qualified electricians are permitted to work on electrical systems.

NOTICE

Overheating

Device failure due to damage to the electronics

- Only use the integrated thermal switch of the control system.
- Never exceed the rated load, see *Technical Information*.
- Observe the max. operating time and break until the next operation sequence, see *Technical Information*.

8.3 Emergency switch off

In hazardous situations, all movements of the actuator must be stopped as quickly as possible and the power supply turned off.

In hazardous situations, proceed as follows:

- If necessary, activate the emergency shut-off immediately or interrupt the power supply.
- Evacuate persons from the danger zone.
- Initiate first aid measures.
- Inform the person responsible on site.
- Keep access routes for emergency vehicles clear.
- Depending on the severity of the emergency, notify the authorities if necessary.
- Have qualified personnel carry out the repair.

Safety information

WARNING

Malfunction of the device or non-functional safety equipment

- Ensure that all safety devices are installed and fully functional.
- Before restarting, check the actuator and the application that uses the actuator.
- Before restarting, make sure that all persons are outside the danger zone.

8.4 After use

- Disconnect the device from the power supply.

9 Troubleshooting

This chapter describes possible causes for malfunctions and the measures required to restore the function.

In the event of frequent malfunctions, shorten the maintenance intervals.

If a malfunction cannot be rectified with the measures described, contact Schaeffler Service.

Authorized personnel

- Unless otherwise specified, the operator can carry out work to rectify malfunctions.
- Some work may only be carried out by qualified personnel who are specified separately in the respective failure description.
- Only qualified electricians are permitted to carry out work on the electrical system.

Safety information

DANGER

Touching live electrical components

Electric shock

- Ensure that the power supply is switched off before starting the troubleshooting.

WARNING

Unexpected movements of the actuator

- Ensure that the actuator is locked out before starting the troubleshooting.

WARNING

Switching on the power supply without authorization

Electric shock during troubleshooting. Switching on the power supply is life-threatening for people in the danger zone.

- Switch off the power supply before starting work and secure it against being switched on again.

WARNING

Improper repair

- Never loosen the screws on the device.
- Never attempt to open the device.
- In the event of a failure of the device that cannot be rectified by the steps in the overview of malfunctions, disassemble the actuator and send it to Schaeffler for repair.

Procedure in the event of malfunctions

If a malfunction occurs:

- If the malfunction poses an immediate danger to persons or assets: switch off the actuator or control unit immediately and secure against restart.
- Determine the cause of the malfunction.
- Depending on the type of malfunction, have the actuator repaired by qualified personnel if necessary.
- Inform the persons responsible on site about the malfunctions.

Refer to the *Troubleshooting* table to determine who is authorized to remedy the malfunction.

4 Troubleshooting

Error	Possible cause	Remedy	To be carried out by
The actuator does not move.	No power voltage available	▸ Check the grid	Qualified electrician
	Missing plug contact or plug not inserted correctly	▸ Check the plug contacts of the device control unit ▸ Check power supply ▸ Check control element, e.g. DPDT switch, relay or H-bridge, and control element, e.g. push button switch, hand switch or foot switch	Operator
	Power supply failed	▸ Check the components of the power supply for damage and replace defective elements: • Power cable and power plug • Actuator control unit	Qualified electrician
	Obstacle in the stroke area of the actuator	▸ Remove all obstacles in the stroke area	Qualified personnel
	Incorrect load	▸ Measure the static and dynamic load and compare it with the information on the type plate ▸ If the load is exceeded, replace the device	Qualified personnel
	The device cannot be set in motion by any of the above measures	▸ Replace the device	Qualified personnel
Drive does not move	Obstacle in the stroke area of the drive	▸ Remove all obstacles in the stroke area	Operator
	Incorrect load	▸ Remove loads on the drive	Operator
	Spindle nut defective	▸ Replace the device	Qualified personnel
Markedly reduced speed	Obstacle in the stroke area of the drive	▸ Remove all obstacles in the stroke area	Operator
	Incorrect load	▸ Remove loads on the drive	Operator
	Defective motor, gear or spindle nut	▸ Replace the device	Qualified personnel
Very loud running noise	Obstacle in the stroke area of the drive	▸ Remove all obstacles in the stroke area	Operator
	Incorrect load	▸ Remove loads on the drive	Operator
	Defective motor, gear or spindle nut	▸ Replace the device	Qualified personnel

9.1 Startup after correcting a malfunction

The device is not designed to be repaired by the customer. In any case, please contact Schaeffler.

Once the malfunction has been corrected:

▸ Before restarting, carry out the steps described in the Assembly and Commissioning sections.

10 Decommissioning

- Disconnect the actuator from the control unit.

11 Maintenance

Authorized personnel

- Unless otherwise specified, the operator may perform the work described here.
- Some work may only be carried out by qualified specialist personnel, which is specified separately in the respective maintenance description.
- Only qualified electricians are permitted to work on electrical systems.

Safety information

DANGER

Improper maintenance

Electric shock due to contact with live electrical components

- Only qualified electricians are permitted to work on electrical systems.

WARNING

Switching on the power supply without authorization

Electric shock during troubleshooting. Switching on the power supply is life-threatening for people in the danger zone.

- Switch off the power supply before starting work and secure it against being switched on again.

11.1 Maintenance plan

The following sections describe the maintenance work required for optimum and trouble-free operation. If increased wear is detected during regular inspections, shorten the maintenance intervals according to the actual signs of wear.

If the linear actuator is used in conditions other than the ambient conditions specified in this manual, check the components once a month for changes such as oxidation or deposits.

5 Maintenance schedule

Maintenance interval	Maintenance work	Carried out by
Daily	▸ Check device for visible damage. ▸ Remove dust and dirt if necessary.	Operator
Monthly	▸ Check operating functions and safety functions. ▸ Check that the actuator is securely mounted at the actuator attachment. If necessary, retighten the bolts at the actuator attachments.	Qualified personnel
Annually	▸ Check connections for secure fit.	Qualified electrician
To be defined by the processor	▸ Visually inspect the condition of the permanent safety device and the wire routing within the application. ▸ Wire routing elements must not be loose or damaged.	Qualified personnel

11.2 Maintenance work

The devices are maintenance-free throughout their service life.

11.2.1 Cleaning

To be performed by the operator

If the device is dirty, clean it immediately to prevent residue from forming.

Safety information

NOTICE

Damage due to improper cleaning

Improper cleaning of the device may cause damage to the device.

- Do not use aggressive cleaning agents. Wash water, including chemical additives, must be pH-neutral.
- Only use cleaning agents specified by the manufacturer.
- Do not use steam cleaners or high-pressure cleaners.
- Other cleaning agents or cleaning devices may only be used with the manufacturer's approval.
- When retracting or extending, the actuator must not come into contact with liquids.

Observe the following points when cleaning:

- Disconnect the device from the power supply.
- Clean dirty parts. Use a damp cloth.

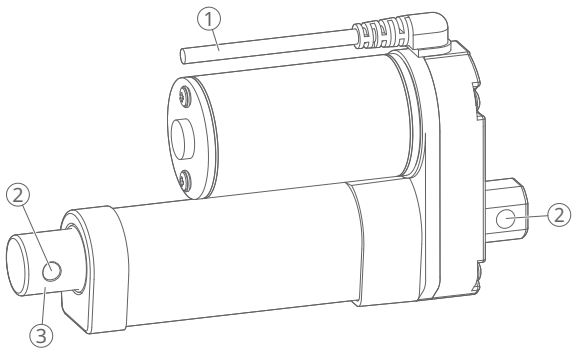
11.2.2 Visual inspection

Performed by qualified personnel

To perform the visual inspection:

1. Disconnect the actuator from the power supply.

8 Visual inspection



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1	Cable	2	Hole
3	Push tube		

2. Inspect the cable for cracks, cuts and crushing.
3. Inspect the holes of front and rear attachment for cracks, deformation and broken parts.
4. Inspect the push tube for scratches and depressions.
5. Inform the processor or manufacturer of any visible external damage.
6. If there is no visible external damage and the processor or the manufacturer has no concerns, reconnect the actuator to the power supply.

11.2.3 Checks and readings

Performed by a qualified electrician.

Observe the following for checks and readings:

- All checks and readings must be carried out in accordance with the applicable standards and regulations.
- All checks must be documented in a maintenance log.

11.2.4 Service log

Enter the following in the maintenance log:

- name of the executing body (company, department)
- names of the staff on duty
- identification of the device or system (type, serial number, inventory number) and the respective accessories
- completed inspections and measurements
- scope and results of the inspections
- measurement method, measuring device, measuring results of the readings
- overall assessment and verification of all functions compared to specifications
- date and signature of the person performing the inspection, personal encoding is possible for IT applications.

11.3 Measures following completed maintenance

After completing the maintenance work, perform the following steps before recommissioning the device:

1. Ensure that all tools, material and other devices used during maintenance have been removed from the work area.
2. Clean work area and remove any spilled fluids, process media, etc.
3. Ensure that all system safety measures are working properly.
4. Check functions against product specifications.
5. Document inspections in the maintenance log.

12 Dismantling

Personnel

Dismantling may only be carried out by qualified personnel.

Only qualified electricians are permitted to work on electrical systems.

Safety instructions

DANGER

Touching live electrical components

Electric shock

- Ensure that the power supply is switched off before starting the dismantling.

WARNING

Unexpected movements of the actuator

- Ensure that the actuator is locked out before starting the dismantling process.

WARNING

Loosely stacked components or components or tools placed on the floor

Risk of tripping

- Ensure that the workstation is clean and tidy.
- Secure components in such a way that the components cannot fall down or tip over.

WARNING

Insufficient information

Improper dismantling

- Dismantle the components in accordance with the applicable local regulations.
- For any questions or concerns, please contact Schaeffler.

WARNING

Sharp-edged components such as pins and corners on the individual components or on required tools

Severe cuts

- Ensure that there is sufficient space for the disassembly
- Handle sharp-edged components with care.

To carry out the disassembly, perform the following:

- Disconnect the actuator from the power supply ➤22|8.2 ➤23|8.3.
- Secure the application elements in such a way that no load can be exerted on the actuator attachments.
- Loosen and remove the fastening bolts, remove the front attachment and rear attachment from the application elements.
- Clean the actuator.
- Pack everything carefully for shipping to the manufacturer ➤17|5.1.

12.1 Disposal

Provided that no take-back agreement or disposal agreement has been put in place, the disassembled components should be recycled. How to dispose of the product:

- Dispose of metal parts and plastic components at an appropriate recycling center.
- Sort the remaining components separately according to the respective materials and dispose of them according to the applicable local regulations for occupational health and safety and the environment.

Safety information

⚠ CAUTION

Improper disposal

Environmental damage

- Electronic waste, electronic components, lubricants and other additives must only be disposed of by approved specialist companies.

The local municipal authorities or specialized waste management companies can provide information concerning environmentally appropriate disposal.

13 Technical data

Detailed information:

LA 1 | Lifting and Actuating Systems |
https://www.schaeffler.de/std/222A

6 Technical data CAHB-10

Characteristic	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	1000	1500
Rated pull force	N	120	240	500	750	1000	1500
Holding force [1]	N	2500	2500	2500	2500	2500	2500
Speed (full load ... no load)	mm/s	45 ... 56	24 ... 30	13 ... 16	8 ... 10	6 ... 8	5 ... 8
Stroke S	mm	50 ... 300	50 ... 300	50 ... 300	50 ... 300	50 ... 300	50 ... 300
Voltage	V DC	12 / 24	12 / 24	12 / 24	12 / 24	12 / 24	12 / 24
Rated consumption DC 12 V	A	4	3.5	3.2	3	2.8	4.4
Rated consumption DC 24 V	A	2.2	2	1.8	1.8	1.6	2.8
Duty cycle	%	25	25	25	25	25	20
Ambient temperature	°C	−40 ... +85	−40 ... +85	−40 ... +85	−40 ... +85	−40 ... +85	−40 ... +85
protection code (IP)	-	IP66S, IP69K	IP66S, IP69K	IP66S, IP69K	IP66S, IP69K	IP66S, IP69K	IP66S, IP69K
Mass (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 switch	–	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 backward.

7 Encoder resolution

Characteristic	Unit	CAHB-10...1	CAHB-10...2	CAHB-10...3	CAHB-10...4	CAHB-10...5	CAHB-10...6
Encoder resolution	mm/pulse	0.3	0.15	0.075	0.05	0.0375	0.0375

8 Potentiometer resolution CAHB-10...1 to CAHB-10...6

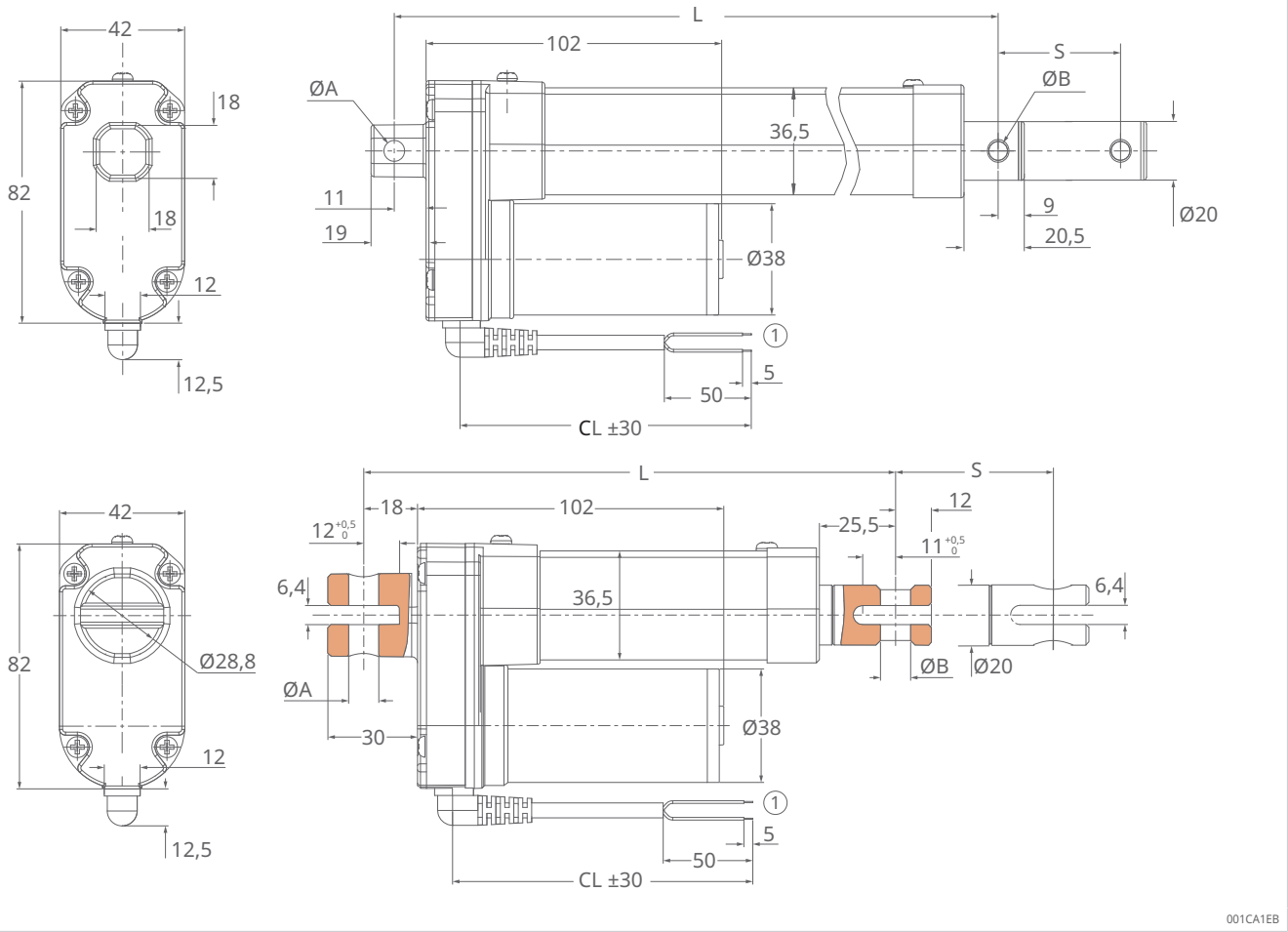
Stroke	mm	50 – 80	80 – 160	160 – 300
Minimum resistance value of potentiometer	Ω	700 – 1300	700 – 1300	700 – 1300
Potentiometer resolution	Ω/mm	100	50	16.6

9 Absolute analog output signal CAHB-10...1 to CAHB-10...6

Stroke	mm	50 – 80	80 – 160	160 – 300
Initial value versus L 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

13.1 Basic configuration and optional 2-Hall encoder

9 Dimensions



10 Mounting CAHB-10...1 to CAHB-10...6

		Unit	Ø A	Ø B
Rod end with bore	A	mm	6.4 (0/+0.1)	6.4 (0/+0.1)
Rod end with bore	B	mm	8.0 (0/+0.1)	8.0 (0/+0.1)
Fork head with hole	C	mm	10.1 (0/+0.1)	10.1 (0/+0.1)

11 Tolerances CAHB-10

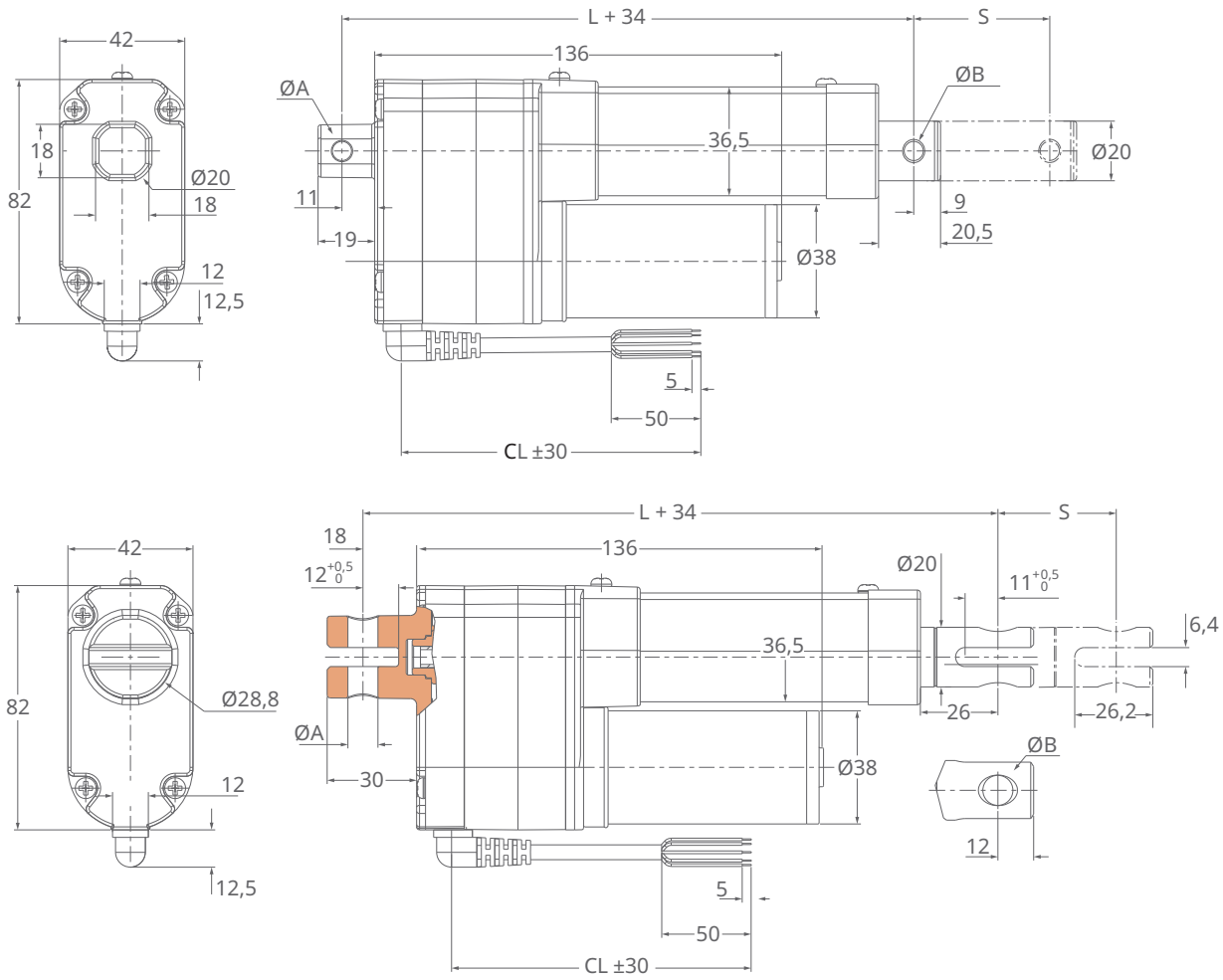
Type	Tolerance Stroke	Tolerance Retracted length
	mm	mm
CAHB-10...1, CAHB-10...2	(–1, +5)	(–5, +1)
CAHB-10...3, CAHB-10...4	(–3, +3)	(–3, +3)
CAHB-10...5, CAHB-10...6	(–4, +2)	(–2, +4)

12 Calculation of the retracted lengths L, CAHB-10...1 to CAHB-10...6

Stroke	mm	50	100	150	200	250	300
Retracted length L with rod end front + rod end rear	mm	158	209	260	311	362	413
Retracted length L with rod end front + fork head rear	mm	165	216	267	318	369	420
Retracted length L with fork head front + rod end rear	mm	172	223	274	325	376	427
Retracted length L with fork head front + fork head rear	mm	179	230	281	332	383	434

13.2 Optional potentiometer and absolute analog value

10 Dimensions



13 Mounting CAHB-10...1 to CAHB-10...6

		Unit	Ø A	Ø B
Rod end with bore	A	mm	6.4 (0/+0.1)	6.4 (0/+0.1)
Rod end with bore	B	mm	8.0 (0/+0.1)	8.0 (0/+0.1)
Fork head with hole	C	mm	10.1 (0/+0.1)	10.1 (0/+0.1)

14 Tolerances CAHB-10

Type	Tolerance Stroke	Tolerance Retracted length
	mm	mm
CAHB-10...1, CAHB-10...2	(−1, +5)	(−5, +1)
CAHB-10...3, CAHB-10...4	(−3, +3)	(−3, +3)
CAHB-10...5, CAHB-10...6	(−4, +2)	(−2, +4)

15 Calculation of the retracted lengths L, CAHB-10...1 to CAHB-10...6

Stroke	mm	50	100	150	200	250	300
Retracted length L with rod end front + rod end rear	mm	192	243	294	345	396	447
Retracted length L with rod end front + fork head rear	mm	199	250	301	352	403	454
Retracted length L with fork head front + rod end rear	mm	206	257	308	359	410	461
Retracted length L with fork head front + fork head rear	mm	213	264	315	366	417	468

13.3 Ambient conditions

Storage

The product may only be stored in its original packaging under the following ambient conditions:

- dry and dust-free environment, not outdoors
- protected from sunlight and UV radiation
- chemically non-aggressive environment
- no mechanical shocks
- temperature: −55 °C to +90 °C
- humidity: max. 95 %, non-condensing

During longer storage periods, check the condition of the packaging every 6 months.

If the packaging contains additional storage instructions that go beyond the requirements listed here, these instructions must also be observed.

Operation

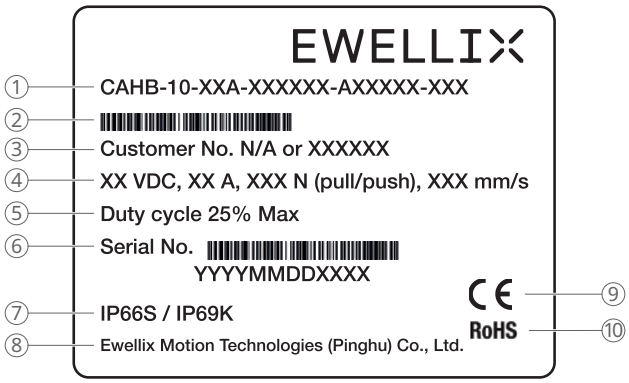
The product may only be operated under the following ambient conditions:

- indoor use only
- temperature: from −40 °C to +85 °C
- humidity: max. 95 %, non-condensing
- max. operating time without break: 1 cycle
- break until next operating sequence: 3 operating times
- max. duty cycle at rated load: 25 %, 120 s on 360 s off

13.4 Type plate

The type plate provides the following information:

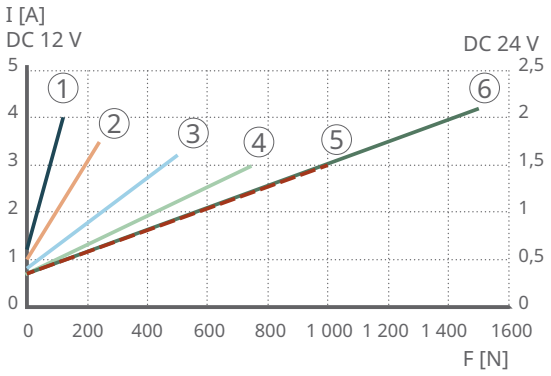
11 Type plate



1	Identification of actuator, type key	2	Part number
3	Customer part number	4	Power: power voltage, nominal current, rated load, speed with rated load
5	Duty cycle	6	Serial number
7	IP level	8	Manufacturer or the country of origin
9	CE mark	10	RoHS mark

13.5 Performance diagrams

12 Current-load diagram CAHB-10



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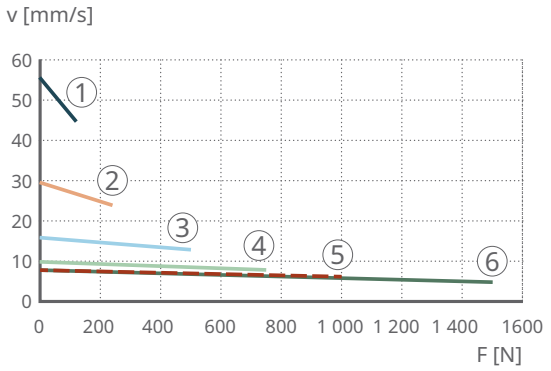
1	CAHB-10...1	2	CAHB-10...2
3	CAHB-10...3	4	CAHB-10...4
5	CAHB-10...5	6	CAHB-10...6
I	Current	F	Load

13

13 Speed-load diagram CAHB-10



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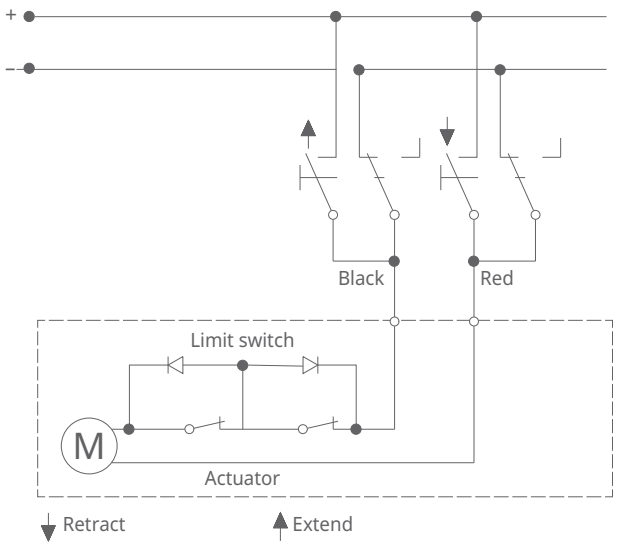
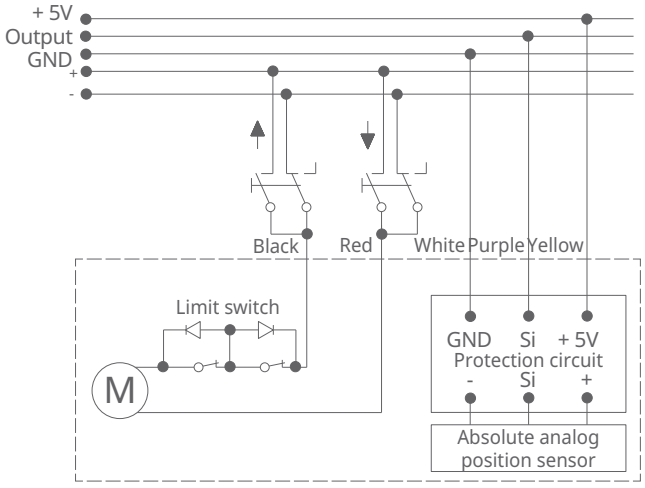
1	CAHB-10...1	2	CAHB-10...2
3	CAHB-10...3	4	CAHB-10...4
5	CAHB-10...5	6	CAHB-10...6
v	Speed	F	Load

13.6 Circuit diagrams

14 Basic configuration



15 Absolute analog output



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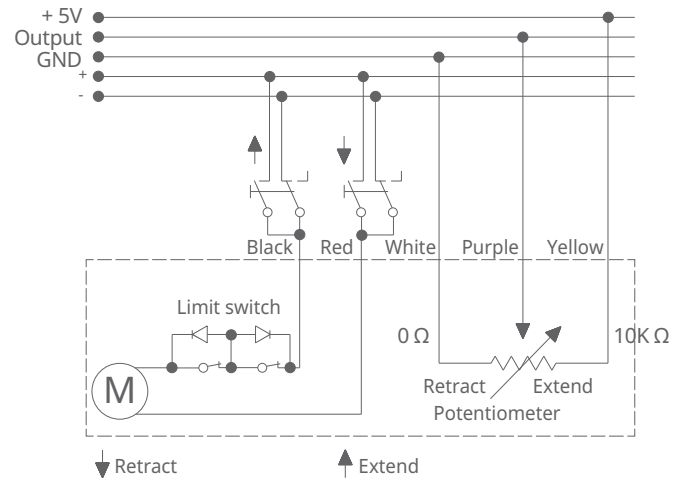
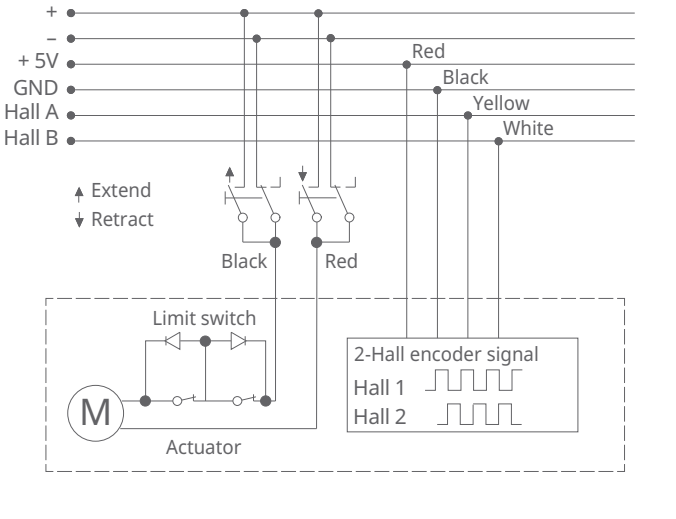
16 potentiometer



17 2-Hall encoder



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13.7 Declaration of incorporation

CAHB-10 |
https://www.schaeffler.de/std/2296

14 Spare parts

⚠ WARNING

Unsuitable or faulty spare parts

Impairment of safety, damage, malfunctions or total failures

- Spare parts in or on the device may only be replaced by Schaeffler.

Customers are not allowed to repair the actuator. All warranty and service claims will be forfeited without prior notice if screws on the actuator have been tampered with. The actuator must be dismounted and sent to the manufacturer to replace any spare parts.

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