

CAHB-10

Linear actuator



WARNING

Read this manual before installing, operating or maintaining this actuator. Failure to follow safety precautions and instructions could cause actuator failure and result in serious injury, death or property damage. Keep this manual nearby for future reference.

Contents

1 General information..	3	6 Installation and first operation.	20
1.1 Information on this manual.	3	6.1 Installation location.	21
1.2 Explanation of symbols.	3	6.2 Installation	21
1.3 Limitation of liability	4	6.3 Inspections prior to first operation..	23
1.4 Warranty terms.	5	6.4 Connect to power supply.	23
1.5 Customer service..	5	7 Operation.	24
2 Safety.	6	7.1 Safety.	24
2.1 Intended use.	6	7.2 Action before operation.	25
2.2 Responsibility of the owner and processor.	6	7.3 Action during operation.	26
2.3 Personnel requirements.	7	7.3.1 Normal operation.	26
2.3.1 Qualifications.	7	7.4 Disengagement in case of emergency.	27
2.4 Specific dangers	8	7.5 Action after use.	27
2.5 Safety equipment.	9	8 Maintenance.	28
2.6 Changes and modifications on the actuator.	10	8.1 Spare parts.	28
3 Technical data	11	8.2 Maintenance plan.	29
3.1 Operating conditions.	11	8.3 Maintenance.	30
3.2 Product label.	11	8.3.1 Cleaning.	30
4 Structure and function.	12	8.3.2 Inspections and readings.	30
4.1 Overview.	12	8.3.3 Check of visual condition.	32
4.2 Brief description.	13	8.4 Measures after completed maintenance.	32
4.3 Construction group description.	14	9 Malfunctions.	32
4.4 Connections	15	9.1 Malfunction table..	34
4.5 Features.	15	9.2 Start of operation after fixing malfunction.	35
4.5.1 Limit switch	15	10 Dismantling	36
4.5.2 Potentiometer	15	10.1 Dismantling.	37
4.5.3 Thermal switch.	16	10.1.1 Dismantling of CAHB-10.	37
4.5.4 2-Hall encoder.	16	10.2 Disposal	37
5 Transport, packaging and storage	17	11 Appendix.	38
5.1 Safety information for the transport.	17		
5.2 Transport inspection.	17		
5.3 Return to the manufacturer.	18		
5.4 Packaging.	18		
5.5 Storage.	19		

1 General information

1.1 Information in this manual

This manual provides important information on how to work with the actuators (also called device) safely and efficiently.

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

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

For better representation of circumstances, the illustrations used are not necessarily to scale and may vary from the actual design of the actuator.

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

1.2 Explanation of symbols and signal words

Safety precautions

Safety precautions are identified by symbols and signal words defined on the right side of this page.

These signal words indicate the severity of the hazard.

Adhere to these safety precautions and act cautiously in order to avoid accidents resulting in personal injury and property damage.



Note!

Describes useful hints and recommendations as well as information for efficient and trouble-free operation..



CAUTION

Is used to indicate a dangerous situation, which can lead to minor or moderate personal injury or property damage, if the precautionary measures are ignored



WARNING

Is used to indicate a dangerous situation, which can lead to serious injury or death, if the precautionary measures are ignored.



DANGER

Is used to indicate a dangerous situation, which will lead to serious injury or death, if the precautionary measures are ignored.

1.3 Limitation of liability

The manufacturer will not be liable for injury or damage resulting from:

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

In case the actuator is customised by SKF, the actual product delivered may be different from what is described in the manual. In this case, ask SKF for any additional instructions or safety precautions relevant to these actuators.

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

1.4 Warranty terms

The applicable and effective warranty terms are those contained in the manufacturer's terms and conditions of sale contained in the SKF sales contract that governs this sale.

1.5 Customer service

SKF customer service is always available to provide technical information and answer questions.

See your local SKF customer service on www.skf.com

2 Safety

This chapter provides an overview of important safety precautions 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 designed and built exclusively for its intended purpose as described in these instructions.

WARNING

Risk from misuse!

Any utilization of this actuator beyond its intended purpose may lead to potentially hazardous situations.

Therefore, follow the precautions below:

- Strictly adhere to all safety precautions and instructions in this manual.
- Do not allow this actuator to be subjected to weather conditions, strong UV rays, corrosive or explosive air media as well as other aggressive media.
- Do not modify, retool or change the structural design or individual components of the actuator.
- Never use the actuator outside of the technical application and operational limits.

2.2 Responsibility of the owner and processor

The actuator is designed for use in commercial applications by its owner or processor.

The processor is the contracting partner of the reseller or the manufacturer. The processor installs the actuator in a complete system (application).

The owner of the system is the user and therefore subject to the requirements of the 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 and accident prevention guidelines and environmental protection regulations applicable to the site of the system's installation:

- Inform themselves of applicable industrial safety precautions and determine additional hazards that arise due to the specific working conditions prevailing at the site where the actuator is installed using risk assessment. Risk assessment must be implemented in the form of work instructions for the actuator operation.
- Confirm that the work instructions created for the system including the actuator satisfy current legal requirements and the work instructions must be altered if they don't.
- Clearly regulate and specify the responsibilities for installation, operation, maintenance, and cleaning.
- Ensure that all employees who deal with the actuator have read and understood this Manual.
- Provide personnel with the required protective equipment.

In addition, owner must train personnel at regular intervals and inform personnel of the hazards.

In addition, owner or processors must ensure that the device is in an adequate working condition. They must do the following:

- Ensure that the maintenance intervals described in these instructions are complied with.
- Have all safety devices inspected regularly to ensure proper functionality.

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

WARNING

Risk from misuse!
Improper installation, operation and maintenance can result in serious injury, death or property damage.

Use only qualified, instructed, or trained personnel (as described below) who have read, understand and follow these instructions.

2.3.1 Qualifications

The following qualifications are specified for different areas of activity listed in the manual.

- **An instructed person (Operator),**
has been instructed by the owner in an orientation session on the assigned tasks and possible dangers in case of improper behaviour.
- **Qualified personnel,**
based on their professional training, know-how and experience as well as knowledge of the applicable standards and regulations, are to perform assigned work activities and to detect and avoid possible dangers on their own.

- **A professional electrician,**
based on his/her professional training, know-how and experience as well as knowledge of the applicable standards and regulations, is able to perform work on electrical systems and to detect and avoid possible dangers on his/her own.

The professional electrician has been trained for the special location where he/she works and knows the relevant standards and regulations.

Only persons who are expected to perform their tasks reliably are permitted to work with this device. Persons whose reaction capability are impaired, through, for example, drugs, alcohol or medication, should not work on this device.

2.4 Specific dangers

The following section lists the residual risks that have been determined by the performance of a risk assessment.

- **Read the safety instructions listed here and the warnings in subsequent chapters of this Manual to reduce health hazards and to avoid dangerous situations.**

DANGER

Danger to life caused by electric current!

Touching conductive parts causes a direct danger to life. Damage to insulation or individual components can cause danger to life.

Therefore, follow the precautions below:

- In the event of damage to insulation, switch off the power supply immediately and have the parts repaired.
- Work on the electrical system must be carried out only by professional electricians.
- De-energize the system for all work on the electrical system.
- Before maintenance, cleaning or repair work, switch off the power supply and perform lockout procedures so it cannot be turned on again.
- Do not bridge fuses or make them ineffective. When changing fuses, make sure you use the correct amperage.
- Keep moisture away from conductive parts. If you do not, this can cause short circuit.



Electric current

WARNING

Danger of injury caused by moving components!

Rotating and/or linearly moving components can cause serious injury.

Therefore, follow the precautions below:

- Do not work on or place any of your body, hands, or arms near moving components.

2.5 Safety equipment

WARNING

Danger due to malfunctioning safety equipment!

For safe operation, be sure all safety equipment is in good working order.

Therefore, follow the precautions below:

- Always check functionality of safety equipment according to the maintenance plan.
- Never disengage safety equipment.
- Safety equipment shall never be by-passed or modified.

Integration in an emergency-stop system required (for specific applications)

The actuator is only intended for installation into an application or system. It does not have its own operating control elements and does not have an independent emergency-stop-function.

Install the actuator so that it is part of an emergency shut-off system and can be stopped if necessary.

The emergency shut-off system has to be connected in such a way that a disruption of the power supply or the reactivation of the power supply after a power disruption cannot cause a hazardous situation for persons and objects.

The emergency shut-off systems must always be freely accessible.



Note!

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

The following safety features may have been installed:

In its standard version, the actuator features a thermal switch protection integrated into the motor housing. This switch protects the motor from overheating.

Thermal switch

 **CAUTION**

To prevent damage from overheating, do not try to operate actuator until its temperature has fallen below the threshold for the switch to operate (95 °C).

2.6 Changes and modifications on the actuator

 **WARNING**

To avoid hazardous situations and to ensure optimal performance, do not make any changes or modifications to the actuator unless they have been specifically authorized by SKF.

3 Technical data



Note!

The technical data (dimensions, weight, output, connection values etc.) can be found in the enclosed drawings and data sheets (→ **Appendix**).

3.1 Operating conditions

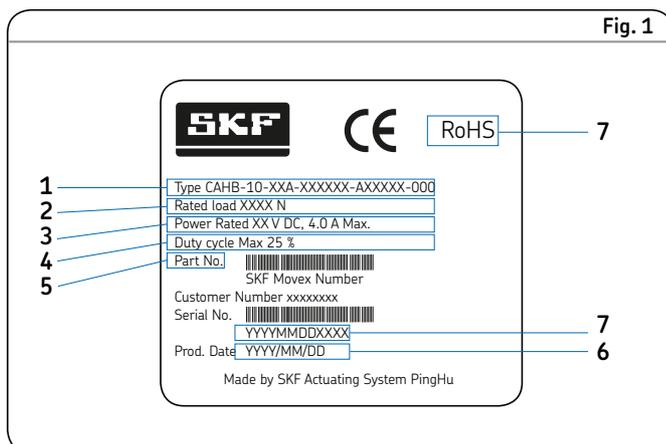
Environment

Information	Value	Unit
Temperature range	-40 to +85	°C
Relative atmospheric humidity (no build up of condensation)	up to 85	%

Duration (intermittent)

Information	Value	Unit
Maximum operating time without a break	1	Cycles
Break until next operation	3	Times of operating time

3.2 Product label

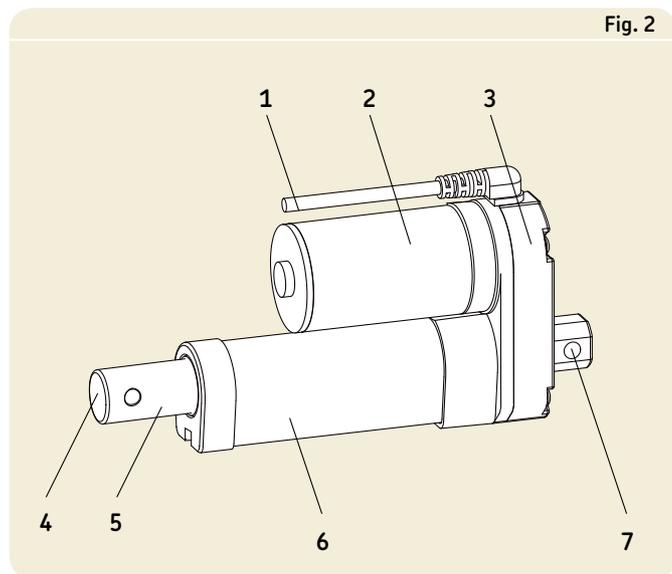


The product label provides the following information

- 1 Identification of actuator
- 2 Load capacity
- 3 Power voltage and max current
- 4 Duty cycle
- 5 Part number
- 6 Production date
- 7 Serial number
- 8 RoHS mark

4 Structure and function

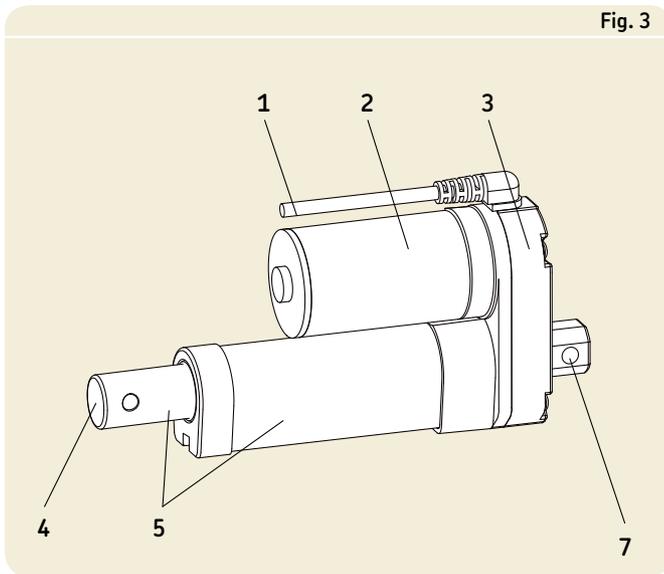
4.1 Overview



CAHB-10

- 1 Cable
- 2 Motor part
- 3 Gearbox
- 4 Front hinge head
- 5 Push tube
- 6 Guide tube
- 7 Rear hinge head

4.2 Brief description



Overview

This actuator is to be used exclusively for installation into a dynamic centric-compression or tensile-loaded lift.

The linear actuator consists of a motor part (3) and a linear unit (5), connected with each other by a bayonet joint.

The actuator consists of a direct current motor with spur gear which sets in motion a trapezoidal sliding spindle system with shaft joint. Via the lead screw mount, the sliding spindle transforms the rotation of the gear into a linear motion of the actuator (1).

The front hinge head (4) and the rear hinge head (7) transmit the actuator power to both sides of the application.

4.3 Construction group description

Motor

The motor is a 12 or 24 V DC. The motor's shaft powers a spur gear. The lift speed depends on the load. The motor unit is surrounded by metal housing. The metal housing cannot be opened.

Gear unit

The spur gear is directly powered by the motor shaft which moves a trapezoidal sliding spindle.

Linear unit

The actuator extends and retracts the push tube. The linear unit is surrounded and protected by the guiding tube. The push tube of the actuator is connected to the spindle with a lead screw nut.

The linear unit is connected to the motor with several screws. These screws should not be loosened or removed.

4.4 Connections

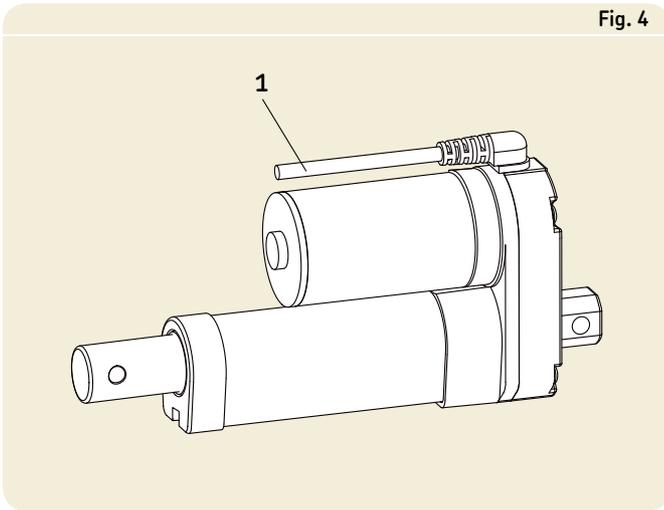


Fig. 4

CAHB-10 connections

1 Wires to connect actuator to power supply or to an external control.

4.5 Features

If not specified otherwise, the options listed below are available for the entire series of CAHB-10 linear actuators

4.5.1 Limit switch

The limit switch makes it possible to control the stroke of the linear unit by internal setting.

4.5.2 Potentiometer

The potentiometer provides a signal indicating the position of the linear actuator.

There is one type of setting for the potentiometer wire.

- Linear actuator with potentiometer unit: colours of wire are white, purple and yellow (→ Fig. 11).

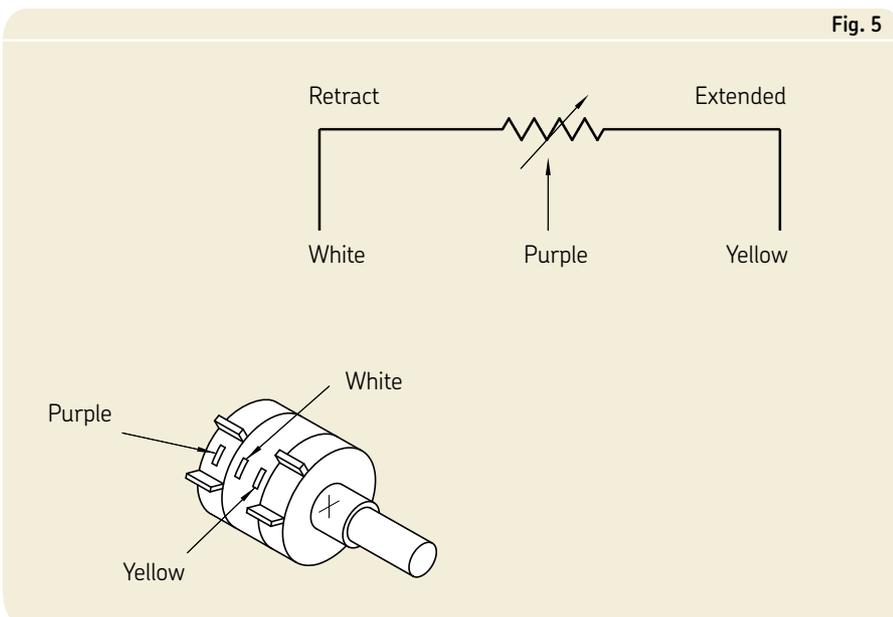


Fig. 5

Potentiometer

4.5.3 Thermal switch

The thermal switch in the motor controls thermal overload by switching off the motor in an emergency.

CAUTION

To prevent damage from overheating, do not try to operate actuator until its temperature has fallen below the threshold for the switch to operate.

4.5.4 2-Hall encoder (optional)

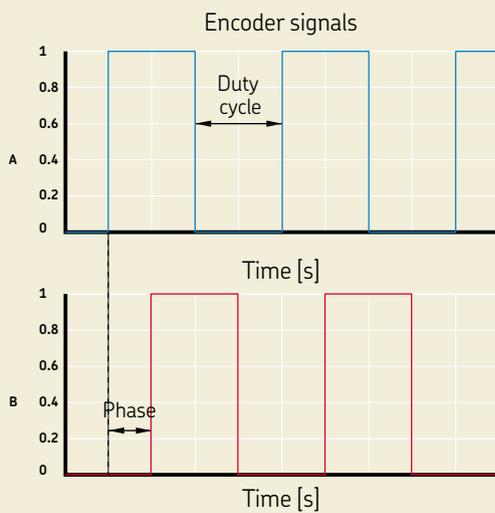
The 2-Hall encoder provides a signal indicating the position of the linear actuator.

It is equipped with 2 Hall effect sensors 45° electrically shifted. They are integrated on a PCB and read a 4 poles magnetic ring.

Hall sensors have an open collector output.

Hall sensors shall provide two signal outputs with the following characteristics:

Fig. 6



5 Transport, packaging and storage

5.1 Safety information for transport

CAUTION

Significant damage to the actuator can occur if not properly transported, unpacked and stored.

Therefore, follow the precautions below:

- Proceed carefully during the unloading of the packaged items and during the delivery as well as during transport to its final destination. Comply with the symbols and information shown on the packaging.
- Only remove the actuator from its packaging right before installation.
- Note storage requirements for return transport to the manufacturer (→ Chapter *Storage*).

Improper transport

5.2 Transport inspection

The CAHB-10 linear actuator is delivered as one packaged unit in a box or on pallets.

Check the delivery for completeness and damage due to transport immediately upon receipt. Send back actuator to manufacturer if it has cracks in the casing caused during transportation.

Check completeness of delivery:

- A complete actuator unit.
If damage to the exterior of the actuator has occurred during transport, do the following:
- Do not accept delivery or do so only with reservations.
- Record scope of damage on the transport documents or on the bill of delivery of the shipping company.
- Initiate complaint.

Note!

Report any damage as soon as it has been identified. Damage claims can only be asserted within the transporter's applicable complaint period.

5.3 Return to the manufacturer

Proceed as follows for the return transport:

- 1 Dismantle the actuator if necessary (→ Chapter *Dismantling*).
- 2 Pack the actuator in its original packaging. Follow storage conditions (→ Chapter *Storage*).
- 3 Send to manufacturer. Contact SKF service to obtain a shipment address.

5.4 Packaging

For packaging

The individual packaged pieces have been packaged appropriately according to the expected transport conditions.

The packaging is supposed to protect the individual components from damage caused by the transport, corrosion and other damage until they are ready for installation. Therefore, do not destroy the packaging and only remove the actuator shortly prior to the installation. Keep packaging for possible return shipment to the manufacturer (→ **Chapter 5.3**).

If the packaging is to be disposed off, please adhere to the following:

CAUTION

Environmental damage due to incorrect disposal!

Packaging material consists of valuable raw materials, which, in many cases, can be recycled.

Therefore, follow the precautions below:

- Dispose of packaging material in an environmentally correct way.
- Comply with locally applicable disposal regulations.

Handling of packaging materials

5.5 Storage

Pack the actuator in its original packaging for storage.

- Do not store outside.
- Dry and dust-free storage.
- Keep away from any aggressive media.
- Protect from UV radiation.
- Avoid mechanical vibrations.
- Storage temperature: -20 to 40 °C.
- Relative atmospheric humidity: max. 95% (no build up of condensation).
- For storage longer than three months, check the general condition of all parts of the packaging on a regular basis.



Note!

It is possible that there are notices on the packaging concerning additional storage requirements. If so, follow all requirements.

6 Installation and first operation

Authorized personnel

- The installation and first start of operation may only be conducted by qualified personnel.
- Work on the electric system may only be performed by professional electricians.

WARNING

Electric shock and moving parts hazards

Serious injury or death can be caused by touching live electrical components and by unexpected movement of the actuator.

Be sure the system's power supply is off and actuator is locked out before installing.



Electrical equipment

WARNING

Danger if restarted without authorization!

When correcting faults, there is danger of the energy supply being switched on without authorization. This poses a life-threatening hazard for persons in the danger zone.

Therefore, follow the precautions below:

- Prior to starting work, switch off the system and be sure it is locked out.



Safeguarding against restart

WARNING

Risk of injury and device damage due to incorrect installation of the optional devices!

Therefore, follow the precautions below:

- Optional devices, in particular components that are part of a retrofitting, may only be installed in accordance with their respective instructions (circuit diagram).
- The electromagnetic compatibility must be tested for the routing and appropriate measures must be carried out and as described in the device's operating manual.



Optional devices

6.1 Installation location

- Adhere to the technical data for operating conditions (→ **chapter 11 Appendix**).
- Install in a location where the actuator is not exposed to strong UV radiation or corrosive or explosive air media.

6.2 Installation

The CAHB-10 linear actuator can be attached over two elements, via the front rod end (**1**) and the trunnion mount (**2**) (the trunnion has two options: pins and bushings).

- 1 Connect the front rod end and trunnion mount to appropriate elements of the application. Adjustments of the rod end are not allowed!

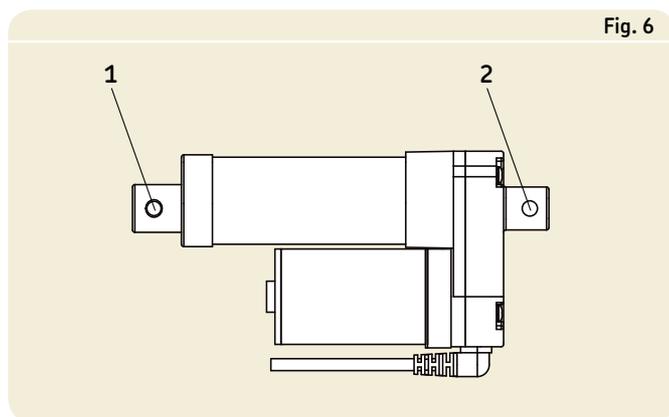


Fig. 6



Note!

Information concerning the dimensions of the drill holes for fastening bolts can be found in the respective data sheets. (→ *Appendix*).

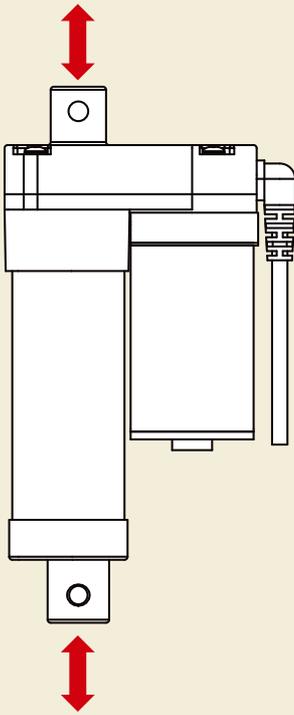
WARNING

Risk of injury and device damage due to insufficient fastening!

Only use fastening bolts and secure them adequately. Do not use screws to install. Never loosen or otherwise manipulate screws on actuator or options.

- 2 Ensure the applied force on the linear actuator is always concentric with the axis of the actuator (→ Fig. 7).

Fig. 7



⚠ WARNING

Risk of injury and device damage due to incorrect installation!

During installation, do not subject the actuator to side-impact or to turning forces.

- 3 During installation, make sure that the linear actuator is not blocked in its movement over the entire stroke.
- 4 During installation, be sure that the motor cable is not squeezed, clamped or pulled.
- 5 Connect linear actuator to power supply (→ **Subchapter Connect to power supply**).
- 6 Ensure that none of the supply or control cables can be pinched by the kinematics of the application or by the linear actuator during the extension or retraction.

6.3 Inspections prior to first operation

Prior to the first operation, a professional electrician must perform and document the following tests and readings:

- Check visual condition
- Function check of operating features and safety features
- Reading of protective conductor resistance
- Reading of leakage currents
- Reading of insulation resistance



Note!

Additional information concerning inspections and readings (→ Chapter *Maintenance*).

6.4 Connect to power supply

DANGER

Electrical shock hazard

Incorrect installation can result in serious injury, death or damage.

Only professional electricians should work on electrical systems.



Electrical equipment

- 1 Connect cable to electric grid.
- 2 Actuator performs the extending and retracting as defined in **Table 1**.

Table 1

	Cable (Red)	Cable (Black)	Actuator (Standard)
I	-	+	Extending
II	+	-	Retracting

7 Operation

7.1 Safety

DANGER

Risk of crushing!

Actuator may cause serious injury while moving.

Therefore, follow the precautions below:

- Ensure that there are no persons in the stroke area of the actuator while in operation.
- Take note of maximum permissible performance specifications for the actuator (→ Data sheets in **Chapter 11 Appendix**).
- Never tamper with the elements that are connected to the actuator while the actuator is in operation.

CAUTION

Risk of injury through contact with the hinge head!

Therefore, follow the precautions below:

- Do not let objects or body parts come in contact with the hinge head of the actuator.

CAUTION

Device damage due to static and dynamic overload of the actuator!

Therefore, follow the precautions below:

- Adhere to maximum permissible operating data for the actuator (→ Data sheets in **Chapter 11 Appendix**).
- Never exceed nominal load.
- Never tamper with the elements that are connected to the actuator while the actuator is in operation.

 **CAUTION**

The device may be damaged if liquids penetrate the actuator during extension and retraction. Keep liquids away.

 **CAUTION**

Device damage through overheating!

Therefore, follow the precautions below:

- Only use control integrated thermal switch.
- Never exceed nominal load (→ technical data in **Chapter 11 Appendix**).
- Always adhere to idle times and operating times (→ technical data in **Chapter 11 Appendix**).

7.2 Action before operation

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

7.3 Action during operation

7.3.1 Normal operation

During normal operation, the linear actuator lifts and lowers the elements that are connected with the CAHB-10 linear actuator via the hinge head.

The linear actuator can directly connect to electrical grid or be controlled by an operating element.

The linear actuator extends or retracts as long as the power is being supplied or until the linear actuator is completely extended or retracted.

Prevent the linear actuator from completely extending or retracting by cutting off power before the end of the stroke or setting up the external limit switch.

The external limit switch has to cut off the power supply to the linear actuator immediately when the limit switch is activated and before the actuator is completely extended or retracted.

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

CAUTION

Device damage through overheating!

Therefore, follow the precautions below:

- Only use control integrated thermal switch.
- Never exceed nominal load.
- Always adhere to idle times and operating times (→ technical data in **Chapter 11 Appendix**).

DANGER

Electrical shock hazard

Incorrect installation can result in serious injury, death or damage.

Only professional electricians should work on electrical systems.



Electrical equipment

7.4 Disengagement in case of emergency

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

Proceed as follows in hazardous situations:

- 1 Immediately engage emergency shut-off, if present, or cut off power for actuator.
- 2 Evacuate people from the hazard zone and initiate first aid measures.
- 3 Notify responsible person on-site.
- 4 If rescue vehicles have been requested, keep access paths open for rescue vehicles.
- 5 Based on severity of emergency, notify the authorities if necessary.
- 6 Refer to qualified staff to repair malfunction.

WARNING

Do not restart until all persons are outside the hazard zone.
Check the actuator and application that uses the actuator prior to restarting the operation and ensure that all safety equipment is installed and fully functional

7.5 Action after use

Separate the actuator from the power supply.

8 Maintenance

Personnel

- The maintenance work described herein can be performed by the operator unless otherwise indicated.
- Some maintenance tasks should only be performed by trained personnel, qualified personnel, or exclusively by the manufacturer; specific reference will be made in each case in the description of the respective maintenance task.

DANGER

Electrical shock hazard

Incorrect maintenance can result in serious injury, death or damage.

Only professional electricians should work on electrical systems.



Electrical equipment

DANGER

Danger if restarted

When correcting faults, there is danger of the energy supply being switched on without authorization. This poses a life-threatening hazard for persons in the danger zone.

Therefore, follow the precautions below:

- Prior to starting work, switch off the system and be sure it is locked out.



Safeguarding against restart

8.1 Spare parts

The CAHB-10 linear actuator is not designed for repair work by the customer. All warranty and service claims become void without notice if any screws on the linear actuator have been manipulated.

 **WARNING**

Safety hazard caused by wrong spare parts!

Wrong or faulty spare parts can adversely affect safety and cause damage, malfunctions or total failure.

Therefore, follow the precautions below:

- Spare parts in/on the actuator may only be replaced by SKF.

The actuator must be dismantled and sent to the manufacturer to replace any spare parts..

8.2 Maintenance plan

Maintenance tasks that are required for optimal and trouble-free operation are described in the sections below.

If increased wear is detected during regular inspections, shorten the required maintenance intervals according to the actual indications of wear.

Linear actuator CAHB-10 maintenance plan

Interval	Maintenance work	To be carried out by
Daily	Check actuator for visible damage (→ see below <i>Check of visual condition</i>)	Operator
	Clean off dust and dirt if necessary (→ see below <i>Cleaning</i>)	Operator
Monthly	Function check of operating features and safety features (→ see below <i>Inspections and readings</i>)	Qualified personnel
	Check tight fit of the actuator to the hinge head. Tighten if necessary	Qualified personnel
Annually	Check connection for tight fit	Professional electrician
As suggested by processor	Conduct visual inspection of the condition of the permanent safeguard and the routing of the supply and control cable within the application. Cable routing elements may not be loose or broken.	Qualified personnel



Note!

If the linear actuator is used outside of the environmental conditions specified earlier in this manual, check such components once a month for any changes such as oxidation or sedimentation.

8.3 Maintenance

8.3.1 Cleaning

To be performed by operator

CAUTION

Damage due to incorrect cleaning!

Therefore, follow the precautions below:

- Do not use any aggressive cleaning agents. Water used for cleaning including chemical additives must be pH-neutral.
- Liquids must not touch the actuator during the retraction or extension.
- Only use additional cleaning materials listed by the SKF.
- No steam jets or pressure washers may be used to clean.
- Other cleaning agents or cleaning devices may only be utilized with the manufacturer's approval.

Clean line actuator:

- 1 Separate the actuator from the energy supply.
- 2 Clean dirty parts with a damp cloth.

8.3.2 Inspections and readings

To be performed by professional electrician

- The inspections and readings must be performed as required by the applicable standards and regulations. The list of the applicable standards can be found in the appendix.
- The inspections must be documented (→ "Service Log").

Service log

Complete the following entries in the service log:

- Name of the executing body (company, department).
- Names of the staff on duty.
- Identification of the actuator/system (type, serial number, inventory number) and the respective accessories.
- Completed inspections and readings.
- Scope and results of the inspections.
- Measuring method, measuring actuator, measuring results for readings.
- Overall assessment.
- Date and signature of the assessing person; personal coding is a viable alternative for IT applications.

8.3.3 Check of visual condition

To be performed by qualified personnel

- 1 Separate the actuator from the energy supply.
- 2 Check the following structural components for visible external damage:

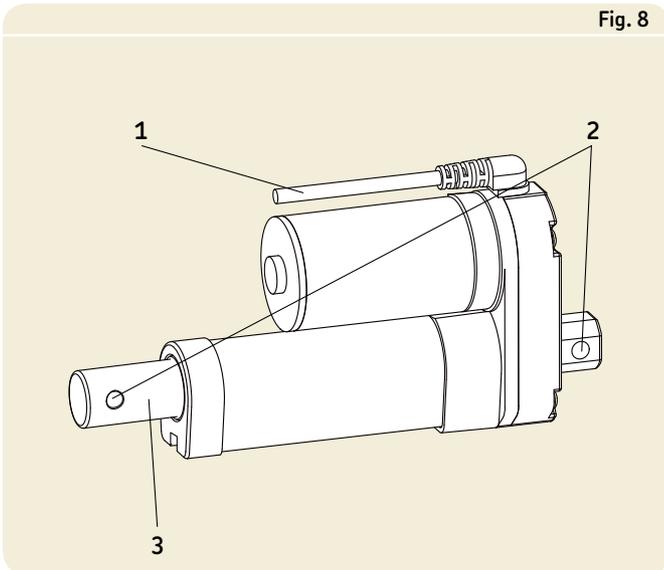


Fig. 8

- 1 Check connecting cables for cracks, cuts and pinched sections
- 2 Check hinge hole for cracks, deformation and broken pieces
- 3 Check stainless steel tube for scratches and indentations

- 3 Notify processor or SKF in case of damage
- 4 If there is no damage and the processors/manufacture has not communicated any concerns, reconnect the actuator to the power supply.

8.4 Measures after completed maintenance

Upon completion of the maintenance, the following steps have to be performed prior to restarting the device.

- 1 Ensure that all tools, material and other equipment used during maintenance have been removed from the work area.
- 2 Clean work area and remove potential spills such as liquids, processing material or similar material.
- 3 Ensure that all safety measures of the system work properly without a problem.
- 4 Check to be sure that all actuator and system functions are operating correctly.
- 5 Document the maintenance in the service log.

9 Malfunctions

The following chapter describes potential causes for malfunctions and the work that is necessary to restore operation.

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

Contact the manufacturer concerning malfunctions which are not solved by the following suggestions.

Personnel

- Unless indicated otherwise, the work described herein to solve malfunctions may be performed by the operator.
- Some work may only be carried out by qualified personnel, and is specifically indicated in the description of the individual malfunction.
- Work on the electric system may only be performed by professional electricians.

DANGER

Electric shock and moving parts hazards

Serious injury or death can be caused by touching live electrical components and by unexpected movement of the actuator.

Be sure power supply is off and actuator is locked out before installing.



Electrical equipment

DANGER

Danger if restarted

When correcting faults, there is danger of the energy supply being switched on without authorization. This poses a life-threatening hazard for persons in the danger zone.

Therefore, follow the precautions below:

- Prior to starting work, switch off the system and be sure it is locked out.



Safeguarding against restart

 **DANGER**

Risk of injury and device damage due to incorrect repair of malfunction

Therefore, follow the precautions below:

- Never loosen the screws on the device or try to open it.
- In the event of a malfunction that cannot be fixed by following the steps in the malfunction table in this operating manual, dismantle the actuator and send it to SKF for repair. (→ Chapter *Transport, packaging and storage*).



Optional devices

Actions during malfunctions

- 1 In the event of a malfunction that may present an immediate danger to persons or assets, turn off the actuator or control unit immediately and safeguard against a restart.
- 2 Determine cause of malfunction.
- 3 Depending on the type of a malfunction, have it repaired by qualified personnel.
- 4 Inform responsible party on-site concerning malfunction.



Note!

The following malfunction table provides information as to who is authorized to perform the repair.

9.1 Malfunction table

Malfunction	Possible cause	To repair malfunction	To be repaired by
Linear actuator doesn't move	No supply voltage	Check power supply	Professional electrician
	Lack of plug contact or plug has not been inserted properly	Plug contacts: Device control unit, control of voltage network. Check control operating element	Operator
	Defective network cable or power plug	Supply cable and plug of the lines: Check actuator control unit, control of voltage network control operating element for damage, if necessary replace defective elements	Professional electrician
	Obstacle in the stroke area of the linear actuator	Remove all obstacles in the stroke area	Operator
	Incorrect load	Measure static and dynamic load and compare with information concerning the product label. If the load capacity is exceeded, check the nominal load and install stronger actuator if necessary.	Qualified personnel
	Linear actuator cannot be set in motion by any of the above listed measures.	Exchange actuator	Qualified personnel
Linear actuator cannot be lifted	Obstacle in the stroke area of the linear actuator	Remove all obstacles in the stroke area	Operator
	Incorrect load	Remove all loads that are connected to the device	Operator
	Defective screw nut	Exchange actuator	Qualified personnel
Significant reduced speed	Obstacle in the stroke area of the linear actuator	Remove all obstacles in the stroke area	Operator
	Incorrect load	Remove all loads that are on the elements.	Operator
	Defective motor, gear or screw nut	Exchange actuator	Qualified personnel
Significant increase in noise	Obstacle in the stroke area of the linear actuator	Remove all obstacles in the stroke area	Operator
	Incorrect load	Remove all loads that are on the elements.	Operator
	Defective motor, gear or screw nut	Exchange actuator	Qualified personnel

9.2 Start of operation after fixing malfunction

After the malfunction has been fixed, perform the steps from the chapter Inspection prior to first operation.

10 Dismantling

Personnel

- Dismantling may only be carried out by qualified personnel.
- Work on the electric system may only be performed by professional electricians.

DANGER

Electric shock and moving parts hazards

Serious injury or death can be caused by touching live electrical components and by unexpected movement of the actuator.

Be sure power supply is off and actuator is locked out before installing.



Electrical equipment

WARNING

Risk of injury due to incorrect dismantling!

Stored residual power, sharp-edged components, pins and corners on the individual components or on required tools can cause serious injury.

Therefore, follow the precautions below:

- Ensure there is ample space for dismantling prior to starting with the work.
- Use caution when working with open, sharp-edged structural components.
- Ensure order and cleanliness at the dismantling site! Loosely stacked structural components or structural components and tools on the floor may present a risk for accidents.
- Dismantle structural components pursuant to applicable local regulations.
- Secure structural components in a way so they would not be able to fall or tip over.
- Contact SKF if you have any questions or concerns.



Safeguarding against restart

10.1 Dismantling

10.1.1 Dismantling of CAHB-10

- 1 Separate actuator from energy supply (→ Chapter *Operation* → *Disengagement in case of emergency*).
- 2 Secure elements of the application in such a fashion that no loads can impact the hinge heads.
- 3 Loosen and remove fastening bolts from the mounting strap of the hinge heads.
- 4 Separate linear actuator from application elements.
- 5 Clean actuator.
- 6 Carefully package for shipment to the manufacturer (→ Chapter *Transport and packaging*).

10.2 Disposal

To the extent that no take-back or disposal agreement has been put in place, disassembled components should be recycled:

- Dispose of metals and plastic components at an appropriate recycling center.
- Sort remaining components based on the respective material and dispose of according to applicable local occupational health and environmental regulations.

CAUTION

Damage can be caused to the environment due to incorrect disposal!

Electronic waste, electronic components, lubricants and other additives are subject to special waste treatment regulations and may only be disposed of by approved specialized companies!

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

11 Appendix

Technical data sheets

The following 4 pages are a reprint from
PUB MT/P8 10265 EN • May 2013

Linear actuator

CAHB-10 series

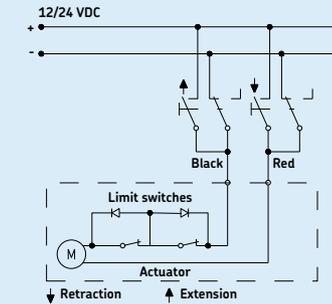
Benefits

- Compact design
- Designed for harsh environment
- Robust and reliable
- Integrated limit switches
- Quiet operation
- Thermal protection
- Optional potentiometer and 2-Hall encoder available
- Electromagnetic compatibility (EMC) compliant

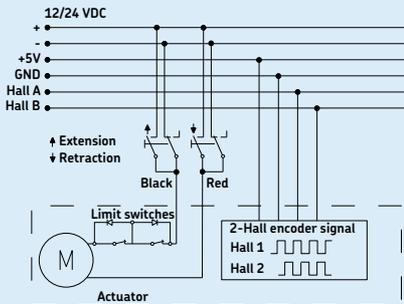


Connecting diagram

Basic configuration

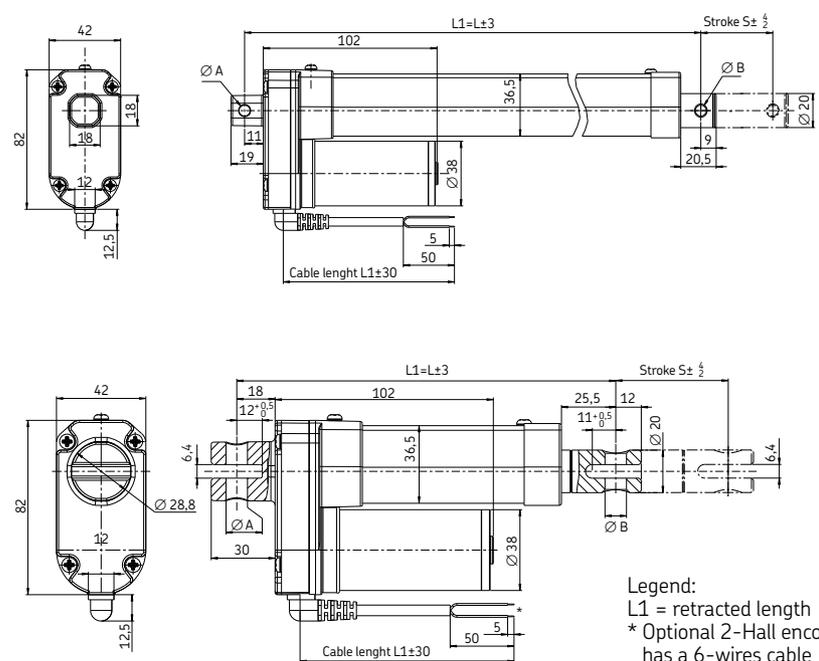


2-Hall encoder



Dimensional drawing

Basic configuration and optional 2-Hall encoder



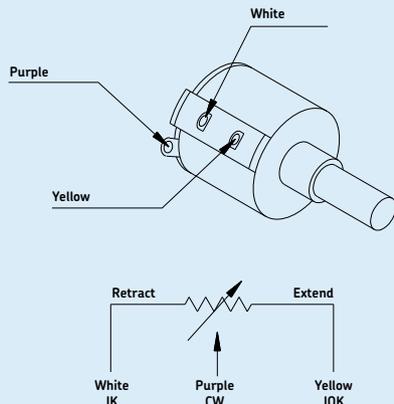
Stroke (mm)	50	100	150	200	250	300
Retracted length (L1)	158	209	260	311	362	413
Retracted length with fork head	179	230	281	332	383	434

Encoder resolution	5:1	10:1	20:1	30:1	40:1
Gear ratio	5:1	10:1	20:1	30:1	40:1
Mm/pulse	0,3	0,15	0,075	0,05	0,038

Technical data		Unit	CAHB-10... 1	CAHB-10... 2	CAHB-10... 3	CAHB-10... 4	CAHB-10... 5
Push load	N	120	240	500	750	1 000	
Pull load	N	120	240	500	750	1 000	
Speed (full load to no load)	mm/s	45 to 56	24 to 30	13 to 16	8 to 10	6 to 8	
Stroke	mm	50 to 300	50 to 300	50 to 300	50 to 300	50 to 300	
Retracted length	mm	-*	-*	-*	-*	-*	
Voltage	V DC	12 or 24	12 or 24	12 or 24	12 or 24	12 or 24	
Power consumption	W	N/A	N/A	N/A	N/A	N/A	
Current consumption	12 V DC	A	4	3,5	3,2	3	2,8
	24 V DC	A	2,2	2,0	1,8	1,8	1,6
Duty cycle	%	25	25	25	25	25	
Ambient temperature	°C	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85	
Type of protection	IP	66s	66s	66s	66s	66s	
Weight (at 300 mm stroke)	kg	1,5	1,5	1,5	1,5	1,5	
Color	-	Silver	Silver	Silver	Silver	Silver	
Limit switches	-	Yes	Yes	Yes	Yes	Yes	
Thermal protection	-	Yes	Yes	Yes	Yes	Yes	

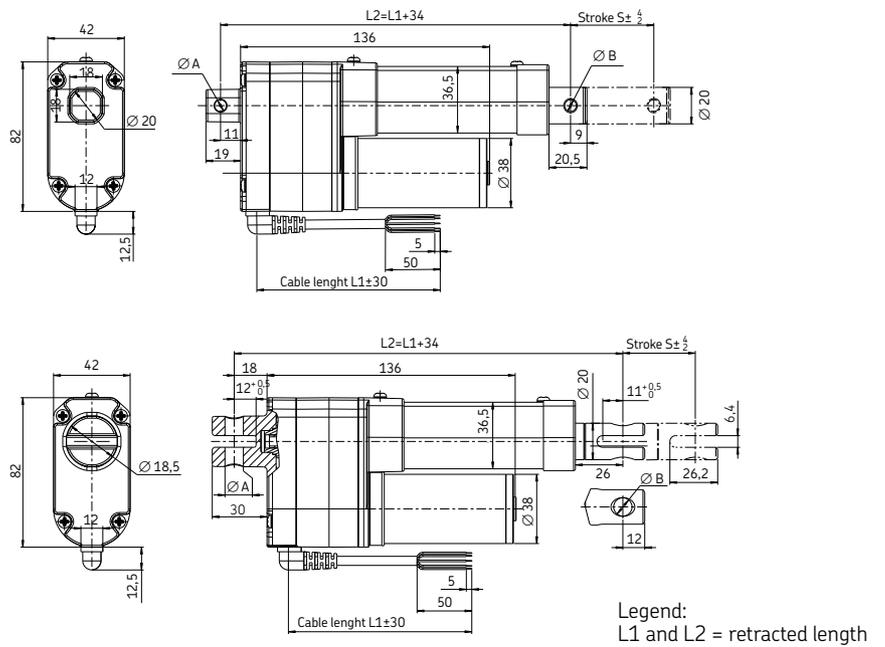
* See above table

Potentiometer



Dimensional drawing

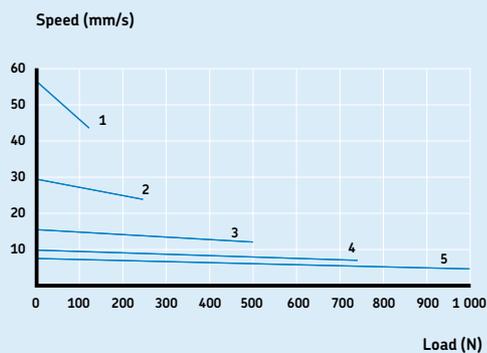
Optional potentiometer



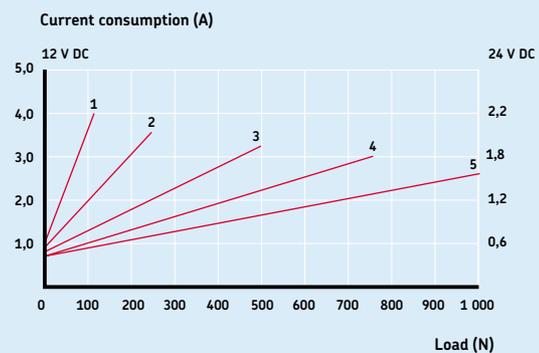
Stroke (mm)	50	100	150	200	250	300
Retracted length (L2)	192	243	294	345	396	447
Retracted length with fork head	213	264	315	366	417	468

Stroke (mm)	50-80	80-160	160-300
Minimum resistance value of potentiometer	700-1300 Ω	700-1300 Ω	700-1300 Ω
Potentiometer resolution	100 Ω/mm	50 Ω/mm	16,6 Ω/mm

Performance diagrams



Speed-load diagram



Current-load diagram

Ordering key

C
A
H
B
- 1 0 -

A
-

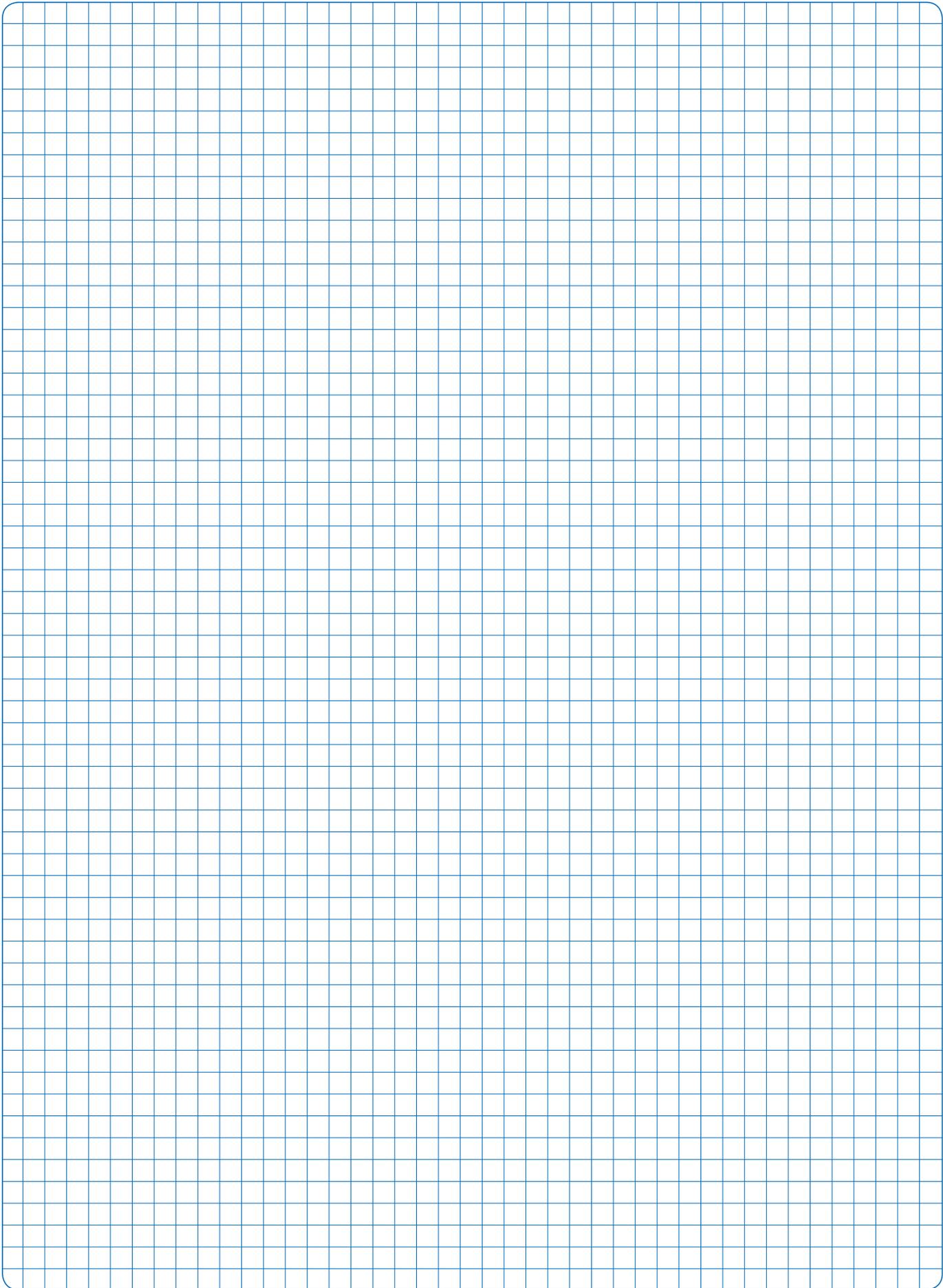
- A

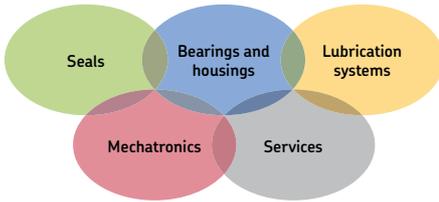
0 - 0 0 0

Type				
Voltage: 12 V DC 24 V DC	A B			
Load: 120 N 240 N 500 N 750 N 1 000 N	1 2 3 4 5			
Screw: TR12 screw Customized	A X			
Stroke: 50 mm 100 mm 150 mm 200 mm 250 mm 300 mm	050 100 150 200 250 300			
Retracted length:*				
<i>Stroke without potentiometer:**</i>	<i>A(B)+A(B)</i>	<i>A(B)+C</i>	<i>C+A(B)</i>	<i>C+C</i>
50 mm	158 mm	165 mm	172 mm	179 mm
100 mm	209 mm	216 mm	223 mm	230 mm
150 mm	260 mm	267 mm	274 mm	281 mm
200 mm	311 mm	318 mm	325 mm	332 mm
250 mm	362 mm	369 mm	376 mm	383 mm
300 mm	413 mm	420 mm	427 mm	434 mm
IP: Standard (IP 66s)				A
Front attachment: Rod with hole Ø 6,4 mm Rod with hole Ø 8 mm Fork head with hole Ø 10,1 mm Customized				A B C X
Rear attachment: Rod with hole Ø 6,4 mm Rod with hole Ø 8 mm Fork head with hole Ø 10,1 mm Customized				A B C X
Hole direction of the attachments: 0° 90°				A B
Option 1: None Potentiometer 2-Hall encoder				O P H
Cable length: 600 mm without connector 1 000 mm without connector 1 500 mm without connector 2 000 mm without connector 2 500 mm without connector 3 000 mm without connector Customized				A B C X E F X
Auxiliary code (Standard products are "00")				

* Retracted length will be enlanged 34 mm with Potentiometer option
 ** Front attachment + Rear attachment; A, B, C mean the attachment types







The Power of Knowledge Engineering

Combining products, people, and application-specific knowledge, SKF delivers innovative solutions to equipment manufacturers and production facilities in every major industry worldwide. Having expertise in multiple competence areas supports SKF Life Cycle Management, a proven approach to improving equipment reliability, optimizing operational and energy efficiency and reducing total cost of ownership.

These competence areas include bearings and units, seals, lubrication systems, mechatronics, and a wide range of services, from 3-D computer modelling to cloud-based condition monitoring and asset management services.

SKF's global footprint provides SKF customers with uniform quality standards and worldwide product availability. Our local presence provides direct access to the experience, knowledge and ingenuity of SKF people.

actuators@skf.com

© SKF is a registered trademark of the SKF Group.

© SKF Group 2014

The contents of this publication are the copyright of the publisher and may not be reproduced (even extracts) unless prior written permission is granted. Every care has been taken to ensure the accuracy of the information contained in this publication but no liability can be accepted for any loss or damage whether direct, indirect or consequential arising out of the use of the information contained herein.

PUB MT/11 10851/1 EN · June 2014

