

EWELLIX

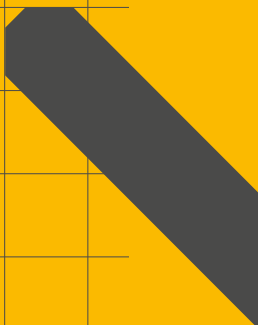
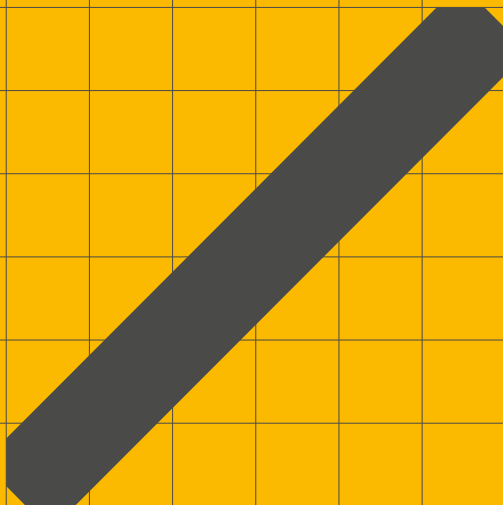
A Schaeffler Company

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

CASM-32/40/63

Linear Actuator





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⚠ 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.

1.0 General information

1.1 Information about this manual

This manual provides important information on how to work with the actuator (also called device or drive) 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.

For a better representation of the circumstance of use, the illustrations used are not necessarily to scale and may vary from the actual design of the device.

1.2 Explanation of symbols and signal words

Safety precautions

Safety precautions are identified by symbols and signal words as shown to the right. 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.

DANGER

Indicates a dangerous situation, which will lead to death or serious personal injury, if the precautionary measures are ignored.

WARNING

Indicates a dangerous situation, which can lead to minor or moderate injury or property damage, if the precautionary measures are ignored.

CAUTION

Indicates a dangerous situation, which can lead to minor or moderate injury if the precautionary measures are ignored.

NOTICE

Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).



NOTE

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

1.3 Limitation of liability

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

The manufacturer will not be liable for damage resulting from:

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

In case the actuator is customised, the actual product delivered may be different from what is described in the manual. In this case, ask Ewellix 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 Copyright

This manual is protected by copyright law and exclusively to be used for internal purpose of Ewellix customers.

Passing this manual on to third parties, duplication of any kind – even in the form of excerpts – as well as the external use and/or disclosure of the contents without the written consent of the manufacturer is not permitted.

Ewellix reserves the right to seek compensation for violations of these restrictions.

1.5 Spare parts

The CASM linear actuator is not meant to be repaired by customer personnel. All warranty and service claims become void without notice if any screws on the linear actuator have been loosened or removed (↳ 9 Malfunctions, **page 38**).

⚠ WARNING

Safety hazard caused by use of non-genuine spare parts

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

Therefore:

- Spare parts in/on the device may only be replaced by the manufacturer.

The device must be dismantled and sent to the manufacturer for repair and replacement of spare parts. The address where to send the device back for repair is listed on the back cover of this document.

1.6 Warranty terms

The applicable and effective warranty terms are those contained in the manufacturer's terms and conditions of sale.

1.7 Customer service

Ewellix Customer Service is always available to provide technical information and answer questions.

See the contact information for Ewellix Customer Service on the back cover.

2.0 Safety

This chapter provides an overview of all important safety precautions for protection of personnel as well as safe and trouble-free operation.

Disregarding this manual and the safety precautions specified therein may result in increased risk of serious injury or death.

2.1 Intended use

The device has been designed and built exclusively for its intended purpose as described in these instructions.

The device is only to be used as a dynamic centric compression or tensile-loaded lift. It will be implemented in industrial and construction technology applications.

⚠ WARNING

Risk from misuse!

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

Therefore:

- 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 device is designed for personal use and is also used in commercial applications by owner or processors.

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

Any injury, damage or loss caused by violation of these instructions will be the responsibility of the customer.

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

- Inform themselves of applicable industrial safety regulations and use risk assessment to determine additional hazards that arise due to the specific working conditions prevailing at the site where the device is installed. The risk assessment must be implemented in the form of work instructions for device operation.
- Must confirm that the work instructions created for the system including the device satisfy current legal requirements and modify the instructions if they don't.
- Clearly regulate and specify the responsibilities for installation, operation, maintenance, and cleaning the system.
- Ensure that all employees who deal with the device have read and understood this manual.
- Provide personnel with the required protective equipment.
- Must train personnel at regular intervals and inform personnel of the hazards .

In addition, owner must ensure that the device is in 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 for function and completeness.

2.3 Personnel requirements

⚠️ WARNING

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

Use only qualified, 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.

- **A trained person (Operator)**
has been instructed by the customer 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 able to perform assigned work activities and to detect and avoid possible dangers on their own.

Only persons who are expected to perform their tasks reliably are permitted as personnel. Persons whose reaction capability is impaired, e.g. through drugs, alcohol or medication, are not permitted.

2.4 Safety equipment

⚠️ WARNING

Danger due to malfunctioning safety equipment

For safe operation, be sure all features are in good working order.

Therefore:

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

Integration of an emergency-stop system required (for certain applications).

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

Install the device 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 system must always be easily accessible.



NOTE

The processor must decide which applications require the installation of an emergency shut-off system.

2.5 Modifications to the device

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

2.5.1 Warning labels



The symbol to the right can be found on the actuator near the hot surface danger.

Hot surfaces on actuator can cause burns and should not be touched. Protection must be provided against accidental contact if necessary.

⚠️ WARNING

Danger because of illegible symbols

Over the course of time stickers and decals may become dirty or illegible for some other reason.

Therefore:

- Keep any safety, warning and operation related decals in legible condition at all times.
- Replace damaged decals or stickers immediately.

3.0 Technical data

NOTE

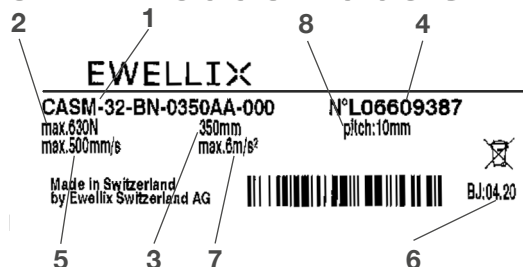
The technical data (dimensions, weight, output, connection values, etc.) can be found in the drawings and data sheets at the end of this manual (↳ **11 Appendix, page 28**).

3.1 Operating conditions

Environment Information	Value	Unit
Temperature range	+0 to +50	°C
Relative atmospheric humidity, maximum (no build up of condensation)	95	%

Duration: 100 % operating time.

3.2 Product labels



The product label provides the following information:

1. Identification of type
2. Force
3. Stroke
4. Serial number
5. Max. speed of linear actuator
6. Manufacturing date (month/year)
7. Max. acceleration
8. Pitch

⚠ WARNING

The outside temperature of the actuator should not exceed 60°C. Exceeding this temperature will decrease the life rating of the actuator as described in the performance diagram.

4.0 Structure and function

4.1 Brief description

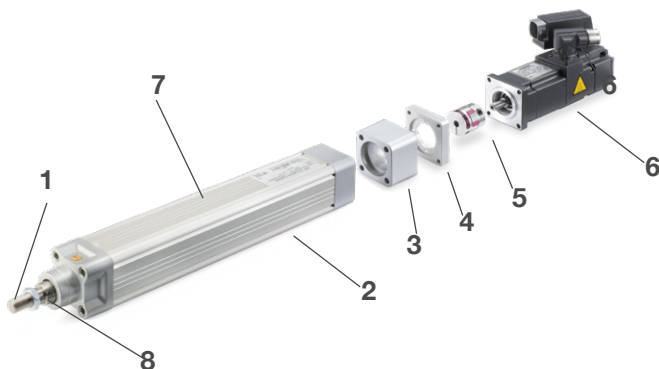
The CASM (↳ Fig. 1) is a linear actuator designed to work in factory automation. The drive is used exclusively for dynamic center compression or traction movement.

The linear unit (7) is powered through a coupling (5) by a motor (6). The motor (6), in direct drive, drives either a trapezoidal or a ball screw system. Via the screw mount, the trapezoidal screw or ball screw system transforms the rotation of the motor (6) into a linear motion of the actuator (8).

The rod leads and the other accessories transmit the actuator power in the application.

4.1.1 CASM 32 to 63 actuator overview

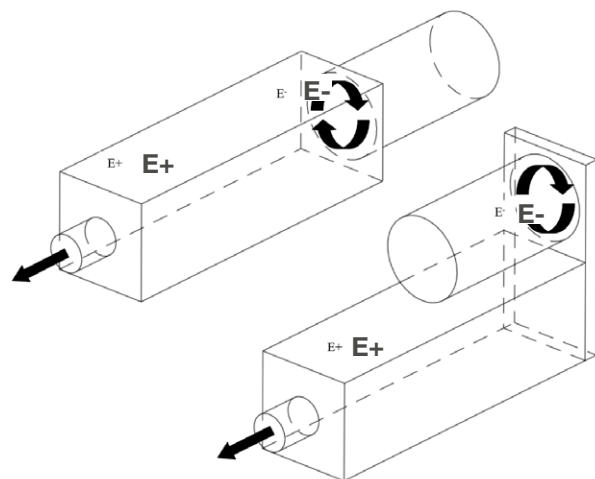
Fig. 1



1. Thread for front attachment
2. Protection tube
3. Coupling housing (option)
4. Motor flange (option)
5. Coupling (option)
6. Motor (e.g. 1FK7 Siemens)
7. Linear unit
8. Push tube

4.2 Direction of motor during extension of the cylinder

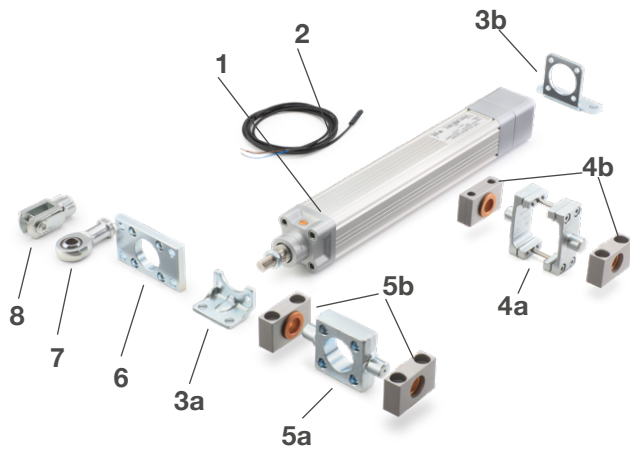
Fig. 2



4.3 Overview

4.3.1 CASM accessories overview

Fig. 3

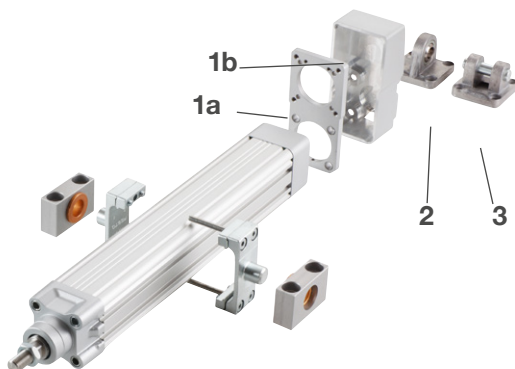


CASM accessories

1. Linear unit
2. Proximity sensor
3. a and b Foot axial mounting kit
- 4a. Trunnion mounting kit (on casing tube)
- 4b. Trunnion support
- 5a. Trunnion flange kit with pair of support (front)
- 5b. Trunnion support
6. Flange mounting kit
7. Rod eye
8. Rod clevis

4.3.2 Parallel adapter kit

Fig. 4



Parallel adapter kit

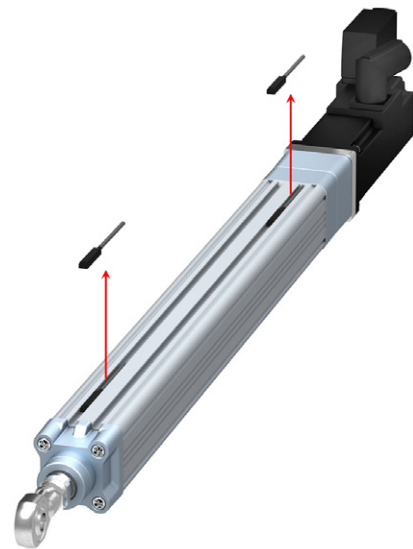
- 1a. Intermediate plate
- 1b. Gear box cover
2. Swivel flange with rod eye
3. Swivel flange

Specific details about accessories and adapter kits (→11 Appendix, page 28).

4.4 Sensor mounting

- The sensor can be inserted into the grooves by sliding it in from the front. (→ Fig. 5).
- Install the sensors: the sensors can be slid into the grooves from the front of the actuator. The cable ends should lead to the direction of the motor. Push the sensors to their approximate positions in the grooves of the cylinder body. Tighten the fixing screws on the proximity switch slightly and lead the cable along the profile groove. Insert the cables into the grooves of the plastic covers and push the cover into the groove together with the cable.

Fig. 5



5.0 Delivery, packaging and storage

5.1 Safety information for transporting

NOTICE

Damage due to improper transporting

Significant material damage can occur in conjunction with improper transport.

Therefore:

- Proceed carefully during the unloading and delivery of the packaged items to its final destination and comply with the information shown on the packaging.
- Only remove the actuator from its packaging right before installation.
- Note storage requirements if actuator needs to be returned to the manufacturer (↳ **5.5 Storage, page 12**).

5.2 Delivery inspection

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

Check the delivery for completeness and damage immediately upon receipt.

Check completeness of delivery:

- Unpack drive.
- Check that the options are mounted or packed.
- Check the drive for damage, scratches, dents.

Proceed as follows in conjunction with visible exterior transport damage:

- 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 recognized. Damage claims can only be asserted within the transporter's applicable complaint period.

5.3 Returning actuator to the manufacturer

Proceed as follows for the return transport:

1. Dismantle the device if necessary (↳ **10 Dismantling, page 27**).
2. Pack device in its original packaging. Follow storage conditions (↳ **5.5 Storage, page 12**).
3. Send to manufacturer. The address is listed on the back cover of this manual.

5.4 Packaging

For packaging

The individual packaged pieces have been packaged appropriately according to the expected transport conditions. Only environmentally- friendly materials were used for the packaging.

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 it shortly prior to the installation. Keep packaging for possible return shipment to the manufacturer (↳ **5.3 Returning actuator to the manufacturer, page 11**).

If you want to dispose of the packaging, please note and adhere to the following:



NOTE

Environmental damage due to incorrect disposal

Packaging material consists of valuable raw materials and in many cases they can be sensibly recycled and reused.

Therefore:

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

5.5 Storage

Pack the actuator in its original packaging for storage.

- Do not store outside.
- Storage should be dry and dust-free.
- 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).
- To store longer than three months, check the general condition of all parts of the packaging on a monthly basis. If necessary, refresh or renew the conservation.



NOTE

It is possible that there are notices on the packaging concerning storage which go beyond the requirements listed here. If so, follow those notices.

6.0 Installation and initial operation

Authorized personnel

The installation and initial operation may only be conducted by qualified personnel.

⚠ WARNING

Risk of injury and material damage due to incorrect installation of the accessories

Therefore:

- Optional devices may only be installed in accordance with their respective instructions.

6.1 Installation location

- To determine the proper location for the actuator, adhere to the technical data (↳ **11 Appendix, page 28**).
- Install in a location where the actuator is not exposed to strong UV radiation or corrosive or explosive air media.

6.2 Inspections prior to initial operation

- Performed by professional electrician.
- Prior to the initial operation, a professional electrician must perform and document the following tests and readings:
- Check visual condition
 - Function check of operating features and safety features



NOTE

See additional information concerning inspections and readings (↳ **8 Maintenance, page 22**).

6.3 Installation

- Installation is to be performed by trained personnel.

⚠ WARNING

Risk of injury and material damage due to loosening or removal of the screws on the device

Removal or loosening of the screws on the linear unit may lead to injuries and material damage during the operation.

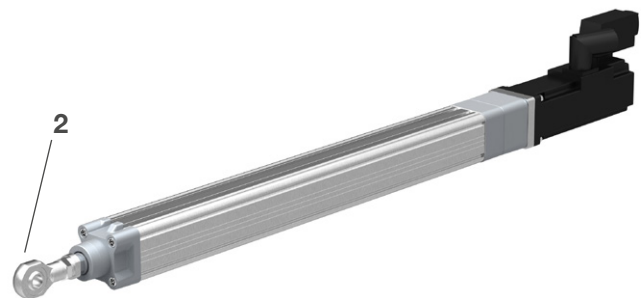
Therefore:

- Never loosen or remove screws on the linear unit.

The CASM Linear actuator (↳ **Fig.6**) is attached to two elements via the push tube and the mounting accessories.

1. Assemble the motor onto the linear unit if the product is not premounted (↳ **7.5 Installation instruction CASM inline kit, page 16**; ↳ **7.6 Installation instruction CASM parallel kit, page 19**).
2. Tighten the rod clevis or rod eye (2) on the rod lead.

Fig.6

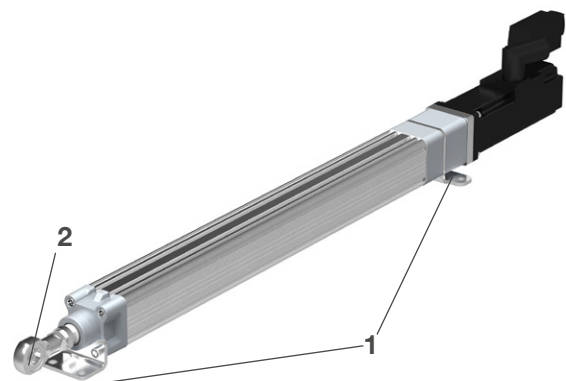


NOTE

Use the wrench flat on the piston rod for counter holding.

3. Bolt the mounting accessories to the actuator (↳ **4.3.1 accessories overview, page 10**).
4. Secure elements of the application in which the linear actuator will be installed.
5. Connect the rod end (2) and the mounting accessories (1) and the elements of the application with the fastening bolts (↳ **Fig.7**).

Fig.7



**NOTE**

Information concerning the dimensions of the drill holes for fastening bolts can be found in the respective data sheets. (↳ **11 Appendix, page 28**).

⚠ WARNING**Risk of injury and material damage due to insufficient fastening!**

Only use fastening bolts and secure them adequately. Do not use screws to install. Never loosen or remove screws on the actuator.

6. During installation, ensure that the applied force is always directed on the center of the actuator.

⚠ WARNING**Risk of injury and material damage due to incorrect installation!**

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

7. Ensure that the linear actuator is not impacted in its movement over the entire stroke area. Consider collision tests of the application.
8. Ensure that the installation requirements of the options have been adhered to (↳ **Chapter “Requirements Concerning the Installation of the Actuators with Options”**).
9. Affix prohibition and warning labels for the application onto the linear actuator, if necessary (↳ **2.5.1 Warning labels, page 7**).
10. Start set-up for 10 reference travel with limited load and speed:
 - CASM 32: $0,1 \times 10^{-3}$ J maximum
 - CASM 40: $0,2 \times 10^{-3}$ J maximum
 - CASM 63: $0,4 \times 10^{-3}$ J maximum

NOTICE

Do not reach the mechanical limit of the drive during operation. Doing so will result in irreversible damage to the drive.

7.0 Operation

7.1 Safety

⚠ DANGER

Risk of crushing

While moving onto solid objects, the force of the device may cause injuries.

Therefore:

- Ensure that there are no persons in the stroke area of the device while in operation.
- Take note of maximum permissible operating parameters for the device (↳ **Data sheets 11 Appendix, page 28**).
- Do not touch elements connected to the device while the device is in operation.

⚠ DANGER

If a part of the actuator fails (screw fracture, loss of input torque), the working mass will drop.

Therefore:

- Additional safety features must be in place to protect the workplace.
- When there is no input torque, the push tube can be moved manually or by gravity. A motor with fail safe brake is highly recommended, particularly for vertical application.
- Check the drive regularly for signs of excessive wear (↳ **8.2 Maintenance work, page 23**).

⚠ CAUTION

Material damage due to static and dynamic overload of the device

Static and dynamic overload can lead to damage and failure of the device.

Therefore:

- Adhere to maximum permissible operating parameters for the device (↳ **Data sheets 11 Appendix, page 28**).
- Never exceed nominal load.

⚠ WARNING

Burn hazard. Do not touch running actuator which gets hot.

NOTICE

Actuator may be damaged if liquids enter the actuator during extension and retraction. Keep liquids away.

NOTICE

Material damage through overheating

An overheating of the device can cause damage.

Therefore:

- Only use control integrated thermal switch.

7.2 Action before use

1. Ensure that there are no persons or objects in the stroke area of the device.

NOTICE

Contamination of the devices can cause serious damage

Therefore:

- Clean dirty parts immediately after they become dirty (↳ **8.2.1 Cleaning, page 23**).

7.3 Installation instruction CASM inline kit

7.3.1 Adapter kit

The adapter kit allows an axial motor mounting of the specified servo motors – linear unit combinations in chapter

7.3.2 Recommended motors.

7.3.2 Recommended motors

In principle, beside the recommended motors, also 3rd party motors may be fitted. It is important that torque and speed specifications of the motor do not exceed the permitted values of the linear unit. Detailed information may be found in the technical notes relating to the electrical cylinders. Ewellix recommends, amongst others, the following Siemens servo motors (**table 1**).

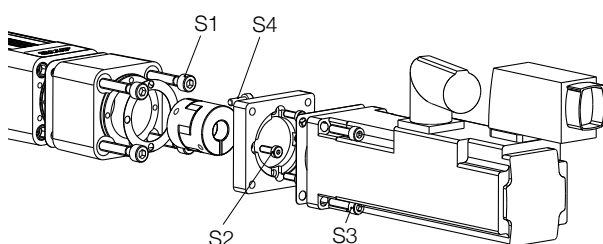
Table 1

Linear unit	CASM-32			CASM-40			CASM-63		
Screw	Lead screw 9x1,5	Ball screw 10x3	Ball screw 10x10	Lead screw 12,5x2.5	Ball screw 12x5	Ball screw 12,7x12,7	Lead screw 20x4	Ball screw 20x10	Ball screw 20x20
Motor	1FK7015 0,35 Nm 6 000 rpm			1FK7022 0,85 Nm 6 000 rpm			1FK7034 1,60 Nm 6 000 rpm		
							1FK7034 4,00 Nm 4 500 rpm		

7.3.3 Screws and tightening torques M_A

Table 2

	S1 (Clutch housing)		S2 (Motor adapter)		S4 (Clutch)		S3 (Motor)	
	Screw	Torque MA	Screw	Torque MA	Screw	Torque MA	Screw	Torque MA
CASM-32 1FK7015	M6x20	4,0 Nm $\pm 0,5$ Nm	M3x12	1,3 Nm $\pm 0,2$ Nm	M2x6	0,6 Nm $\pm 0,2$ Nm	M4x16	3,0 Nm $\pm 0,3$ Nm
CASM-32 -1FK7022	M6x30	4,0 Nm $\pm 0,5$ Nm	M4x12	3,0 Nm $\pm 0,5$ Nm	M4x12	4,0 Nm $\pm 0,5$ Nm	M5x20	5,9 Nm $\pm 0,8$ Nm
CASM-40 -1FK7022	M6x30	4,0 Nm $\pm 0,5$ Nm	M4x12	3,0 Nm $\pm 0,5$ Nm	M4x12	4,0 Nm $\pm 0,5$ Nm	M5x20	5,9 Nm $\pm 0,8$ Nm
CASM-40 -1FK7034	M6x30	4,0 Nm $\pm 0,5$ Nm	M4x12	3,0 Nm $\pm 0,5$ Nm	M4x12	4,0 Nm $\pm 0,5$ Nm	M6x20	10,1 Nm $\pm 0,8$ Nm
CASM-63 -1FK7034	M8x30	8,0 Nm $\pm 0,8$ Nm	M6x16	10,1 Nm $\pm 0,8$ Nm	M5x18	8,0 Nm $\pm 0,8$ Nm	M6x20	10,1 Nm $\pm 0,8$ Nm
CASM-63 -1FK7044	M8x30	8,0 Nm $\pm 0,8$ Nm	M6x25	10,1 Nm $\pm 0,8$ Nm	M5x18	8,0 Nm $\pm 0,8$ Nm	M6x25	10,1 Nm $\pm 0,8$ Nm

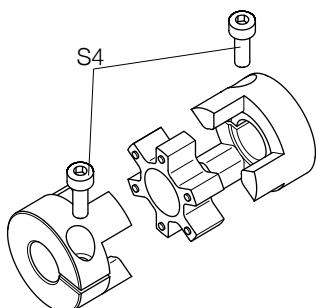


7.3.4 Coupling installation

Step 1

- Separate the two coupling halves (↳ fig. 8).

Fig. 8

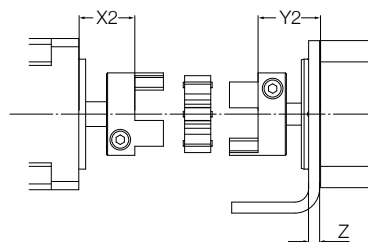


Step 2

- Align the coupling halves to the motor and linear unit shafts, following the specifications of **table 3 or 4**.
- Tighten the screws (S4) according the specified torques in table 2.

Table 4

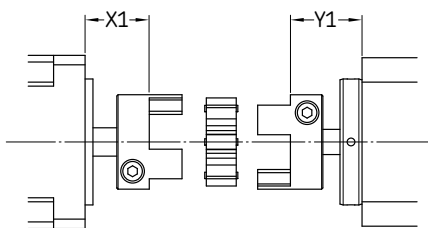
Positioning dimensions for coupling with foot mounting



	Standard Motor X2 mm	Linear unit Y2	Z
CASM-32-1FK7015	20,9	18,1	4
CASM-32-1FK7022	23,7	18,9	4
CASM-40-1FK7022	22,5	20,2	4
CASM-40-1FK7034	30,8	14,7	4
CASM-63-1FK7034	29,1	23,5	5
CASM-63-1FK7044	37,5	23,5	5

Table 3

Positioning dimensions for coupling



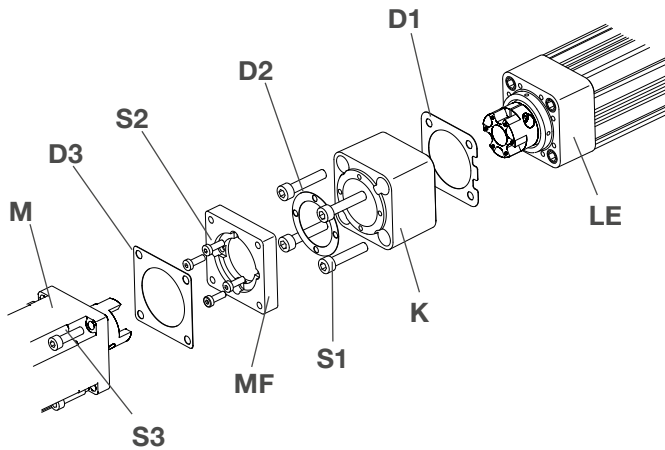
	Standard Motor X1 mm	Linear unit Y1
CASM-32-1FK7015	18,5	16,2
CASM-32-1FK7022	20	18,3
CASM-40-1FK7022	20,2	18,2
CASM-40-1FK7034	26,5	14,7
CASM-63-1FK7034	23,8	23,5
CASM-63-1FK7044	32,2	23,5

7.3.5 Adapter kit installation

NOTE

The relevant seal must always be fitted between all components to ensure the requisite degree of IP protection.

Fig.9



NOTE

For the following steps, check the required screw size and the tightening torques using the values indicated in the **table 2**.

Step 1

Mount the coupling housing (**K**) to the linear unit (**LE**) by inserting the square seal with the cut-out (**D1**) between the two components and tightening the housing using four Allen screws (**S1**). (→ **Foot mounting option 7.5.5.1**)

Step 2

Mount the motor flange (**MF**) to the coupling housing (**K**) by inserting the circular seal (**D2**) in between them. Make sure that the coupling is positioned according to table 3 for the configuration without the foot mounting kit or table 4 when using the foot mounting kit. Tighten the screws (**S2**) according to **table 2**.

Step 3

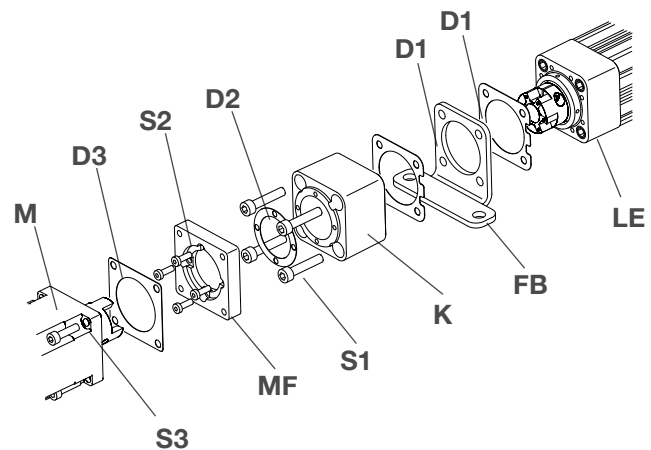
Mount the motor flange (**MF**) to the motor (**M**) by inserting the seal (**D3**) in between and using the four screws (**S3**) (**fig. 9**) to finish the installation.

7.5.5.1 Foot mounting option

Fitting the foot mounting

First fit the foot mounting (**FB**) to the linear unit (**LE**) and then the coupling housing (**K**). Insert one square seal with cut-out (**D1**) between each of the components, and secure the housing (**K**) using four Allen screws (**S1**) to the linear unit (**LE**). Continue with **Step 2** as described in **chapter 7.3.5**.

Fig.10



7.4 Installation instruction

CASM parallel kit

7.4.1 Use as intended

The adapter kit allows a parallel motor mounting (↳ 7.4.2 Recommended motors, page 19) to a CASM linear unit.

7.4.2 Recommended motors

In principle, all motors that are equipped with an smooth shaft may be fitted. It is important that the rated torque and speed of the motors does not exceed the permitted values of the linear unit. Detailed information may be found in the technical notes relating to the electric cylinders. Ewellix recommends the following SIEMENS 1FK7 servo motors: (↳ table 1).

Table 5

Recommended CASM linear unit /Siemens servo motor combinations									
Linear unit	CASM-32			CASM-40			CASM-63		
Screw	Lead screw 9x1,5	Ball screw 10x3	Ball screw 10x10	Lead screw 12,5x2.5	Ball screw 12x5	Ball screw 12,7x12,7	Lead screw 20x4	Ball screw 20x10	Ball screw 20x20
Motor	1FK7015			1FK7022 / 1FK7034			1FK7034		

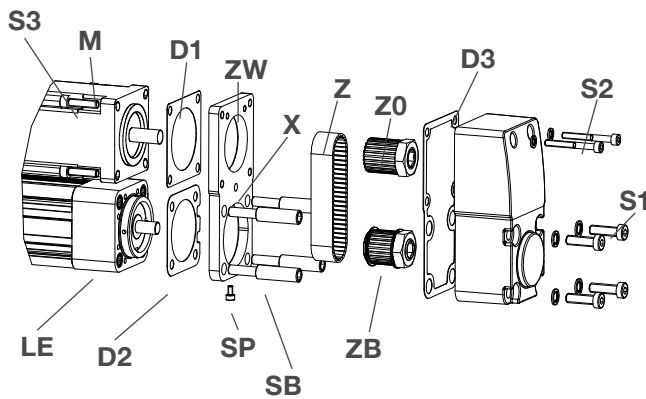
7.4.3 Screws and tightening torques M_A

Table 6

	SB (Intermediate plate)		S1 (Cover)		S2 (Cover)		S3 (Cover)	
	Screw	Torque M_A	Screw	Torque M_A	Screw	Torque M_A	Screw	Torque M_A
CASM-32 -1FK7015	M6x20	5,9 Nm ±0,8 Nm	M6x20	4,0 Nm ±0,5 Nm	M4x30	4,0 Nm ±0,5 Nm	M4x16	3,0 Nm ±0,3 Nm
CASM-40 -1FK7022	M6x20	5,9 Nm ±0,8 Nm	M6x20	4,0 Nm ±0,5 Nm	M4x35	4,0 Nm ±0,5 Nm	M5x20	5,9 Nm ±0,8 Nm
CASM-63 -1FK7034	M8x24	10,1 Nm ±0,8 Nm	M8x20	5,9 Nm ±0,8 Nm	M4x45	4,0 Nm ±0,5 Nm	M6x20	10,1 Nm ±0,8 Nm

Intermediate plate installation

Fig.11



Step 1

Mount the motor (M) on the intermediate plate (ZW) by inserting the square seal without cut-out (D1) in between and tightening it using all the Allen screws (S3). When assembling, note the alignment of the intermediate plate marking (X).

Step 2

Attach the linear unit (LE) to the intermediate plate (ZW), insert the square seal with cut-out (D2) and hand tighten the four screws (SB).

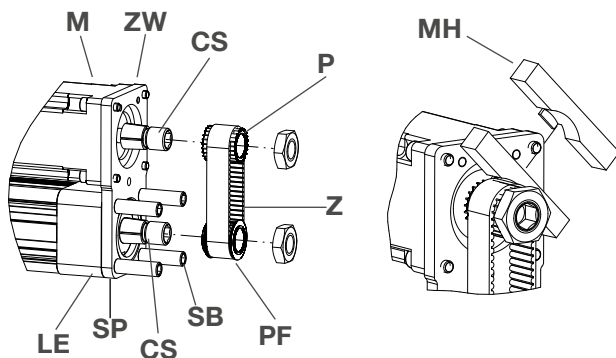


NOTE

Do not tighten the screws (SB) until **step 5 chapter 7.4.4.**

7.4.4 Timing belt installation

Fig. 12



Step 1

Push the linear unit (LE) as far as possible towards the motor (M) and tighten the screws (SB) by hand.

Place the two clamping sleeves (CS) on the shaft of the linear unit and the motor. Take the timing belt and insert the pulleys (P/PF).

Step 2

Push the pulleys over the clamping sleeves. The flanged pulley (PF) has to be on the shaft of the linear unit. Push the flanged pulley and clamping sleeve as far as possible on the screw trunnion and align the pulley (P) and the 2nd clamping sleeve on the motor side as follows:

- CASM-32: Push the pulley as far as possible
- CASM-40/63: Position the pulley by placing the assembly tool (MH) on the intermediate plate and pushing the pulley as far as possible.

Step 3

Secure the pulley by tightening the nut (torque as per **table 7**) and countering at the same time with a hexagonal wrench.

Tab. 7

Pulley fixation - tightening Torque (MA)	Torque MA	
	Pulley	Torque MA
CASM-32-1FK7015	GT3-3M-Z18	5 Nm
CASM-40-1FK7022	GT3-3M-Z24	20 Nm
CASM-63-1FK7034	GT3-5M-Z22	40 Nm

Step 4

Place the central pretension screw (SP) in the side bore of the intermediate plate (ZW, **fig.12**) and tighten the timing belt (Z) using the pretension screw (SP).



NOTE

Loosen the special screw (SB, **fig. 11**) if the belt cannot be tightened.

Step 5

Measure the timing belt tension using a suitable frequency measurement device. Adjust the pretension screw (SP) until the required belt tension is reached and tighten the screws (SB) according to **table 6**.

Tightening the pretension screw (SP) increases the natural frequency of the timing belt (**table 8**). Excessive preloads can lead to increased wear in the bearing of the linear unit (LE) or motor (M) due to radial loading. Once the correct frequency is set, secure the special screws (SB) and check the timing belt frequency again.

Tab. 8

	CASM-32-1FK7015	CASM-40-1FK7022	CASM-63-1FK7034
Natural frequency	565 Hz ±8	525 Hz ±8	345 Hz ±8
Strand deflection	1 mm @ 8 N	1,2 mm @ 15 N	1,6 mm @ 20 N

Replace interval for all timing belts: 2 Mio cycles

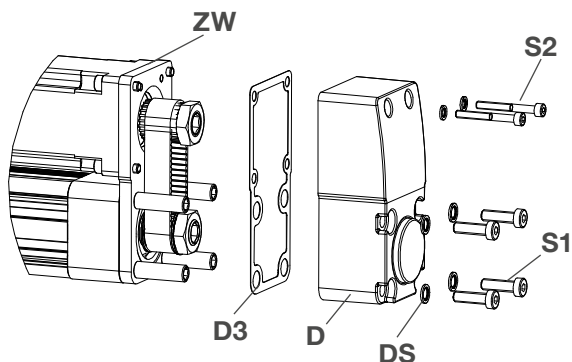
NOTE

3rd party motors installation: the given natural frequencies in table 8 refer to the recommended Siemens motors. The natural frequency limit for of a third party motor might be different from the given values in **table 8**.

The frequency is usually limited by the max. admissible radial load of the motor shaft.

7.4.5 Gearbox cover installation

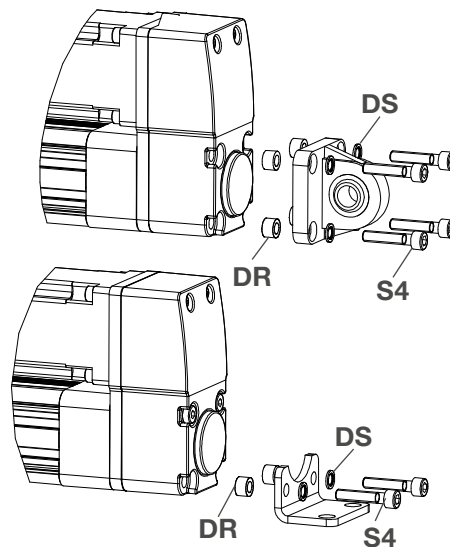
Fig. 13



Place the flat seal (**D3**) in between the gearbox cover (**D**) and the intermediate plate (**ZW**). Push the sealing washers (**DS**) over the Allen screws (**S1/S2**) and fix the gearbox cover (**Fig. 13**). For screws and torques, refer to **table 6**.

7.4.6.1 Fixing accessories option

Fig. 14



Insert the sealing rings (**DR**) between the gearbox cover and fixing accessories. Push the sealing washers (**DS**) over the Allen screws (**S4**) and fix the accessories by tightening the screws (torque as per **table 9**).

Table 9

S4 (CASM-32)		S4 (CASM-40)		S4 (CASM-63)	
Screw	Torque M _A	Screw	Torque M _A	Screw	Torque M _A
M6×30	5 Nm ±0,5 Nm	M6×30	5 Nm ±0,5 Nm	M8×35	8 Nm ±0,8 Nm

8.0 Maintenance

Personnel

- Daily maintenance work described herein can be performed by the operator.
- Some maintenance tasks should only be performed by specially trained, qualified personnel employed by the product owner, or exclusively by personnel of the manufacturer; specific reference will be made in each case in the description of the respective maintenance task.
- Only professional electricians should perform work on electrical equipment.

8.1 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.

CASM linear actuator maintenance plan		
Interval	Maintenance work	To be carried out by
Daily	Check actuator for visible damage (↳ 8.2.3 Check of visual condition).	Operator
	Clean off dust and dirt if necessary (↳ 8.2.1 Cleaning).	Operator
Monthly	Check tight fit of the rod and options, correct if necessary. Check connection for tight fit.	Qualified personnel
Annually	Check labels and warning notices for legibility and replace if necessary.	Qualified personnel
	Check sealings for damage (↳ 8.2.2 Check sealing function).	Qualified personnel
Semi-annually	Check options for visible damage	Qualified personnel

NOTICE

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.

8.2 Maintenance work

8.2.1 Cleaning

To be performed by operator.

NOTICE

Damage due to incorrect cleaning

Therefore:

- 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 retraction or extension.
- Only use the auxiliary materials.
- No steam jets or pressure washers may be used for cleaning.
- Other cleaning agents or cleaning devices may only be utilized with the manufacturer's approval.

Clean line actuator:

1. Clean dirty parts with a damp cloth.

8.2.2 Check sealing function

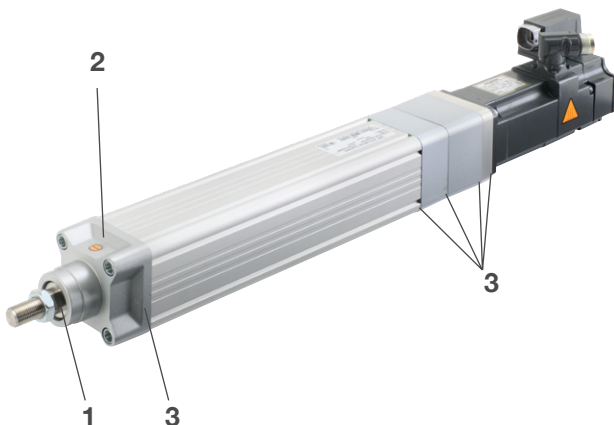
To be performed by qualified personnel.

Device must be stopped and secured.

1. Check seal for damage
2. Check filter and plug for damage
3. Check gaskets for damage

Check for potential leakage in the actuator. If there is no damage, you can restart the application.

Fig. 15



NOTICE

Material damage due to damaged or incorrect sealing rings

Damaged or incorrect sealing rings cannot guarantee protection pursuant to IP54S.

Therefore:

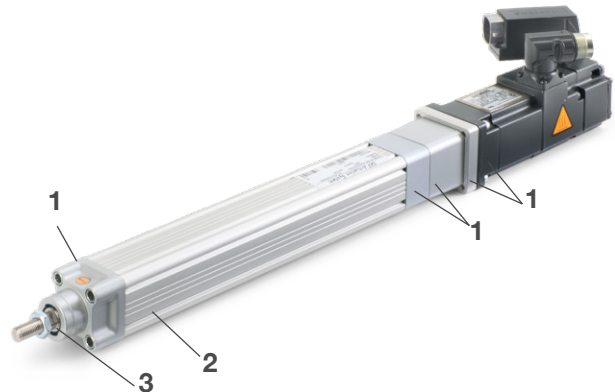
- Ask the manufacturer to replace the damaged sealing rings immediately.

8.2.3 Check of visual condition

To be performed by qualified personnel.

1. Separate the device from the energy supply.
2. Check the following structural components for visual external damage:
 - Check housings for cracks and gaps (1)
 - Check profile for cracks, gaps and broken pieces (2)
 - Check push tube for scratches and indentations (3)

Fig. 16



Notify processor or actuator manufacturer in case of damage. If there is no damage and the processor/manufacturer has not communicated any concerns, reconnect the device to the power supply.

8.3 Measures after maintenance completed

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

1. Check all screw connections for a tight fit.
2. Ensure that all used tools, materials and other equipment have been removed from the work area.
3. Clean work area and remove potential spills such as liquids and processing material.
4. Ensure that all safety measures of the system work without a problem.
5. Check functions.
6. Document completion of the inspections in the service log.

8.4 Maintenance checks

During each service interval, the following measurement/check needs to be done:

- LS: the axial play must be less than the following values:

CASM-32	CASM-40	CASM-63
0,35 mm	0,6 mm	1,0 mm

If the play is above the specified values, the drive needs to be replaced. If not replaced, it could lead to catastrophic failure of the system (uncontrolled movement of the moving mass).
- BS: excessive wear of the ball screw could lead to a noise increase and a potential blockage of the drive
- In the case of the U-shape (belt drive), check:
 - the tooth belt for sign of early fatigue (cracks and/or heavy wear)
 - replace after 2 million cycles without regard for wear
- Setting data (↳ **7.6.5 Timing belt installation, page 20**)

WARNING

Crush hazard

Therefore:

- Do not operate the system when the gearbox cover is removed.

9.0 Malfunctions

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

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

Contact the manufacturer concerning malfunctions which are not solved by the repair suggestions in the table below; see service address on the back cover.

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, which is specifically indicated in the description of the individual malfunction.
- Work on the electric system may only be performed by professional electricians.



⚠ DANGER

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

The CASM linear actuator is not designed to be repaired by the customer in most situations. Incorrect repair of a malfunction may lead to personal injury or material damage.

Therefore:

- Never loosen the screws on the linear actuator or try to open the linear actuator.
- In the event of a malfunction that cannot be fixed by adhering to the suggestions in the table below, dismantle the device and send it to the manufacturer for repair. (↳ **5 Delivery, packaging and storage, page 11**).

Actions during malfunctions

1. In the event of a malfunction that may present an immediate danger to persons or assets, turn off the actuator.
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 and how it is to be performed.

9.1 Malfunction table

Malfunction	Possible cause	Repair malfunction	To be repaired by
Linear actuator doesn't move	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.
	Lifespan of the device is exceeded.	See performance diagram in the CASM brochure.	Qualified personnel.
Linear actuator cannot be set in motion by any of the above listed measures.	Linear actuator cannot be set in motion by any of the above listed measures.	Exchange device.	Qualified personnel.
	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.
Linear actuator cannot be lifted	Defective screw nut.	Exchange device.	Qualified personnel.
	Obstacle in the stroke area of the linear actuator.	Remove all obstacles in the stroke area.	Operator.
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 device.	Qualified personnel.
Significant increase of noises during operation	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 ball screw nut.	Exchange device.	Qualified personnel.

9.2 Start of operation after fixing malfunction

After the malfunction has been fixed, perform the steps from the chapter Installation prior to restart.

10.0 Dismantling

Personnel

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

⚠ WARNING

Risk of injury due to incorrect dismantling!

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

Therefore:

- 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 source for accidents.
- Dismantle structural components professionally pursuant to applicable local regulations.
- Secure structural components in a way so they would not be able to fall or tip over.
- Contact the manufacturer if you have any questions or concerns.

Dismantling of CASM

1. Secure elements of the application in such a fashion that no loads can impact the fork and the hinge head.
2. Loosen and remove fastening bolts from trunnion or flange and rods.
3. Separate linear actuator from application elements.
4. Clean device.
5. Carefully package for shipment to the manufacturer.
6. For disposal, disassemble device according to applicable local occupational health and environmental regulations.

10.1 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 centre.
- 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 .

11.0 Appendix

Technical data sheets

PUB NUM IL-06010/1-EN-May 2020 Electric cylinders CASM 32/40/63

For further technical information please contact Ewellix.



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