

Hazard Warnings

Hazard warnings in this manual indicate potential harm to the user or the product. For the person interacting with the product, the level of risk includes consequences ranging from slight, up to lethal injuries. As for the product, disobeying the warnings may cause damage to the equipment and/or void the warranty. Therefore, said warnings are made apparent to instruct and warn the user, which precautions have to be made prior to performing any actions described in this manual. The user must read and be familiar with the manual, before performing any tasks as described in this manual.

Hazard warnings in this manual are presented in these three forms:

WARNING: These warning notices refer to personal safety. Failure to obey these notices could result in personal injury or death.



WARNING

CAUTION: General precautions must be made. Failure to obey these notices could result in personal injury and/or equipment damage.



CAUTION

NOTE: Directs the user's attention to essential information.

Operation manual for linear units type LK

1 General

Type LK linear units are offered in different variants, see Table 1. These are mounted together with electric open/close or modulating actuators, of the series CM, on valves which require a linear positioning movement. These linear units convert the torque output from the actuator into an axial force through a ball screw drive. Not only is a higher control accuracy allowed, but also a longer lifetime is provided with the use of a ball screw drive. The combination of actuator and linear unit, is based on the required thrust and the necessary stroke.

Type	Actuator	Output flange	Stroke	Output thread	Pitch	Factor ($\frac{Nm}{kN}$)	Weight [kg]
LK50	CM03	G0/F10	50mm	M20x1,5	5mm/rev	1,06	12,3
LK100	CM03	G0/F10	100mm	M20x1,5	5mm/rev	1,06	15,0
LK120	CM06	G0/F10	120mm	M20x1,5	5mm/rev	1,06	19,2
	CM06	G $\frac{1}{2}$ /F14	120mm	M36x3,0	5mm/rev	1,06	23,6

Table 1: Technical data linear units

2 Structure

Figure 1 shows e.g. an CM03 actuator with mounted LK linear unit. The linear unit itself consists essentially of a solid cast housing, a mounted spindle nut and a non-rotating spindle, see Figure 2. To prevent contamination by dusty ambient air and to ensure the mechanical protection, the linear unit is completely sealed with O-rings at the output.

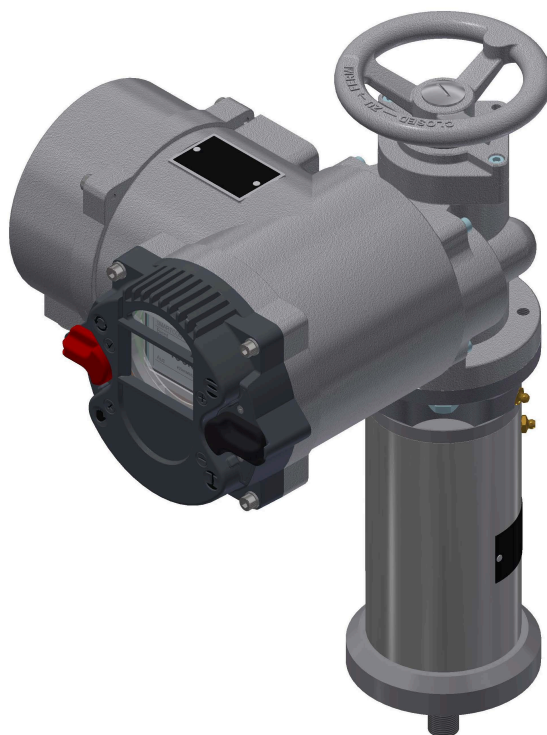


Figure 1: CM03-Actuator with mounted LK100 linear unit

Figure 2 shows the exploded drawing of the linear unit.

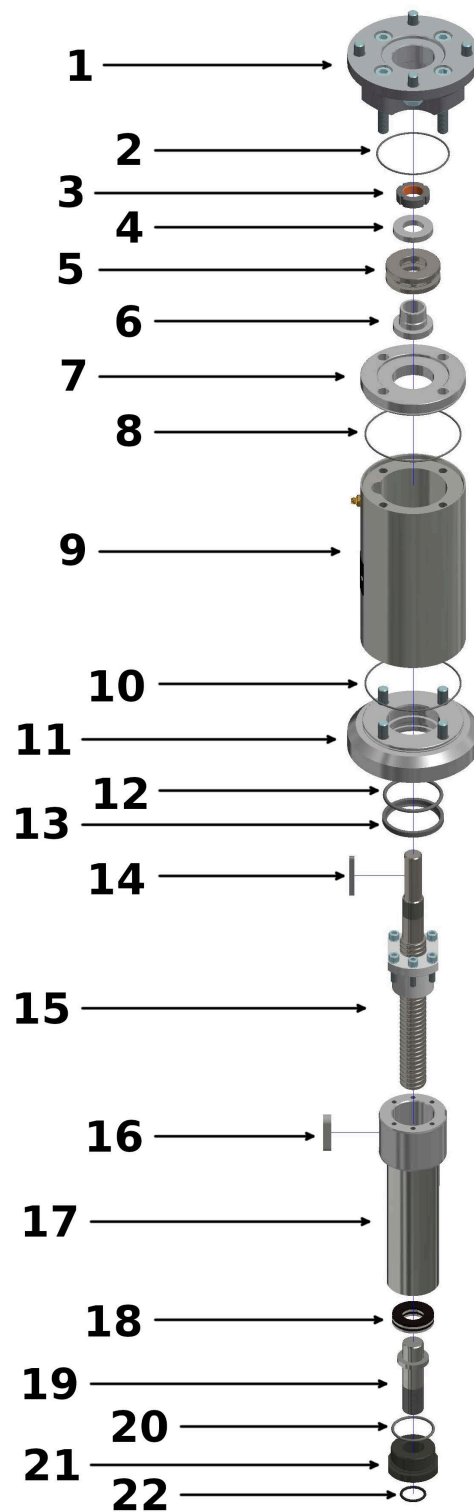


Figure 2: This image shows the exploded view of the linear unit. The parts are listed in table 2.

Table 2: Parts list of the linear unit

Part no.	Description
1	Output flange
2	O-Ring
3	Groove nut
4	Bearing plate
5	Axial deep groove ball bearing
6	Bearing ring
7	Intermediate flange
8	O-Ring
9	Housing tube
10	O-Ring
11	Base flange
12	O-Ring
13	Wiper
14	Feather key
15	Ball screw spindle
16	Feather key
17	Coupling and output shaft
18	Cup spring
19	Spindle pin
20	O-Ring
21	Spindle pin ring nut
22	O-Ring

3 Packaging, transport and storage

See chapter „Packaging, transport and storage“ in der standard user manual.

4 Assembly and disassembly of linear units on valves

In the following two subsections, the procedures for assembly and disassembly of linear units on valves are explained step by step.

4.1 Security and assembly instructions

WARNING: The device may only be mounted and commissioned by qualified personnel!

Qualified personnel within the meaning of this operating manual are persons who are familiar, with assembly, commissioning and operation of this product, and have the required appropriate qualifications for this activity.



WARNING

WARNING: For assembly and disassembly of the linear unit, the pipes where the valve is installed on have to be depressurized! If the actuator is removed from the linear unit, the position of the valve stem won't be fixed anymore and will be lost due to the linear units non self locking property.



WARNING

WARNING: The linear unit has end stops on both end positions. Do not move against the end stops in electrical operation! The end limits of the actuator must be set accordingly!



WARNING

WARNING: Never bring the valve cone with excessive force in the CLOSED position. This can damage the high-quality sealing edges.



WARNING

4.2 Assembly

1. Check that the actuator flange, the linear unit flanges and the valve flange match.
2. Thoroughly clean screw-on surfaces and bare parts on actuator, linear unit and valve.
3. Lightly grease the connections of the actuator, the linear unit and the valve.
4. Grease the spindle of the linear unit.
5. Move the valve cone in the CLOSED position.
6. Turn the spindle nut until the linear unit is in a central position.
7. Mount the linear unit on the valve and tighten the screws crosswise. The coupling between the linear unit and the valve will be connected later.
8. Mount the actuator on the linear unit and tighten the screws crosswise.
9. Extend the spindle by rotating the handwheel until the coupling of the linear unit and the valve fit together.
10. Connect the coupling between linear unit and valve.
11. Use the handwheel to move the linear unit to a center position, to prevent accidental damage to the valve during startup.

4.3 Disassembly

1. If the valve is fully closed, move the valve cone to about ten percent OPEN position
2. Loosen the screws between the output flange of the actuator and the linear unit and dismount the actuator.
3. Open the spindle coupling between the linear unit and the valve.
4. Loosen the screws between the output flange of the linear unit and the valve.
5. Dismount the linear unit from the valve.

5 Commissioning

See chapter „Commissioning“ in the standard user manual.

6 Maintenance

Pay attention to increased running noises, occur on them, grease the two lubrication nipples of the linear unit to lubricate the bearings and the spindle guidance.

Regularly check the fixing screws between the actuator, the linear unit and the valve for firm hold, if necessary tighten them with the torques specified in chapter „Installation instructions“ of the standard user manual.

6.1 Moving interval

The linear unit should be actuated at least every 3 months.

6.2 Greasing intervall

Every 6 months the linear unit should be re-greased via the greasing nipples .

7 Lubricant recommendation

Lubricating grease DIN 51825-K(P) R -40

i.e. Water-repellent complex grease based on Al-soap with high resistance to acids and alkalis:

Ambient Temperature:	-40 bis +85 °C
Worked penetration 0,1 mm:	310 - 340
Dripping point:	ca. 260 °C
NLGI-Class:	1
acid-free, not or only slightly reactive with water	