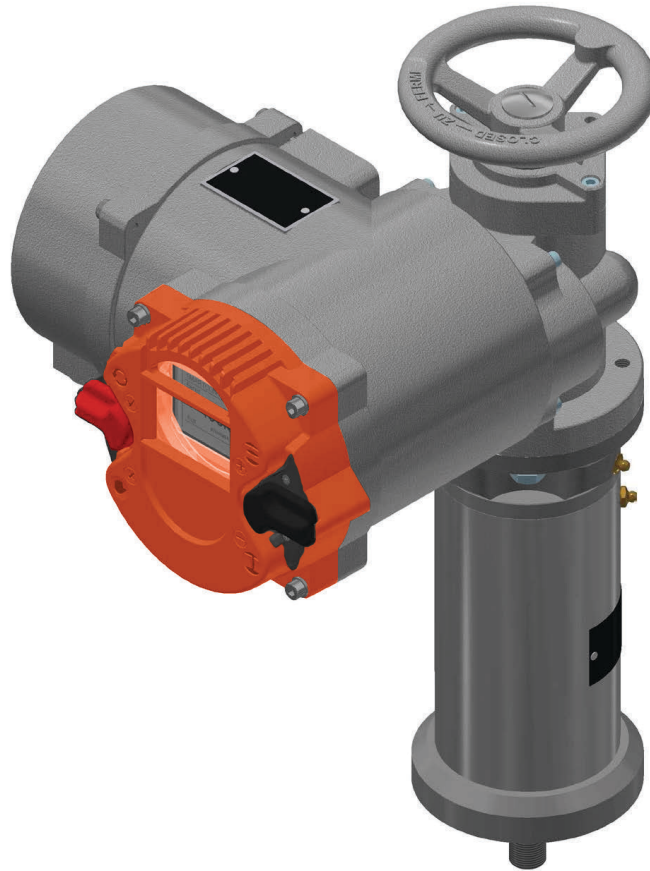


Bettis RTS

Ball Screw Linear Drives



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Section 1: General

Type ball screw linear drives 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.

Table 1. Technical Data Linear Units

Type	Actuator	Output Flange	Stroke	Output Thread	Pitch	Factor (Nm/kN)	Weight (kg)
LK50	CM03	G0/F10	50 mm	M20x1.5 mm	5 mm/rev	1.06	12.3
LK100	CM03	G0/F10	100 mm	M20x1.5 mm	5 mm/rev	1.06	15.0
LK120	CM06	G0/F10	120 mm	M20x1.5 mm	5 mm/rev	1.06	19.2
	CM06	G1/2 F14	120 mm	M36x3 mm	5 mm/rev	1.06	23.6

Section 2: Structure

Figure 1 shows e.g. a CM-32 actuator with mounted LK100 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 CM-32-Actuator with Mounted LK100 Linear Unit

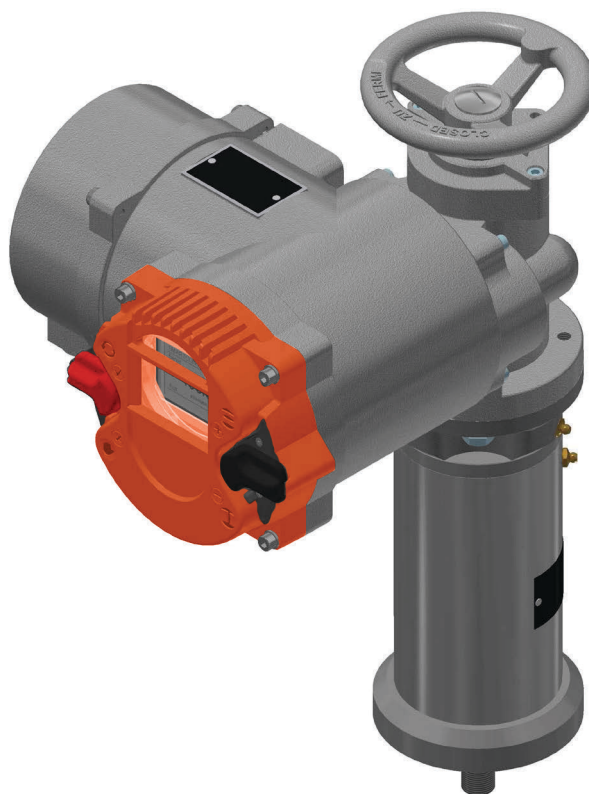


Figure 2 shows the exploded drawing of the linear unit. The parts are listed in Table 2.

Figure 2

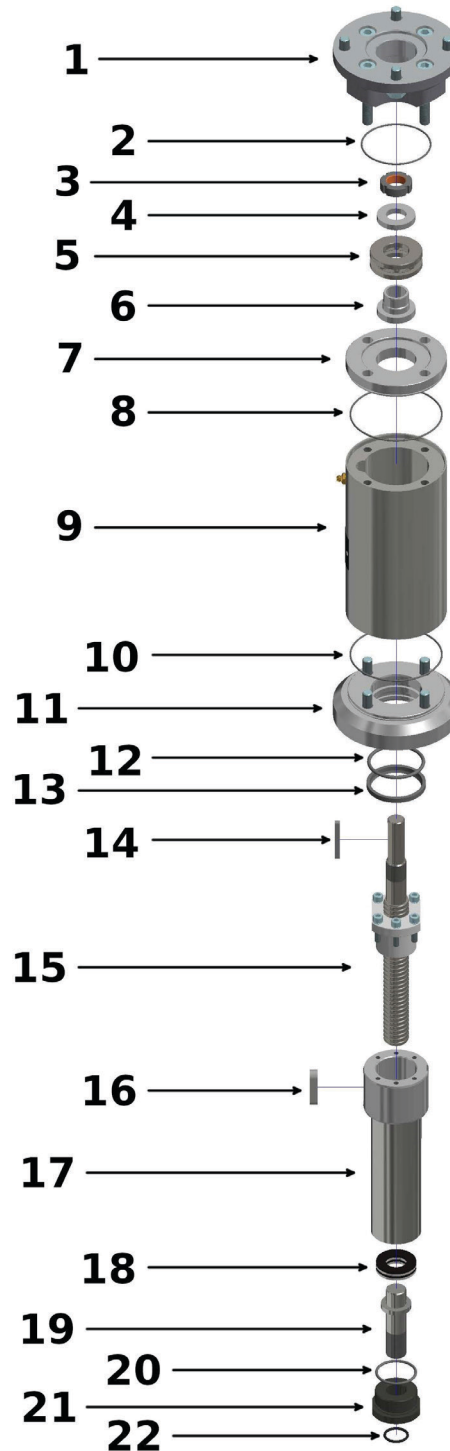


Table 2. Parts List of the Linear Unit

Part Number	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

Section 3: Packaging, Transport and Storage

See chapter "Packaging, Transport and Storage" in the standard user manual.

Section 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

For assembly and disassembly of the linear unit, the pipes where the valve is installed on must 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

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

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 start-up.

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.

Section 5: Commissioning

See chapter Commissioning in the standard user manual.

Section 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 Interval

Every 6 months the linear unit should be regreased via the greasing nipples.

Section 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	

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