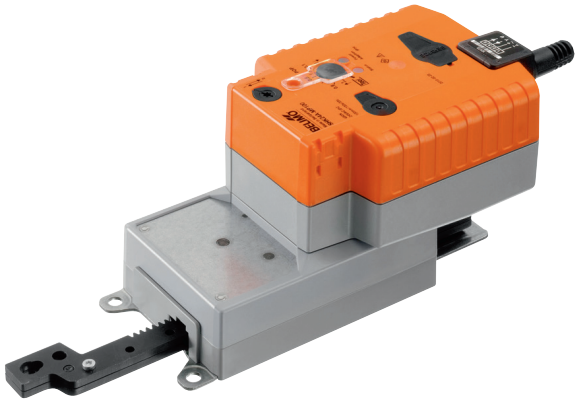
BELIMO

Technical data sheet SHK24A-1-100

Linear actuator fail-safe and extended functionalities for adjusting dampers and slide valves in technical building installations and in laboratories

- **Air damper size up to approx. 3 m²**
- **Actuating force 450 N**
- **Nominal voltage AC/DC 24 V**
- **Control Open/close**
- **Length of Stroke Max. 100 mm, adjustable in 20 mm increments**



Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	11 W
	Power consumption in rest position	3 W
	Power consumption for wire sizing	21 VA
	Power consumption for wire sizing note	Imax 20 A @ 5 ms
	Connection supply / control	Cable 1 m, 3 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Actuating force motor	450 N
	Setting fail-safe position	0...100%, adjustable in increments of 10% (POP rotary knob on 0 corresponds to retracted gear rod)
	Bridging time (PF)	2 s
	Position accuracy	±5%
	Direction of motion motor	selectable with switch 0 (extended) / 1 (retracted)
	Direction of motion fail-safe	selectable with switch 0...100% (retracted 0%)
	Manual override	with push-button
	Stroke	100 mm
	Length of Stroke	Max. 100 mm, adjustable in 20 mm increments
	Stroke limitation	can be limited on both sides with mechanical end stops
	Running time motor	120 s / 100 mm
	Running time fail-safe	35 s / 100 mm
	Running time fail-safe note	<35 s @ 0...50°C
	Sound power level, motor	52 dB(A)
	Sound power level, fail-safe	61 dB(A)
Safety	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2
	Enclosure	UL Enclosure Type 2
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1:02
	Certification UL note	The UL marking on the actuator depends on the production site, the device is UL-compliant in any case
	Mode of operation	Type 1.AA
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Storage temperature	-40...80°C
	Ambient humidity	Max. 95% r.H., non-condensing
	Servicing	maintenance-free

Technical data

Weight	Weight	1.6 kg
Terms	Abbreviations	POP = Power off position / fail-safe position PF = Power fail delay time / bridging time

Safety notes

- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Outdoor application: only possible in case that no (sea) water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The device may only be opened at the manufacturer's site. It does not contain any parts that can be replaced or repaired by the user.
- Cables must not be removed from the device.
- The rotary supports and coupling pieces available as accessories and must always be used if transverse forces are likely. In addition, the actuator must not be tightly bolted to the application. It must remain movable via the rotary support (refer to «Assembly notes»).
- If a rotary support and/or coupling piece is used, actuation force losses are to be expected.
- If the actuator is exposed to severely contaminated ambient air, appropriate precautions must be taken on the system side. Excessive deposits of dust, soot etc. can prevent the gear rod from being extended and retracted correctly.
- If not installed horizontally, the gear disengagement push-button may only be actuated when there is no pressure on the gear rod.
- To calculate the actuating force required for air dampers and slide valves, the specifications supplied by the damper manufacturers concerning the cross section, the design, the installation site and the ventilation conditions must be observed.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Mode of operation

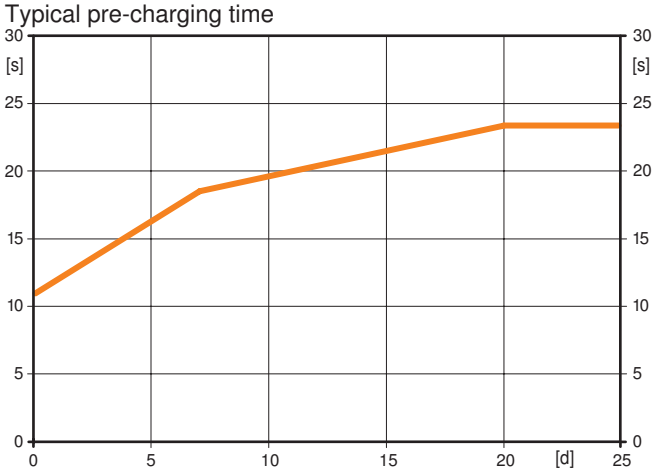
The actuator moves the damper to the desired operating position at the same time as the integrated capacitors are charged. Interrupting the supply voltage causes the damper to be rotated back into the fail-safe position by means of stored electrical energy.

Product features

Pre-charging time (start up)

The capacitor actuators require a pre-charging time. This time is used for charging the capacitors up to a usable voltage level. This ensures that, in the event of a power failure, the actuator can move at any time from its current position into the preset fail-safe position.
The duration of the pre-charging time depends mainly on following factors:
– Duration of the power failure
– PF delay time (bridging time)

Typical pre-charging time



	[d]		
	0	7	≥20
[s]	11	18	23

[d] = Electricity interruption in days
[s] = Pre-charging time in seconds

Delivery condition (capacitors)

The actuator is completely discharged after delivery from the factory, which is why the actuator requires approximately 20 s pre-charging time before initial commissioning in order to bring the capacitors up to the required voltage level.

Simple direct mounting

The actuator can be directly connected with the application using the enclosed screws. The head of the gear rod is connected to the moving part of the ventilating application individually on the mounting side or with the Z-KS1 coupling piece provided for this purpose.

Manual override

Manual control with push-button possible - temporary. The gear is disengaged and the actuator decoupled for as long as the button is pressed.

High functional reliability

The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Setting direction of stroke

When actuated, the stroke direction switch changes the running direction in normal operation. The stroke direction switch has no influence on the fail-safe position which has been set.

Setting fail-safe position (POP)

The rotary knob fail-safe position can be used to adjust the desired fail-safe position. The setting range always refers to the maximum height of stroke of the actuator.
In the event of a power failure, the actuator will move into the selected fail-safe position, taking into account the bridging time (PF) of 2 s which was set ex-works.

Accessories

Mechanical accessories

Description	Type
End stop kit, Multipack 20 pcs.	Z-AS1
Rotary support, for linear actuator	Z-DS1
Coupling piece M8	Z-KS1

Electrical installation

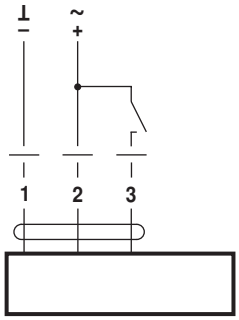
Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

Electrical installation

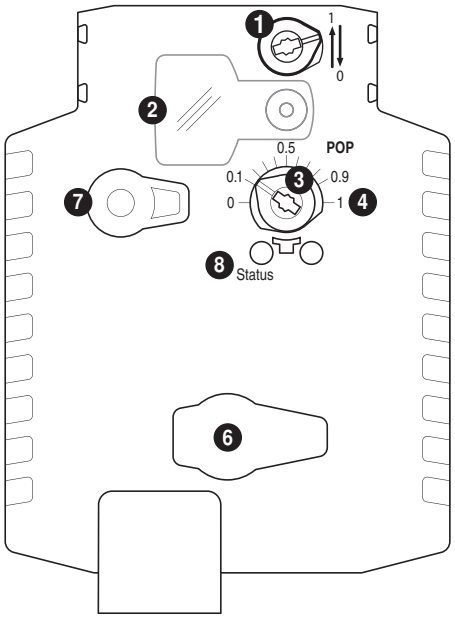
Wiring diagrams

AC/DC 24 V, open/close



Cable colours:
1 = black
2 = red
3 = white

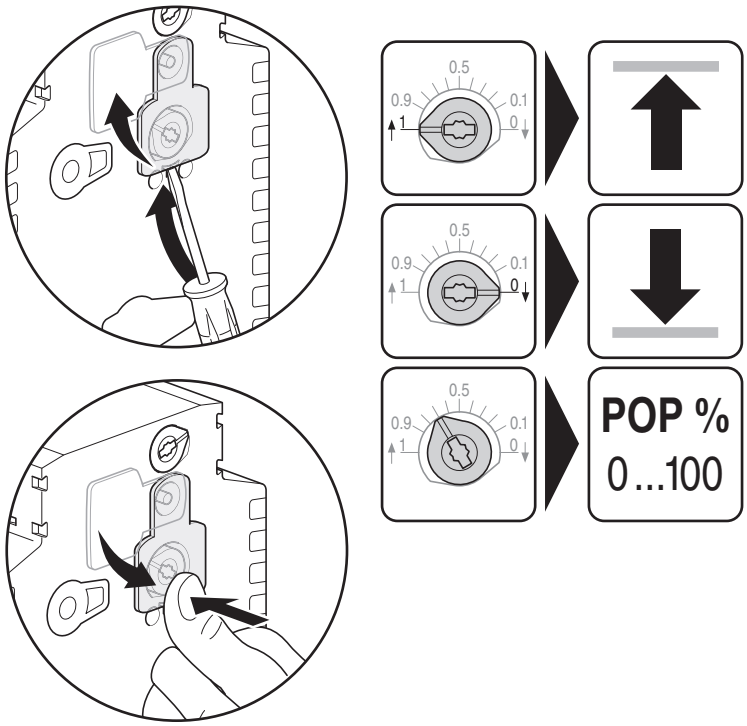
Operating controls and indicators



1. **Direction of stroke switch**
2. **Cover, POP button**
3. **POP button**
4. **Scale for manual adjustment**
6. (no function)
7. **Disengagement button**

LED display 8 green	Meaning / function
On	Operation OK / without fault
Flashing	POP function active
Off	– Not in operation – Pre-charging time SuperCap – Fault SuperCap

Setting emergency setting position (POP)



Installation notes

Notes

- If a rotary support and/or coupling piece is used, losses in the actuation force losses are to be expected.

Applications without transverse force

The linear actuator is screwed directly to the housing at three points. Afterwards, the head of the gear rod is fastened to the moving part of the ventilation application (e.g. damper or slide valve).

Applications with transverse forces

The coupling piece with the internal thread (Z-KS1) is connected to the head of the gear rod. The rotary support (Z-DS1) is screwed to the ventilation application. Afterwards, the linear actuator is screwed to the previously mounted rotary support with the enclosed screw. Afterwards, the coupling piece, which is mounted to the head of the gear rod, is attached to the moving part of the ventilating application (e.g. damper or slide valve). The transverse forces can be compensated for to a certain limit with the rotary support and/or coupling piece. The maximum permissible swivel angle of the rotary support and coupling piece is 10° (angle), laterally and upwards.

Stroke limitation

If the stroke limitations are used on the gear rod, the mechanical operating range on this side of the gear rod can be used starting with an extension length of 20 mm.

Dimensions [mm]

Dimensional drawings