BELIMO

Technical data sheet NKQ24A-1

SuperCap rotary actuator with emergency control function and extended functionalities for adjusting dampers in technical building installations and in laboratories

- **Air damper size up to approx. 1.2 m²**
- **Nominal torque 6 Nm**
- **Nominal voltage AC/DC 24 V**
- **Control Open-close**
- **Running time motor 4 s**
- **Design life SuperCaps: 15 years**

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	22 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	Torque motor	Min. 6 Nm
	Setting emergency setting position (POP)	0...100%, adjustable in increments of 10% (POP rotary knob on 0 corresponds to left end stop)
	Position accuracy	±5%
	Direction of motion motor	Selectable with switch 0 (ccw rotation) / 1 (cw rotation)
	Direction of motion emergency control function	Selectable with switch 0...100%
	Manual override	Gear disengagement with push-button
	Angle of rotation	Max. 95°
	Angle of rotation note	can be limited on both sides with adjustable mechanical end stops
	Minimum angle of rotation	Min. 30°
	Running time motor	4 s / 90°
	Running time emergency control position	4 s / 90°
	Running time emergency setting position note	<4 s @ 0...50°C
	Adaption setting range	manual (automatic on first power-up)
	Sound power level motor	60 dB(A)
	Sound power level emergency control position	60 dB(A)
	Spindle driver	Universal spindle clamp 8...26.7 mm
	Position indication	Mechanically, pluggable
Safety	Protection class IEC/EN	III Safety extra-low voltage
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02
	Mode of operation	Type 1.AA
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30...50°C
	Non-operating temperature	-40...80°C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free

Technical data

Weight	Weight approx.	1.4 kg
Terms	Abbreviations	POP = Power off position / emergency setting 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.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site and the ventilation conditions must be observed.
- Self adaption is necessary when the system is commissioned and after each adjustment of the angle of rotation (press the adaption push-button once).
- 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

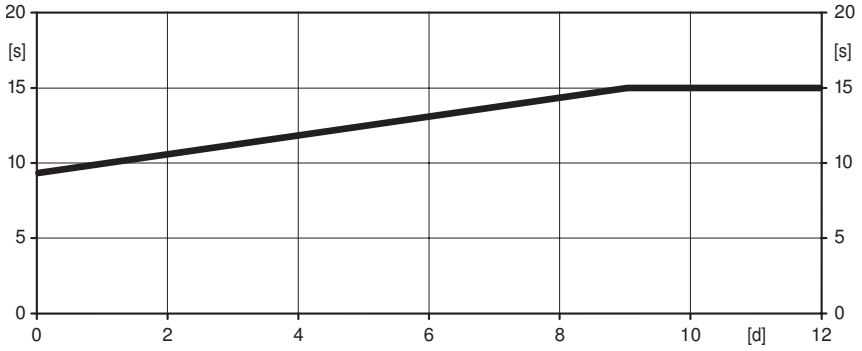
Mode of operation

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 emergency setting position (POP) by means of stored electrical energy.

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 an electricity interruption, the actuator can move at any time from its current position into the preset emergency setting position (POP).
The duration of the pre-charging time depends mainly on following factors:
– Duration of the electricity interruption
– PF delay time (bridging time)

Typical pre-charging times



	[d]				
	0	**1**	**2**	**7**	**≥10**
[s]	9	10	11	13	15

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

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.

Product features

Simple direct mounting
Simple direct mounting on the damper spindle with an universal spindle clamp, supplied with an anti-rotation device to prevent the actuator from rotating.

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.

Adjustable angle of rotation
Adjustable angle of rotation with mechanical end stops. A minimum permissible angle of rotation of 30° must be allowed for.

Home position
The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaption, which is when the operating range and position feedback adjust themselves to the mechanical setting range.
The detection of the mechanical end stops enables a gentle approach to the end positions, thus protecting the actuator mechanics.
The actuator then moves into the position defined by the positioning signal.

Direction of rotation switch
When actuated, the direction of rotation switch changes the running direction in normal operation. The direction of rotation switch has no influence on the emergency setting position (POP) which has been set.

Adaption and synchronisation
An adaption can be triggered manually by pressing the “Adaption” button. Both mechanical end stops are detected during the adaption (entire setting range).
Automatic synchronisation after pressing the gear disengagement button is configured.
The synchronisation is in the home position (0%).
The actuator then moves into the position defined by the positioning signal.

Emergency setting position (POP) rotary knob
The «Emergency setting position» rotary knob can be used to adjust the desired emergency setting position (POP) between 0 and 100% in 10% increments.
The rotary knob refers only to the adapted angle of rotation range between 30 and 95°. No set Min or Max values are observed.
In the event of a electricity interruption, the actuator will move into the selected emergency setting position (POP), taking into account the bridging time that has been set.

Accessories

Electrical accessories

Description	Type
Auxiliary switch, add-on, 1 x SPDT	S1A
Auxiliary switch, add-on, 2 x SPDT	S2A
Auxiliary switch and feedback pot. Adapter	Z-SPA
Feedback potentiometer 140 Ohm, add-on	P140A
Feedback potentiometer 200 Ohm, add-on	P200A
Feedback potentiometer 500 Ohm, add-on	P500A
Feedback potentiometer 1 kOhm, add-on	P1000A
Feedback potentiometer 2.8 kOhm, add-on	P2800A
Feedback potentiometer 5 kOhm, add-on	P5000A
Feedback potentiometer 10 kOhm, add-on	P10000A
Positioner for wall mounting, range 0...100%	CRP24-B1

Mechanical accessories

Description	Type
Actuator arm, for one-sided spindle clamp K-ENSA	AH-25
Shaft extension 250 mm, for damper spindles Ø 8...25 mm	AV8-25
Straight ball joint with M8, suitable for damper crank arms KH8	KG10A
Angled ball joint with M8, suitable for damper crank arms KH8	KG8
Damper crank arm, for damper spindles	KH8
Spindle clamp, reversible for SM..A and NMQ..	K-SA
Mounting kit for linkage operation, NM..A for flat installation	ZG-NMA

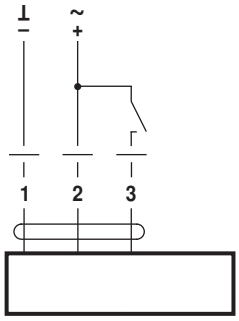
Electrical installation

Notes

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

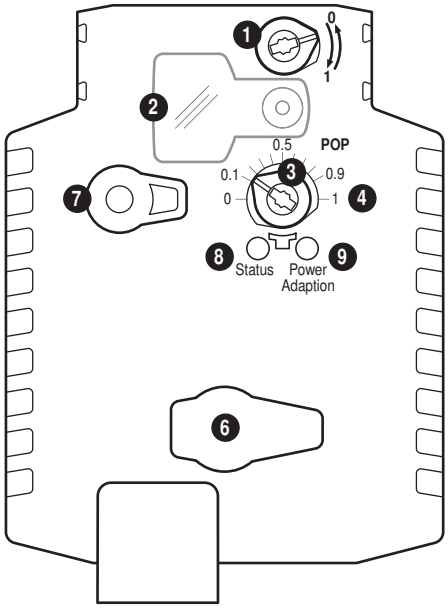
Wiring diagrams

AC/DC 24 V, open-close



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

Operating controls and indicators



1. **Direction of rotation switch**
2. **Cover, POP button**
3. **POP button**
4. **Scale for manual adjustment**

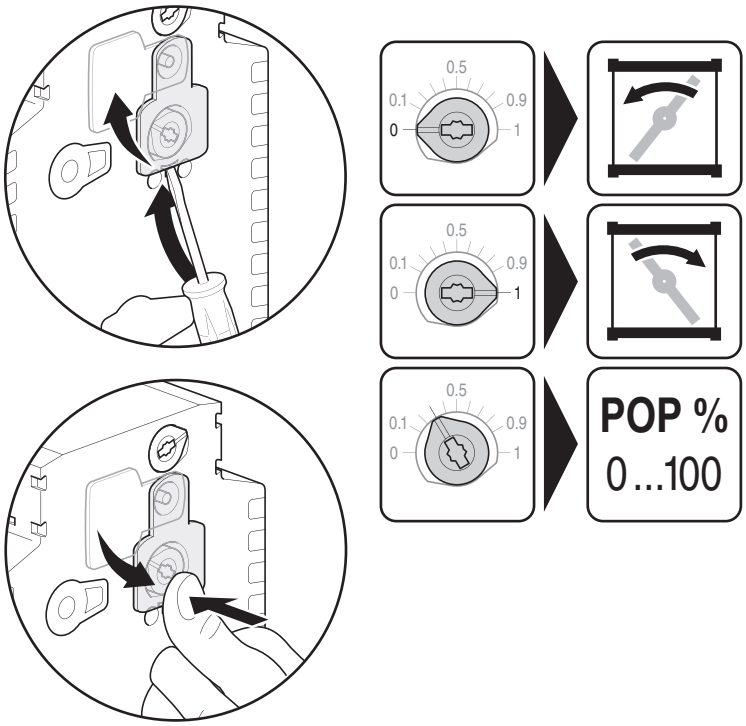
6. (no function)
7. **Disengagement button**

LED displays 8 yellow	LED displays 9 green	Meaning / function
Off	On	Operation OK / without fault
Off	Flashing	POP function active
On	Off	Fault
Off	Off	Not in operation
On	On	Adaptation procedure running

9. **Press button:** Triggers angle of rotation adaption, followed by standard operation

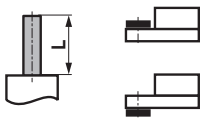
Operating controls and indicators

Setting emergency setting position (POP)



Dimensions [mm]

Spindle length

	Min. 42
	Min. 20

Clamping range

	8...26.7	≥8	≤26.7
*	8...20	≥8	≤20

*Option: Spindle clamp mounted below: When an auxiliary switch or a feedback potentiometer is used the adapter Z-SPA is required.

Dimensional drawings