

Modulating damper actuator with capacitor technology for adjusting air dampers with emergency control function and extended functionalities in ventilation and air-conditioning systems for building services installations and in laboratories

- For air dampers up to approx. 1.2 m²
- Torque 6 Nm
- Nominal voltage AC/DC 24 V
- Control: modulating DC 0 ... 10 V
- Position feedback DC 2 ... 10 V
- Running time 4 s



Technical data

Electrical data	Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V
	Nominal voltage range	AC 19.2 ... 28.8 V / DC 21.6 ... 28.8 V
	Power consumption In operation	11 W @ nominal torque
	At rest	<3 W
	For wire sizing	≤22 VA (I _{max} 20 A @ 5 ms)
Functional data	Connection	Cable 1 m, 4 x 0.75 mm ²
	Parallel operation	Yes (note the performance data)
	Torque	≥6 Nm
	Inhibiting torque	≥6 Nm
	Control Control signal Y	DC 0 ... 10 V, input impedance 100 kΩ
	Operating range	DC 2 ... 10 V
	Position feedback (Measuring voltage U)	DC 2 ... 10 V, max. 0.5 mA
	Setting emergency position (POP)	0 ... 100%, adjustable in increments of 10% (POP rotary button)
	Position accuracy	±5%
	Direction of rotation Motor	Reversible with switch ↺ / ↻
	Emergency setting position	Reversible with switch 0 ... 100%, Adjustable in increments of 10%
	Direction of motion at Y = 0 V	At switch position 1 ↺ or 0 ↻, respectively
	Manual override	Gearing latch disengaged with push button
	Angle of rotation	Max. 95°↔, can be limited at both ends with adjustable mechanical end stops
	Angle of rotation limiting	min. 30°↔
	Running time Motor	4 s / 90°↔
	Emergency setting position	4 s @ 0 ... 50°C
	Sound power level Motor	≤60 dB (A) @ 4 s running time
	Emergency setting position	≤60 dB (A) @ 4 s running time
Safety	Service life Design life	15 years
	Full cycles	100,000
	Part cycles	1,000,000
	Position indication	Mechanical, pluggable
	Protection class	III Safety extra-low voltage UL Class 2 Supply
	Degree of protection	IP54 NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC
	Certification	Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14 cULus according to UL 60730-1A and UL 60730-2-14 and CAN/CSA E60730-1:02
	Mode of operation	Type 1.AA
	Rated impulse voltage	0.8 kV
	Control pollution degree	3

Terms and abbreviations CPO = Controlled power off / controlled emergency control function
POP = Power off position / emergency setting position

Technical data

(continued)

Ambient temperature	-30 ... +50 °C
Non-operating temperature	-40 ... +80 °C
Ambient humidity	95% r.h., non-condensating
Maintenance	Maintenance-free
Dimensions / Weight	
Dimensions	See «Dimensions» on page 5
Weight	Approx. 1.1 kg

Safety notes



- The actuator is not allowed to be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- It may only be installed by suitably trained personnel. Any legal regulations or regulations issued by authorities must be observed 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.
- The cable must not be removed from the device.
- Adaption is necessary when the system is commissioned and after each adjustment of the angle (press the adaption push button once).
- The device contains electrical and electronic components and is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Mode of operation

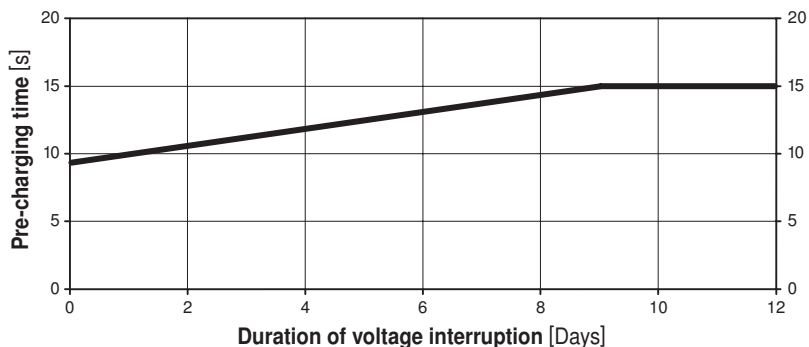
The actuator moves the air damper to the desired operating position at the same time as the integrated capacitors are loaded. Interrupting the supply voltage causes the air damper to be rotated back into the emergency setting position by means of stored electrical energy. The actuator is controlled with a standard modulating signal of DC 0 ... 10 V and travels to the position defined by the control signal. The measuring voltage U serves for the electrical display of the damper position 0 ... 100%.

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 voltage interruption, the actuator can be moved at any time from its current position into the preset emergency setting position (POP). The duration of the pre-charging time depends mainly on how long the power was interrupted.

Typical pre-charging times

	Duration of voltage interruption [Days]				
	0	1	2	7	≥10
Pre-charging time [s]	9	10	11	13	15



Delivery condition (capacitors)

The actuator is completely discharged after delivery from the factory, which is why the actuator requires approximately 15 s pre-charging time before initial commissioning in order to bring the capacitors up to the required voltage level.

Simple direct mounting

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

Manual override

Manual override with push button possible (the gear is disengaged for as long as the button remains pressed down).

High functional reliability

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

Product features

(continued)

Home position / Start	The spindle clamp of the actuator is set ex-works to 0°↺. After the supply voltage has been applied, the actuator moves into the position defined by the control 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.
Emergency setting position (POP) rotary button	The «Emergency setting position» rotary button can be used to adjust the desired emergency setting position (POP) between 0 and 100% in 10% increments. The rotary button is always in reference to the adapted angle of rotation range. In the event of a voltage interruption, the actuator will move immediately into the selected emergency setting position.
Adjustable angle of rotation	Adjustable angle of rotation with mechanical end stops. A minimum permissible angle of rotation of 30°↺ must be allowed for.
Adaption and synchronisation	With the adaption, the upper and lower spindle end stops are detected and stored in the actuator. The detection of the mechanical end stops makes it possible to have a gentle approach of the end positions, thus protecting the actuator mechanics. During synchronization, the actuator moves into home position for angle referencing. This ensures a correct position modulation.

Accessories

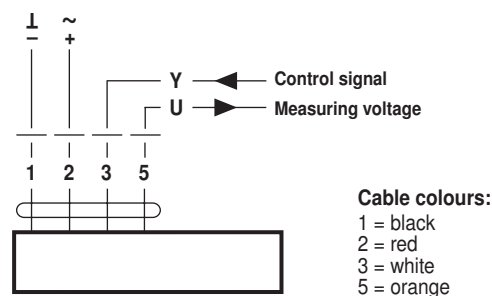
	Description	Data sheet
Electrical accessories	Auxiliary switch S..A..	T2 - S..A..
	Feedback potentiometer P..A..	T2 - P..A..
	Adapter Z-SPA This adapter must be ordered if an auxiliary switch or a feedback potentiometer is required.	
	Positioner SGA24, SGE24 and SGF24	T2 - SG..24
	Digital position indicator ZAD24	T2 - ZAD24
Mechanical accessories	Room temperature controller CR24..	S4 - CR24..
	Various accessories	T2 - Z-NKQ..A..

Electrical installation

Wiring diagram

Note

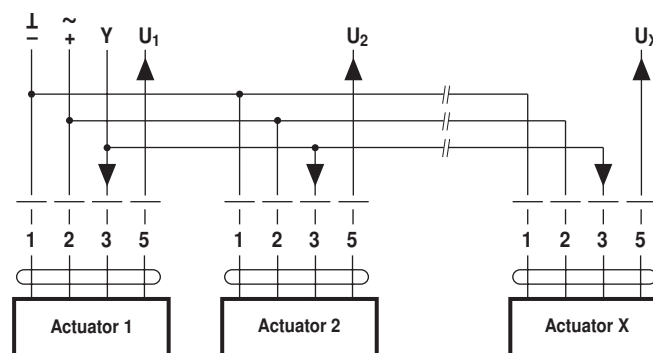
Connect via safety isolation transformer.



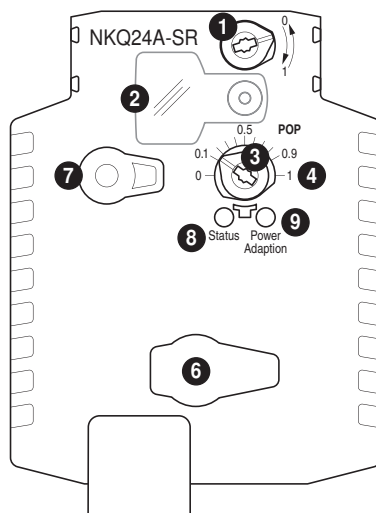
Wiring diagram for parallel operation

Information

- A maximum of eight actuators can be connected in parallel.
- Parallel operation is permitted only on separated axes.
- It is imperative that the performance data be observed with parallel operation.



Operating controls and indicators

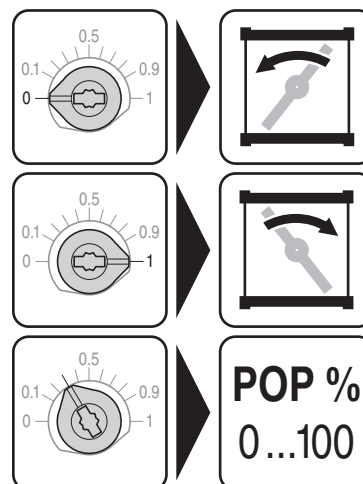
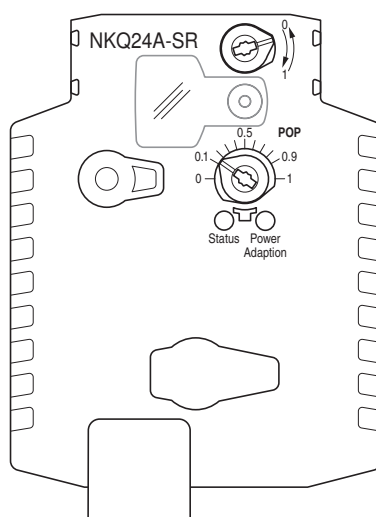
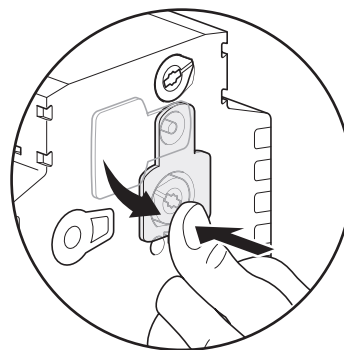
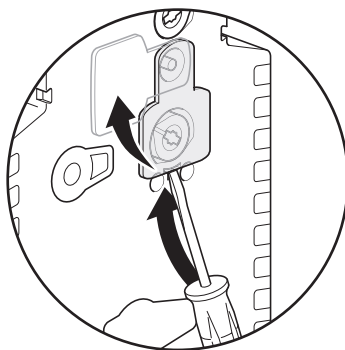


- ➊ Direction of rotation switch
- ➋ Cover, POP button
- ➌ POP button
- ➍ Scale for manual adjustment
- ➎ (no function)
- ➏ Disengagement button

LED displays		Meaning / function
➐ yellow	➑ green	
Off	Illuminated	Operation OK / without fault
Illuminated	Off	Fault
Off	Off	Not in operation
Illuminated	Illuminated	Adaptation procedure running

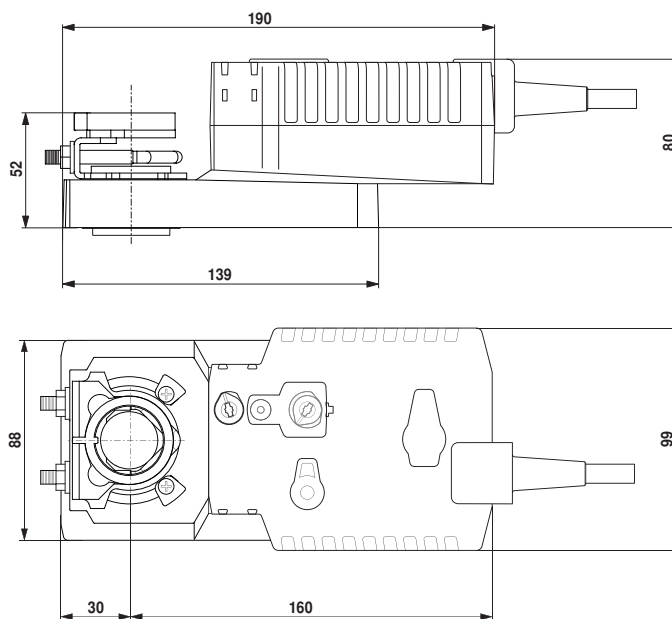
- ➐ **Press button:** Triggers angle of rotation adaption, followed by standard operation






Setting the POP Power off position



Dimensions [mm]

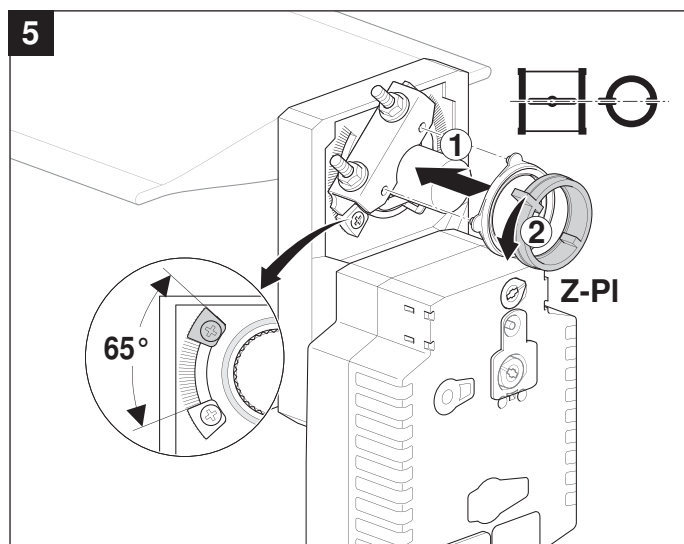
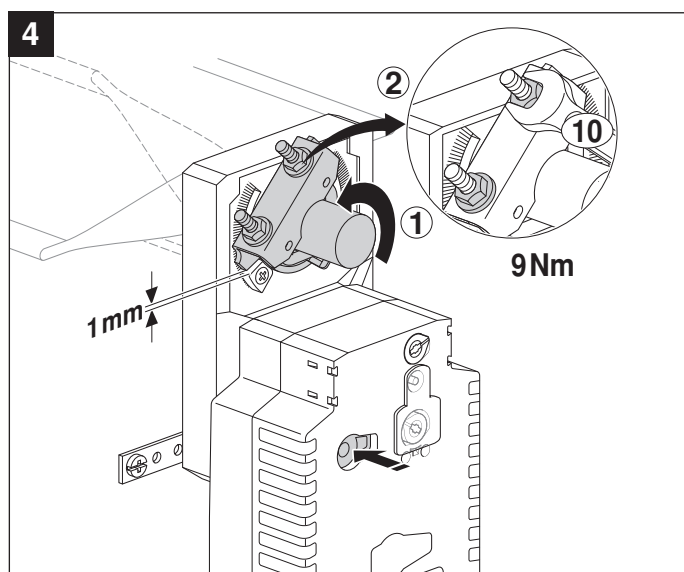
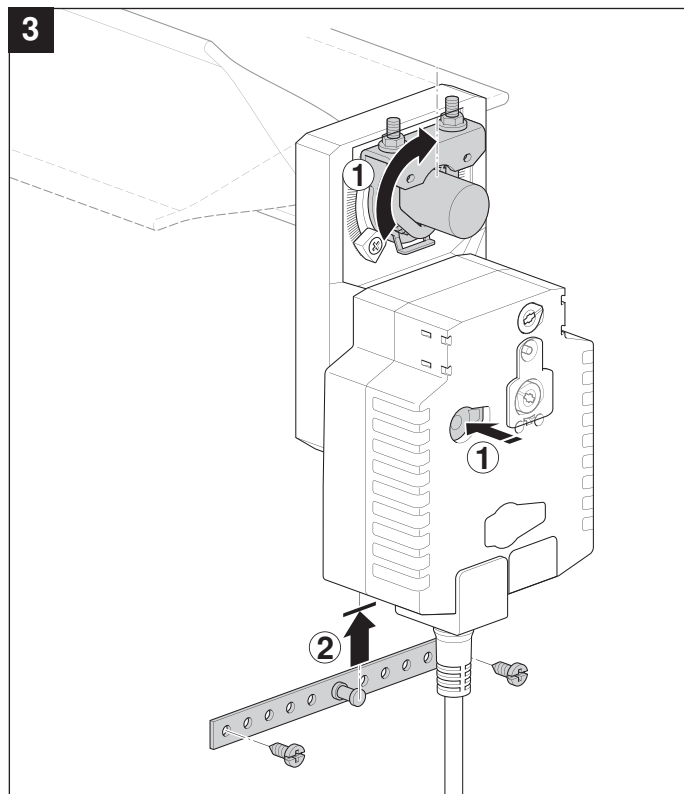
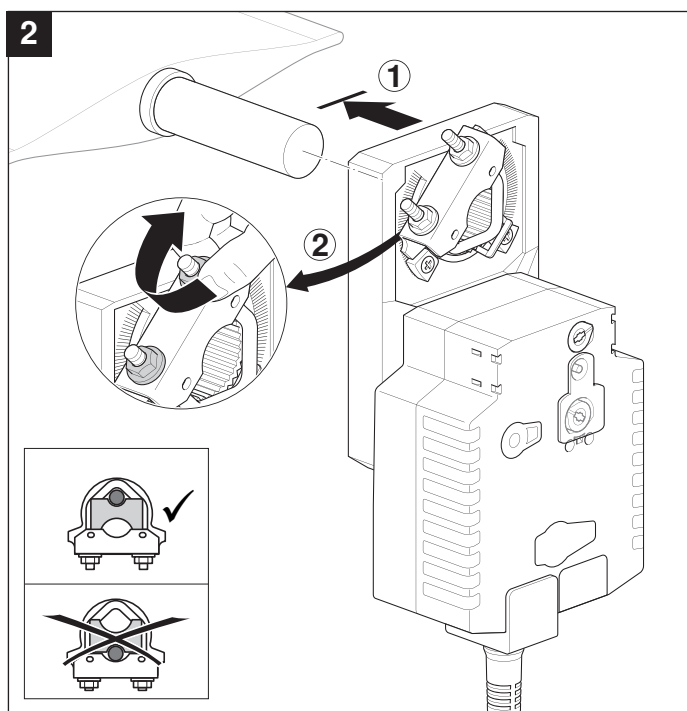
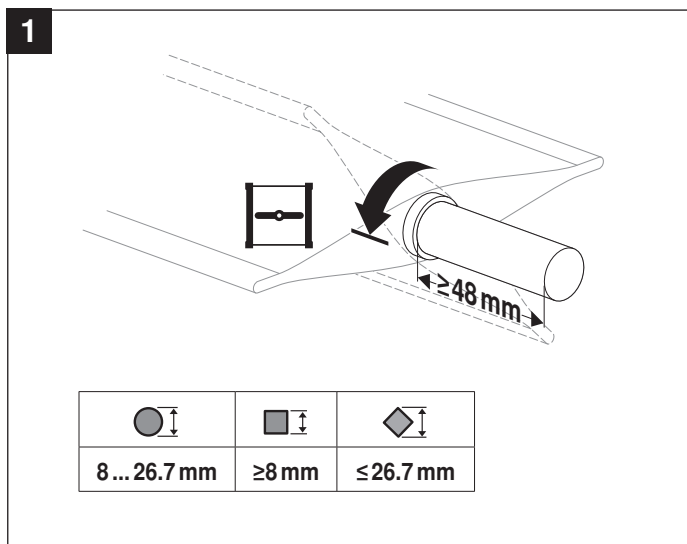
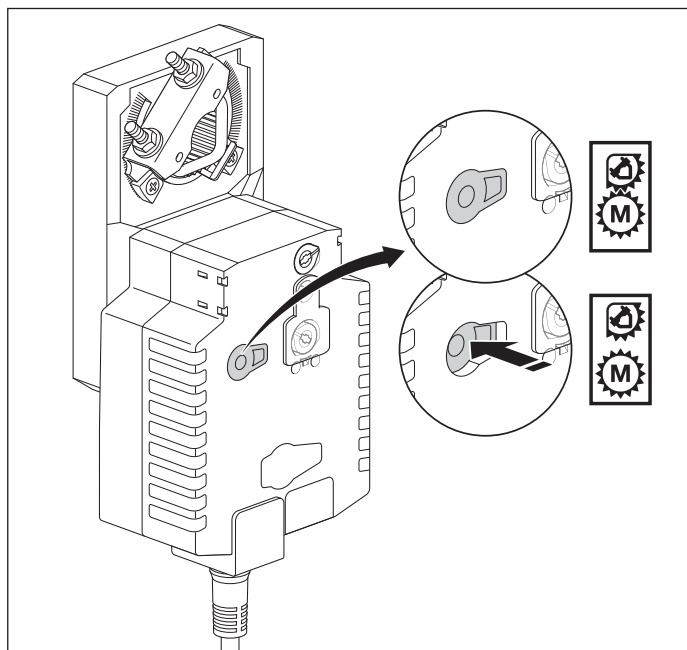
Dimensional drawings

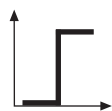


Damper spindle	Length			
	≥42	8 ... 26.7	≥8	≤26.7
	≥20	8 ... 20	≥8	≤20

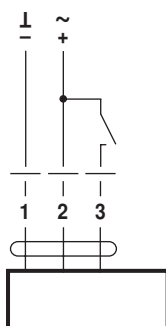
* Option (Accessories K-SA)

When an auxiliary switch or a feedback potentiometer is used, see «Accessories»





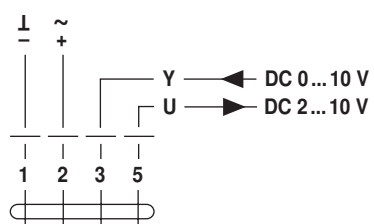
AC 24 V / DC 24 V



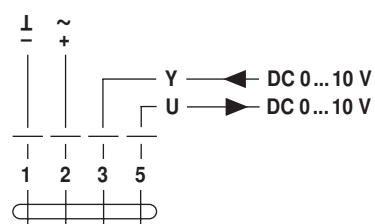
NKQ24A-1



AC 24 V / DC 24 V



NKQ24A-SR



NKQ24A-SZ
NKQ24A-MF