Technical data sheet NKA-DKC 101 T0L

Modulating 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 Modulating DC (0)2...10 V**
- **Position feedback DC 2...10 V**
- **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, 4 x 0.75 mm²
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	Min. 6 Nm
	Positioning signal Y	DC 0...10 V
	Positioning signal Y note	Input impedance 100 kΩ
	Operating range Y	DC 2...10 V
	Position feedback U	DC 2...10 V
	Position feedback U note	Max. 0.5 mA
	Emergency setting position	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 / 1
	Direction of motion note	Y = 0 V: At switch position 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°
	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

Technical data

Safety	Non-operating temperature	-40...80 °C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
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.
- When calculating the torque required, the specifications supplied by the damper manufacturers (cross-section, construction, place of installation), 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 is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Principle of operation

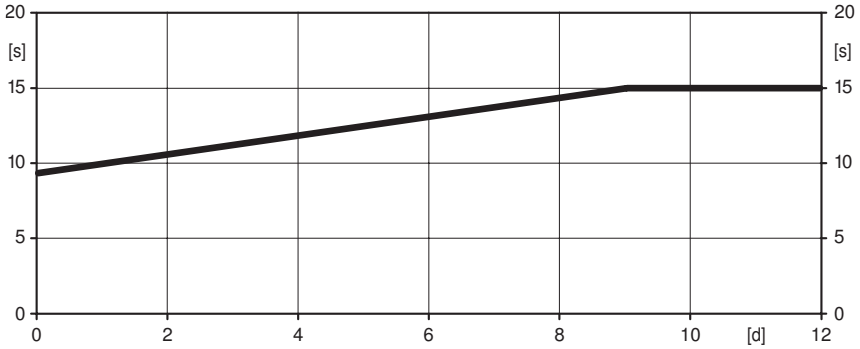
The actuator moves the damper to the desired operating position at the same time as the integrated capacitors are charged. Interrupting the supply voltage causes the damper to be rotated back into the emergency setting position (POP) by means of stored electrical energy.
The actuator is connected with a standard modulating signal of DC 0 ... 10V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the damper position 0 ... 100% and as slave control signal for other actuators.

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 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.

Simple direct mounting

Simple direct mounting on the damper spindle with a universal spindle clamp, supplied with a universal mounting bracket 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 in intermediate positions and automatically stops when the end stop is reached (at rest).

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 gearbox 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 always refers to an angle of rotation range of 95° and does not take into account any retroactively adjusted end stops.
In the event of an electricity interruption, the actuator will move into the selected emergency setting position (POP), taking into account the bridging time (PF) of 2 s which is set ex-works.

Accessories

	Description	Type
Electrical accessories	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 10 kOhm, add-on	P10000A
	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Auxiliary switch and feedback pot. Adapter	Z-SPA

	Description	Type
Mechanical accessories	Actuator arm, for one-sided spindle clamp K-ENSA	AH-25
	Shaft extension 250 mm, length approx. 250 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

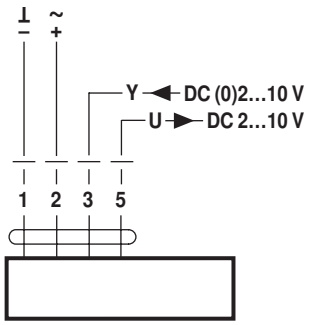
Electrical installation

Notes

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

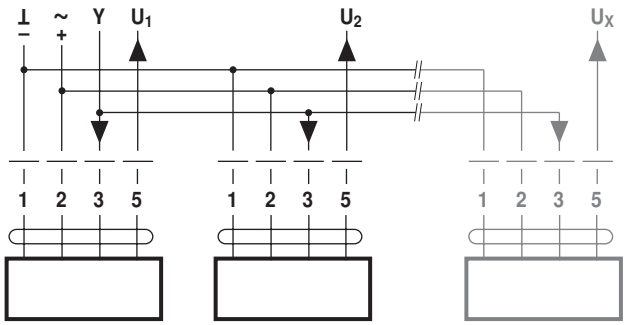
Wiring diagrams

AC/DC 24 V, modulating



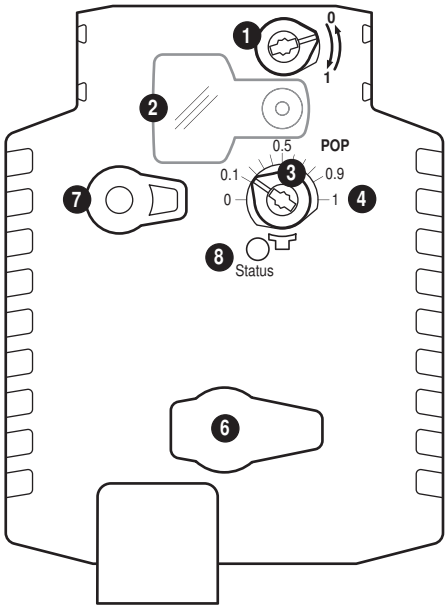
Cable colours:
1 = black
2 = red
3 = white
5 = orange

Parallel operation



Notes
• A maximum of eight actuators can be connected in parallel.
• Parallel operation is permitted only on non-connected axes.
• Do not fail to observe performance data with parallel operation.

Operating controls and indicators

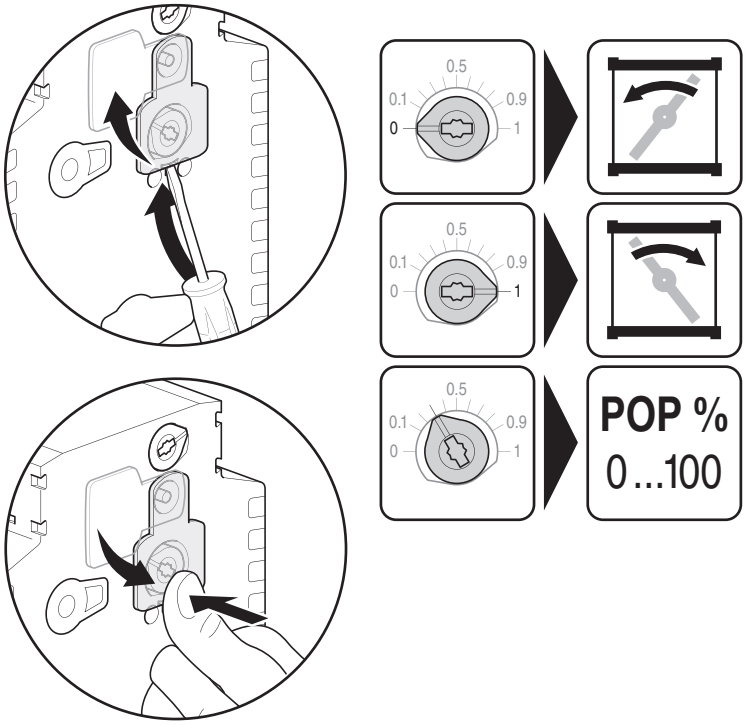


1. **Direction of rotation switch**
2. **Cover, POP button**
3. **POP button**
4. **Scale for manual adjustment**

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

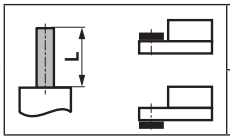
LED displays 8 green	**Meaning / function**
On	Operation OK / without fault
Flashing	POP function active
Off	– Not in operation – Pre-charging time SuperCap – Fault SuperCap

Emergency position (POP) setting



Dimensions [mm]

Spindle length

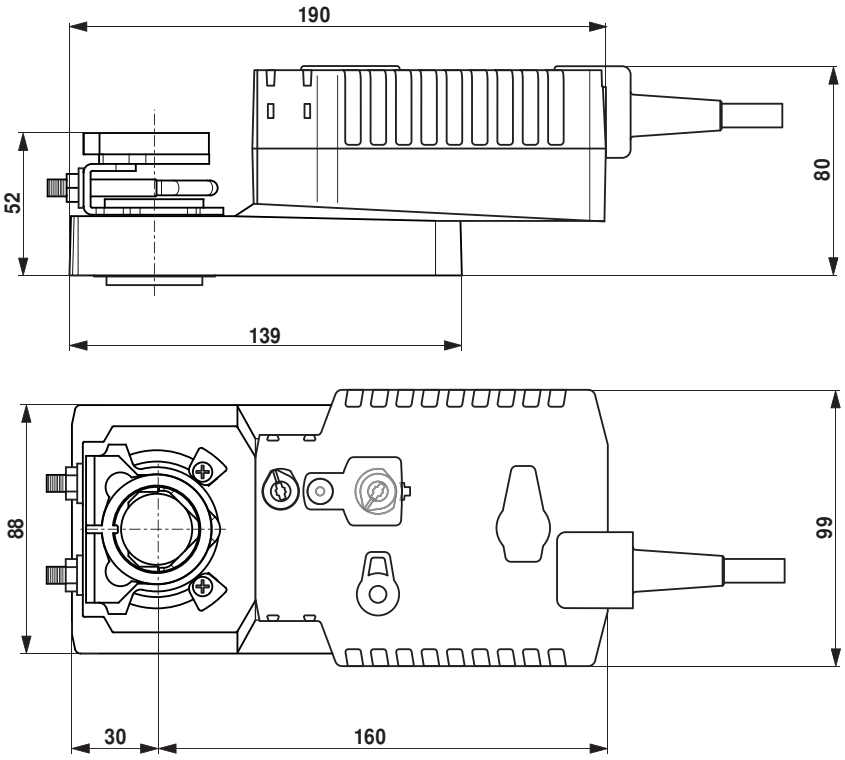
	Min. 42
	Min. 20

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



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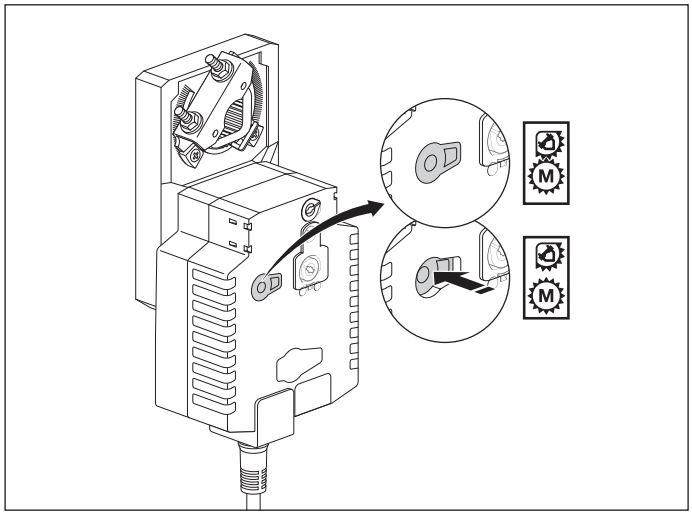

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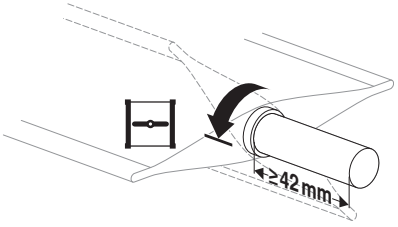
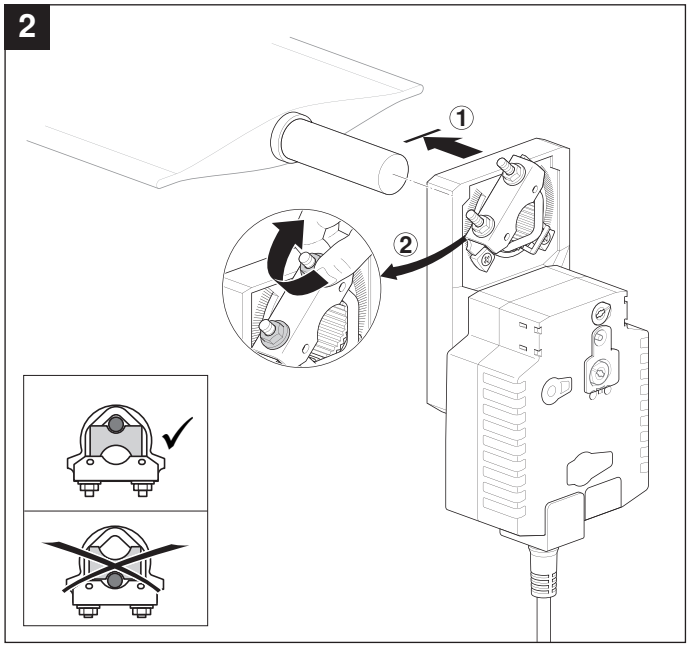


8 ... 26.7 mm	≥8 mm	≤26.7 mm

2



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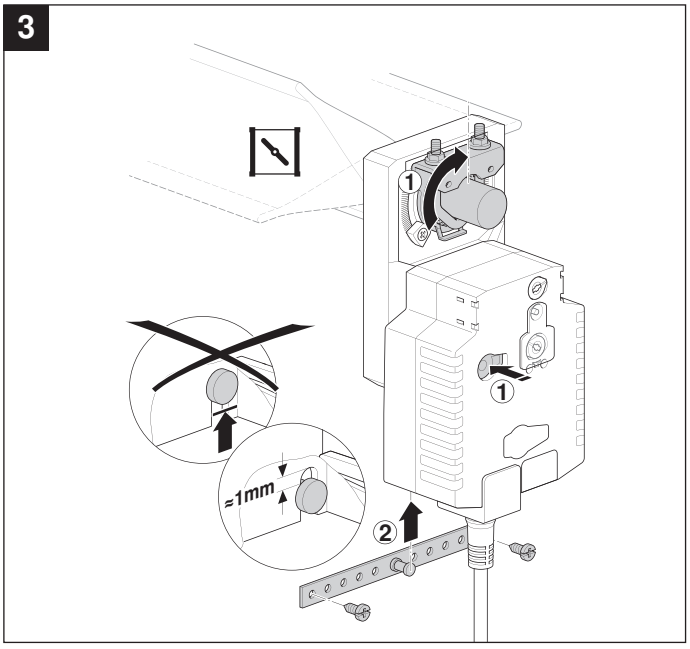

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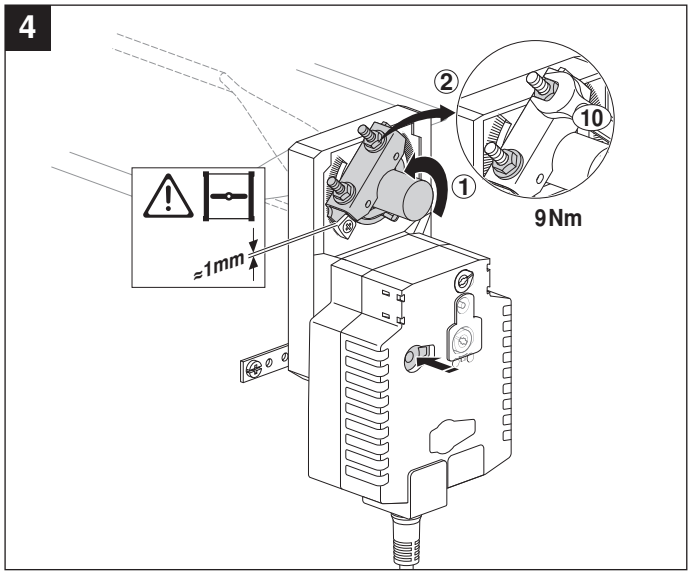

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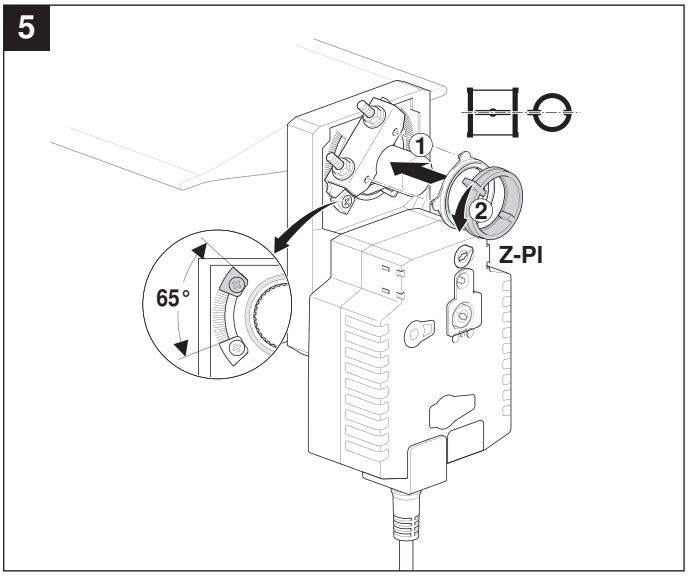

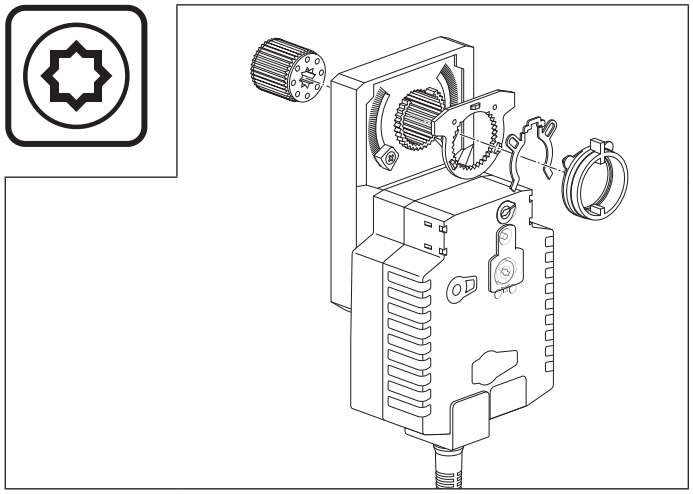

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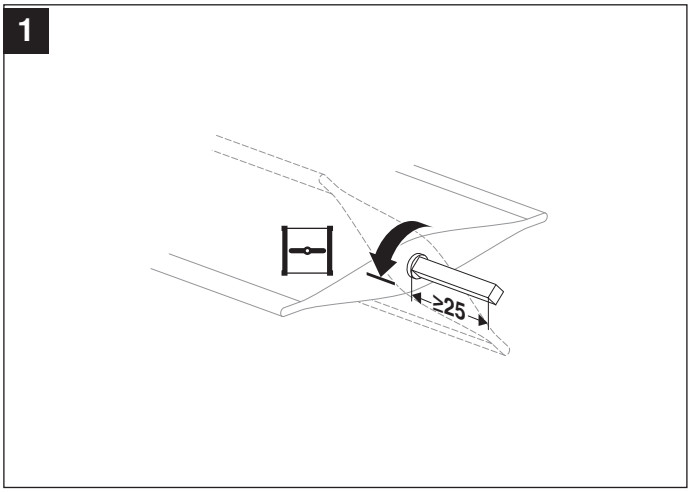

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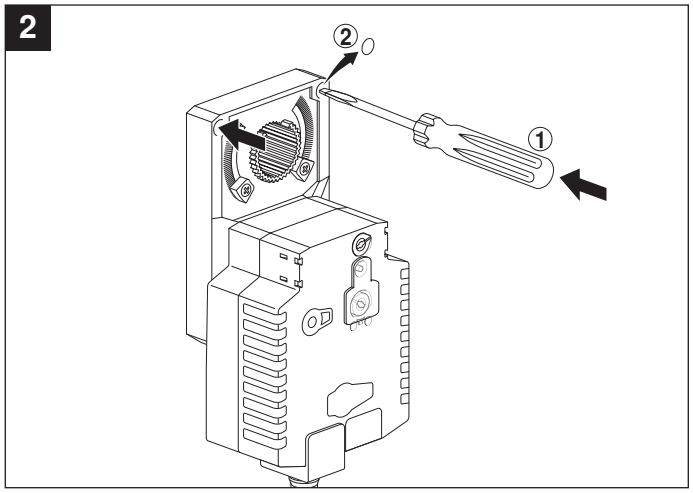

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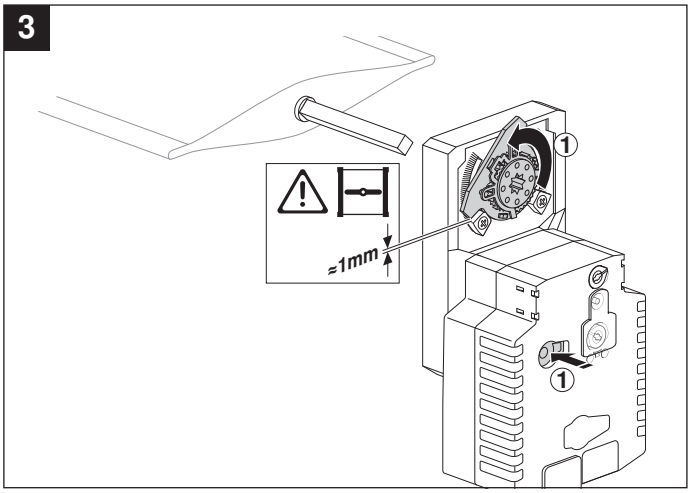

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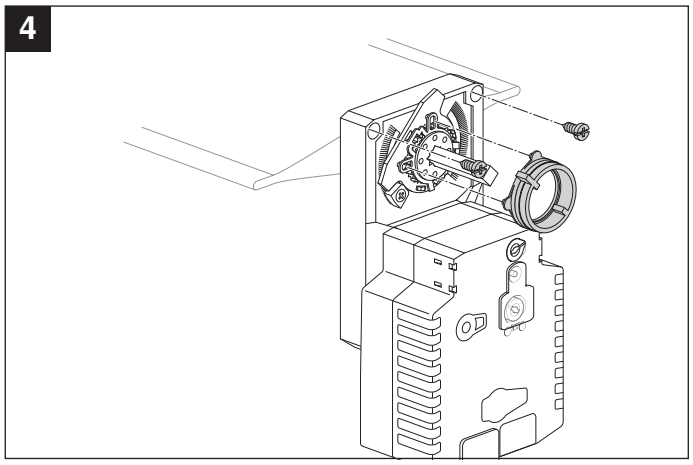

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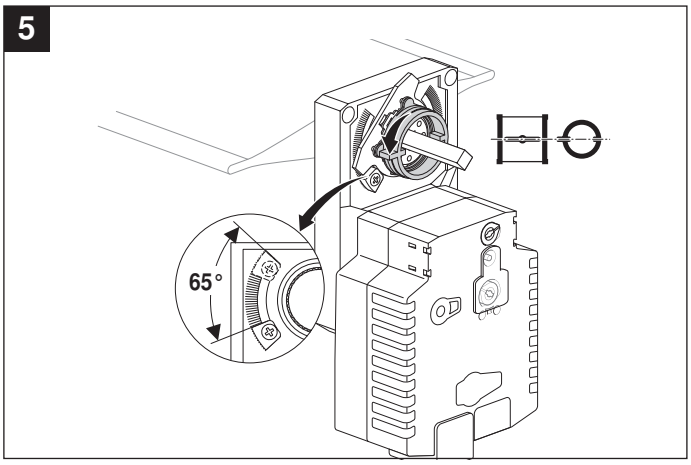

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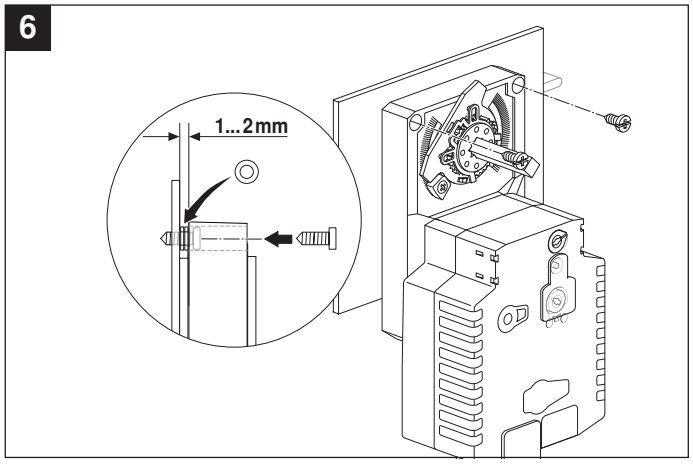

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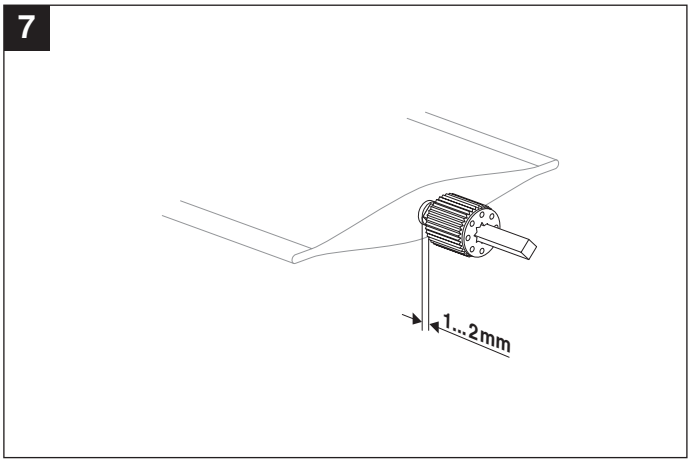
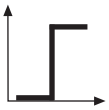
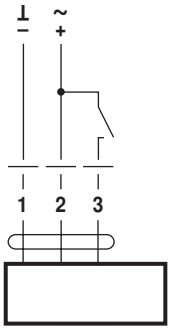




AC 24 V / DC 24 V



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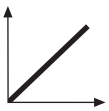
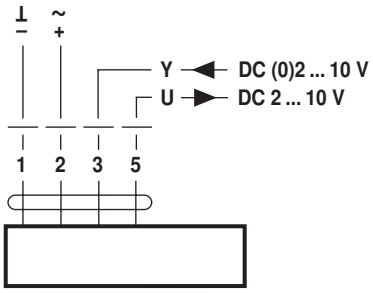


AC 24 V / DC 24 V



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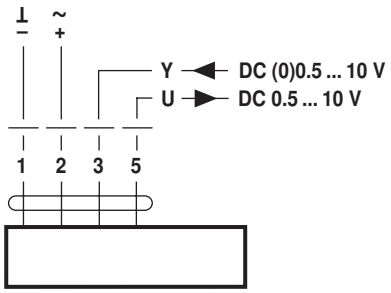

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