BELIMO

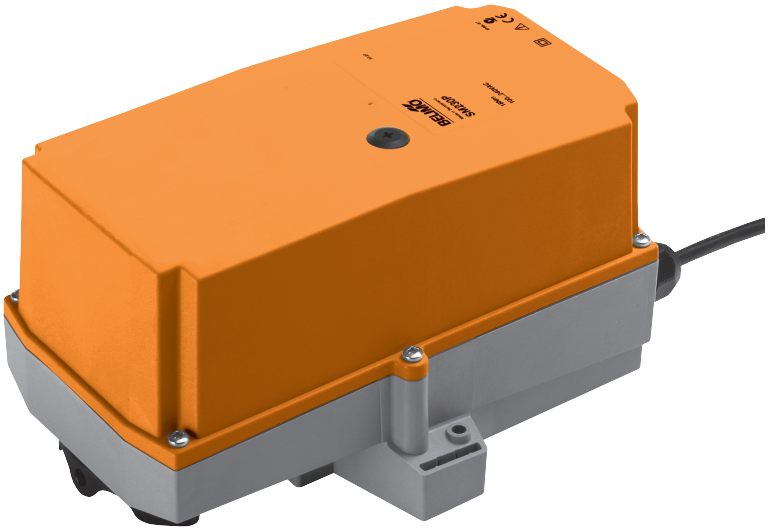
Technical data sheet NM24P-MF

Multifunctional Robustline damper actuator for operating air dampers in industrial plants and in the technical building installations

- **For air dampers up to approx. 1.6 m²**
- **Torque 8 Nm**
- **Nominal voltage AC/DC 24 V**
- **Control: modulating DC 0 ... 10 V or variable**
- **Position feedback DC 2 ... 10 V or variable**

Optimum protection against

- **Corrosion and chemical influences**
- **UV radiation**
- **Damp and condensation**



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	Operation	3.5 W @ nominal torque		
	At rest	1.25 W		
	Wire sizing	5.5 VA		
Connection		Halogen-free cable 1 m, 4 x 0.75 mm²		
Functional data		**Factory settings**	**Variable**	**Settings**
Torque (nominal torque)		Min. 8 Nm @ nominal voltage	25%, 50%, 75% reduced	.....
Control	Control signal Y	DC 0 ... 10 V, input impedance 100 kΩ	Open-close / 3-point (only AC), modulating (DC 0 ... 32 V)	.....
	Operating range	DC 2 ... 10 V	Starting point DC 0.5 ... 30 V End point DC 2.5 ... 32 V	.....
Position feedback (measuring voltage U)		DC 2 ... 10 V, max. 0.5 mA	Starting point DC 0.5 ... 8 V End point DC 2.5 ... 10 V	.....
Position accuracy		±5%		
Direction of rotation		Reversible with switch 0 / 1		
Direction of motion at Y = 0 V		At switch position 0 ↶ resp. 1 ↷	Electronically reversible	.....
Manual override		Gearing latch disengaged with pushbutton, can be locked		
Angle of rotation		Max. 95°∢, can be limited at both ends with adjustable mechanical end stops		
Running time		150 s / 90°∢	43 ... 173 s	.....
Automatic adjustment of running time, operating range and measuring signal U to match the mechanical angle of rotation		Manual triggering of the adaption by pressing the «Adaption» button or with the PC-Tool	Automatic adaption / synchronisation whenever the supply voltage is switched on	.....
Override control		MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, only AC) = 50%	MAX = (MIN + 30°∢) ... 100% MIN = 0% ... (MAX – 30°∢) ZS = MIN ... MAX	.....
Sound power level		Max. 35 dB (A)	With a running time of 43 s = 45 dB (A) 173 s ≤ 35 dB (A)	
Position indication		Mechanical, pluggable		
Safety				
Protection class		**III** Safety extra-low voltage		
Degree of protection		IP66 + IP67		
EMC		CE according to 2004/108/EC		
Mode of operation		Type 1 (EN 60730-1)		
Rated impulse voltage		0.8 kV (EN 60730-1)		
Control pollution degree		4 (EN 60730-1)		
Ambient temperature		–30 ... +50°C		
Non-operating temperature		–40 ... +80°C		
Ambient humidity		100% r.H.		
Maintenance		Maintenance-free		
Dimensions / Weight				
Dimensions		See «Dimensions» on page 6		
Weight		Approx. 1.3 kg		

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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 assembly.**
- **The cover of the protective housing may be opened for adjustment and servicing. When it is closed afterwards, the housing must seal tight (see installation instructions).**
- **The device on the inside may only be opened up in the factory. It does not contain any parts that can be replaced or repaired by the user.**
- **The cable must not be removed from the device.**
- **When calculating the required torque, the specifications supplied by the damper manufacturers (cross section, design, installation site), and the air flow conditions must be observed.**
- **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.**
- **The information on chemical resistance refers to laboratory tests with raw materials and finished products and to trials in the field in the areas of application indicated.**
- **The materials used may be subjected to external influences (temperature, pressure, constructional fixture, effect of chemical substances etc.), that cannot be simulated in laboratory test or field trials.**
- **The information regarding areas of application and resistance can therefore only serve as a guideline. In case of doubt, we recommend that you definitely carry out a test. This information does not imply any legal entitlement. Belimo will not be held liable and will provide no warranty. The chemical or mechanical resistance of the materials used is not alone sufficient for judging the suitability of a product. Regulations pertaining to combustible liquids such as solvents etc. must be taken into account with special reference to explosion protection.**

Product features

Fields of application

The actuator is particularly suited for use in difficult conditions, e.g. in the field of:
– Wood drying
– Animal breeding
– Food processing
– Agricultural
– Swimming baths / Bathrooms
– Rooftop units
– General outdoor applications
– Changing atmosphere

Resistances

Test	Test standard	Testing body
Noxious gas tests	EN 60068-2-60	Fraunhofer Institute ICT / DE
Salt fog spray test	EN 60068-2-52	Fraunhofer Institute ICT / DE
Ammoniac test	DIN 50916-2	Fraunhofer Institute ICT / DE
Climatic test	IEC 60068-2-30	Trikon Solutions AG / CH
Disinfectants (animals)		Trikon Solutions AG / CH
UV test (Solar radiation at ground level)	EN 60068-2-5 EN 60068-2-63	Quinel / Zug CH

Used materials

Actuator parts	Material
Actuator housing	Polypropylene (PP)
Cable glands / hollow shaft	Polyamide (PA)
Connection cable	FRNC
Clamp / screws in general	Steel 1.4404
Seals	EPDM
Form-fit insert	Anodised aluminium

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Product features

(continued)

Mode of operation
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% and as slave control signal for other actuators.

Parameterisable actuators
The factory settings cover the most common applications.

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 pushbutton possible (the gear is disengaged for as long as the button is pressed or remains locked).

Adjustable angle of rotation
Adjustable angle of rotation with mechanical end stops. Standard setting 0 ... 90°∢.
The housing cover must be removed to set the angle of rotation.

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

Home position
When the supply voltage is switched on for the first time, i.e. at commissioning or after pressing the «gear disengagement» switch, the actuator moves to the home position.

Pos. Direction of rotation switch	Home position
Y = 0 ◤	ccw ◤ Left stop
Y = 0 ◥	◥ cw Right stop

The actuator then moves into the position defined by the control signal.

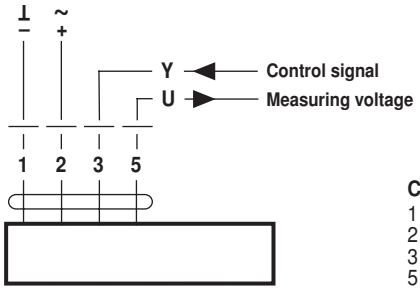
Accessories

	Description	Data sheet
Electrical accessories	Auxiliary switch S..A..	T2 - S..A..
	Feedback potentiometer P..A..	T2 - P..A..
	Manual parameterising device MFT-H	T2 - MFT-H
	PC-Tool MFT-P	T2 - MFT-P
	Range controller SBG24	T2 - SBG24
	Positioner SG..24	T2 - SG..24
	Digital position indication ZAD24	T2 - ZAD24
Mechanical accessories	Various form-fit inserts	T2 - Z-NM..

Electrical installation

Wiring diagram

Note
- Connect via safety isolation transformer.
- Other actuators can be connected in parallel. Note the performance data.



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

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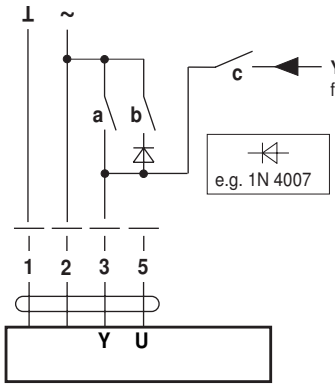
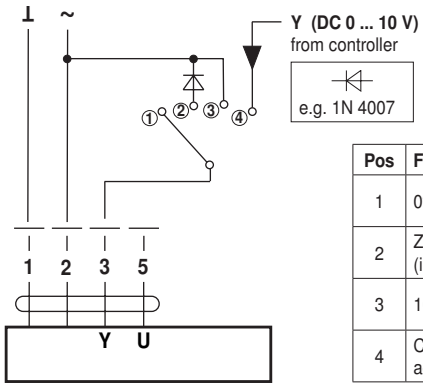
Functions with basic values

Override control with AC 24 V with relay contacts



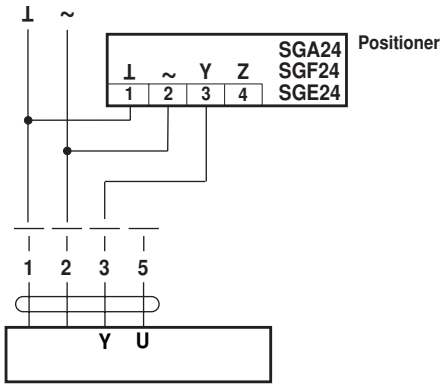
Functions	a	b	c
0% ◁	⌐	⌐	⌐
ZS 50% ◁ (intermediate position)	⌐	⌐	⌐
100% ◁	⌐	⌐	⌐
Control mode in according with Y	⌐	⌐	⌐

Override control with AC 24 V with rotary control switch

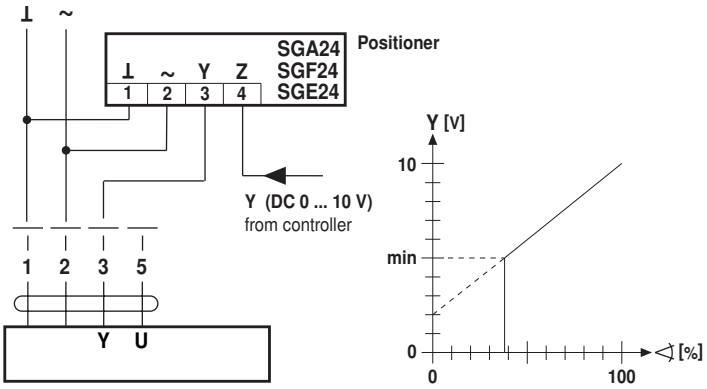


Pos	Functions
1	0% ◁
2	ZS 50% ◁ (intermediate position)
3	100% ◁
4	Control mode in according with Y

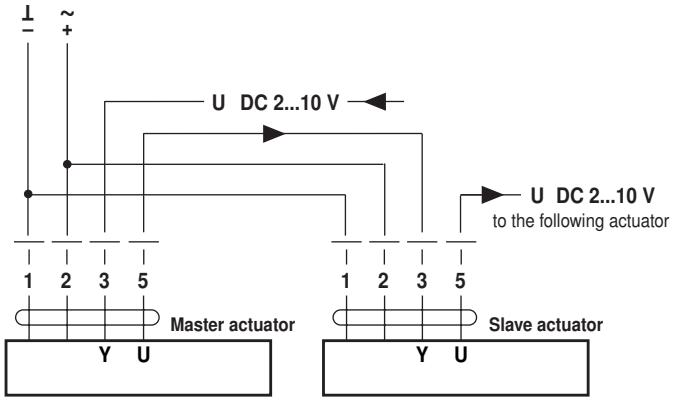
Remote control 0 ... 100%



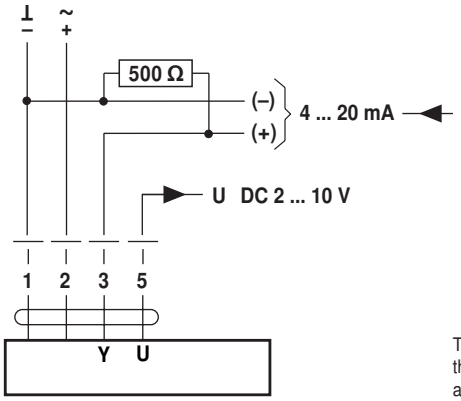
Minimum limit



Master/Slave control (position-dependent)

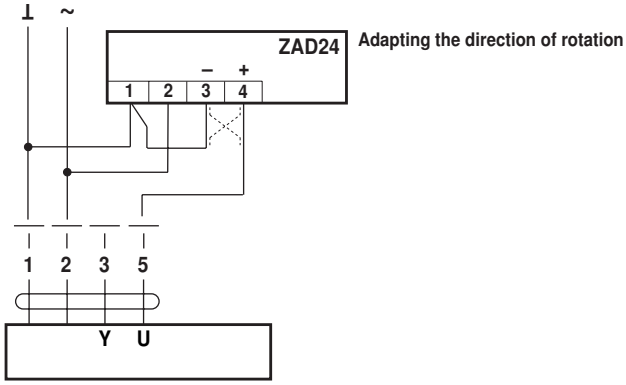


Control with 4 ... 20 mA via external resistance

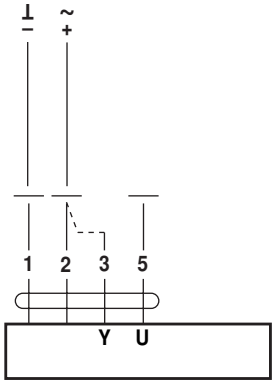


The 500 Ω resistor converts the 4 ... 20 mA current signal to a voltage signal DC 2 ... 10 V

Position indication



Functional check



Procedure

- Apply AC 24 V to connection 1 and 2
- Disconnect connection 3:
  - – For direction of rotation 0: Actuator turns in the direction of ↶
  - – For direction of rotation 1: Actuator turns in the direction of ↷
- Short circuit connections 2 and 3:
  - – Actuator runs in the opposite direction

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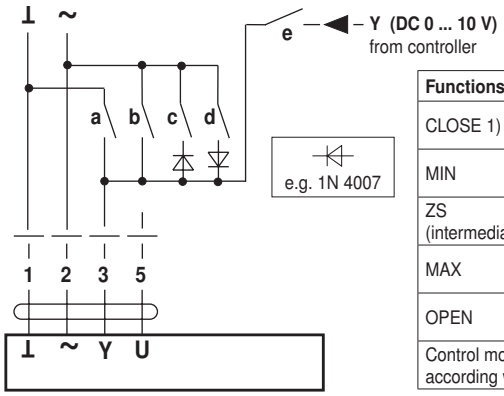
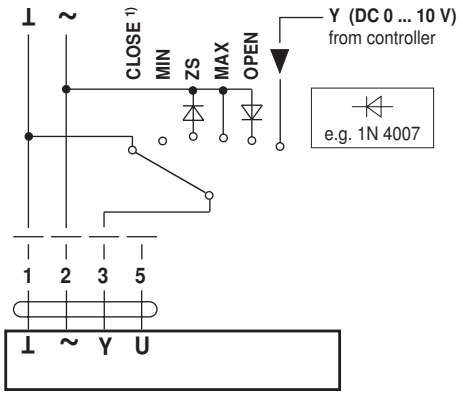
Functions for actuators with specific parameters

Override control and limiting with AC 24 V with relay contacts



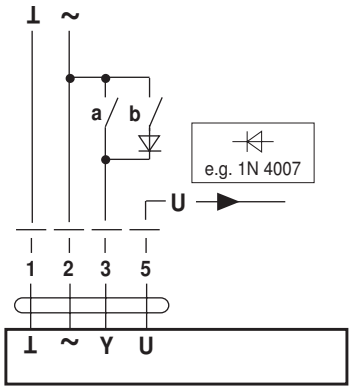
Functions	a	b	c	d	e
CLOSE 1)					
MIN					
ZS (intermediate position)					
MAX					
OPEN					
Control mode in according with Y					

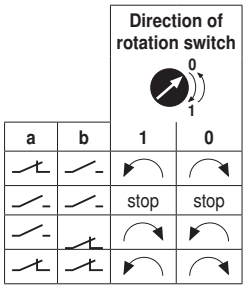
Override control and limiting with AC 24 V with rotary switch



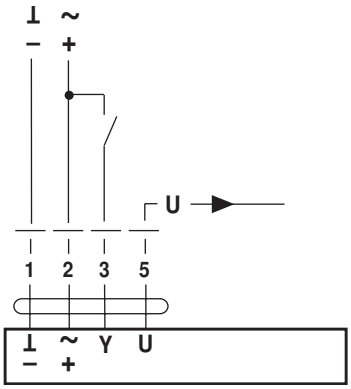
1) **Caution !** This function is only guaranteed if the start point of the operating range is defined as min. 0.6 V.

3-point control

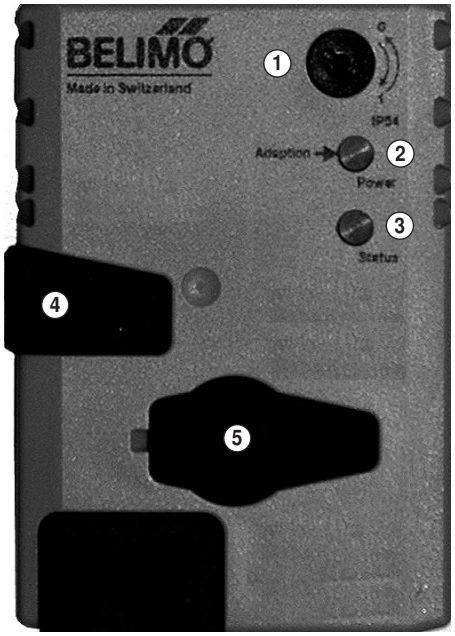




Open-close control



Operating controls and indicators



① **Direction of rotation switch**
Switching over:: Direction of rotation changes

② **Push-button and green LED display**
Off: No voltage supply or fault
On: Operation
Press button: Switches on angle of rotation adaptation followed by standard operation

③ **Pushbutton and yellow LED display**
Off: Standard operation
On: Adaptation or synchronising process active
Press button: No function

④ **Gear disengagement switch**
Press button: Gear disengaged, motor stops, manual override possible
Release button: Gear engaged, synchronisation starts, followed by standard operation

⑤ **Service plug**
For connecting parameterising and service tools

Check connection power supply

② Off / ③ On } or { flashing / flashing } Check the power supply connections. ⏚ and ⏦ could be reverse.

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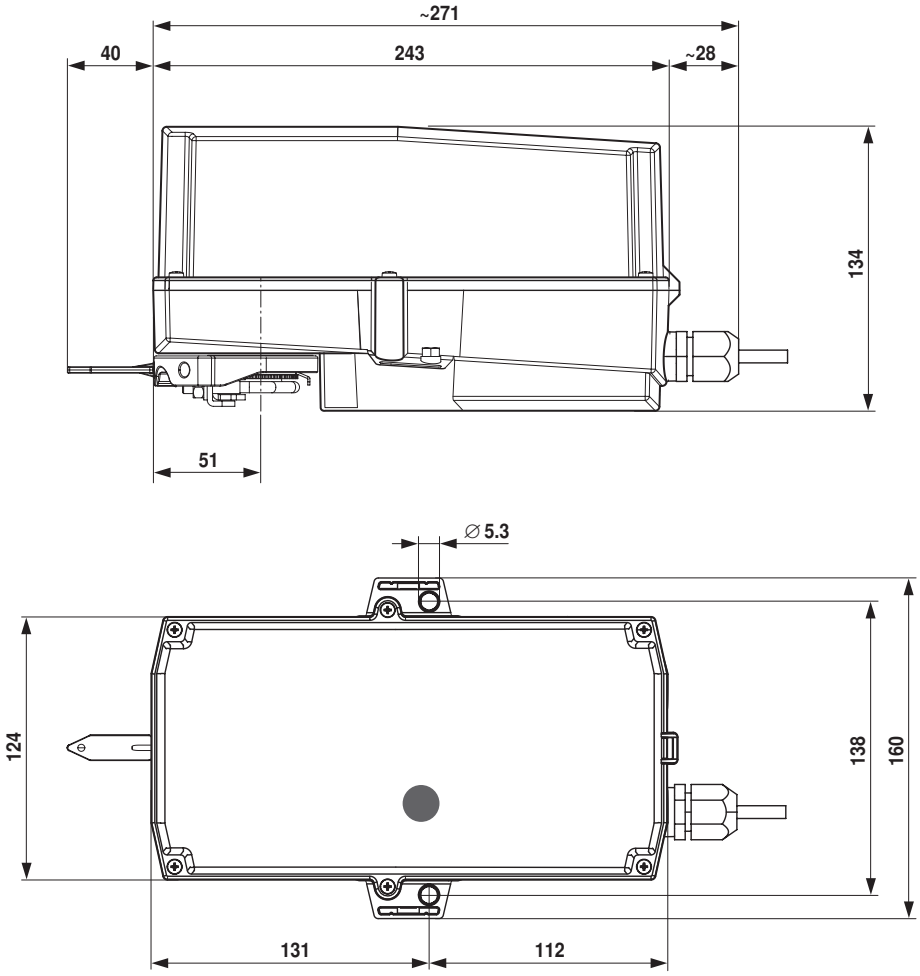
Dimensions [mm]

Dimensional drawings



Damper spindle	Length			
	20...58	8...20	8...14	10...20

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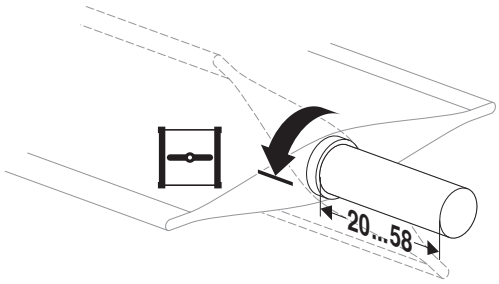
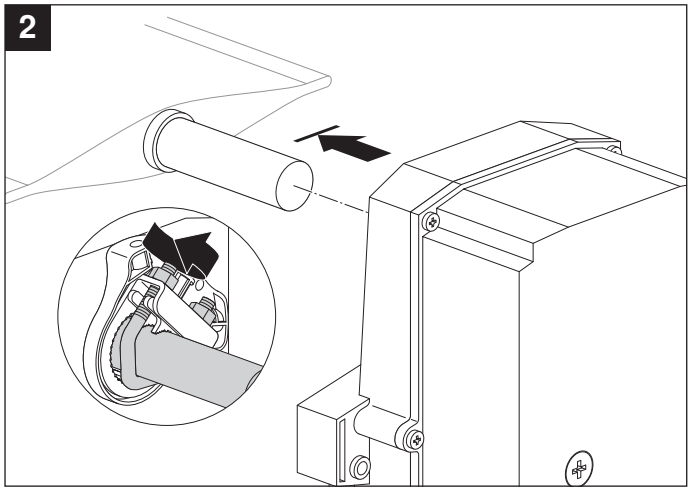
1



	●	■	◆
NM..P..	10 ... 20	8 ... 14	10 ... 20
SM..P..	14 ... 20	10 ... 14	14 ... 20

2



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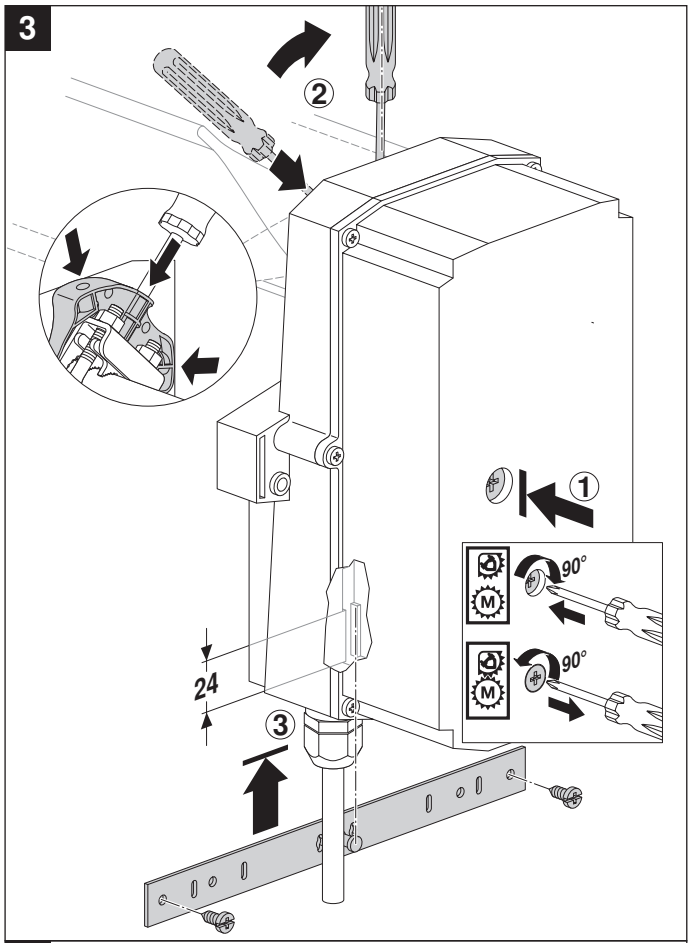
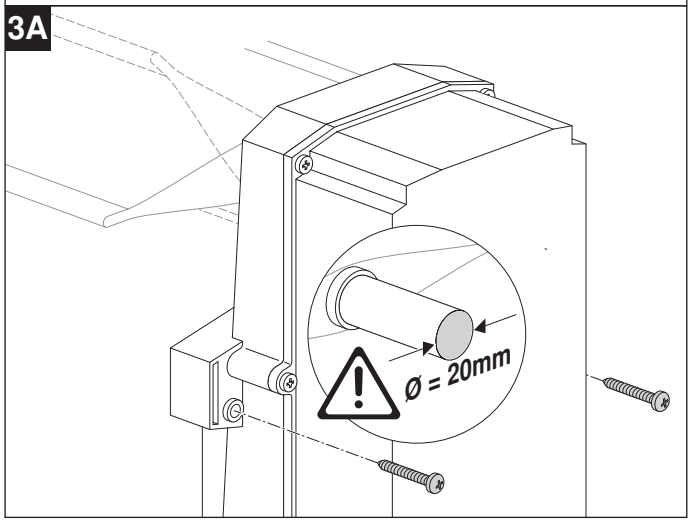


3A



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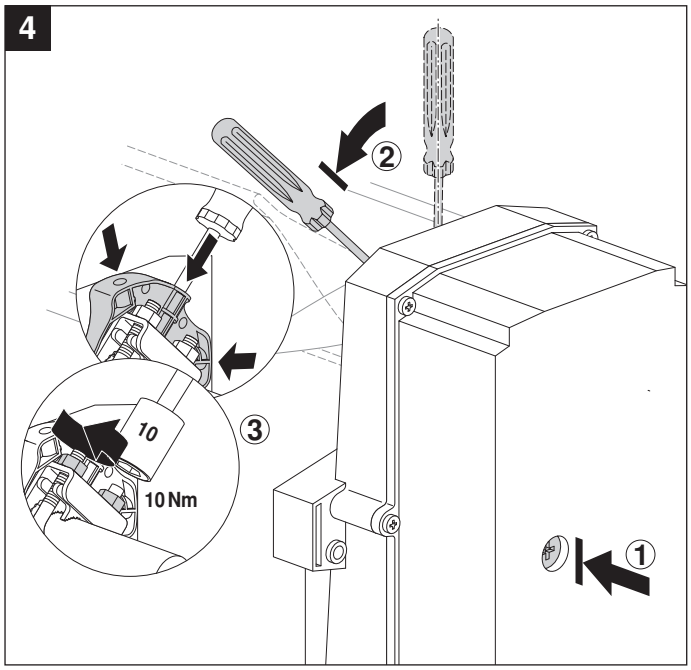

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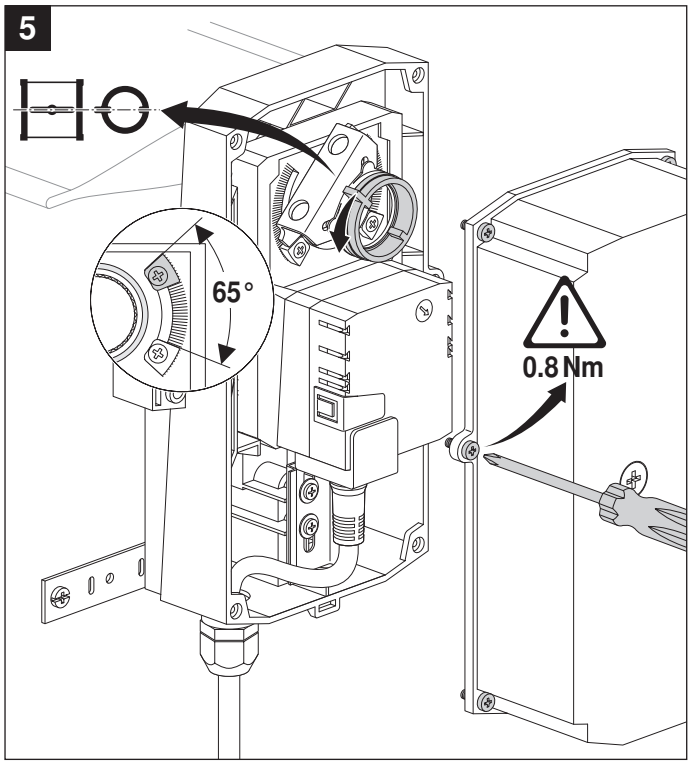

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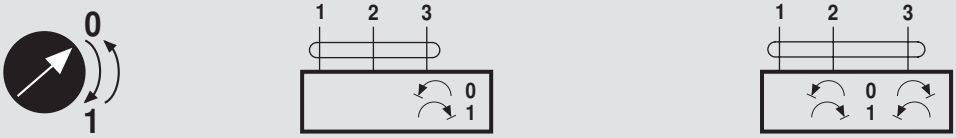
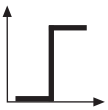
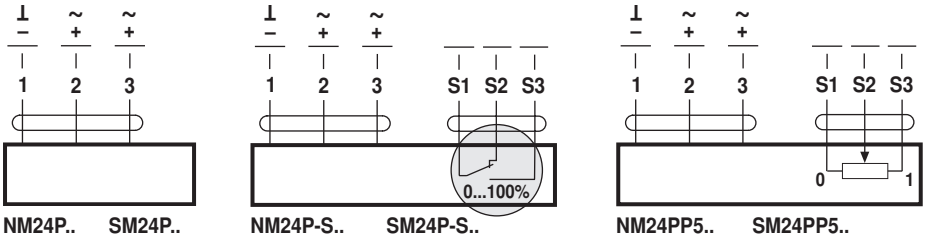




AC 24 V / DC 24 V

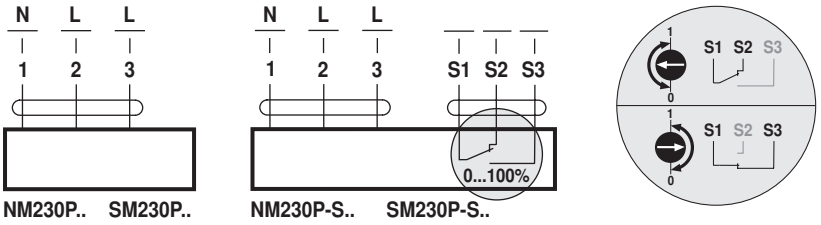


NM24P.. SM24P..

NM24P-S.. SM24P-S..

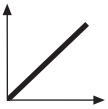
NM24PP5.. SM24PP5..

AC 100 ... 240 V ⚠

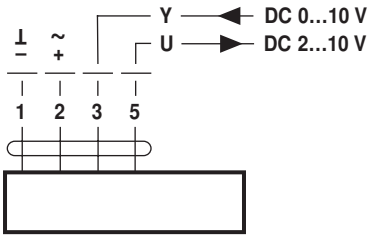


NM230P.. SM230P..

NM230P-S.. SM230P-S..

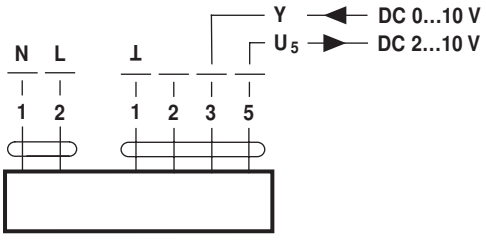


AC 24 V / DC 24 V



NM24P-SR.. SM24P-SR..
NM24P-MF.. SM24P-MF..

AC 100 ... 240 V ⚠



NM230PSR.. SM230PSR..

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