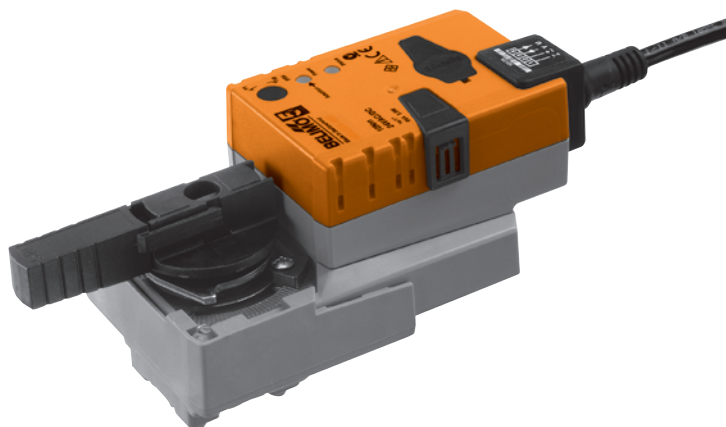


Multifunctional rotary actuator  
for 2 and 3 way control ball valves

- Torque 10 Nm
- Nominal voltage AC/DC 24 V
- Control: modulating DC 0 ... 10 V or variable
- Position feedback DC 2 ... 10 V or variable



## 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	3.5 W @ nominal torque
At rest	1.25 W
For wire sizing	5.5 VA
Connection	Cable 1 m, 4 x 0.75 mm <sup>2</sup>

### Functional data

		Factory settings	Variable	Setting
Torque (nominal torque)		Min. 10 Nm @ nominal voltage		
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	Start point DC 0.5 ... 30 V End point DC 2.5 ... 32 V	.....
Stellungsrückmeldung (Messspannung U)		DC 2 ... 10 V, max. 0.5 mA	Start point DC 0.5 ... 8 V End point DC 2.5 ... 10 V	.....
Position accuracy		±5%		
Manual override		Gearing latch disengaged with pushbutton, can be locked		
Running time		90 s / 90°↔	90 ... 150 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 whenever the supply voltage is switched on, or manual triggering	.....
Angle of rotation limiting		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) (without ball valve)	With a 90 s = 45 dB (A) running time of 150 s = 35 dB (A)	
Position indication		Mechanical, pluggable		

### Safety

Protection class	III Safety extra-low voltage / UL Class 2 Supply
Degree of protection	IP54 in any mounting position NEMA 2, UL Enclosure Type 2
EMC	CE according to 2004/108/EC
Certification	cULus according to UL 60730-1A and UL 60730-2-14 and CAN/CSA E60730-1:02 Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14
Mode of operation	Type 1
Rated impulse voltage	0.8 kV
Control pollution degree	3
Ambient temperature	0 ... +50°C
Medium temperature	+5 ... +100°C in the ball valve -10°C with stem heating on request
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. 850 g



## Safety notes



- The actuator has been designed for use in stationary heating, ventilation and air conditioning systems and 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 switch for changing the direction of rotation may only be operated by authorized personnel.  
The direction of rotation must not be reversed in a frost protection circuit.
- 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.
- 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

<b>Mode of operation</b>	The actuator is controlled with a standard modulating signal of DC 0 ... 10 V and travels to the position defined by the control signal. Measuring voltage U serves for the electrical display of the ball position 0 ... 100% and as slave control signal for other actuators.
<b>Parameterisable actuators</b>	The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the BELIMO Service Tool, MFT-P.
<b>Simple direct mounting</b>	Straightforward direct mounting on the ball valve with only one screw. The assembly tool is integrated in the plug-on position indicator. The mounting position in relation to the ball valve can be selected in 90°-steps.
<b>Manual override</b>	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
<b>Adjustable angle of rotation</b>	Adjustable angle of rotation with mechanical end stops.
<b>High functional reliability</b>	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
<b>Home position</b>	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. Factory default: Y2 (counter-clockwise rotation)

Actuator	Valve
 Y2	A - AB = 0%
 Y1	A - AB = 100%

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

## Accessories

	Description	Data sheet
<b>Electrical accessories</b>	Auxiliary switch S..A..	T2 - S..A..
	Feedback potentiometer P..A..	T2 - P..A..
	PC-Tool MFT-P from version 3.3	T2 - MFT-P
	Position positioner SGA24, SGE24 and SGF24	T2 - SG..24
	Digital position indication ZAD24	T2 - ZAD24

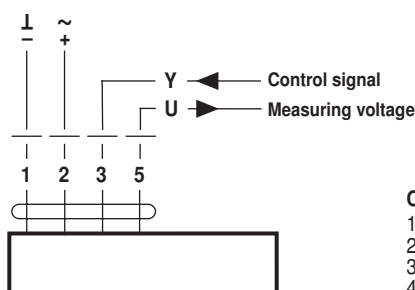
## Electrical installation

## Wiring diagram

## Notes

- Connect via safety isolation transformer.
- Other actuators can be connected in parallel.  
Note performance data for supply.
- Direction of rotation switch is covered.  
Factory default: Direction of rotation Y2

## Direction of rotation

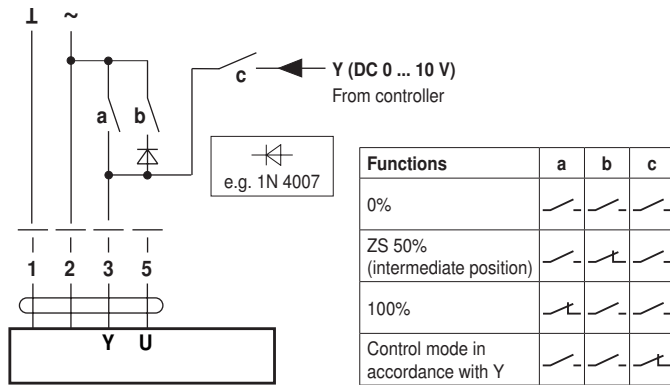


## Cable colours:

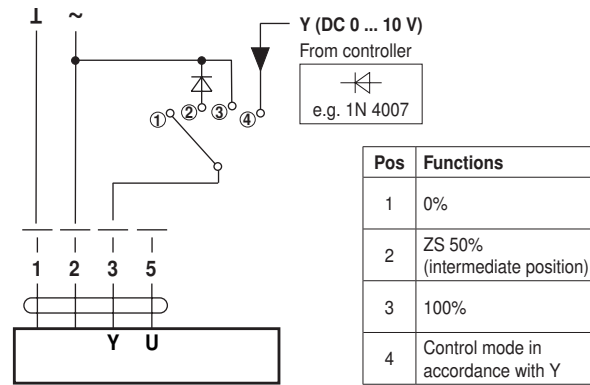
- 1 = black
- 2 = red
- 3 = white
- 4 = orange

Functions with basic values

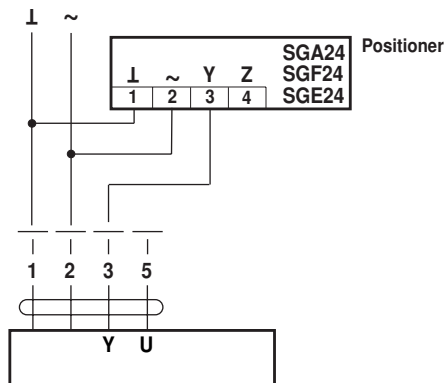
Override control with AC 24 V with relay contacts



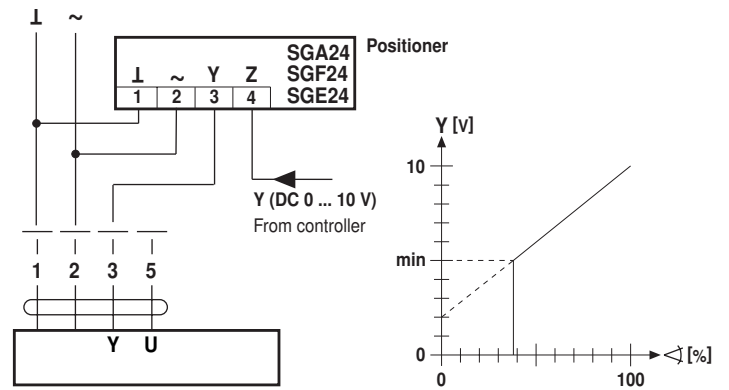
Override control with AC 24 V with rotary control switch



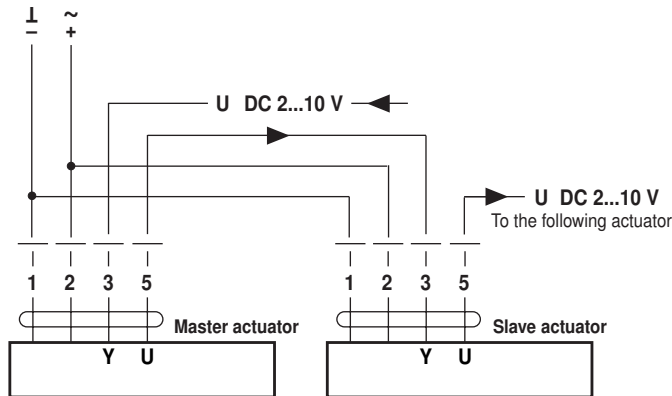
Remote control 0 ... 100 %



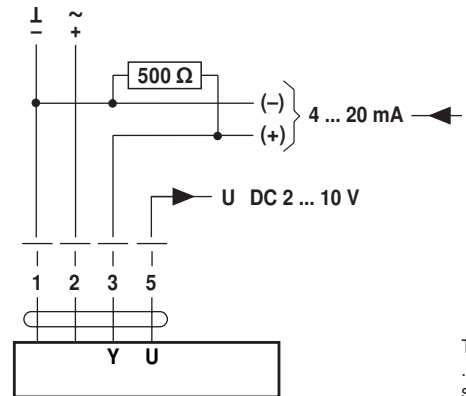
Minimum limit



Master/Slave control (position-dependent)

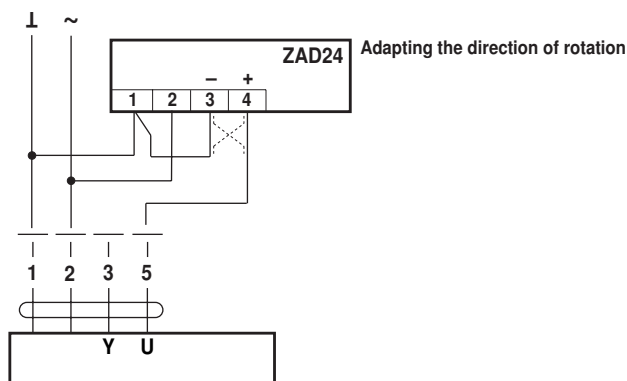


Control with 4 ... 20 mA via external resistance

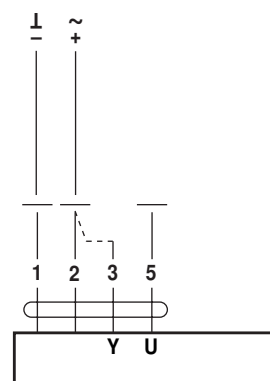


The 500 Ω-resistor converts the 4 ... 20 mA current signal to a voltage signal DC 2 ... 10 V

Position indication



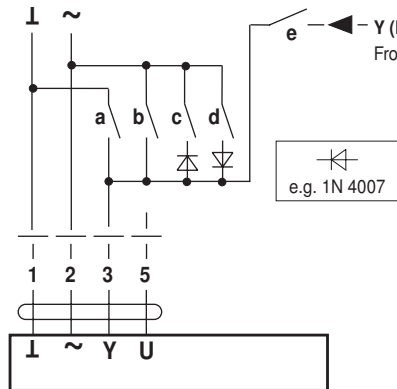
Functional check



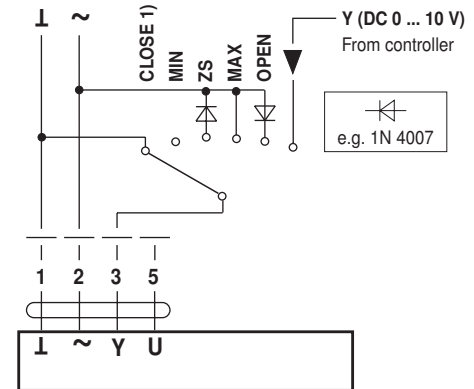
Procedure

- Apply 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

## Functions for actuators with specific parameters

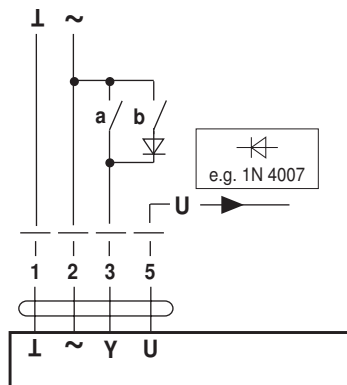
Override control and limiting  
with AC 24 V with relay contacts

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

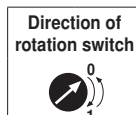
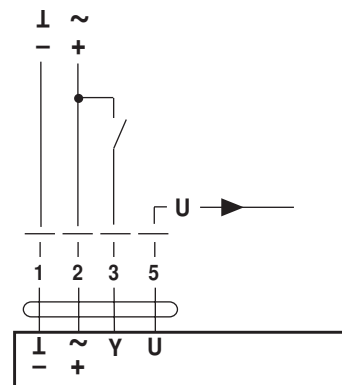
Override control and limiting  
with AC 24 V with rotary switch

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

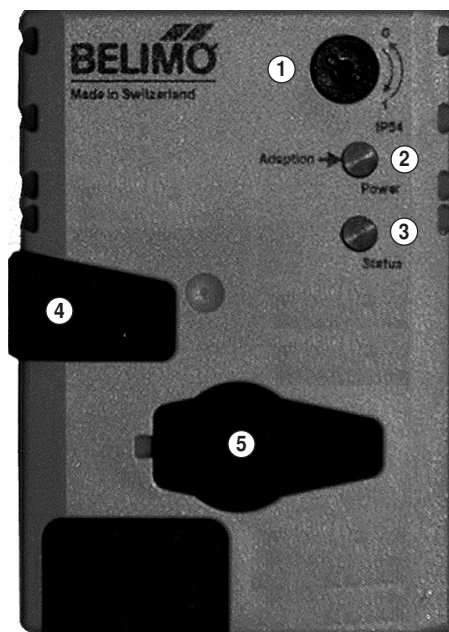


## Open-close control



a	b	1	0
		Stop	Stop

## 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: In operation

Press button: Switches on angle of rotation adaptation followed by standard operation

## ③ Push-button 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 voltage supply connection

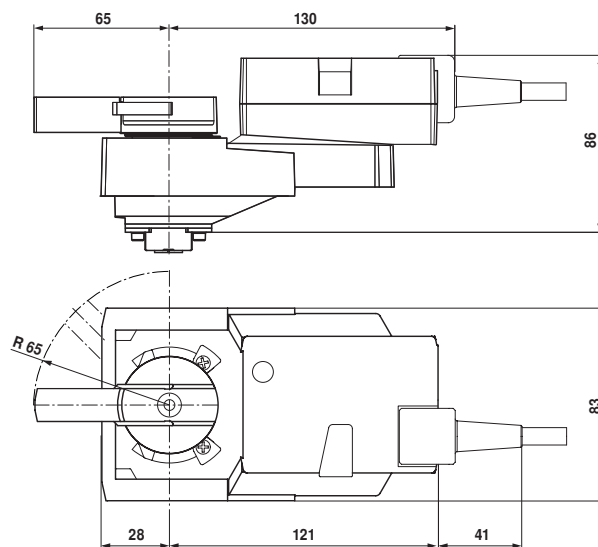
a) ② Off and ③ On

b) ② Blinking and ③ Blinking

} Check the power supply connections.  $\perp$  and  $\nabla$  could be reverse.

## Dimensions [mm]

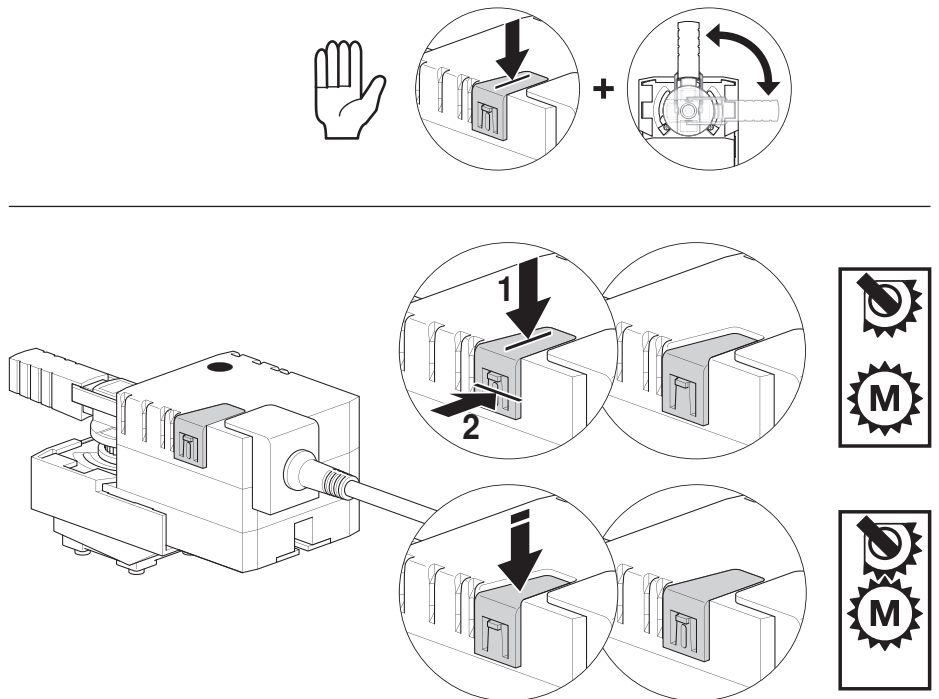
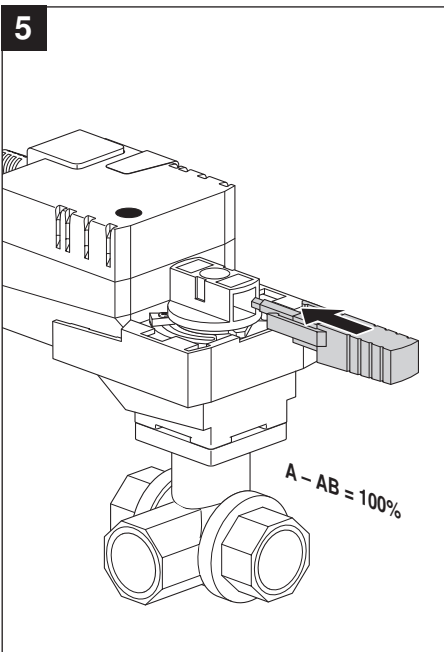
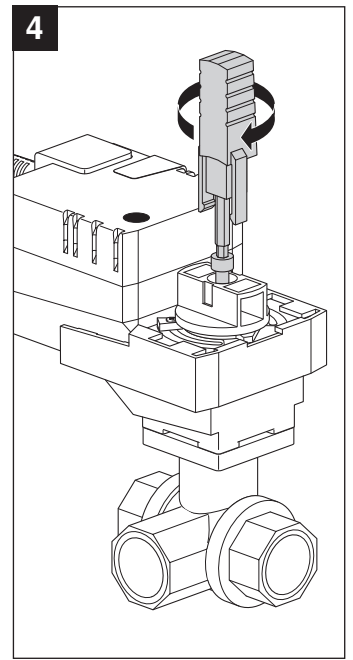
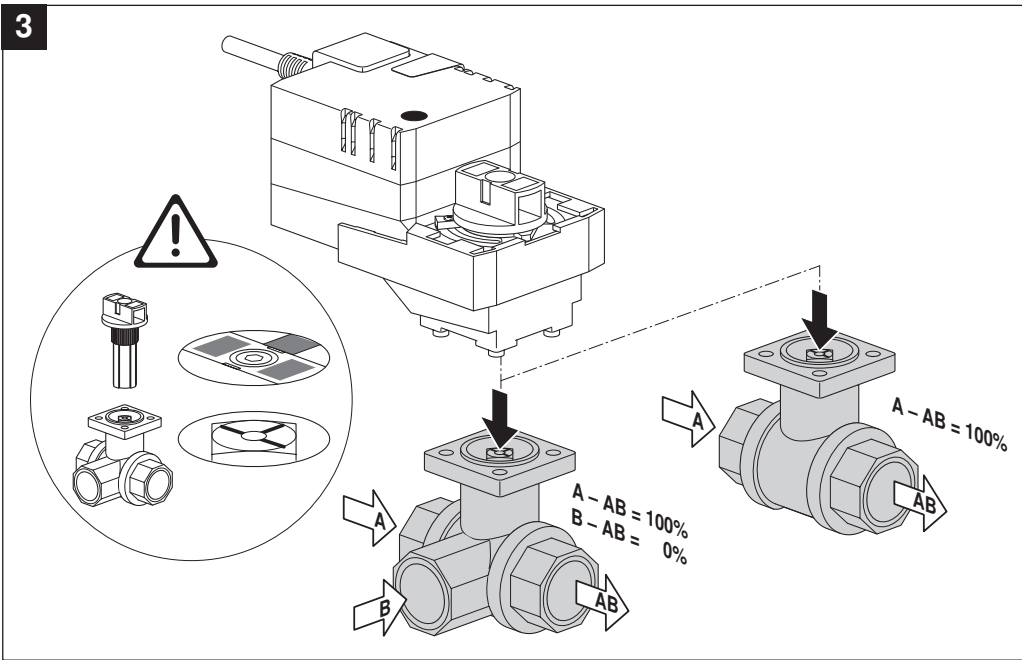
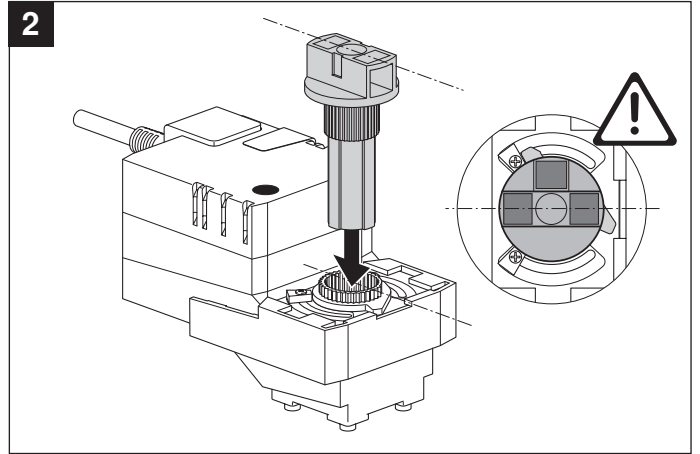
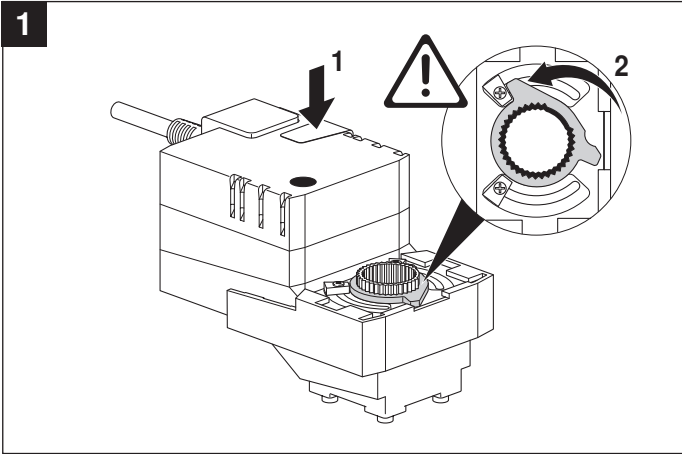
## Dimensional drawings

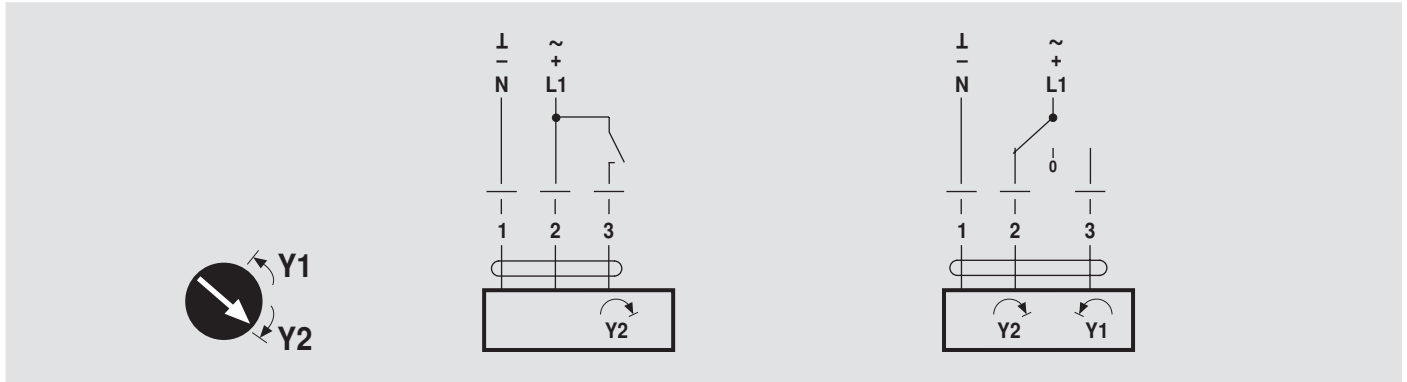


## Further documentations

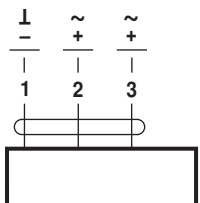
- Complete overview «The complete product range of water solutions»
- Datasheets control ball valves
- Mounting instructions for actuators or control ball valves, respectively
- Notes for project planning (hydraulic characteristic curves and circuits, installation regulations, commissioning, maintenance, etc.)

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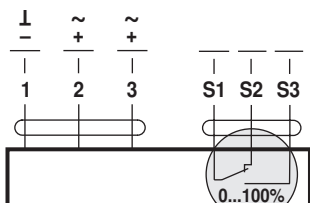




AC 24 V / DC 24 V

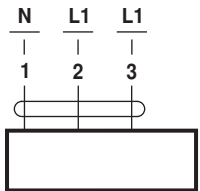


LR24A NR24A  
SR24A

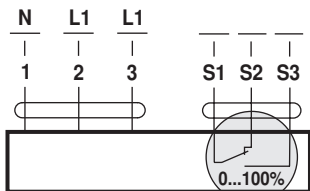


LR24A-S NR24A-S  
SR24A-S

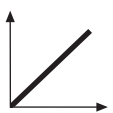
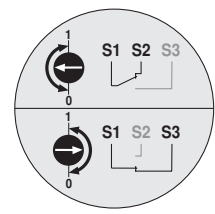
AC 100 ... 240 V ⚠



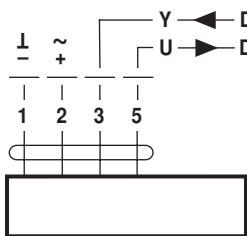
LR230A NR230A  
SR230A



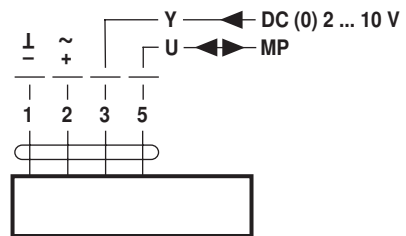
LR230A-S NR230A-S  
SR230A-S



AC 24 V / DC 24 V



TRC24A-SR LR24A-MF  
LR(C)24A-SR NR24A-MF  
NR(C)24A-SR SR24A-MF  
SR24A-SR



LR24A-MP NR24A-MP  
SR24A-MP

**LONWORKS®** AC 24 V / DC 24 V

