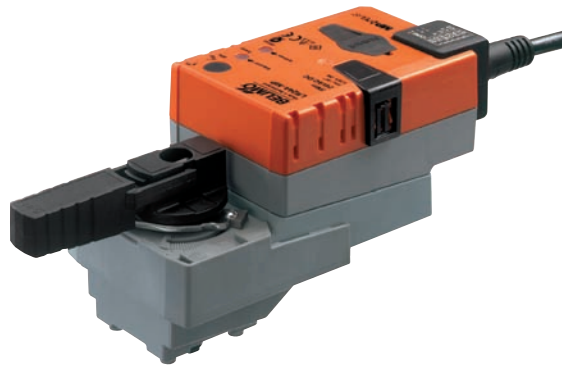


**Multifunctional rotary actuator for 2 and 3 way control ball valves**

- Torque 5 Nm
- Nominal voltage AC/DC 24 V
- Control: Modulating DC 0 ... 10 V or variable
- Position feedback DC 2 ... 10 V or variable
- Communication via BELIMO MP-Bus
- Conversion of sensor signals


**Technical data**
**Electrical data**

Nominal voltage	AC 24 V, 50/60 Hz / DC 24 V
Power supply range	AC 19.2 ... 28.8 V / DC 21.6 ... 28.8 V
Power consumption In operation	2 W at nominal torque
At rest	1.2 W
For wire sizing	3.5 VA
Connection	Cable 1 m, 4 x 0.75 mm <sup>2</sup>

Functional data	Factory settings	Variable	Settings
Torque (nominal torque)	Min. 5 Nm at nominal voltage		
Control Control signal Y	DC 0 ... 10 V, input impedance 100 kΩ	Open-close, 3-point (AC only)	.....
Working range	DC 2 ... 10 V	Start 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	Start point DC 0.5 ... 8 V	.....
		End point DC 2.5 ... 10 V	.....
Uni-rotation	±5% absolutely		
Running time	90 s/90° <math>\triangleleft</math>	35 ... 150 s	.....
Automatic adjustment of running time, operating range and measuring signal U to match the mechanical angle of rotation	Manual triggering of this adaption by pressing the button «Adaption» or with the PC-Tool	Automatic adaption whenever the supply voltage is switched on, or manual triggering	.....
Angle de rotation limiting	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%	MAX = (MIN + 30° <math>\triangleleft</math>) ... 100% MIN = 0% ... (MAX - 30° <math>\triangleleft</math>) ZS = MIN ... MAX	.....
Sound power level	Max. 35 dB (A)	With a running 35 s = 45 dB (A) time of 90 s = 35 dB (A)	
Position indication	Mechanical, plug-on		

**Safety**

Protection class	III Safety extra-low voltage
Degree of protection	IP54 in all mounting positions
EMC	CE according to 89/336/EEC
Mode of operation	Type 1 (to EN 60730-1)
Rated impulse voltage	0.8 kV (to EN 60730-1)
Control pollution degree	3 (in acc. with EN 60730-1)
Ambient temperature range	+0 ... +50°C
Temperature of medium	+5 ... +110°C in control ball valve -10°C with stem heating upon request
Non-operating temperature	-40 ... +80°C
Ambient humidity range	95% r.H., non-condensating (to EN 60730-1)
Maintenance	Maintenance-free

**Dimensions/weight**

Dimensions	See «Dimensions» on page 5
Weight	Approx. 500 g



## Safety notes



- The rotary 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. All applicable legal or institutional installation regulations must be complied with.
- 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 is not allowed to be removed from the unit.
- 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>	<p><i>Conventional operation:</i> 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 actuator position 0 ... 100% and as slave control signal for other actuators.</p> <p><i>Operation on the MP-Bus:</i> The actuator receives its digital positioning signal from the higher level controller via the MP-Bus and travels to the position defined. Connection U serves as communication interface and does not supply an analogue measuring voltage.</p>
<b>Converter for sensors</b>	Connection option for a sensor (passive or active sensor or switching contact). The MP actuator serves as an analogue/digital converter for the transmission of the sensor signal via MP-Bus to the higher level system.
<b>Parameterisable actuators</b>	The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the MFT-H parameterising device or the BELIMO Service Tool, MFT-P.
<b>Simple direct mounting</b>	Straightforward direct mounting on the ball valve with only one screw. The mounting position in relation to the ball valve can be selected in $90^\circ <$ steps.
<b>Manual override</b>	Manual operation with pushbutton possible - temporary, permanently. The gear is disengaged and the actuator decoupled for as long as the button is pressed / latched.
<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 travels to the home position. Factory setting: Direction of rotation Y2 (counter-clockwise rotation)

Rotary actuator	Rotary valve
	A - AB = 0%
	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..
	Parameterizing device MFT-H	T2 - MFT-H
	PC-Tool MFT-P	T2 - MFT-P
	Positioner SG..24	T2 - SG..24
	Digital position indicator ZAD24	T2 - ZAD24

**Electrical installation**

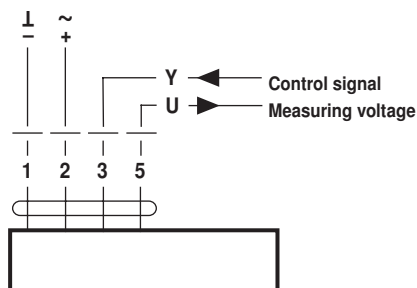
**Note**

- Connect via safety isolation transformer.
- Parallel connection of other actuators possible.
- Direction of rotation switch is covered.
- Factory setting: Direction of rotation Y2

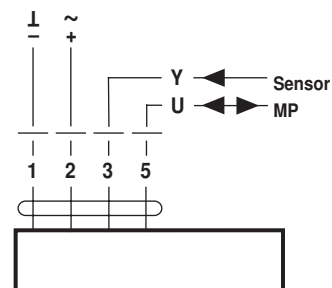


**Wiring diagram**

**Conventional operation**

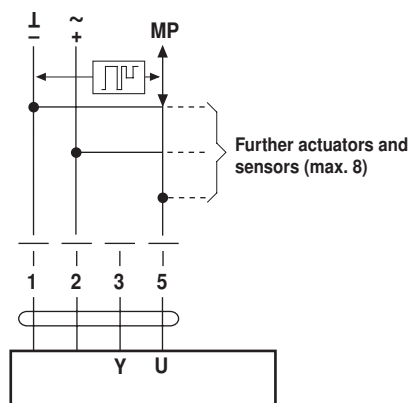


**Operation on the MP-Bus**



**Functions when operated on MP-Bus**

**Connection on the MP-Bus**

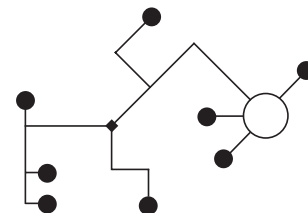


**Supply and communication**

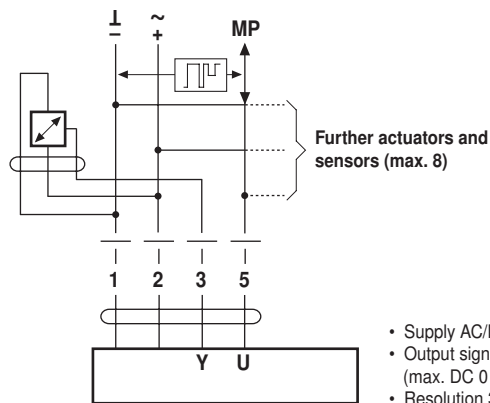
- in one and the same 3-wire cable
- no shielding or twisting necessary
- no terminating resistors required

**Power topology**

There are no restrictions for the network topology (star, ring, tree or hybrid forms are permitted).

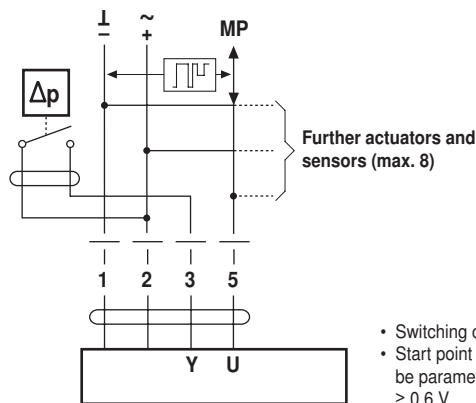


**Connection of active sensors**



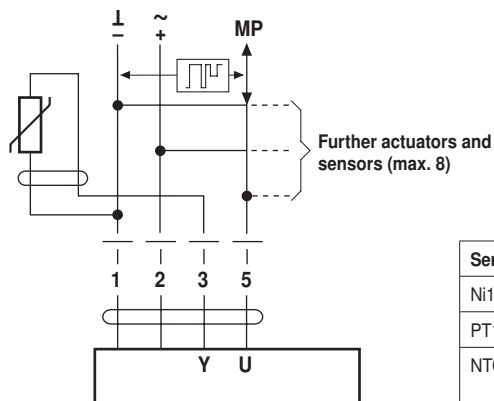
- Supply AC/DC 24 A
- Output signal DC 0 ... 10 V (max. DC 0 ... 32 V)
- Resolution 30 mV

**Connection of external switching contact**



- Switching current 16 mA @ 24 V
- Start point of the operating range must be parameterised on the MP actuator as  $\geq 0.6$  V

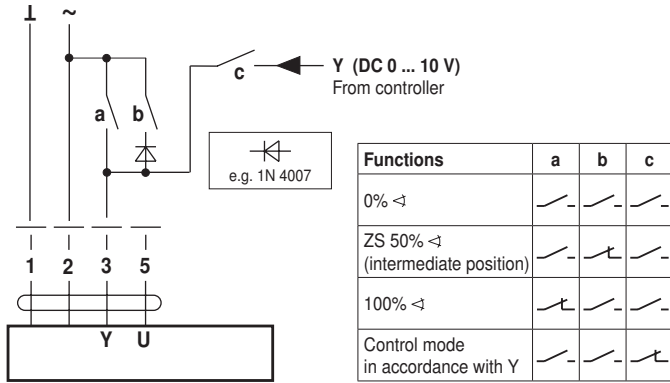
**Connection of passive sensors**



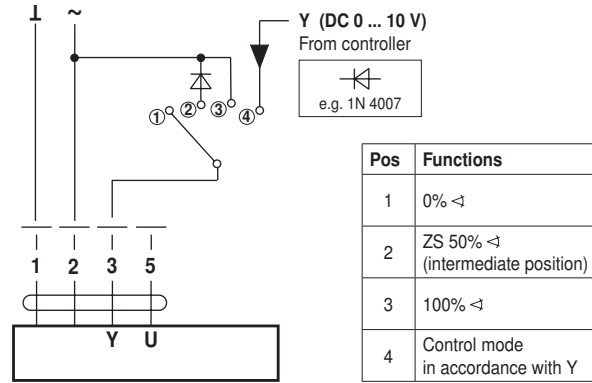
Sensor	Temperature range	Resistance range	Resolution
Ni1000	-28 ... +98 °C	850 ... 1600 Ω	1 Ω
PT1000	-35 ... +155 °C	850 ... 1600 Ω	1 Ω
NTC	-10 ... +160 °C (depending on type)	200 Ω ... 60 kΩ	1 Ω

Functions with basic values (only in conventional mode)

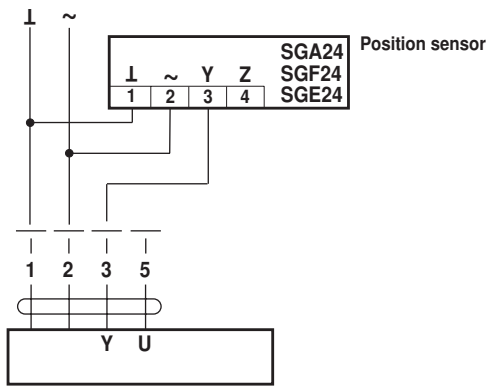
Override control with AC 24 V with relay contacts



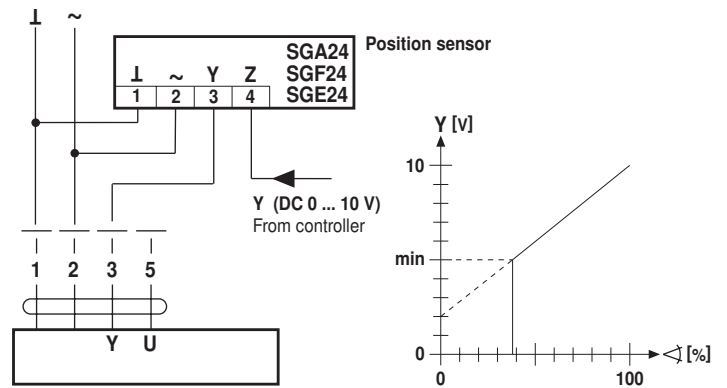
Override control with AC 24 V with rotary control switch



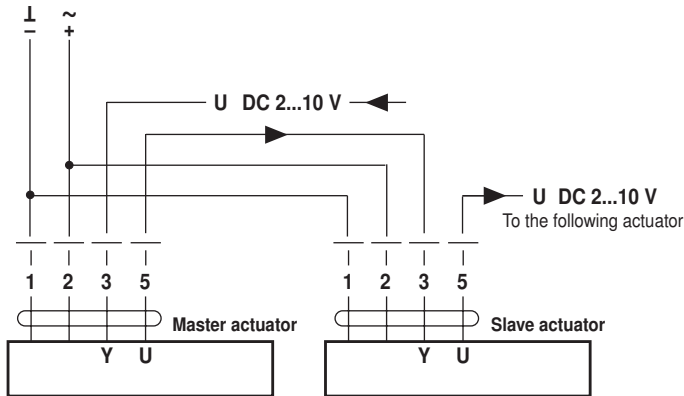
Remote control 0 ... 100 %



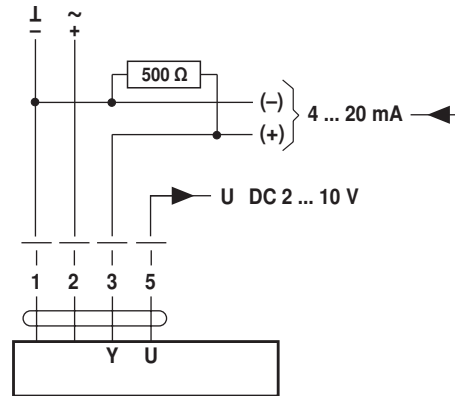
Minimum limit



Master/Slave control (position-dependent)

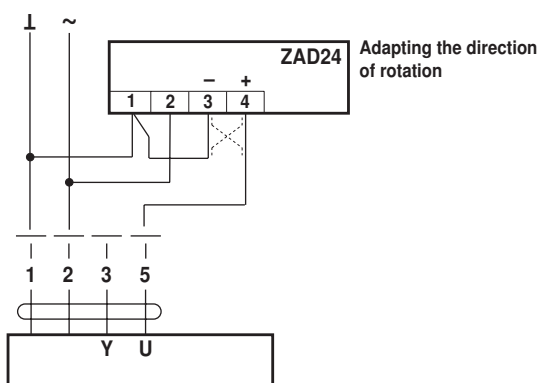


Control with 4 ... 20 mA via external resistance

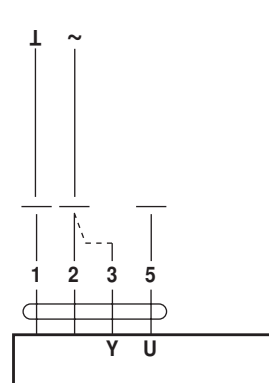


The 500 Ω resistor converts the 4 ... 20 mA current signal to a voltage signal DC 2 ... 10 V

Position indication



Functional check

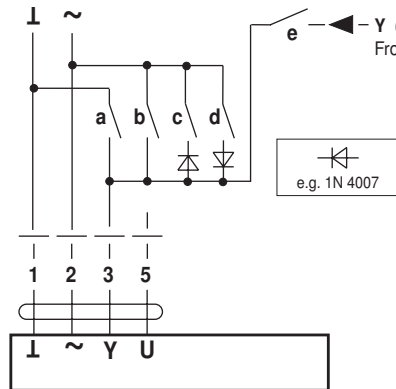


Procedure

- Apply AC 24 A to connection 1 and 2
- Disconnect connection 3:
  - For direction of rotation Y1: Actuator turns in the direction of ↻
  - For direction of rotation Y2: Actuator turns in the direction of ↻
- Short circuit connections 2 and 3:
  - Actuator runs in the opposite direction

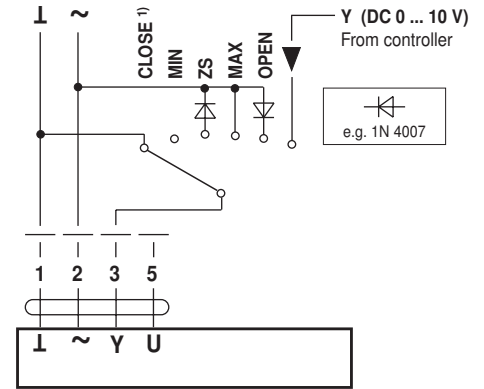
Functions for actuators with specific parameters

Override control and limiting with AC 24 V with relay contacts



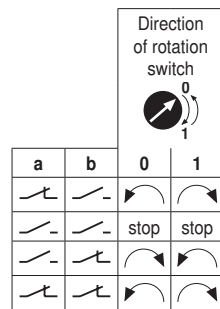
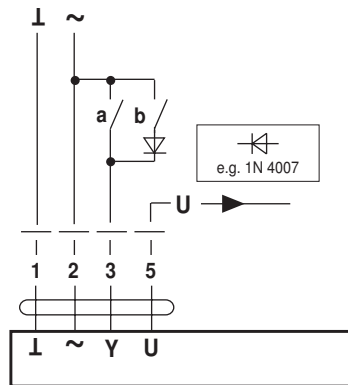
Functions	a	b	c	d	e
CLOSE <sup>1)</sup>					
MIN					
ZS (intermediate position)					
MAX					
OPEN					
Control mode in accordance with Y					

Override control and limiting with AC 24 V with rotary switch

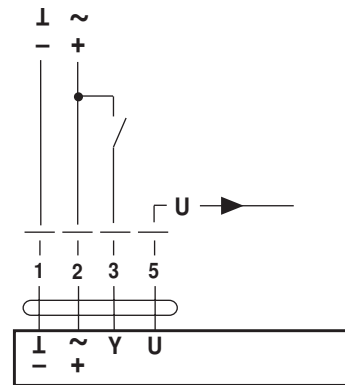


<sup>1)</sup> **Caution!** This function is only guaranteed if the start point of the operating range is defined as min. 0.6 V.

3-point control

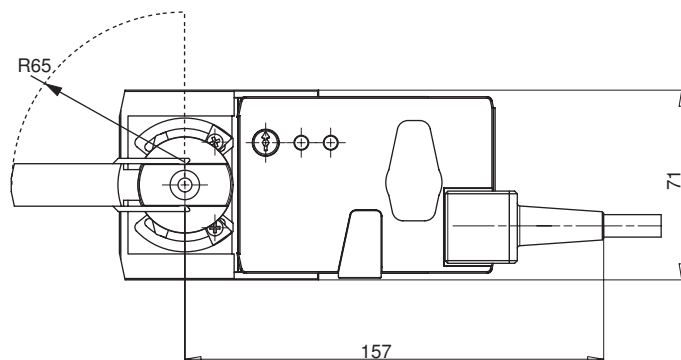
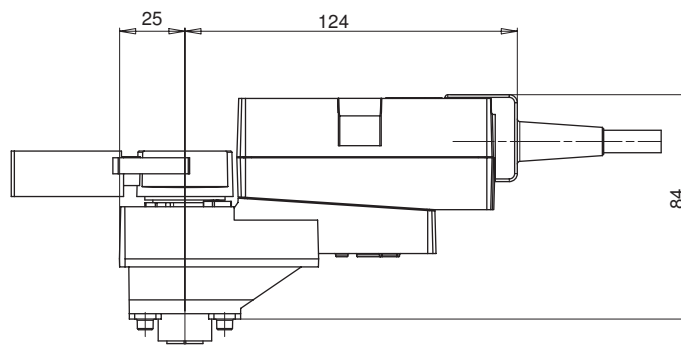


Open/close control



Dimensions [mm]

Dimensional diagrams



## Operating controls and indicators

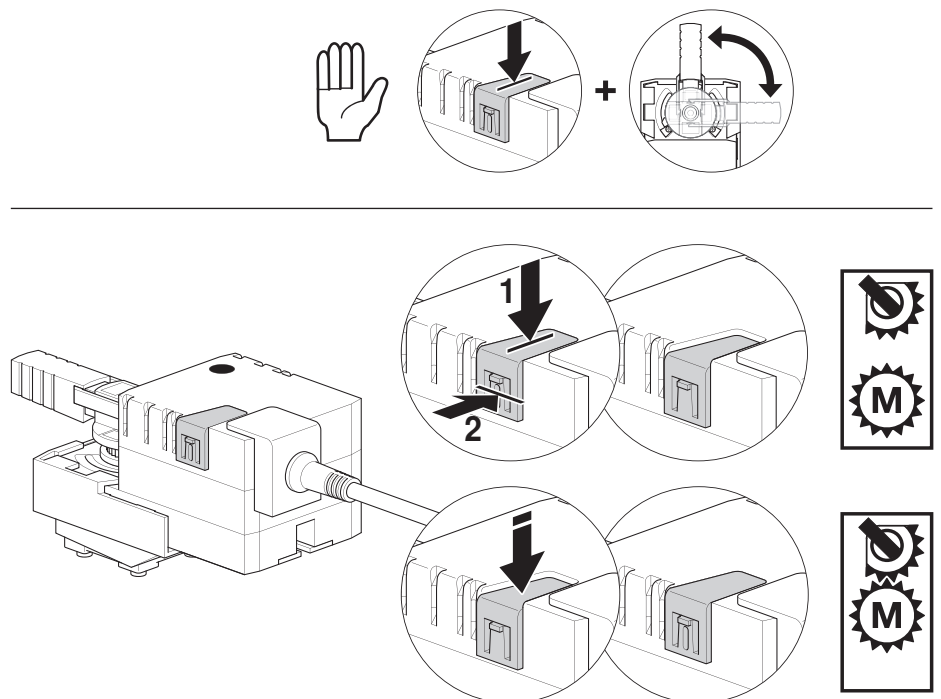
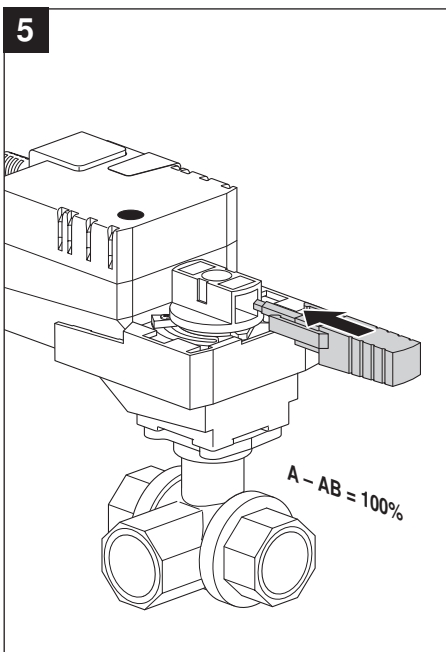
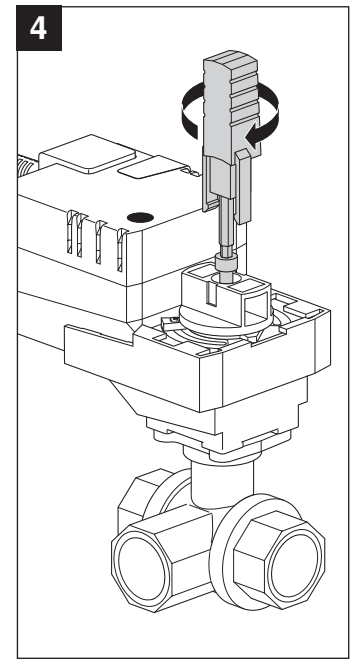
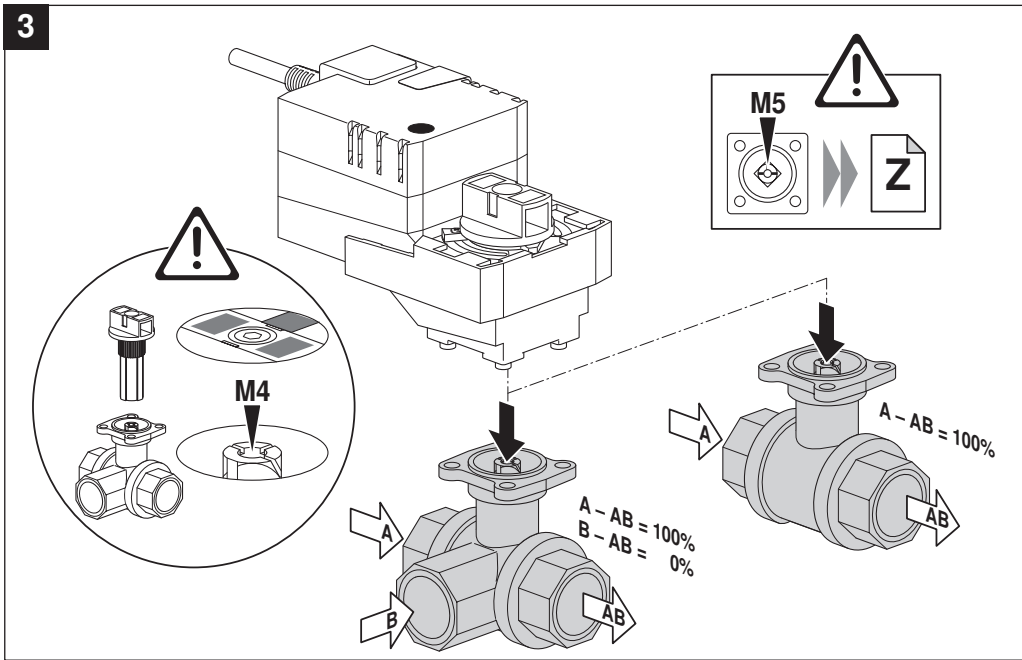
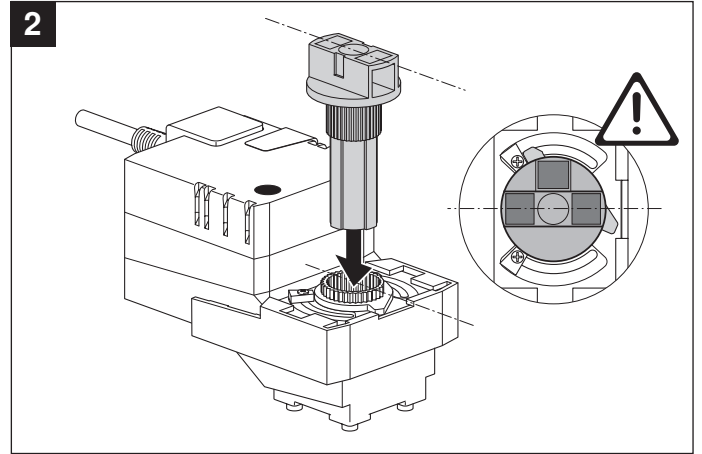
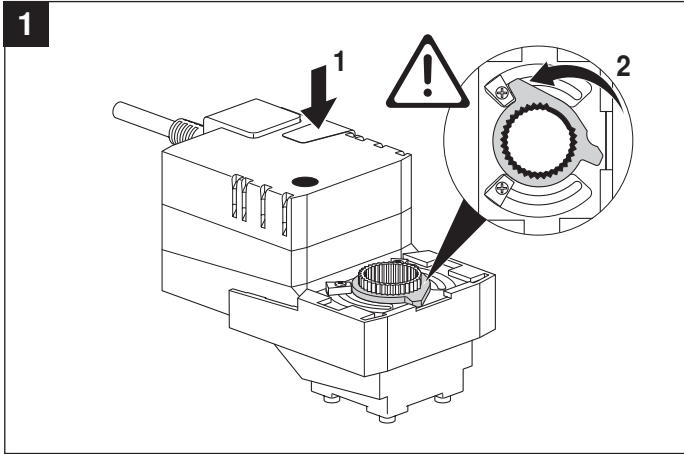


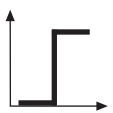
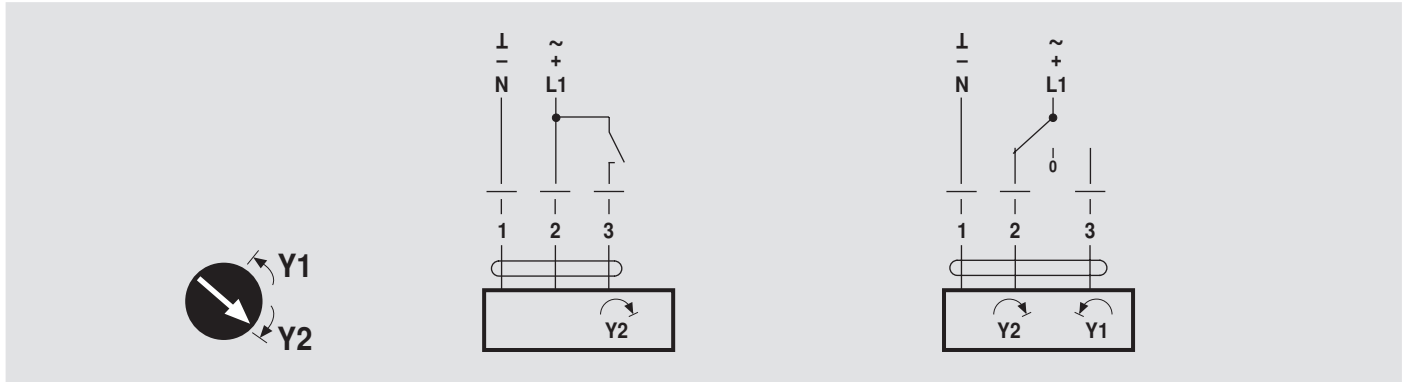
- ① Direction of rotation switch**  
Switching over: Direction of rotation changes
- ② Pushbutton and green LED display**  
Off: No voltage supply or malfunction  
Green on: Operation  
Press button: Switches on angle of rotation adaption followed by standard operation
- ③ Pushbutton and yellow LED display**  
Off: Standard operation without MP-Bus  
Yellow on: Adaption or synchronising process active  
Yellow, blinking: Addressing request sent to MP master  
Press button: Acknowledgment of addressing  
Yellow, flickering: MP communication active
- ④ Gear disengagement switch**  
Press button: Gear disengaged, motor stops, manual operation possible  
Release button: Gear engaged, synchronisation starts, followed by standard operation
- ⑤ Service plug**  
For connecting parameterising and service tools

### Further documentations

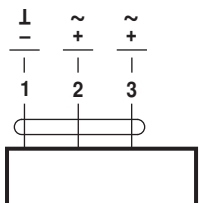
- Complete overview of actuators for water solutions
- Data sheets for butterfly valves
- Installation instructions for actuators and/or ball valves
- Notes for project planning (hydraulic characteristic curves and circuits, installation regulations, commissioning, maintenance etc.)

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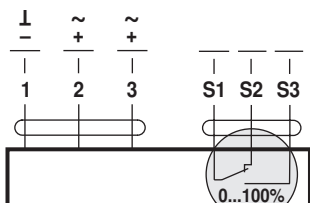




AC 24 V / DC 24 V

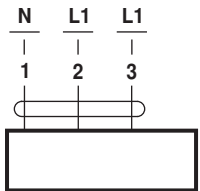


LR24A NR24A  
SR24A

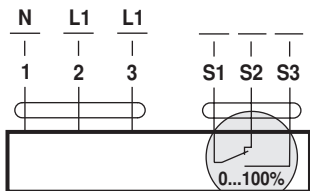


LR24A-S NR24A-S  
SR24A-S

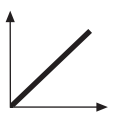
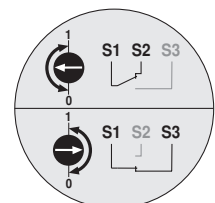
AC 100 ... 240 V ⚠



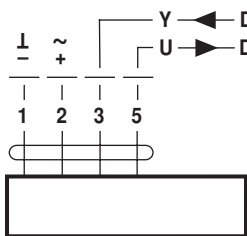
LR230A NR230A  
SR230A



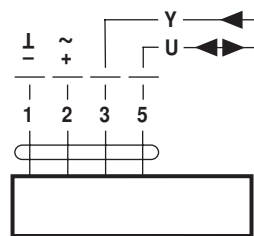
LR230A-S NR230A-S  
SR230A-S



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

