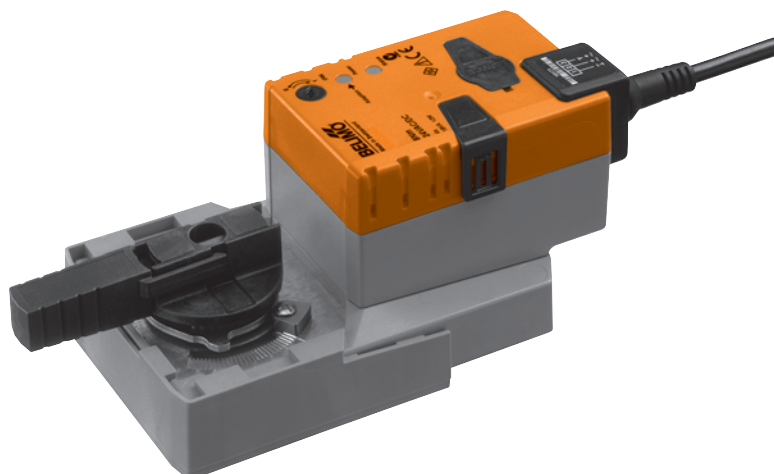


Modulating rotary actuator for 2 and 3 way control ball valves

- Torque 8 Nm
- Nominal voltage AC/DC 24 V
- Control: modulating DC 0 ... 10 V
- Position feedback DC 2 ... 10 V
- Running time 9 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 12 W @ nominal torque At rest 1.5 W For wire sizing 18 VA (I max. 20 A @ 5 ms)
	Connection	Cable 1 m, 4 x 0.75 mm ²
Functional data	Parallel connection	Possible, note the performance data
	Torque (nominal torque)	Min. 8 Nm @ nominal voltage
	Control	Control signal Y DC 0 ... 10 V, input impedance 100 kΩ Operating range DC 2 ... 10 V
	Position feedback (Measuring voltage)	DC 2 ... 10 V, max. 0.5 mA
	Position accuracy	±5%
	Manual override	Gearing latch disengaged with push-button, can be locked
	Running time	9 s / 90° \leftarrow
	Automatic adjustment of operating range and measuring signal U to match the mechanical angle of rotation	Manual triggering of the adaption by pressing the «Adaption» button
	Override control	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, only AC) = 50%
	Sound power level	52 dB (A)
	Position indication	Mechanical, pluggable
Safety	Protection class	III Safety extra-low voltage
	Degree of protection	IP54 in any mounting position, UL/NEMA 2
	EMC	CE according to 2004/108/EC
	Certification	cULus according to UL 60730-1A and UL 60730-2-14 and CAN/CSA E60730-01:02 Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1 (EN 60730-1)
	Rated impulse voltage	0.8 kV (EN 60730-1)
	Control pollution degree	3 (EN 60730-1)
	Ambient temperature	-30 ... +40 °C (no restrictions) ⚠ +40 ... +50 °C (Caution: can only be used with restrictions. Please contact your Belimo representative.)
	Non-operating temperature	-40 ... +80 °C
	Ambient humidity	95% r.H., non-condensating (EN 60730-1)
Maintenance	Maintenance-free	
Dimensions / Weight	Dimensions	See «Dimensions» on page 3
	Weight	Approx. 1.8 kg

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.



Safety notes

(continued)

- The switch for changing the direction of rotation may only be operated by authorised 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.
- Self adaptation is necessary when the system is commissioned and after each adjustment of the angle (press the adaptation push-button)
- 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 is controlled with a standard modulating signal of DC 0 ... 10 V and moves 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.
Simple direct mounting	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 fitting can be selected in 90° steps.
Manual override	Manual override with push-button 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.
High functional reliability	The actuator is overload-proof, requires no limit switches and automatically stops when the end stop is reached.
Position feedback U5	Operation of the ball valve is optimised by a limiting ring. This ring reduces the angle of rotation from 95° to 90°, i.e. U5 will deviate from Y by approximately 0.3 V when the valve is closed.
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. Factory setting: 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
Electrical accessories	Auxiliary switch S..A..	T2 - S..A..
	Feedback potentiometer P..A..	T2 - P..A..

Electrical installation

Wiring diagram

Note

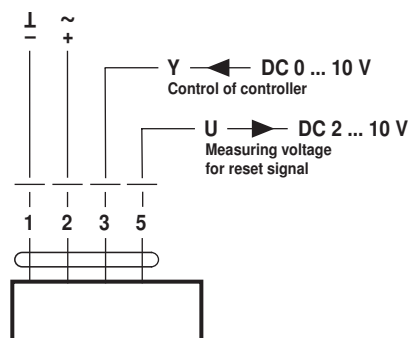
- Connect via safety isolation transformer.
- Parallel connection of others actuators possible. Note the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2



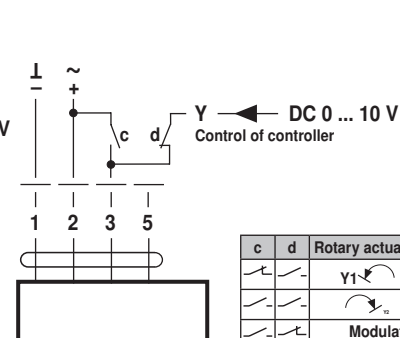
Direction of rotation









Standard connection



Override control (frost protection circuit)

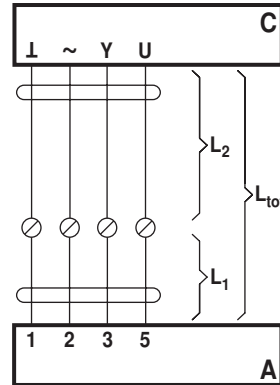


c	d	Rotary actuator	Rotary valve
		Y1	A – AB = 100%
		Y2	A – AB = 0%
		Modulating operation	

Electrical installation

(continued)

Cable lengths



A = Actuator
 C = Control unit
 L₁ = Belimo connecting cable, 1 m (4 x 0.75 mm²)
 L₂ = Customer cable
 L_{tot} = Maximum cable length

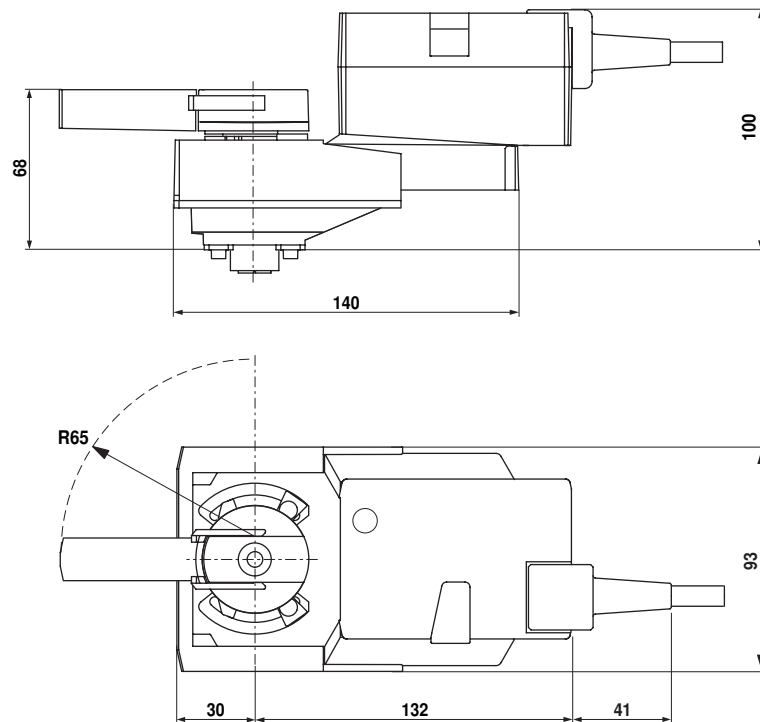
Cross section L ₂ ↓ / ~	Max. cable length L _{tot} = L ₁ + L ₂		Example for DC
	AC	DC	
0.75 mm ²	≤30 m	≤5 m	1 m (L ₁) + 4 m (L ₂)
1.00 mm ²	≤40 m	≤8 m	1 m (L ₁) + 7 m (L ₂)
1.50 mm ²	≤70 m	≤12 m	1 m (L ₁) + 11 m (L ₂)
2.50 mm ²	≤100 m	≤20 m	1 m (L ₁) + 19 m (L ₂)

Note

When several actuators are connected in parallel, the maximum cable length must be divided by the number of actuators.

Dimensions [mm]

Dimensional drawings



Operating controls and indicators

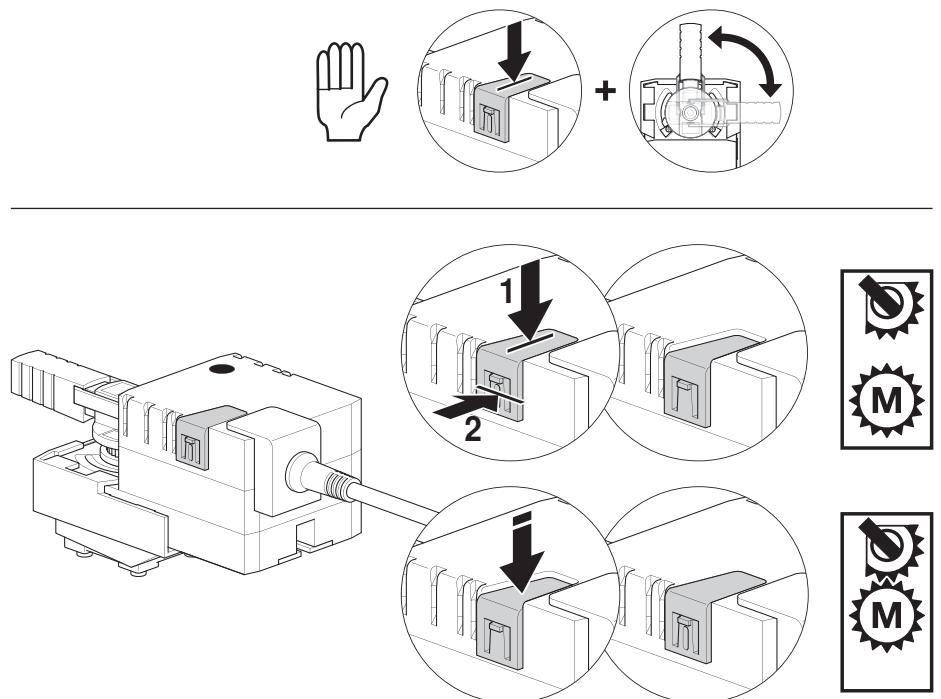
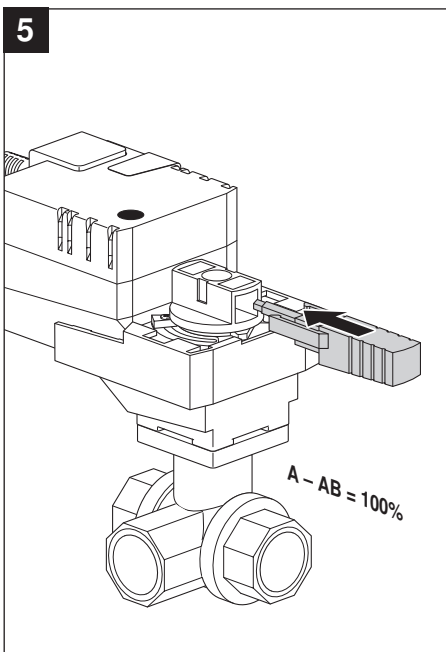
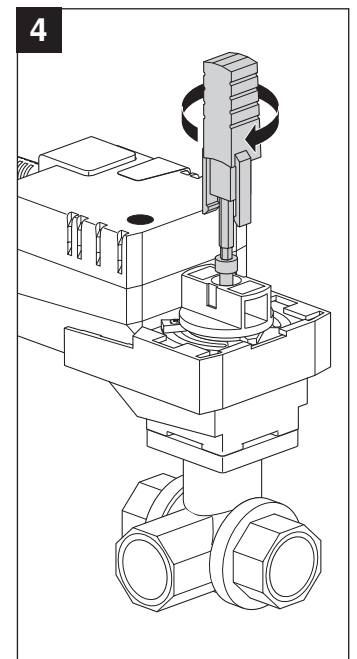
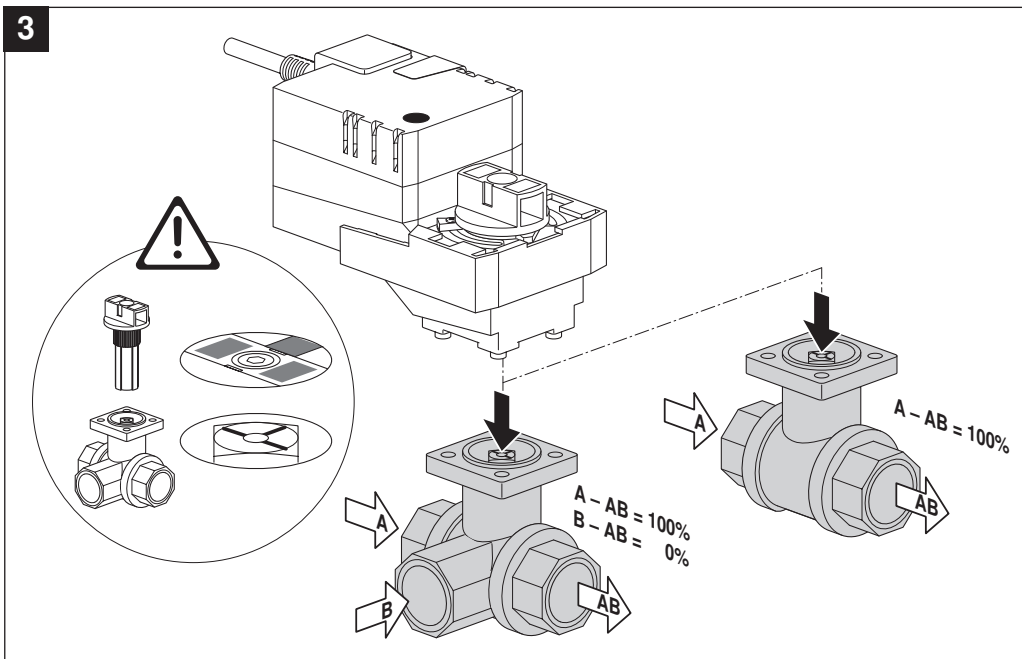
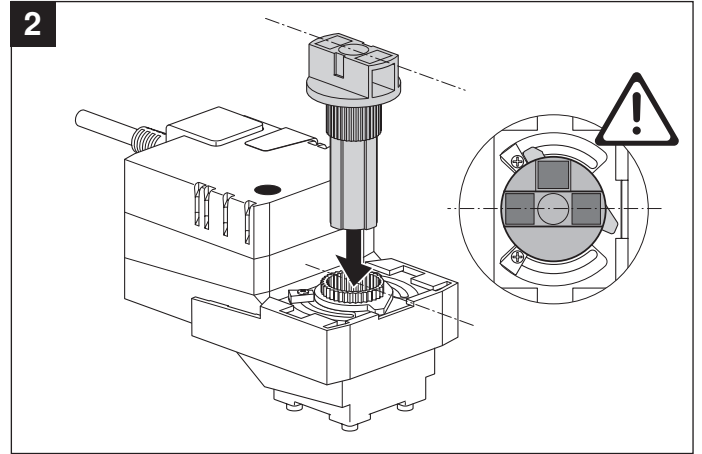
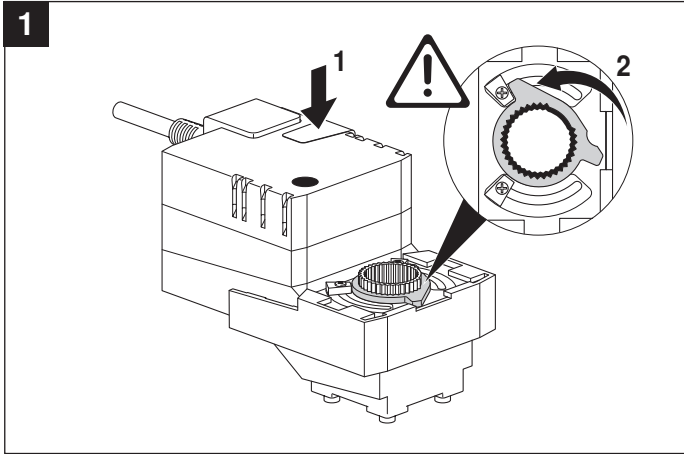


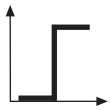
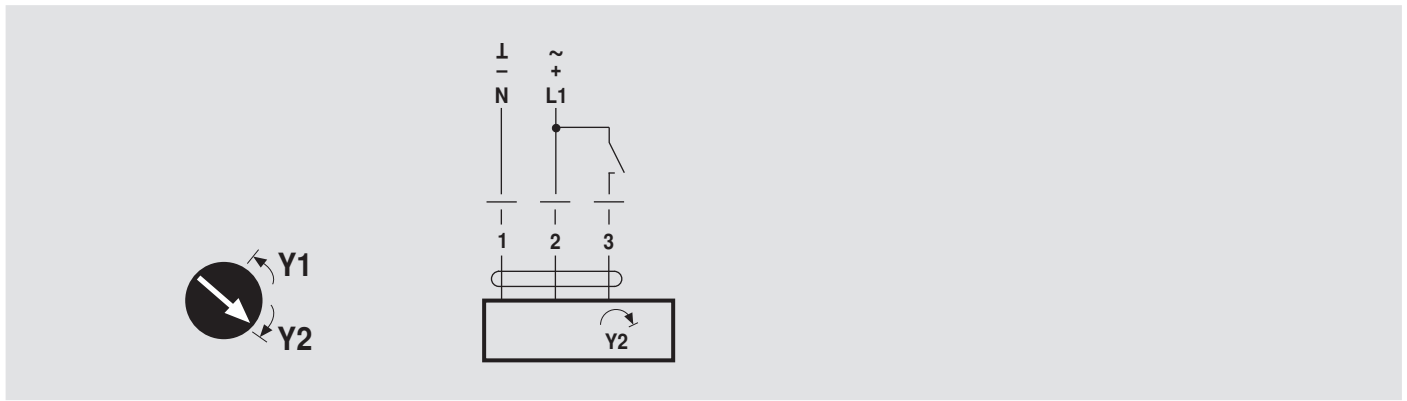
- ① **Direction of rotation switch**
Switching over: Direction of rotation changes
- ② **Push-button and green LED display**
Off: No voltage supply or fault
On: In operation
Press button: Switches on angle of rotation adaptation followed by standard operation
- ③ **Push-button and yellow LED display**
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

Further documentations

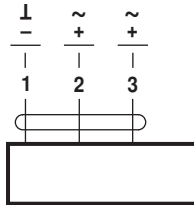
- Complete overview «The complete range of water solutions»
- Data sheets for ball valves
- Installation instructions for actuators resp. ball valves
- Notes for project planning (hydraulic characteristic curves and circuits, installation regulations, commissioning, maintenance etc.)

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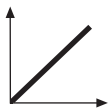




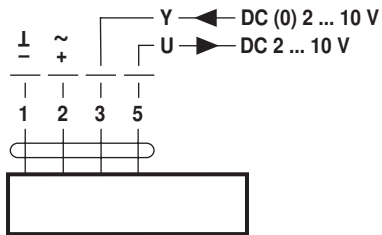
AC 24 V / DC 24 V



LRQ..
NRQ..



AC 24 V / DC 24 V



LRQ..-SR LRQ..-SZ
NRQ..-SR NRQ..-SZ