

Rotary actuator for ball valves

- Torque 16Nm
- Nominal voltage AC/DC 24V
- Control: Open-close
- Running time 9s


Technical data

Electrical data	Nominal voltage	AC 24V, 50/60Hz / DC 24V	
	Nominal voltage range	AC/DC 19.2...28.8V / DC 21.6...28.8V	
	Power consumption	In operation	15W @ nominal torque
		At rest	2W
	For wire sizing	25VA (I _{max} 20 A @ 5ms)	
Connection	Cable 1m, 3 x 0.75mm ²		
Parallel connection	Possible, note the performance data		
Functional data	Torque (nominal torque)	Min. 16Nm @ nominal voltage	
	Manual override	Gearing latch disengaged with push-button, can be locked	
	Running time	9s / 90°	
	Sound power level	Max. 52dB(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	Certified to CAN/CSA E60730-01:02	
	Mode of operation	Type 1	
	Rated impulse voltage	0.8kV	
	Control pollution degree	3	
	Ambient temperature		0...+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	
	Maintenance	Maintenance-free	
Dimensions / Weight	Dimensions	See «Dimensions»	
	Weight	Approx. 2.4kg	

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 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

- 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.
- 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%

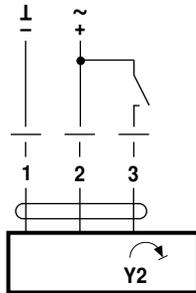
The actuator then moves into the position defined by the control signal.

Electrical installation

Wiring diagram

Note

- Connect via safety isolation transformer.
- Parallel connection of other actuators possible. Note performance data for supply.



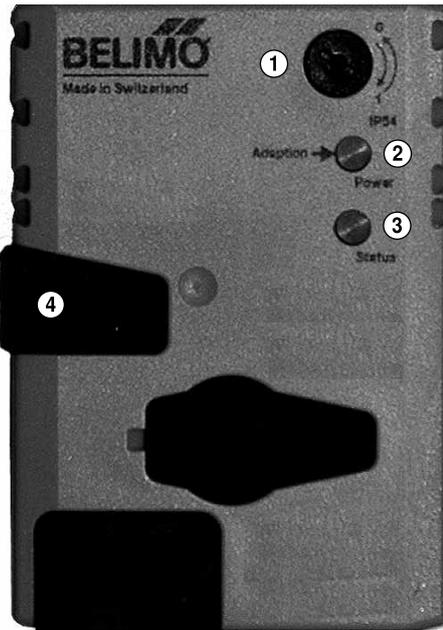
Direction of rotation

Rotary actuator	Rotary valve
Y2	A – AB = 0%

Accessories

	Description	Type
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 1 kOhm, add-on	P1000A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
Feedback potentiometer 10 kOhm, add-on	P10000A	

Operating controls and indicators



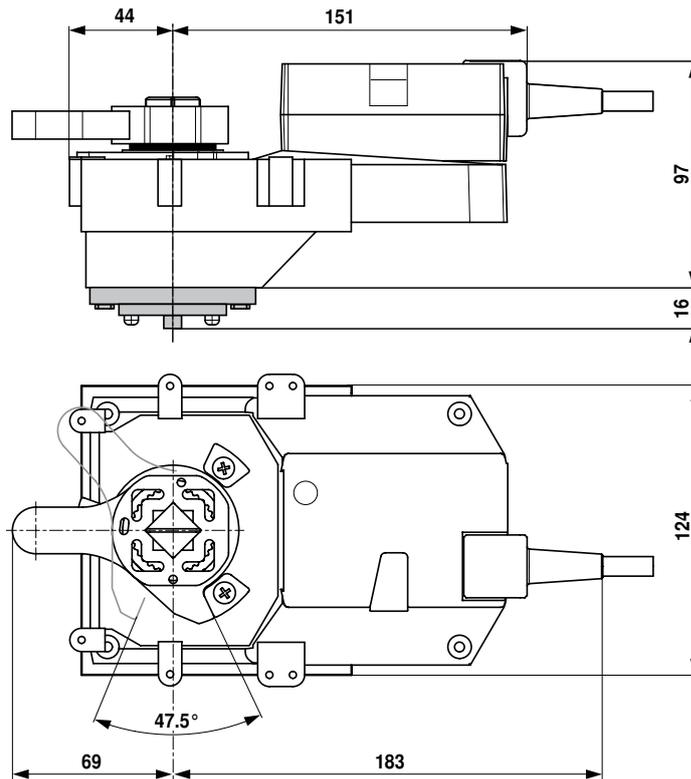
- ① **Direction of rotation switch**
Switching over: Direction of rotation changes
- ② **Push-button and green LED display**
Off: No voltage supply or fault
On: In operation
Press button: Switches on angle of rotation adaptation followed by standard operation
- ③ **Push-button and yellow LED display**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

Check voltage supply connection

- a) ② Off and ③ On } Check the supply connections.
- b) ② Blinking and ③ Blinking } Possibly \pm and \sim are swapped over.

Dimensions [mm]

Dimensional drawings



Modulating rotary actuator for 2 and 3 way control ball valves

- Torque 16Nm
- Nominal voltage AC/DC 24V
- Control: modulating DC (0)2...10V
- Position feedback DC 2...10V
- Running time 9s


Technical data

Electrical data	Nominal voltage	AC 24V, 50/60Hz / DC 24V	
	Nominal voltage range	AC 19.2 ... 28.8V / DC 21.6 ... 28.8V	
	Power consumption	In operation	15W @ nominal torque
		At rest	2W
	For wire sizing	26VA (I max. 20 A @ 5ms)	
	Connection	Cable 1m, 4 x 0.75mm ²	
	Parallel connection	Possible, note the performance data	
Functional data	Torque (nominal torque)	Min. 16Nm @ nominal voltage	
	Control	Control signal Y	DC (0)2...10V, input impedance 100kΩ
		Operating range	DC 2...10V
	Position feedback (Measuring voltage)	DC 2...10V, max. 0.5mA	
	Position accuracy	±5%	
	Manual override	Gearing latch disengaged with push-button, can be locked	
	Running time	9s / 90°	
	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	63dB(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	Certified to IEC/EN 60730-1 and IEC/EN 60730-2-14	
	Mode of operation	Type 1	
	Rated impulse voltage	0.8kV	
	Control pollution degree	3	
	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		
Maintenance	Maintenance-free		
Dimensions / Weight	Dimensions	See «Dimensions»	
	Weight	Approx. 2.4kg	

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

- 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)2...10V 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	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. Factory setting: Y2 (counter-clockwise rotation).
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%).

Accessories

	Description	Type
Electrical accessories	Auxiliary switch, add-on, 1 x SPDT	S1A
	Auxiliary switch, add-on, 2 x SPDT	S2A
	Feedback potentiometer 140 Ohm, add-on	P140A
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Electrical installation

Wiring diagram

Standard connection

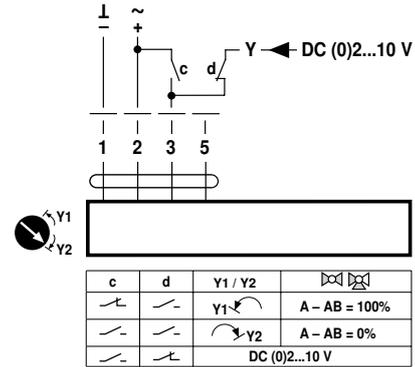
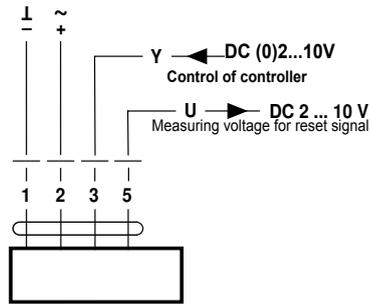
Override control (frost protection circuit)

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

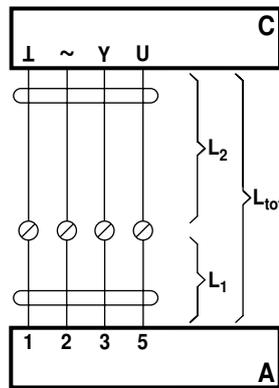


Cable colours:
 1 = black
 2 = red
 3 = white
 5 = orange

Electrical installation

(continued)

Cable lengths



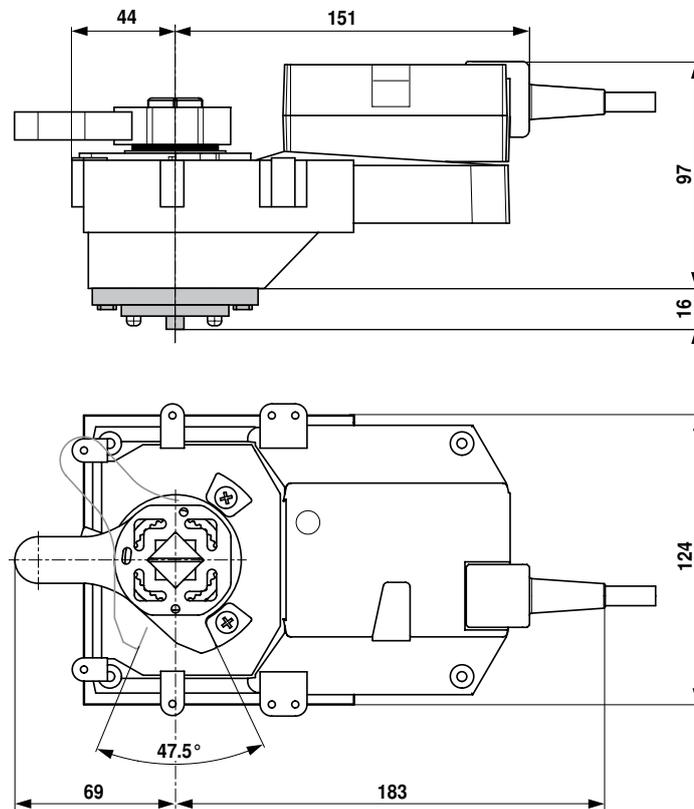
A = Actuator
 C = Control unit
 L₁ = Belimo connecting cable, 1 m (4 x 0.75 mm²)
 L₂ = Customer cable
 L_{tot} = Maximum cable length

Cross section L ₂ 1/~	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)

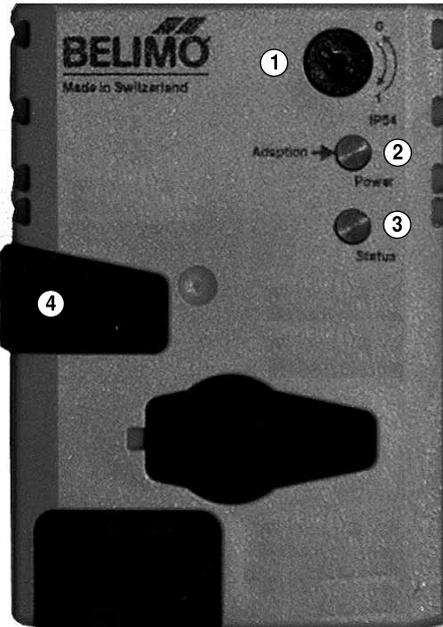
Note
 When several actuators are connected in parallel, the maximum cable length must be divided by the number of actuators.

Dimensions [mm]

Dimensional drawings



Operating controls and indicators



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