

Modulating rotary actuator fail-safe and extended functionalities in the IP66/67 housing for adjusting dampers in technical building installations and in laboratories

- Air damper size up to approx. 8 m²
- Torque motor 40 Nm
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V
- Optimum weather protection for use outdoors (for use in ambient temperatures up to -40 °C, there is a separate actuator available with built-in heater ex works)


Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...28.8 V
	Power consumption in operation	11 W
	Power consumption in rest position	3 W
	Power consumption for wire sizing	21 VA
	Connection supply / control	Cable 1 m, 4 x 0.75 mm ² (halogen-free)
	Parallel operation	Yes (note the performance data)
	Functional data	Torque motor
Operating range Y		2...10 V
Input Impedance		100 kΩ
Position feedback U		2...10 V
Position feedback U note		Max. 0.5 mA
Setting fail-safe position		0...100%, adjustable in increments of 10% (POP rotary knob on 0 corresponds to left end stop)
Bridging time (PF)		2 s
Position accuracy		±5%
Direction of motion motor		selectable with switch 0/1
Direction of motion note		Y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)
Direction of motion fail-safe		selectable with switch 0...100%
Manual override		with push-button (under protective housing)
Angle of rotation		Max. 95°
Angle of rotation note		can be limited on both sides with adjustable mechanical end stops
Running time motor		150 s / 90°
Running time fail-safe		35 s / 90°
Running time fail-safe note		<35 s @ 0...50 °C
Sound power level, motor		52 dB(A)
Sound power level, fail-safe		61 dB(A)
Mechanical interface		Universal shaft clamp 14...26.7 mm
Position indication	Mechanical	
Safety	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Protection class UL	UL Class 2 Supply
	Degree of protection IEC/EN	IP66/67
	Degree of protection NEMA/UL	NEMA 4X
	Enclosure	UL Enclosure Type 4X
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Certification UL	cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1:02
	Certification UL note	The UL marking on the actuator depends on the production site, the device is UL-compliant in any case
	Mode of operation	Type 1.AA
	Rated impulse voltage supply / control	0.8 kV
Control pollution degree	4	
Ambient temperature	-30...50 °C	

Technical data

Safety	Ambient temperature note	-40...50 °C for actuator with integrated heating
	Storage temperature	-40...80 °C
	Ambient humidity	Max. 100% r.H.
	Servicing	maintenance-free
Weight	Weight	4.5 kg
Terms	Abbreviations	POP = Power off position / fail-safe position PF = Power fail delay time / bridging time

Safety notes



- The device must not be used outside the specified field of application, especially not in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- Junction boxes must at least correspond with enclosure IP degree of protection!
- 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 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 cables must not be removed from the device installed in the interior.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site and the ventilation conditions must be observed.
- The device contains electrical and electronic components and must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- The actuator is not designed for applications where chemical influences (gases, fluids) are present or for utilisation in corrosive environments in general.
- The actuator may not be used in plenary applications (e.g. suspended ceilings or raised floors).
- The materials used may be subjected to external influences (temperature, pressure, construction fastening, effect of chemical substances, etc.), which cannot be simulated in laboratory tests or field trials. In case of doubt, we definitely recommend that you carry out a test. This information does not imply any legal entitlement. Belimo will not be held liable and will provide no warranty.
- Flexible metallic cable conduits or threaded cable conduits of equal value are to be used for UL (NEMA) Type 4X applications.
- When used under high UV loads, e.g. extreme sunlight, the use of flexible metallic or equivalent cable conduits is recommended.

Product features

- Fields of application** The actuator is particularly suitable for utilisation in outdoor applications and is protected against the following weather conditions:
- UV radiation
 - Rain / Snow
 - Dirt / Dust
 - Air humidity
 - Alternating climate / frequent and severe temperature fluctuations (Recommendation: use the actuator with integrated factory-installed heating which can be ordered separately to prevent internal condensation)

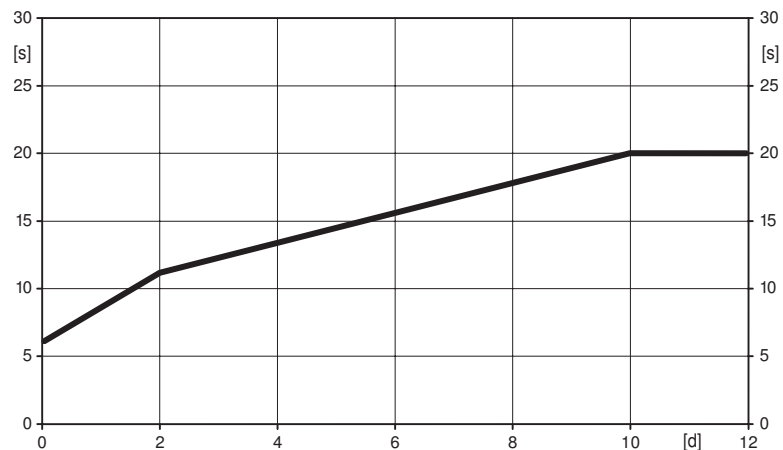
Product features

Mode of operation The actuator moves the damper to the desired operating position at the same time as the integrated capacitors are charged. Interrupting the supply voltage causes the damper to be rotated back into the fail-safe position by means of stored electrical energy.

The actuator is connected with a standard modulating signal of 0...10 V and drives to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the damper position 0.5...100% and as a slave control signal for other actuators.

Pre-charging time (start up) The capacitor actuators require a pre-charging time. This time is used for charging the capacitors up to a usable voltage level. This ensures that, in the event of a power failure, the actuator can move at any time from its current position into the preset fail-safe position. The duration of the pre-charging time depends mainly on how long the power was interrupted.

Typical pre-charging time



[d] = Electricity interruption in days
[s] = Pre-charging time in seconds

	[d]				
	0	1	2	7	≥10
[s]	6	9	11	16	20

Delivery condition (capacitors)

The actuator is completely discharged after delivery from the factory, which is why the actuator requires approximately 20 s pre-charging time before initial commissioning in order to bring the capacitors up to the required voltage level.

Simple direct mounting

Simple direct mounting on the damper shaft with a universal shaft clamp, supplied with an anti-rotation device to prevent the actuator from rotating.

Manual override

Manual control with push-button possible - temporary. The gear is disengaged and the actuator decoupled for as long as the button is pressed. The housing cover must be removed for manual override.

Adjustable angle of rotation

Adjustable angle of rotation with mechanical end stops.

High functional reliability

The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

Setting direction of rotation

When actuated, the direction of the rotation switch changes the running direction in normal operation. The direction of the rotation switch has no influence on the fail-safe position which has been set.

Setting fail-safe position (POP)

The rotary knob fail-safe position can be used to adjust the desired fail-safe position 0...100% in 10% increments.

The rotary knob always refers to an angle of rotation range of 95° and does not take into account any retroactively adjusted end stops.

In the event of a power failure, the actuator will move into the selected fail-safe position, taking into account the bridging time (PF) of 2 s which is set ex-works.

Accessories

	Description	Type	
Electrical accessories	Auxiliary switch 1 x SPDT add-on	S1A	
	Auxiliary switch 2 x SPDT add-on	S2A	
	Auxiliary switch 2 x SPDT add-on, grau	S2A GR	
	Auxiliary switch 2 x SPDT add-on, grau	S2A/300 GR	
	Auxiliary switch 2 x SPDT add-on, grau	S2A/500 GR	
	Feedback potentiometer 140 Ω add-on	P140A	
	Feedback potentiometer 140 Ω add-on, grau	P140A GR	
	Feedback potentiometer 200 Ω add-on	P200A	
	Feedback potentiometer 500 Ω add-on	P500A	
	Feedback potentiometer 500 Ω add-on, grau	P500A GR	
	Feedback potentiometer 1 kΩ add-on	P1000A	
	Feedback potentiometer 1 kΩ add-on, grau	P1000A GR	
	Feedback potentiometer 2.8 kΩ add-on	P2800A	
	Feedback potentiometer 2.8 kΩ add-on, grau	P2800A GR	
	Feedback potentiometer 5 kΩ add-on	P5000A	
	Feedback potentiometer 5 kΩ add-on, grau	P5000A GR	
	Feedback potentiometer 10 kΩ add-on	P10000A	
	Feedback potentiometer 10 kΩ add-on, grau	P10000A GR	
	Adapter for auxiliary switch and feedback potentiometer	Z-SPA	
	Signal converter voltage/current 100 kΩ Supply AC/DC 24 V	Z-UIC	
	Range controller for wall mounting	SBG24	
	Positioner for wall mounting	SGA24	
	Positioner for built-in mounting	SGE24	
	Positioner for front-panel mounting	SGF24	
	Positioner for wall mounting	CRP24-B1	
	Mechanical accessories	Description	Type
		Cable gland for cable diameter Ø 4...10 mm	Z-KB-PG11

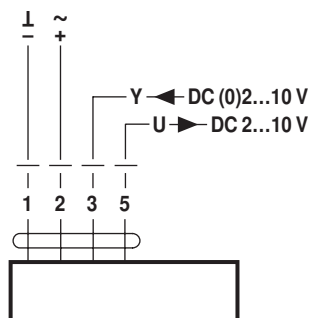
Electrical installation

**Notes**

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.

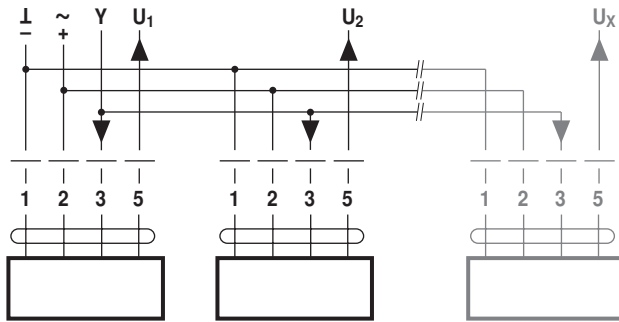
Wiring diagrams

AC/DC 24 V, modulating



Electrical installation

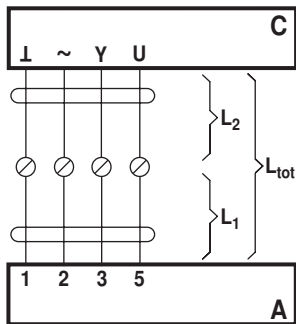
Parallel operation



Notes

- A maximum of eight actuators can be connected in parallel.
- Parallel operation is permitted only on non-connected axes.
- Do not fail to observe performance data with parallel operation.

Signal cable lengths

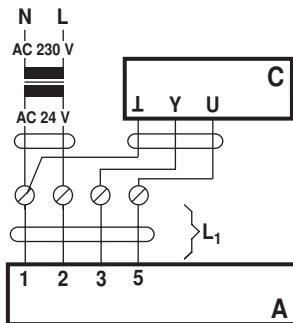


L ₂ I / ~	L _{tot} = L ₁ + L ₂	
	AC	DC
0.75 mm ²	≤30 m	≤5 m
1.00 mm ²	≤40 m	≤8 m
1.50 mm ²	≤70 m	≤12 m
2.50 mm ²	≤100 m	≤20 m

- A = Actuator
- C = Control unit (controlling unit)
- L₁ = Connecting cable of the actuator
- L₂ = Customer cable
- L_{tot} = Maximum signal cable length

Note:

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

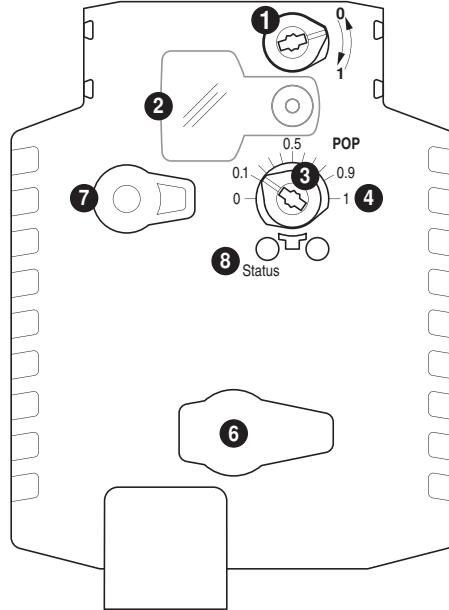
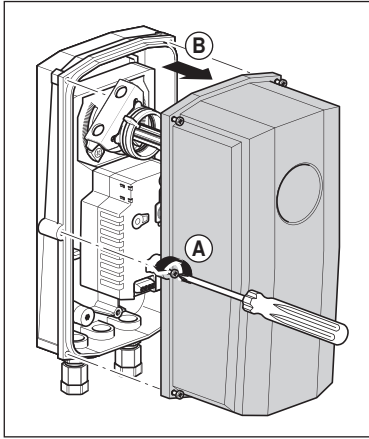


- A = Actuator
- C = Control unit (controlling unit)
- L₁ = Connecting cable of the actuator

Note:

There are no special restrictions on installation if the supply and the data cable are routed separately.

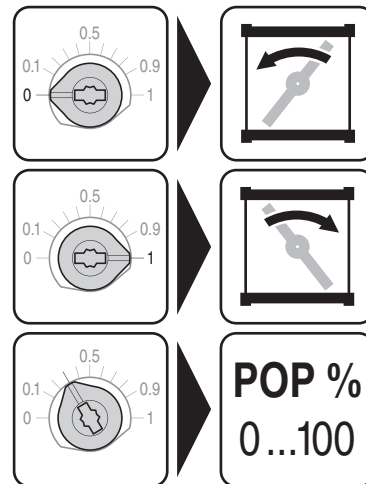
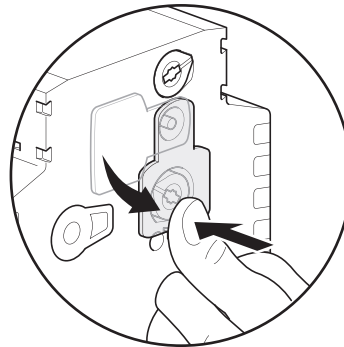
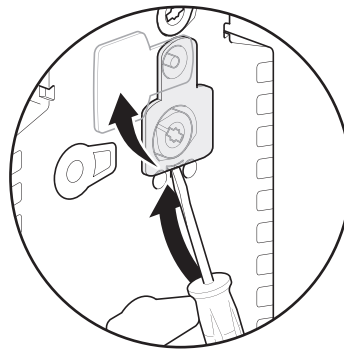
Operating controls and indicators



- 1 Direction of rotation switch
- 2 Cover, POP button
- 3 POP button
- 4 Scale for manual adjustment
- 6 (no function)
- 7 Disengagement button

LED display	Meaning / function
8 green	
On	Operation OK / without fault
Flashing	POP function active
Off	– Not in operation – Pre-charging time SuperCap – Fault SuperCap

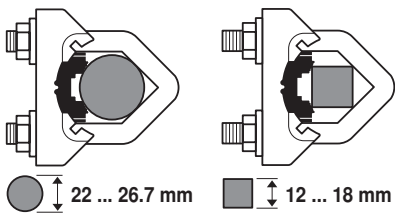
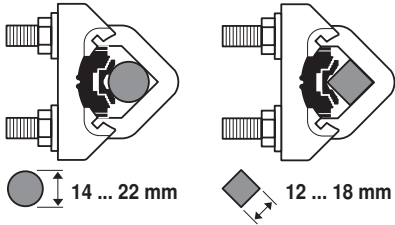
Setting emergency setting position (POP)



Dimensions [mm]

Spindle length

	-
	16...75



Dimensional drawings

