

Modulating rotary actuator fail-safe and extended functionalities for adjusting dampers in technical building installations

- Air damper size up to approx. 8 m<sup>2</sup>
- Torque motor 40 Nm
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V
- Position feedback 2...10 V
- PWIS/LABS-compliant according to VDMA 24364



Picture may differ from product

## 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, 4x 0.75 mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
Functional data	Torque motor	40 Nm
	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 fail-safe	selectable with switch 0...100%
	Direction of motion note	Y = 0 V: At switch position 0 (ccw rotation) / 1 (cw rotation)
	Manual override	with push-button
	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°
	Sound power level, motor	53 dB(A)
	Sound power level, fail-safe	61 dB(A)
	Mechanical interface	Universal shaft clamp reversible 12...26.7 mm
	Position indication	Mechanical, pluggable
Safety data	Protection class IEC/EN	III, Safety Extra-Low Voltage (SELV)
	Power source UL	Class 2 Supply
	Degree of protection IEC/EN	IP54
	Degree of protection NEMA/UL	NEMA 2
	Housing	UL Enclosure Type 2
	EMC	CE according to 2014/30/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14

## Technical data

<b>Safety data</b>	UL Approval	cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1 The UL marking on the actuator depends on the production site, the device is UL-compliant in any case
	PWIS/LABS-conformity	According to VDMA 24364 (test class C1) Approved for use in zone II Cleaning with low-pressure plasma treatment
	Hygiene test	According to VDI 6022 Part 1
	Type of action	Type 1.AA
	Rated impulse voltage supply / control	0.8 kV
	Pollution degree	3
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	-30...50°C [-22...122°F]
	Storage temperature	-10...40°C [14...104°F]
	Servicing	maintenance-free
<b>Weight</b>	Weight	1.9 kg
<b>Terms</b>	Abbreviations	POP = Power off position / fail-safe position PF = Power fail delay time / bridging time

## Safety notes



- This device has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Outdoor application: Only possible if no (sea) water, snow, ice, sunlight or aggressive gases act directly on the device and if it is ensured that the ambient conditions remain within the limit values specified in the data sheet at all times.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied with during installation.
- 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.
- Cables must not be removed from the device.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section and the design, as well as the installation situation 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.
- PWIS/LABS-conformity is guaranteed as long as the packaging is unopened. Once the PWIS/LABS-compliant packaging has been opened, the proper handling of the products is the responsibility of the customer. PWIS/LABS-conformity of unopened products is guaranteed for a period of one year after cleaning, provided they are handled properly, professionally and cleanly. Proof of proper, professional and clean handling is the responsibility of the purchaser. Ensure that the required cleanliness of the products is maintained. Do not touch the products with bare hands. Belimo accepts no liability for the consequences resulting from the contamination of a product caused by the customer.

## Product features

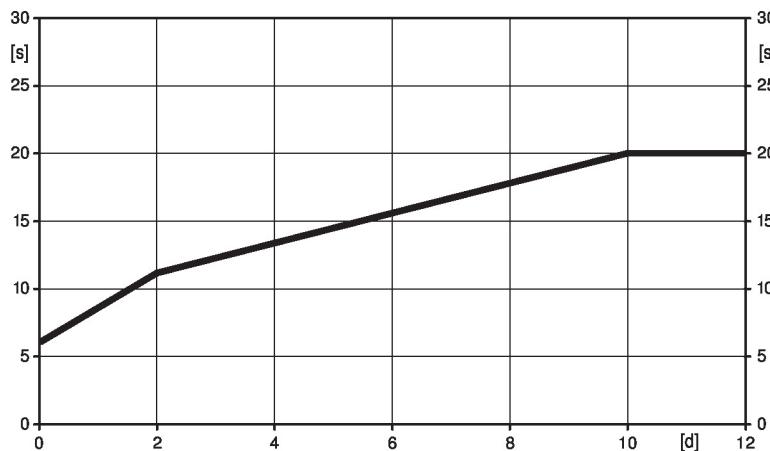
<b>Operating mode</b>	The actuator moves the damper to the desired operating position at the same time as the integrated capacitors are charged. Interrupting the supply voltage causes the damper to be rotated back into the fail-safe position by means of stored electrical energy.  The actuator is connected with an analogue control signal Y (note the operating range) and drives to the position defined. The measuring voltage U serves for the electrical display of the damper position 0...100% and as control signal for other actuators.
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## Product features

## 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] = Power failure in days

[s] = Pre-charging time in seconds

## 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.

## Setting fail-safe position (POP)

The rotary knob fail-safe position can be used to adjust the desired fail-safe position between 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 to the selected fail-safe position, taking into account the bridging time (PF) of 2 s set at the factory.

## Simple direct mounting

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

## Manual override

Manual control with push-button possible - temporary. The gear train is disengaged and the actuator decoupled for as long as the button is pressed.

## Setting direction of motion

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.

## Accessories

Electrical accessories	Description	Type
Auxiliary switch 1x SPDT add-on		S1A
Auxiliary switch 2x SPDT add-on		S2A
Feedback potentiometer 140 Ω add-on		P140A
Feedback potentiometer 1 kΩ add-on		P1000A
Feedback potentiometer 10 kΩ add-on		P10000A
Adapter for auxiliary switch and feedback potentiometer, Multipack 20 pcs.		Z-SPA
Signal converter voltage/current 100 kΩ 4...20 mA, Supply AC/DC 24 V		Z-UIC
Positioner for wall mounting		SGA24
Positioner for built-in mounting		SGE24
Positioner for front-panel mounting		SGF24
Positioner for wall mounting		CRP24-B1

## Accessories

Mechanical accessories	Description	Type
	Actuator arm for standard shaft clamp	AH-GMA
	Damper crank arm Slot width 8.2 mm, clamping range ø14...25 mm	KH10
	Mounting kit for linkage operation for flat installation	ZG-GMA
	* Adapter Z-SPA	
	It is imperative that this adapter will be ordered if an auxiliary switch or a feedback potentiometer is required and if at the same time the shaft clamp is installed on the rear side of the actuator (e.g. with short shaft installation).	

## Electrical installation



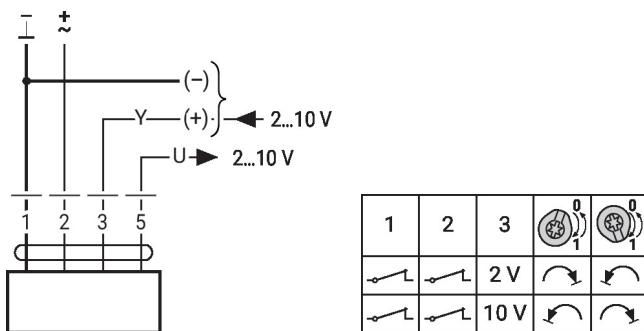
## Supply from isolating transformer.

Parallel connection of other actuators possible. Observe the performance data.

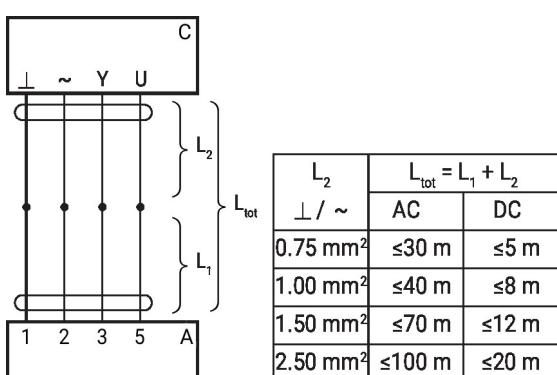
## Wire colours:

1 = black  
2 = red  
3 = white  
5 = orange

AC/DC 24 V, modulating



## Signal cable lengths

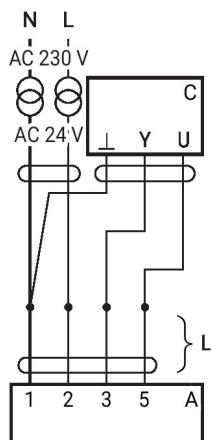


A = Actuator  
C = Control unit (controlling unit)  
L1 = Connecting cable of the actuator  
L2 = Customer cable  
Ltot = Maximum signal cable length

**Note:**

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

## Electrical installation

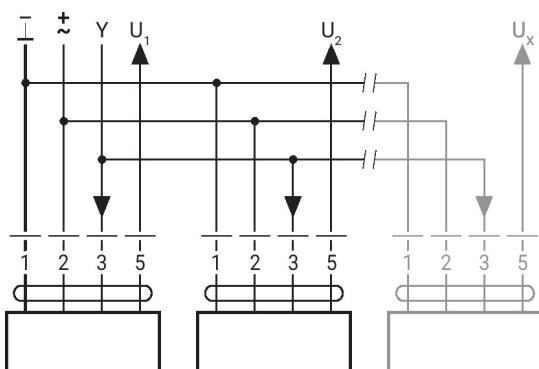


A = Actuator  
 C = Control unit (controlling unit)  
 L1 = Connecting cable of the actuator

## Note:

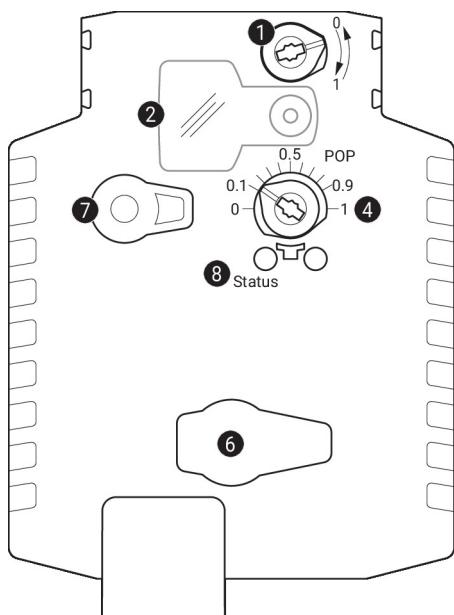
There are no special restrictions on installation if the supply and the data cable are routed separately.

## Parallel operation



- Max. 8 actuators in parallel
- Parallel operation is permitted only on non-connected axes
- Do not fail to observe performance data with parallel operation

## Operating controls and indicators



## ① Direction of rotation switch

Switch over: Direction of rotation changes

## ② Cover, POP button

## ③ POP button

## ④ Scale for manual adjustment

## ⑥ (no function)

## ⑦ Manual override button

Press button: Gear train disengages, motor stops, manual override possible

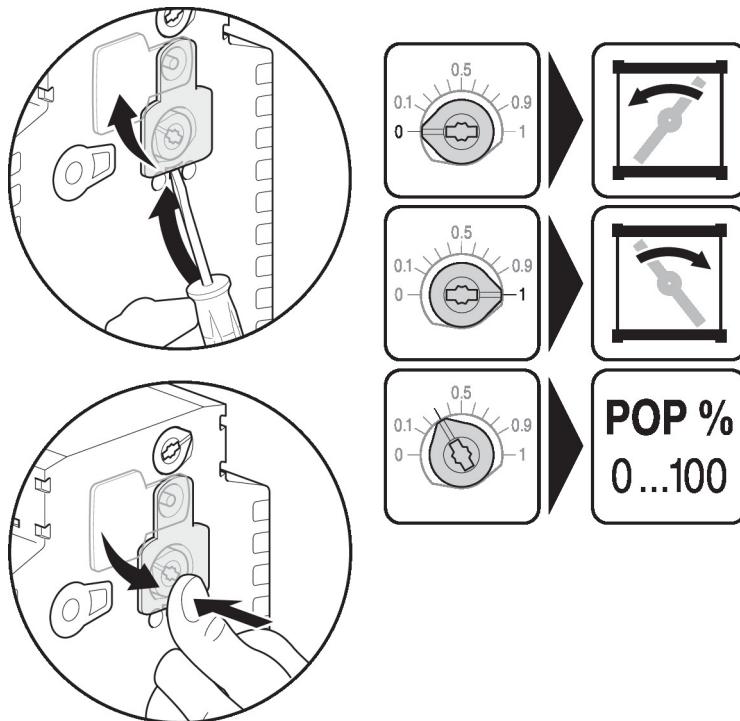
Release button: Gear train engages, standard mode

## LED displays

green ⑧	Meaning / function
On	Operation OK
Flashing	POP function active
Off	<ul style="list-style-type: none"> <li>- Not in operation</li> <li>- Pre-charging time SuperCap</li> <li>- Fault SuperCap</li> </ul>

## Operating controls and indicators

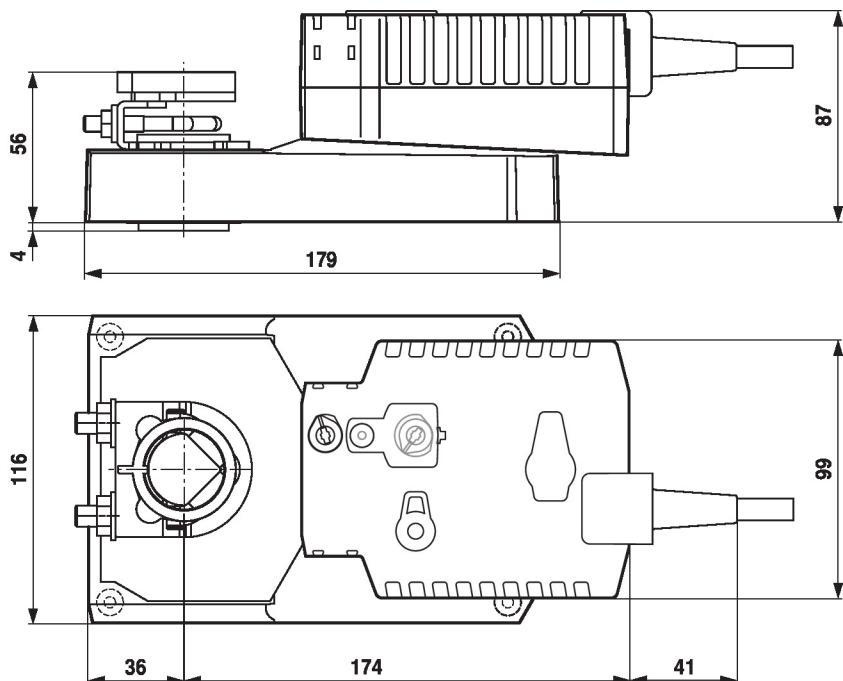
## Setting fail-safe position (POP)



## Dimensions

## Shaft length

	Min. 52 mm [2.05"]
	Min. 20 mm [0.75"]



## Clamping range


\*Option: Shaft clamp mounted below: If an auxiliary switch or a feedback potentiometer is used the adapter Z-SPA is required.