

Configurable rotary actuator fail-safe for adjusting dampers in technical building installations

- Air damper size up to approx. 0.8 m<sup>2</sup>
- Torque motor 4 Nm
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V variable
- Position feedback 2...10 V variable


**Technical data**

<b>Electrical data</b>	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Nominal voltage range	AC 19.2...28.8 V / DC 21.6...35.0 V
	Power consumption in operation	2.5 W
	Power consumption in rest position	1.2 W
	Power consumption for wire sizing	5 VA
	Connection supply / control	Cable 1 m, 4 x 0.75 mm <sup>2</sup>
	Parallel operation	Yes (note the performance data)
<b>Functional data</b>	Torque motor	4 Nm
	Torque fail-safe	4 Nm
	Operating range Y	2...10 V
	Input Impedance	100 kΩ
	Options positioning signal	Open/close 3-point (AC only) Modulating (DC 0...32 V)
	Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V
	Position feedback U	2...10 V
	Position feedback U note	Max. 0.5 mA
	Position feedback U variable	Start point 0.5...8 V End point 2.5...10 V
	Position accuracy	±5%
	Direction of motion motor	selectable with switch L/R
	Direction of motion variable	electronically reversible
	Direction of motion fail-safe	selectable by mounting L/R
	Manual override	No
	Angle of rotation	Max. 95°
	Angle of rotation note	Adjustable 37...100% with integrated mechanical limitation
	Running time motor	150 s / 90°
	Running time motor variable	75...300 s
	Running time fail-safe	<20 s / 90°
	Running time fail-safe note	@ -20...50°C / <60 s @ -30°C
	Adaptation setting range	manual
	Adaptation setting range variable	No action Adaptation when switched on Adaptation after using the rotation switch
Override control	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%	
Override control variable	MAX = (MIN + 32%)...100% MIN = 0%...(MAX - 32%) ZS = MIN...MAX	
Sound power level, motor	30 dB(A)	
Mechanical interface	Universal shaft clamp 8...16 mm	
Position indication	Mechanical	
Service life	Min. 60'000 fail-safe positions	
<b>Safety</b>	Protection class IEC/EN	III Safety Extra-Low Voltage (SELV)
	Degree of protection IEC/EN	IP54

**Technical data**

<b>Safety</b>	EMC	CE according to 2014/30/EU
	Low voltage directive	CE according to 2014/35/EU
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Control pollution degree	3
	Ambient temperature	-30...50 °C
	Storage temperature	-40...80 °C
	Ambient humidity	Max. 95% r.H., non-condensing
	Servicing	maintenance-free
<b>Weight</b>	Weight	1.6 kg

**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.
- Outdoor application: only possible in case that no (sea) water, snow, ice, insolation or aggressive gases interfere directly with the actuator and that is ensured that the ambient conditions remain at any time within the thresholds according to the data sheet.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied 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, 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.

**Product features**

<b>Mode of operation</b>	The actuator is connected with a standard modulating signal of 0...10 V and moves the damper to the operating position at the same time as tensioning the return spring. The damper is turned back to the fail-safe position by spring force when the supply voltage is interrupted.
<b>Parametrisable actuators</b>	The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the Belimo Service Tool MFT-P.
<b>Simple direct mounting</b>	Simple direct mounting on the damper shaft with a universal shaft clamp, supplied with an anti-rotation device to prevent the actuator from rotating.
<b>Adjustable angle of rotation</b>	Adjustable angle of rotation with mechanical end stops.
<b>High functional reliability</b>	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
<b>Home position</b>	The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out a synchronisation. The synchronisation is in the home position (0%). The actuator then moves into the position defined by the positioning signal.
<b>Adaption and synchronisation</b>	An adaption can be triggered manually by switching the direction of rotation switch from the left to the right twice within 5s or with the PC-Tool. Both mechanical end stops are detected during the adaption (entire setting range). Automatic synchronisation after actuating the direction of rotation switch once is programmed. The synchronisation is in the home position (0%). The actuator then moves into the position defined by the positioning signal. A range of settings can be adapted using the PC-Tool (see MFT-P documentation)

Accessories

	Description	Type
<b>Electrical accessories</b>	Auxiliary switch 2 x SPDT	S2A-F
	Feedback potentiometer 200 Ω	P200A-F
	Feedback potentiometer 1 kΩ	P1000A-F
	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
	Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin service socket for Belimo device	ZK1-GEN
Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal	ZK2-GEN	
<b>Mechanical accessories</b>	<b>Description</b>	<b>Type</b>
	Shaft extension 170 mm Ø10 mm for damper shaft Ø 6...16 mm	AV6-20
	Shaft extension 240 mm Ø20 mm for damper shaft Ø 8...22.7 mm	AV8-25
	Shaft clamp reversible, clamping range Ø16...20 mm	K6-1
	Ball joint suitable for damper crank arm KH8 / KH10	KG10A
	Ball joint suitable for damper crank arm KH8	KG8
	Damper crank arm Slot width 8.2 mm, clamping range Ø10...18 mm	KH8
	Actuator arm, clamping range Ø8...16 mm, Slot width 8.2 mm	KH-LF
	Angle of rotation limiter, with end stop	ZDB-LF
	Form fit adapter 8x8 mm	ZF8-LF
Mounting kit for linkage operation for flat installation	ZG-LF1	
Mounting kit for linkage operation for side installation Slot width 6.2 mm	ZG-LF3	
Anti-rotation mechanism 180 mm, Multipack 20 pcs.	Z-ARS180L	
<b>Service Tools</b>	<b>Description</b>	<b>Type</b>
	Service Tool, with ZIP-USB function	ZTH EU
	Belimo PC-Tool, Software for adjustments and diagnostics	MFT-P
	Adapter for Service-Tool ZTH	MFT-C

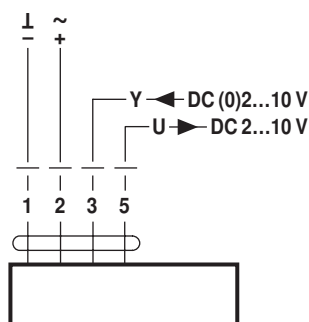
Electrical installation

**Notes**

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

Wiring diagrams

AC/DC 24 V, modulating

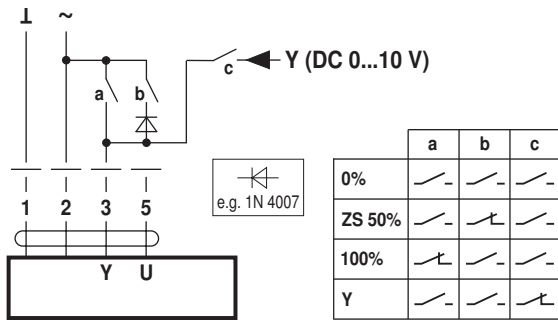


Cable colours:  
 1 = black  
 2 = red  
 3 = white  
 5 = white

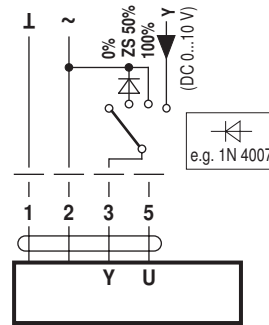
Functions

Functions with basic values (conventional mode)

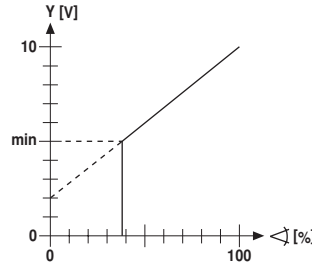
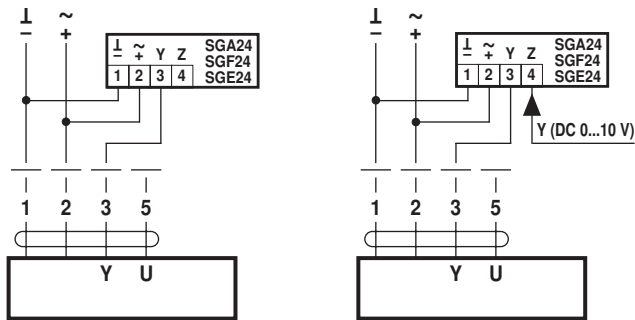
Override control with AC 24 V with relay contacts



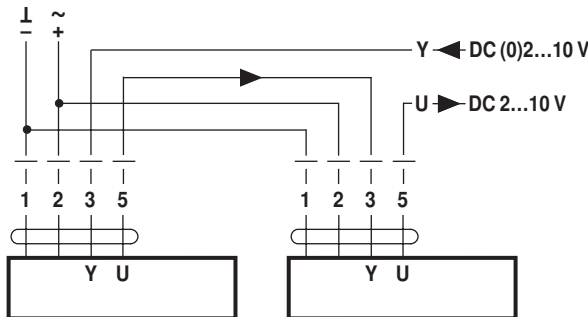
Override control with AC 24 V with rotary switch



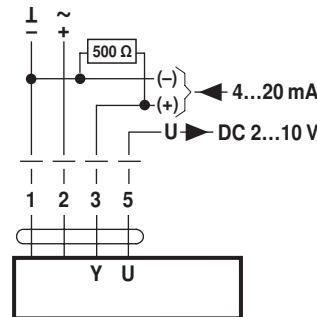
Control remotely 0...100% with positioner SG..  
Minimum limit with positioner SG..



Follow-up control (position-dependent)

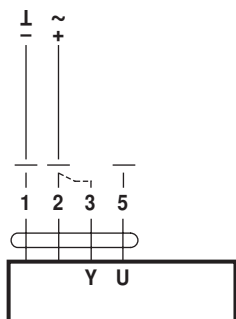


Control with 4...20 mA via external resistor



**Caution:**  
The operating range must be set to DC 2...10 V.  
The 500 Ω resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V

Functional check



**Procedure**

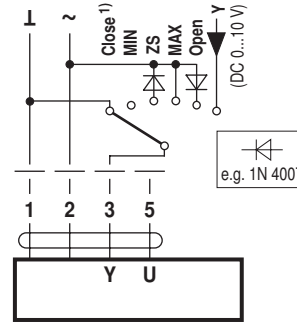
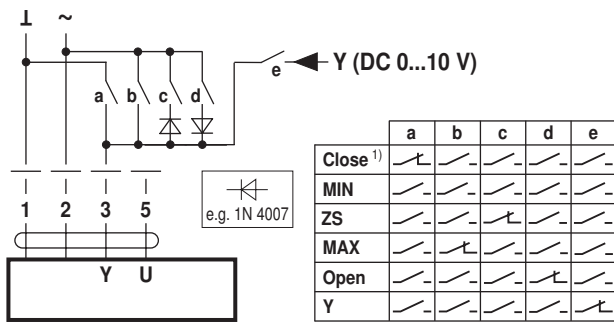
1. Connect 24V to connections 1 and 2
2. Disconnect connection 3:
  - with direction of rotation 0: Actuator rotates to the left
  - with direction of rotation 1: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
  - Actuator runs in opposite direction

Functions

Functions for devices with specific parameters (Parametrisation necessary)

Override control and limiting with AC 24 V with relay contacts

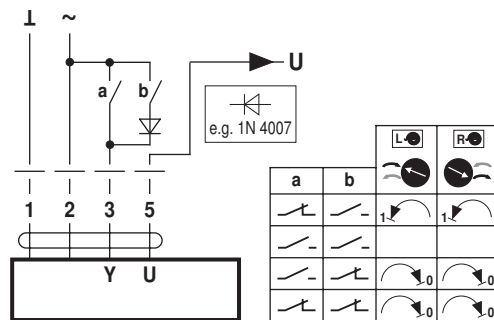
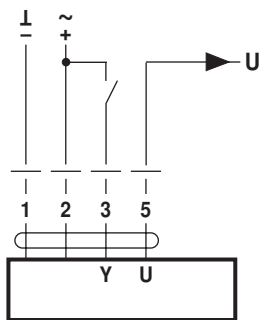
Override control and limiting with AC 24 V with rotary switch



1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

Control open/close

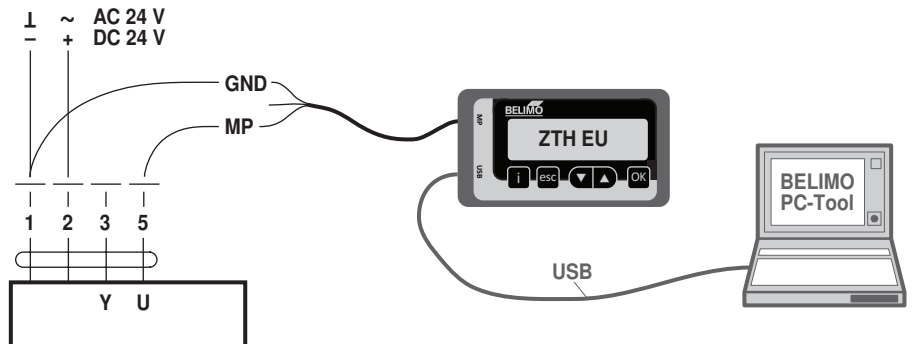
Control 3-point



Service

**Service Tools connection** The actuator can be parametrised by ZTH EU via terminal connection. For extended parametrisation the PC tool can be connected.

Connection ZTH EU / PC-Tool



Dimensions [mm]

Spindle length

	Min. 84
	Min. 20

Clamping range

8...16	8...16

Dimensional drawings

