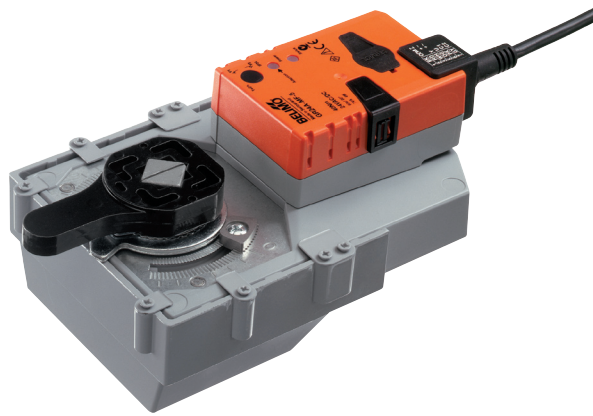


Parameterisable rotary actuator for rotary valves and butterfly valves

- Nominal torque 40 Nm
- Nominal voltage AC/DC 24 V
- Control Modulating DC (0)2...10 V Variable
- Position feedback DC 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...28.8 V	
	Power consumption in operation	4 W	
	Power consumption in rest position	1.5 W	
	Power consumption for wire sizing	7 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	Min. 40 Nm
Positioning signal Y		DC 0...10 V	
Positioning signal Y note		Input impedance 100 kΩ	
Control signal Y variable		Open-close 3-point (AC only) Modulating (DC 0...32 V)	
Operating range Y		DC 2...10 V	
Operating range Y variable		Start point DC 0.5...30 V End point DC 2.5...32 V	
Position feedback U		DC 2...10 V	
Position feedback U note		Max. 0.5 mA	
Position feedback U variable		Start point DC 0.5...8 V End point DC 2.5...10 V	
Position accuracy		±5%	
Manual override		Gear disengagement with push-button, can be locked	
Running time motor		90 s / 90°	
Motor running time variable		75...270 s	
Adaption setting range		manual (automatic on first power-up)	
Adaption setting range variable		No action Adaption when switched on Adaption after pushing the gear disengagement button	
Override control		MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%	
Override control variable		MAX = (MIN + 33%)...100% MIN = 0%...(MAX - 33%) ZS = MIN...MAX	
Sound power level motor		45 dB(A)	
Position indication		Mechanically (integrated)	
<b>Safety</b>		Protection class IEC/EN	III Safety extra-low voltage
		Protection class UL	UL Class 2 Supply
		Degree of protection IEC/EN	IP54
		Degree of protection NEMA/UL	NEMA 2, UL Enclosure Type 2
	EMC	CE according to 2004/108/EC	
	Certification IEC/EN	IEC/EN 60730-1 and IEC/EN 60730-2-14	
	Certification UL	cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02	
	Mode of operation	Type 1	
	Rated impulse voltage supply / control	0.8 kV	

## Technical data

<b>Safety</b>	Control pollution degree	3
	Ambient temperature	-30...50 °C
	Non-operating temperature	-40...80 °C
	Ambient humidity	95% r.h., non-condensing
	Maintenance	Maintenance-free
<b>Mechanical data</b>	Connection flange	F05
<b>Weight</b>	Weight approx.	2.5 kg

## Safety notes



- This device 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.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular 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.
- Cables must not be removed from the device.
- 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

<b>Principle of operation</b>	The actuator is connected with a standard modulating signal of DC 0...10V and travels to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0...100% and as slave control signal for other actuators.
<b>Parameterisable actuators</b>	The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the PC-Tool MFT-P or with the Service tool ZTH EU.
<b>Simple direct mounting</b>	Simple direct mounting on the rotary valve or butterfly valve with mounting flange. The mounting orientation in relation to the fitting can be selected in 90° steps.
<b>Manual override</b>	Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).
<b>High functional reliability</b>	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
<b>Adjustable angle of rotation</b>	Adjustable angle of rotation with mechanical end stops.
<b>Combination valve/actuator</b>	For valves with the following mechanical specifications in accordance with ISO 5211 F05: - Square stem head SW = 14 mm for form fit coupling of the rotary actuator. - Hole circle d = 50 mm
<b>Home position</b>	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 actuator then moves into the position defined by the positioning signal. Factory setting: Y2 (counter-clockwise rotation).
<b>Adaption and synchronisation</b>	An adaption can be triggered manually by pressing the „Adaption“ button or with the PC-Tool. 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%). 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>	Feedback potentiometer 200 Ohm, add-on	P200A
	Feedback potentiometer 500 Ohm, add-on	P500A
	Feedback potentiometer 2.8 kOhm, add-on	P2800A
	Feedback potentiometer 5 kOhm, add-on	P5000A
<b>Service Tools</b>	<b>Description</b>	<b>Type</b>
	Service Tool, for MF/MP/Modbus/LonWorks actuators and VAV-Controller	ZTH EU
	Belimo PC-Tool, software for adjustments and diagnostics	MFT-P
	Adapter to Service-Tool ZTH	MFT-C

Electrical installation

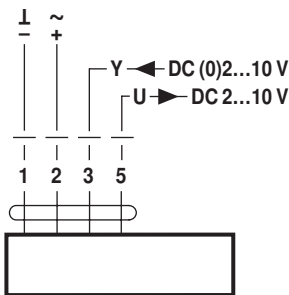


Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

Wiring diagrams

AC/DC 24 V, modulating



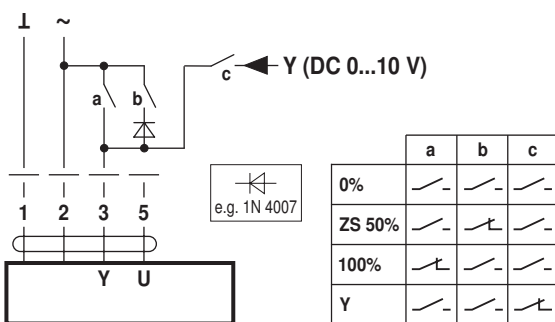
Cable colours:

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

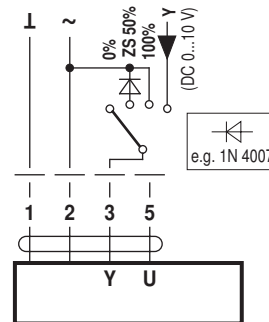
Functions

Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts

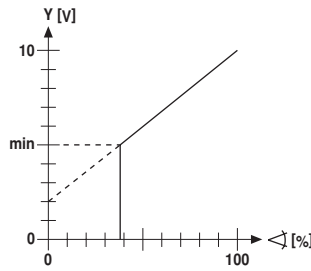
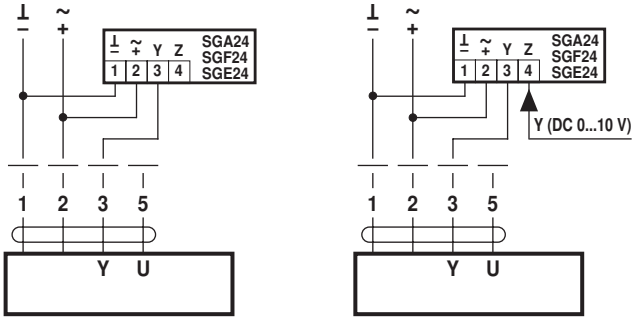


Override control with AC 24 V with rotary switch



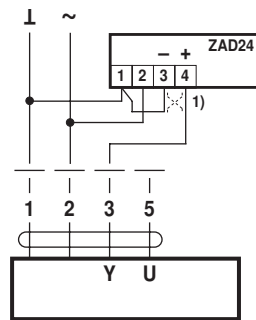
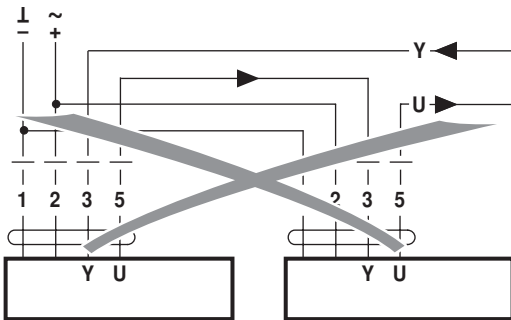
**Functions**

Remote control 0...100% with positioner SG.. Minimum limit with positioner SG..  
positioner SG..



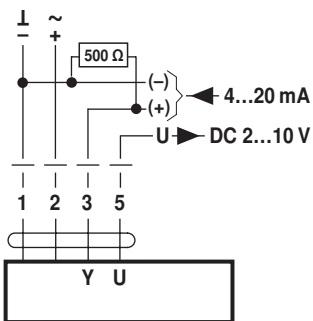
Follow-up control (position-dependent)

Position indication

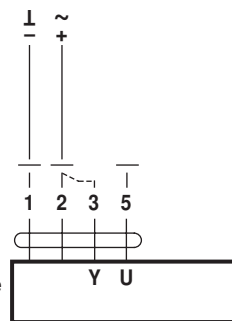


Control with 4...20 mA via external resistor

Functional check



**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



(1) Adapting the direction of rotation

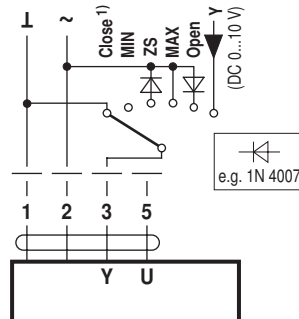
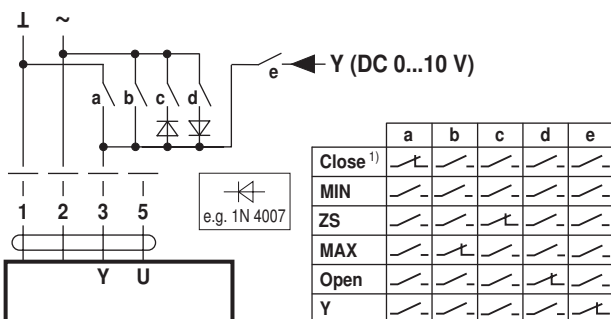
**Procedure**

1. Connect 24V to connections 1 and 2
2. Disconnect connection 3:
  - with direction of rotation Y1: Actuator rotates to the left
  - with direction of rotation Y2: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
  - Actuator runs in opposite direction

**Functions for actuators with specific parameters (Parametrisation with PC-Tool necessary)**

Override control and limiting with AC 24 V with relay contacts

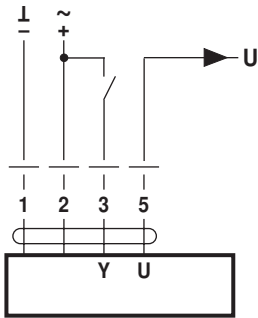
Override control and limiting with AC 24 V with rotary switch



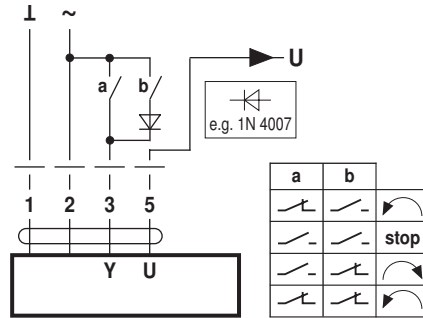
1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

## Functions

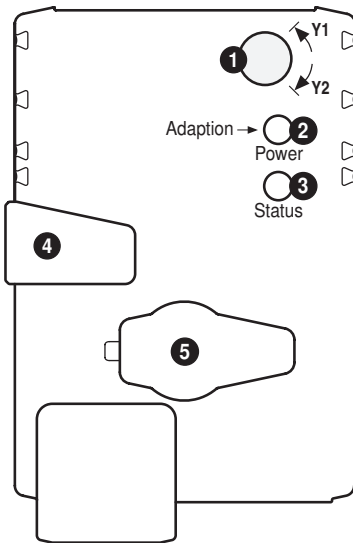
Control open-close



Control 3-point with AC 24 V



## Operating controls and indicators



### 1 Direction of rotation switch

Switch over: Direction of rotation changes

### 2 Push-button and LED display green

Off: No power supply or malfunction

On: In operation

Press button: Triggers angle of rotation adaptation, followed by standard mode

### 3 Push-button and LED display yellow

Off: Standard mode

On: Adaptation or synchronising process active

Press button: No function

### 4 Gear disengagement button

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

Release button: Gear engages, synchronisation starts, followed by standard mode

### 5 Service plug

For connecting parameterisation and service tools

### Check power supply connection

2 Off and 3 On Possible wiring error in power supply

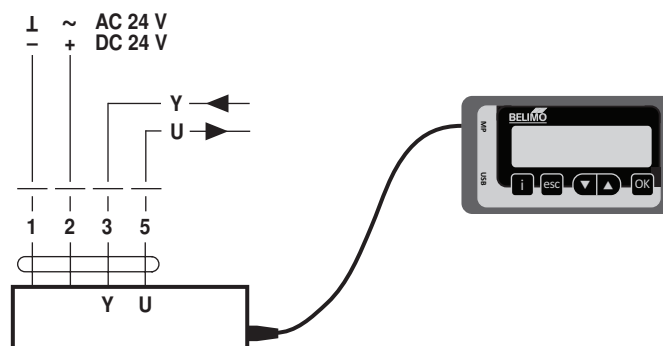
## Service



### Notes

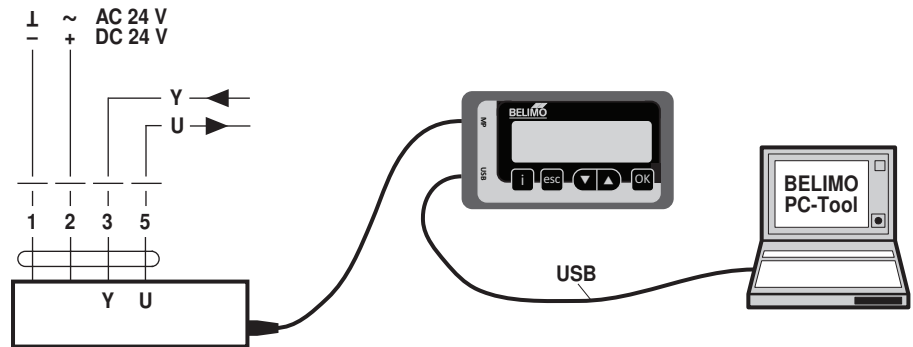
- The actuator can be parameterised by PC-Tool and ZTH EU via the service socket.

### ZTH EU connection



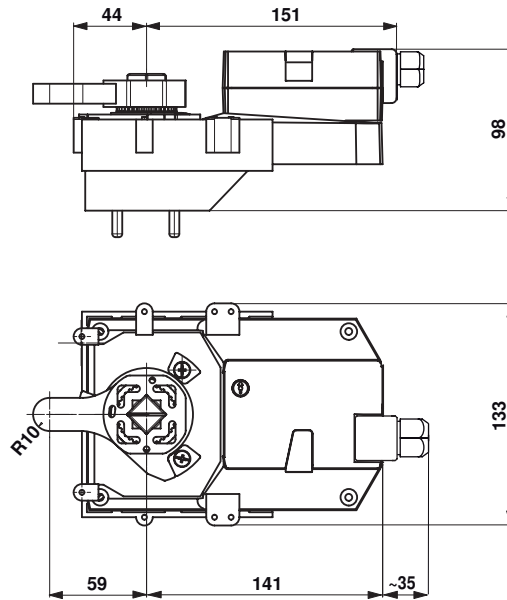
## Service

## PC-Tool connection



## Dimensions [mm]

## Dimensional drawings



## Further documentation

- Overview Valve-actuator combinations
- Data sheets for rotary valves and butterfly valves
- Installation instructions for actuators and/or rotary valves and butterfly valves
- General notes for project planning