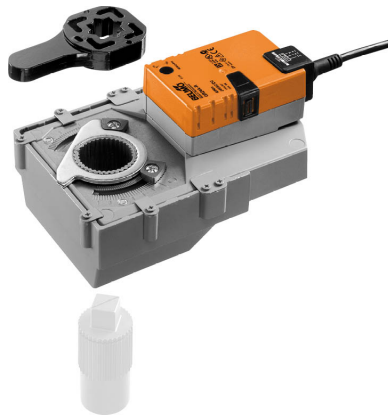


- Torque motor 40 Nm
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V variable
- Position feedback 2...10 V variable
- Running time motor 35 s



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	8 W	
	Power consumption in rest position	2.5 W	
	Power consumption for wire sizing	11 VA	
	Connection supply / control	Terminals 4 mm <sup>2</sup>	
	Parallel operation	Yes (note the performance data)	
<b>Functional data</b>	Torque motor	40 Nm	
	Operating range Y	2...10 V	
	Input Impedance	100 kΩ	
	Operating range Y variable	Start point 0.5...30 V End point 2.5...32 V	
	Options positioning signal	Open/close 3-point (AC only) Modulating (DC 0...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%	
	Manual override	with push-button, can be locked	
	Running time motor	35 s / 90°	
	Running time motor variable	35...150 s	
	Adaptation setting range	manual (automatic on first power-up)	
	Adaptation setting range variable	No action Adaptation when switched on Adaptation 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	60 dB(A)	
	Position indication	Mechanically (integrated)	
	<b>Safety data</b>	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	

<b>Safety data</b>	Enclosure	UL Enclosure Type 2
	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 The UL marking on the actuator depends on the production site, the device is UL-compliant in any case
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Pollution degree	3
	Ambient temperature	0...50°C
	Storage temperature	-40...80°C
	Ambient humidity	Max. 95% RH, non-condensing
Servicing	maintenance-free	
<b>Mechanical data</b>	Connection flange	F05/F07
<b>Weight</b>	Weight	1.9 kg

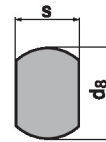
**Safety notes**


- 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 in case that no (sea) water, snow, ice, insulation or aggressive gases interfere directly with the device and that it is ensured that the ambient conditions remain within the thresholds according to the data sheet at any time.
- 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 surface temperature between actuator and fitting may not exceed 50°C.
- 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 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 drives to the position defined by the positioning signal. Measuring voltage U serves for the electrical display of the valve position 0.5...100% and as slave control signal for other actuators.
<b>Parametrisable actuators</b>	The factory settings cover the most common applications. Single parameters can be modified with the Belimo Service Tools MFT-P or ZTH EU.
<b>Application</b>	For rotary valves and butterfly valves with the following mechanical specifications: <ul style="list-style-type: none"> <li>– ISO 5211: F05 or F07 (hole circle diameter on the flange for mounting the fitting)</li> <li>– ISO 5211: quadratic or flat head spindle head geometry</li> </ul>

**Tapet shaft** The form fit adapter is not included in the scope of delivery (see «Accessories»).



Type	s [mm]
ZGV-14	14
ZGV-16	16
ZGV-17	17
ZGV-19	19

Type	s [mm]	d8 [mm]
ZGF-14	14	18
ZGF-17	17	22

**Simple direct mounting** 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.

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

**Home position** The first time the supply voltage is switched on, i.e. at the time of commissioning, the actuator carries out an adaptation, 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).

**Adaptation and synchronisation** An adaptation can be triggered manually by pressing the "Adaptation" button or with the PC-Tool. Both mechanical end stops are detected during the adaptation (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

Electrical accessories	Description	Type
	Auxiliary switch 1 x SPDT add-on	S1A
	Auxiliary switch 2 x SPDT add-on	S2A
	Feedback potentiometer 140 Ω add-on	P140A
	Feedback potentiometer 200 Ω add-on	P200A
	Feedback potentiometer 500 Ω add-on	P500A
	Feedback potentiometer 1 kΩ add-on	P1000A
	Feedback potentiometer 2.8 kΩ add-on	P2800A
	Feedback potentiometer 5 kΩ add-on	P5000A
	Feedback potentiometer 10 kΩ add-on	P10000A
Mechanical accessories	Description	Type
	Form fit adapter square 14x14x40 mm (LxWxH)	ZGV-14
	Form fit adapter square 16x16x40 mm (LxWxH)	ZGV-16
	Form fit adapter square 17x17x20 mm (LxWxH)	ZGV-17
	Form fit adapter square 19x19x40 mm (LxWxH)	ZGV-19
	Form fit adapter flat head 14xØ18x33 mm (WxØxH)	ZGF-14
	Form fit adapter flat head 17xØ22x33 mm (WxØxH)	ZGF-17

Service tools	Description	Type
	Service Tool, with ZIP-USB function, for parametrisable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH EU
	Belimo PC-Tool, Software for adjustments and diagnostics	MFT-P
	Adapter for Service-Tool ZTH	MFT-C
	Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin for connection to service socket	ZK1-GEN
	Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal	ZK2-GEN

**Electrical installation**



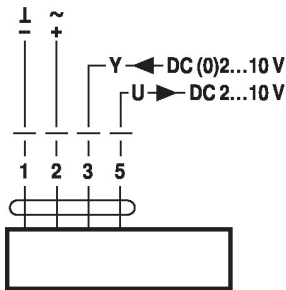
Supply from isolating transformer.

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



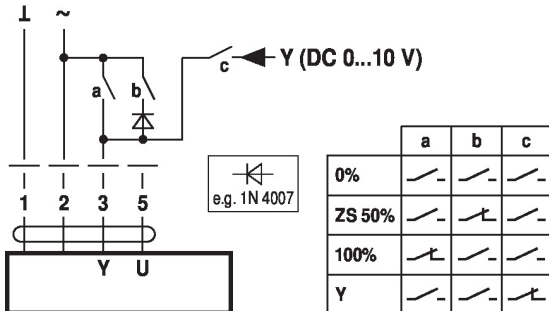
Cable colours:

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

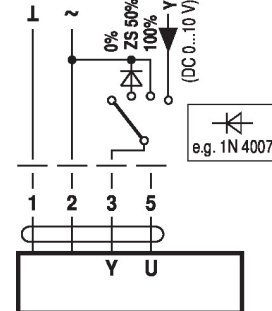
**Functions**

**Functions with basic values (conventional mode)**

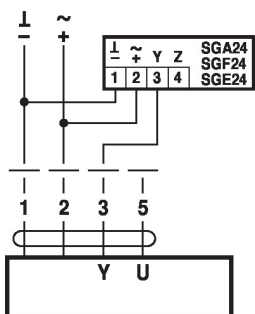
Override control with AC 24 V with relay contacts



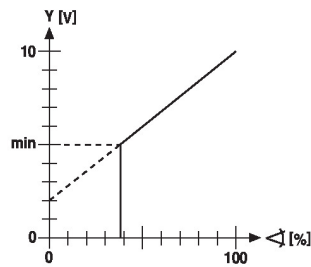
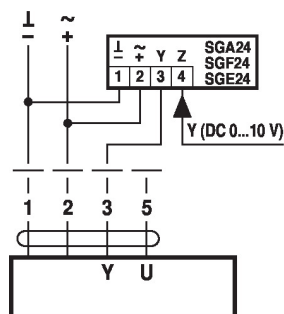
Override control with AC 24 V with rotary switch



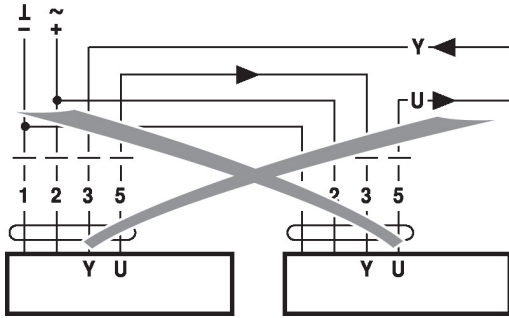
Control remotely 0...100% with positioner SG..



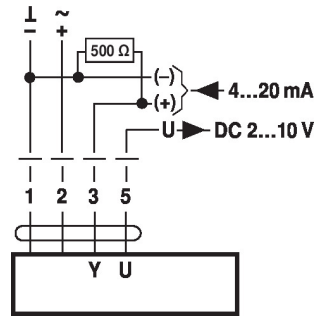
Minimum limit with positioner SG..



Follow-up control (position-dependent)



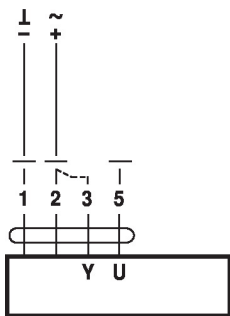
Control with 4...20 mA via external resistor



**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

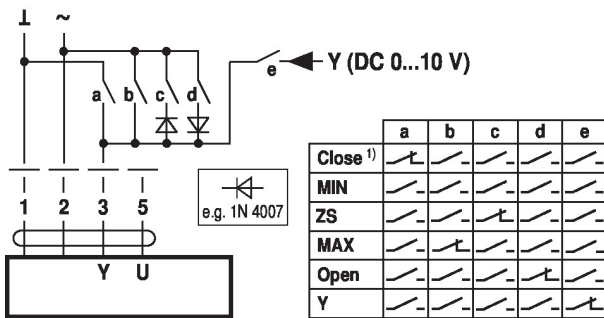


**Procedure**

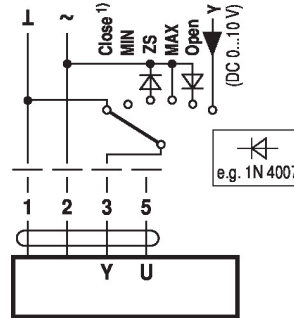
1. Connect 24 V to connections 1 and 2
2. Disconnect connection 3:
  - with direction of rotation Y1: Actuator rotates to the left
  - with direction of rotation Y2: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
  - Actuator runs in opposite direction

**Functions with specific parameters (parametrisation necessary)**

Override control and limiting with AC 24 V with relay contacts

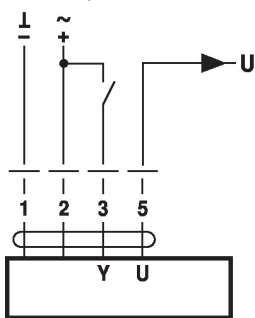


Override control and limiting with AC 24 V with rotary switch

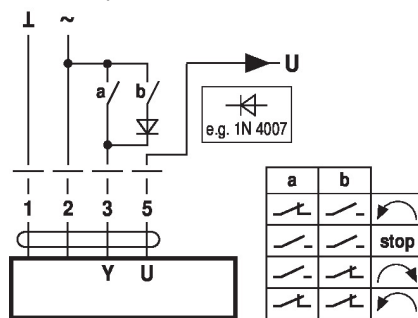


1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

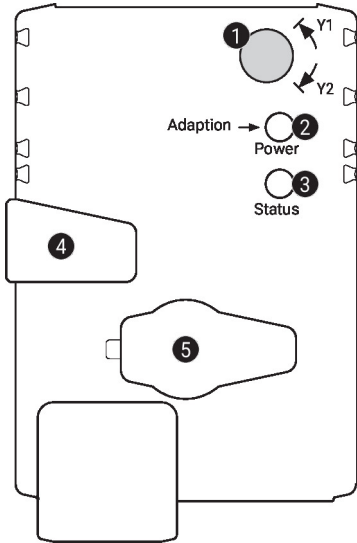
Control open/close



Control 3-point 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: Triggers angle of rotation adaptation, followed by standard mode button:

**3 Push-button and LED display yellow**

Off: Standard mode

On: Adaptation or synchronisation process active

Press button: No function

**4 Gear disengagement button**

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

Release button: Gear engages, standard mode

**5 Service plug**

For connecting parametrisation and service tools

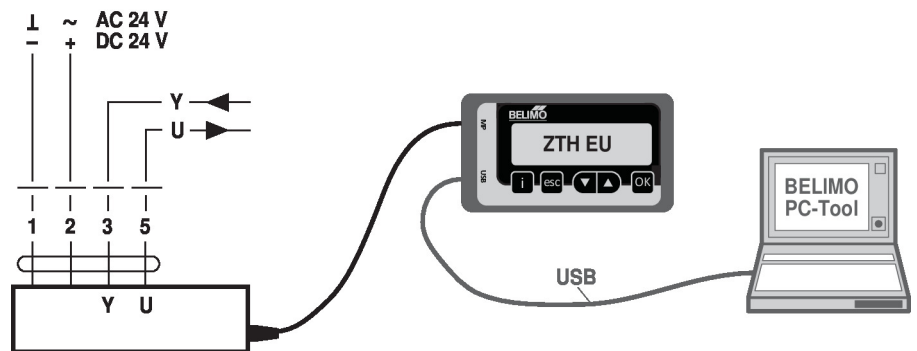
**Check power supply connection**

**2** Off and **3** On Possible wiring error in power supply

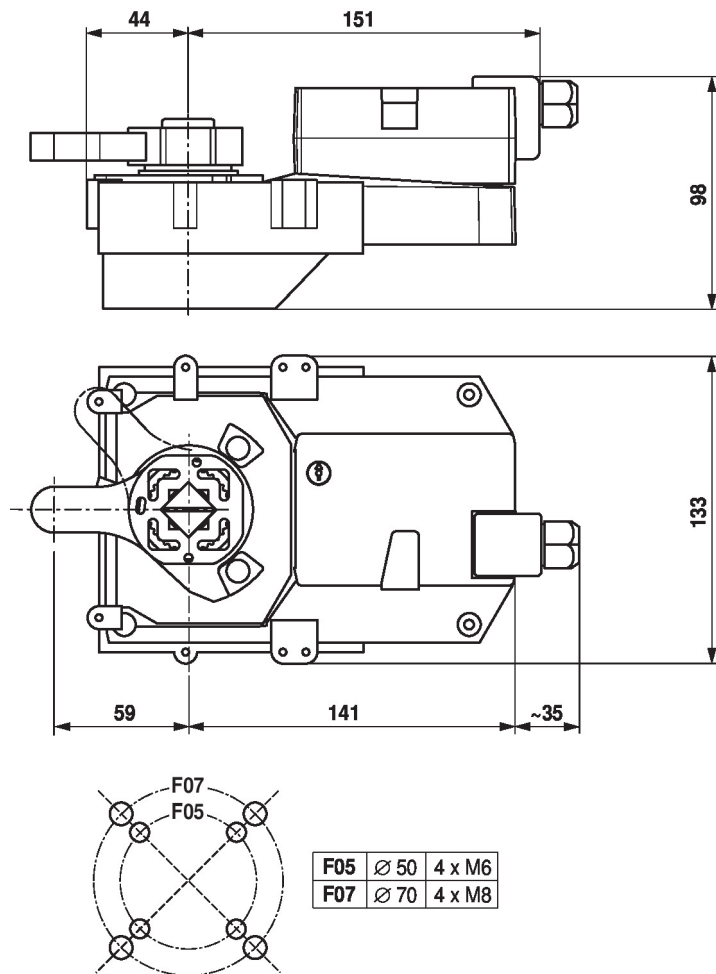
Service

**Service tools connection** The actuator can be parametrised by ZTH EU via the service socket. For an extended parametrisation the PC tool can be connected.

Connection ZTH EU / PC-Tool



Dimensions



Further documentation

- General notes for project planning