

Technical data

Safety	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
Weight	Weight	0.90 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, 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 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 must not be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

Mode of operation	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.
Parametrisable actuators	The factory settings cover the most common applications. Single parameters can be modified with the Belimo Service Tools MFT-P or ZTH EU.
Simple direct mounting	Straightforward direct mounting on the ball valve with only one central screw. The assembly tool is integrated in the plug-in position indication. The mounting orientation in relation to the ball valve 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 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).
Adaption and synchronisation	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	
Electrical accessories	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	
	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	
	Service Tools	Description	Type
		Service Tool, Setting tool with ZIP-USB function	ZTH EU
Belimo PC-Tool, Software for adjustments and diagnostics		MFT-P	
	Adapter for Service-Tool ZTH	MFT-C	

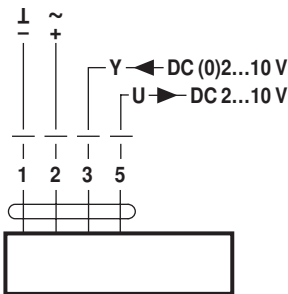
Electrical installation

Notes

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

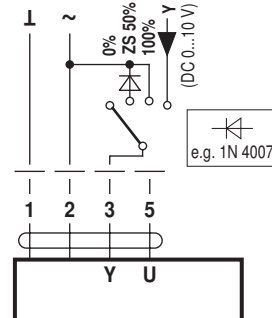
Functions

Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts

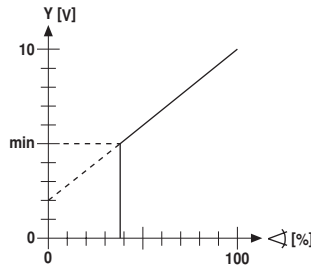
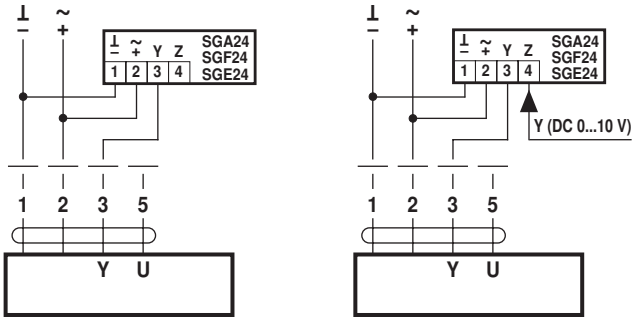
	a	b	c
0%	—	—	—
ZS 50%	—	—	—
100%	—	—	—
Y	—	—	—

Override control with AC 24 V with rotary switch



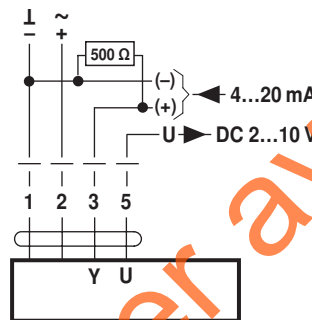
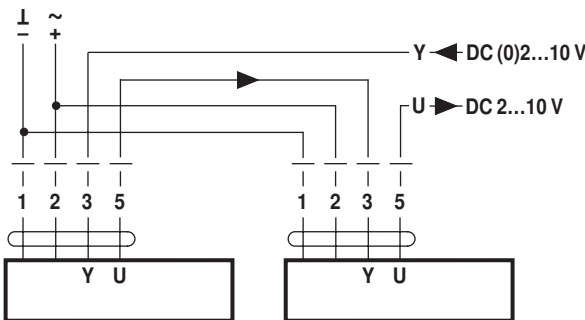
Functions

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



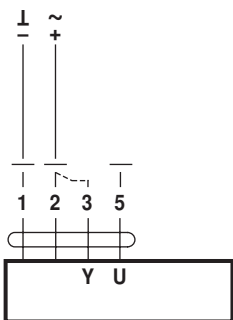
Follow-up control (position-dependent)

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



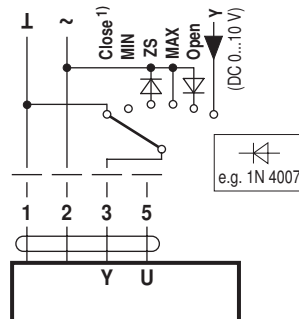
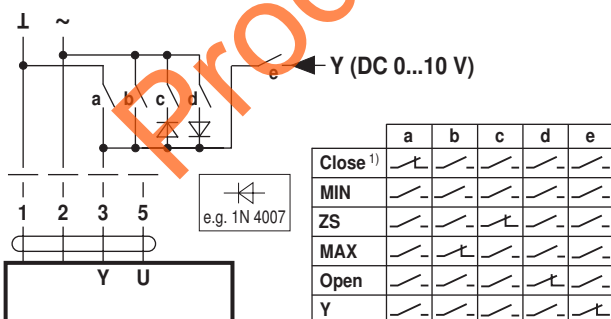
Procedure

1. Connect 24V to connections 1 and 2
2. Disconnect connection 3:
 - with direction of rotation 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 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

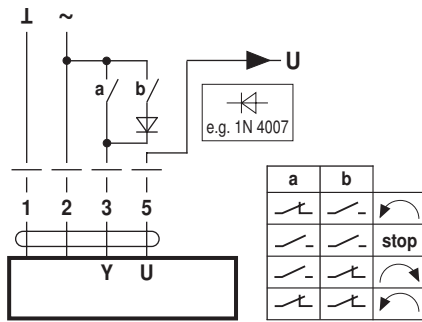
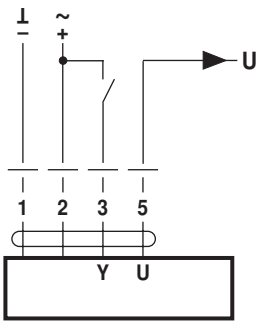


1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

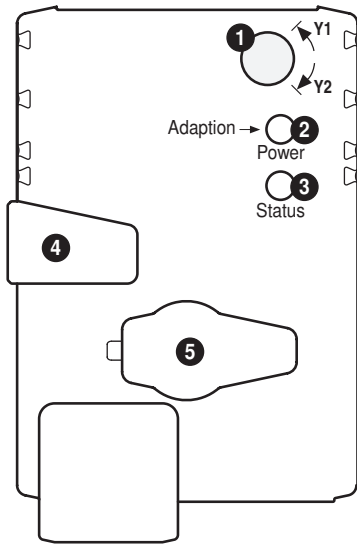
Functions

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

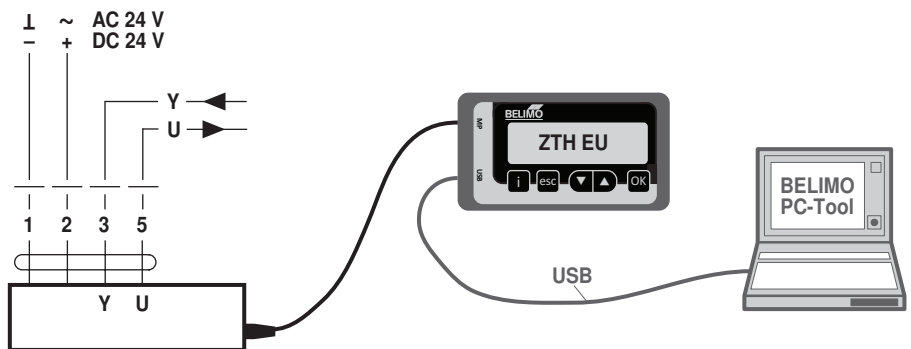
Check power supply connection

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

Service

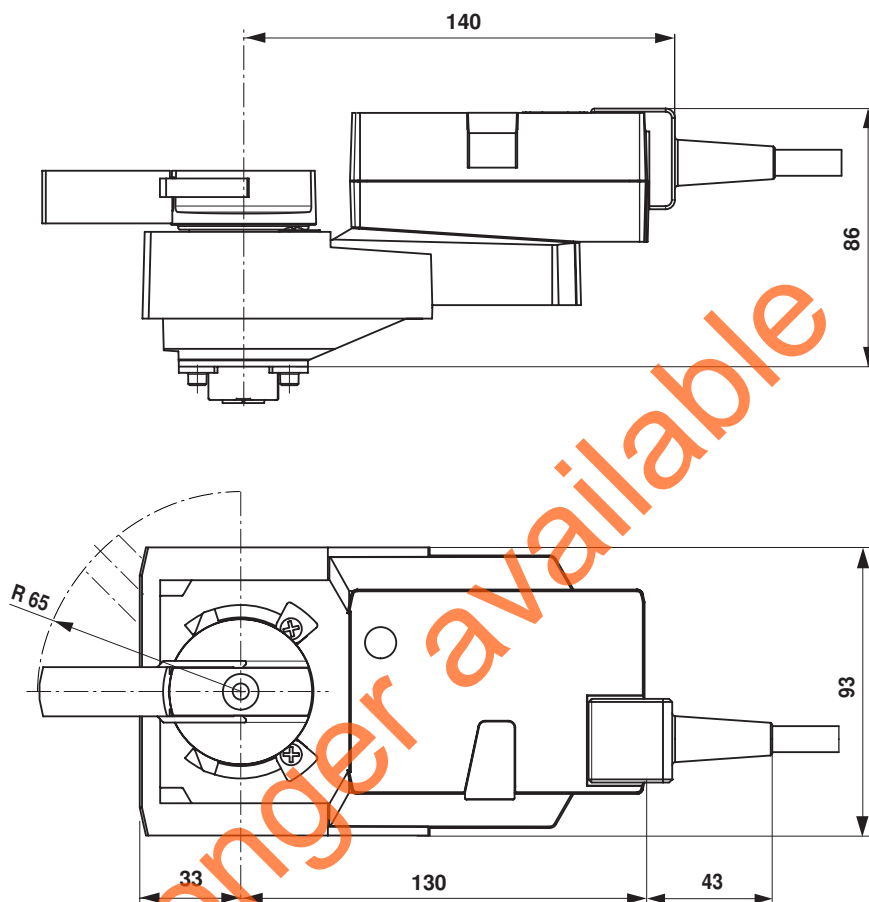
Service Tools connection The actuator can be parametrised by ZTH EU via the service socket. For an extended parametrisation the PC tool can be connected.

Connection ZTH EU / PC-Tool



Dimensions [mm]

Dimensional drawings



Further documentation

- The complete product range for water applications
- Data sheets for ball valves
- Installation instructions for actuators and/or ball valves
- General notes for project planning