

- Actuating force 4500 N
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V variable
- Stroke 50 mm



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	6 W
	Power consumption in rest position	1.5 W
	Power consumption for wire sizing	11 VA
	Connection supply / control	Cable 1 m, 4 x 0.75 mm ²
	Parallel operation	Yes (note the performance data)
Functional data	Actuating force motor	4500 N
	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
	Operating modes optional	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
	Stroke	50 mm
	Running time motor	150 s / 50 mm
	Running time motor variable	90...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 manual override button
	Override control	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50%
	Override control variable	MAX = (MIN + 33%)...100% ZS = MIN...MAX
	Sound power level, motor	56 dB(A)
Position indication	Mechanically, 5...50 mm stroke	
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

Safety data	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
	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
	Mode of operation	Type 1
	Rated impulse voltage supply / control	0.8 kV
	Pollution degree	3
	Ambient humidity	Max. 95% RH, non-condensing
	Ambient temperature	0...50°C [32...122°F]
	Storage temperature	-40...80°C [-40...176°F]
	Servicing	maintenance-free
Weight	Weight	3.7 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 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 motion and so the closing point may be adjusted only by authorised specialists. The direction of motion is critical, particularly in connection with frost protection circuits.
- 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 control signal of 0...10 V and drives to the position defined by the control signal. The measuring voltage U serves for the electrical display of the actuator position 0.5...100% and as 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	Simple direct mounting on the globe valve by means of form-fit hollow clamping jaws. The actuator can be rotated by 360° on the valve neck.
Manual override	Manual override with push-button possible (the gear train is disengaged for as long as the button is pressed or remains locked). The stroke can be adjusted by using a hexagon socket screw key (5 mm), which is inserted into the top of the actuator. The stem extends when the key is rotated clockwise.
High functional reliability	The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

- Home position** Factory setting: Actuator stem is retracted.
 When valve-actuator combinations are shipped, the direction of motion is set in accordance with the closing point of the valve.
 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 control signal.
- 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 manual override button is configured. The synchronisation is in the home position (0%).
 The actuator then moves into the position defined by the control signal.
 A range of settings can be adapted using the PC-Tool (see MFT-P documentation)
- Setting direction of motion** When actuated, the stroke direction switch changes the running direction in normal operation.

Accessories

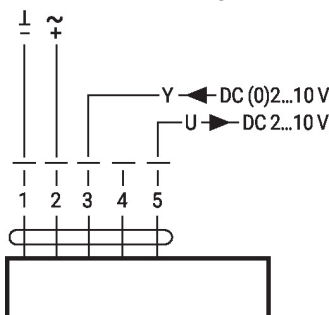
Electrical accessories	Description	Type
	Auxiliary switch 2 x SPDT add-on	S2A-H
Tools	Description	Type
	Service Tool, with ZIP-USB function, for parametrisable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH EU
	Belimo PC-Tool, Software for adjustments and diagnostics	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 stroke switch factory setting: Actuator stem retracted (▲).

Wiring diagrams

AC/DC 24 V, modulating

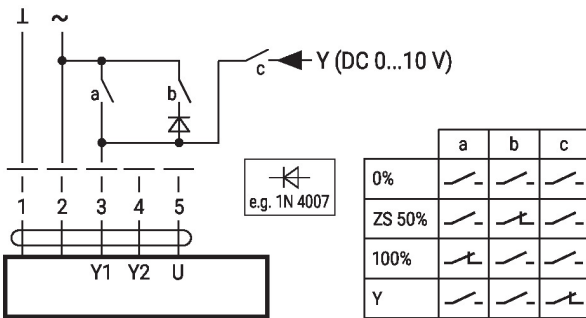

Cable colours:

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

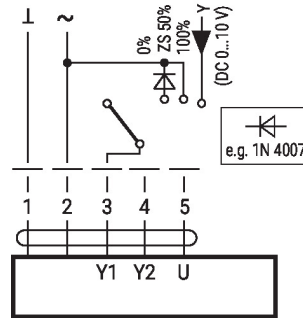
Functions

Functions with basic values (conventional mode)

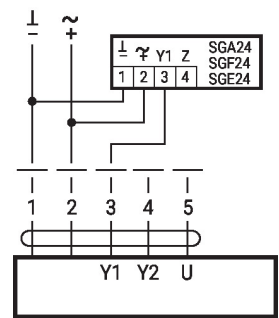
Override control with AC 24 V with relay contacts



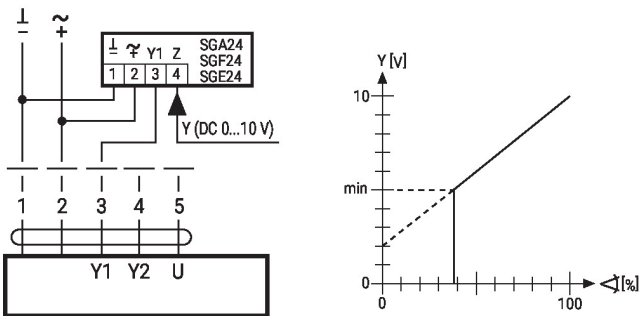
Override control with AC 24 V with rotary switch



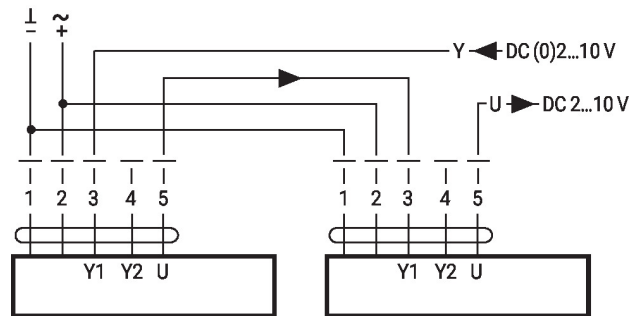
Control remotely 0...100% with positioner SG..



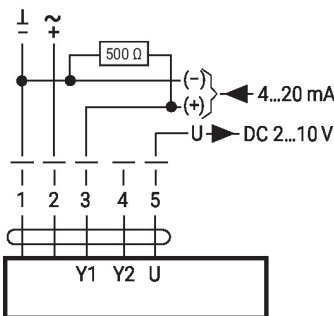
Minimum limit with positioner SG..



Primary/secondary operation (position-dependent)

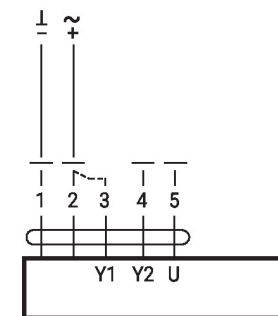


Control with 4...20 mA via external resistor



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

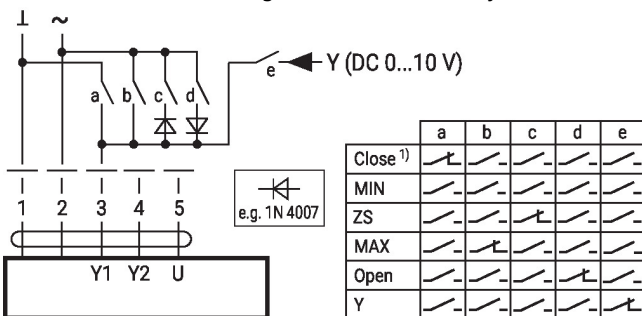


Procedure

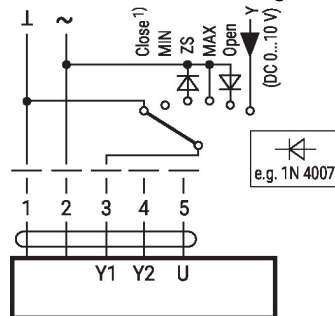
1. Apply 24 V to connection 1 and 2
2. Disconnect connection 3:
 - with upwards direction of motion: closing point at top
 - with downwards direction of motion: closing point at bottom
3. Short circuit connections 2 and 3:
 - Actuator runs in the opposite direction

Functions with specific parameters (parametrisation necessary)

Override control and limiting with AC 24 V with relay contacts

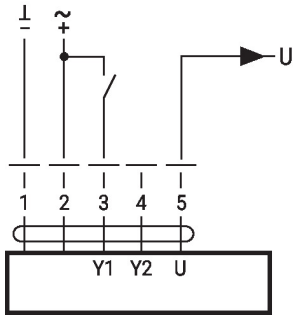


Override control and limiting with AC 24 V with rotary switch

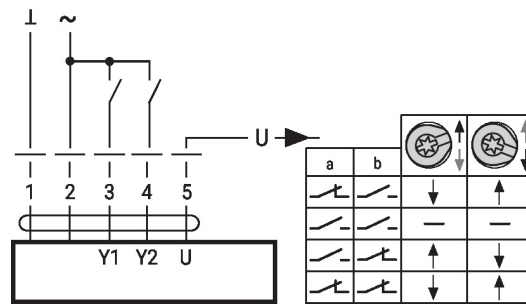


1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

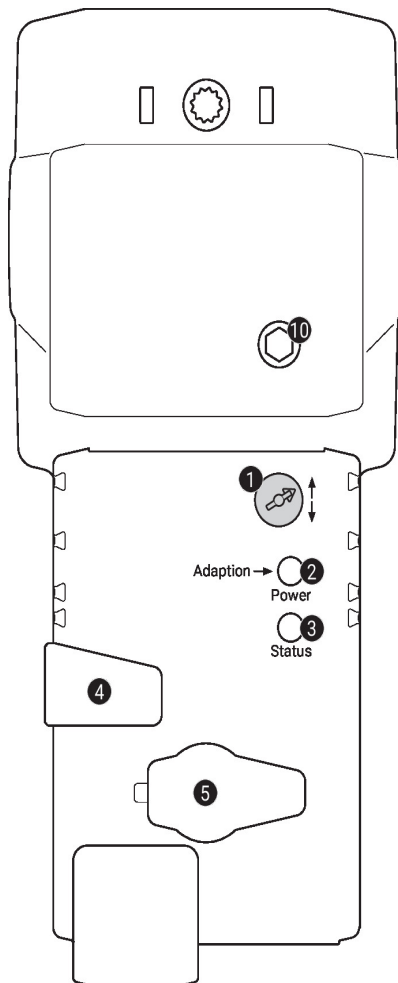
Control open/close



Control 3-point



Operating controls and indicators



1 Direction of stroke switch

Switch over: Direction of stroke changes

2 Push-button and LED display green

Off: No power supply or malfunction
 On: In operation
 Press: Triggers stroke 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 Manual override button

Press button: Gear train disengages, motor stops, manual override possible
 Release button: Gear train engages, standard mode

5 Service plug

For connecting parametrisation and service tools

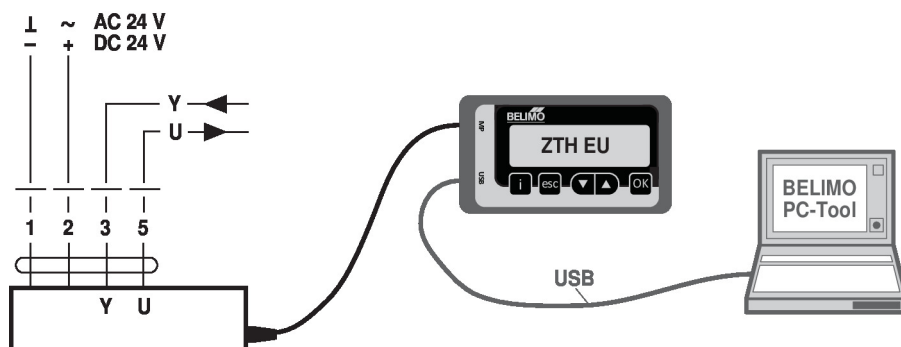
10 Manual override

Clockwise: Actuator stem extends
 Counterclockwise: Actuator stem retracts

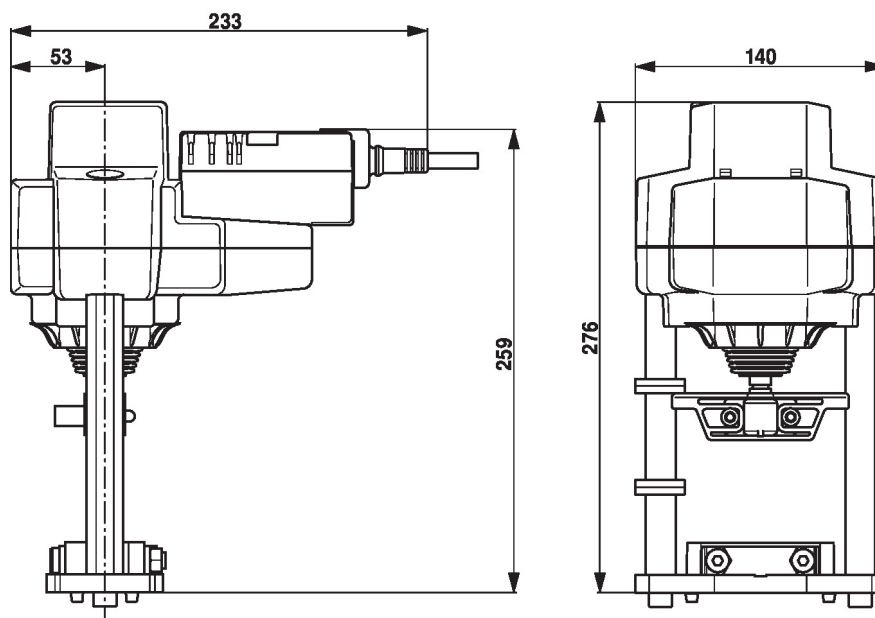
Service

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

- The complete product range for water applications
- Data sheets for globe valves
- Installation instructions for actuators and/or globe valves
- Notes for project planning 2-way and 3-way globe valves
- General notes for project planning