

Communicative globe valve actuator for 2-way and 3-way globe valves

- Actuating force 2500 N
- Nominal voltage AC/DC 24 V
- Control modulating, communicative 2...10 V variable
- Stroke 40 mm
- Communication via Belimo MP-Bus
- Conversion of sensor signals




## 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	4 W
	Power consumption in rest position	1.5 W
	Power consumption for wire sizing	6 VA
	Connection supply / control	Terminals with cable 1 m, 4x 0.75 mm <sup>2</sup> (Terminal 4 mm <sup>2</sup> )
	Parallel operation	Yes (note the performance data)
Data bus communication	Communicative control	MP-Bus
	Number of nodes	MP-Bus max. 8
Functional data	Actuating force motor	2500 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	40 mm
	Running time motor	150 s / 40 mm
	Running time motor variable	90...150 s
	Sound power level, motor	56 dB(A)
	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%

## Technical data

Functional data	Override control variable	MAX = (MIN + 33%)...100% ZS = MIN...MAX
	Position indication	Mechanical, 5...40 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
	Housing	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
	Type of action	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	3.6 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 with 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.
- 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

Operating mode	<p>Conventional operation:</p> <p>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.</p> <p>Operation on Bus:</p> <p>The actuator receives its digital control signal from the higher level controller via the MP-Bus and drives to the position defined. Connection U serves as communication interface and does not supply an analogue measuring voltage.</p>
----------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Product features

<b>Converter for sensors</b>	Connection option for a sensor (passive or active sensor or switching contact). The MP actuator serves as an analogue/digital converter for the transmission of the sensor signal via MP-Bus to the higher level system.
<b>Parametrisable actuators</b>	The factory settings cover the most common applications. Single parameters can be modified with Belimo Assistant 2 or ZTH EU.
<b>Simple direct mounting</b>	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.
<b>Manual override</b>	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.
<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>	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.
<b>Adaptation and synchronisation</b>	An adaptation can be triggered manually by pressing the "Adaptation" button or with Belimo Assistant 2. Both mechanical end stops are detected during the adaptation (entire setting range).  Automatic synchronisation after pressing the manual override button is parametrised. 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 made using Belimo Assistant 2.
<b>Setting direction of motion</b>	When actuated, the direction-of-stroke switch changes the direction of motion in normal operation.

## Accessories

Tools	Description	Type
	Service tool, with ZIP-USB function, for parametrisable and communicative Belimo actuators, VAV controller and HVAC performance devices	ZTH EU
	Service tool for wired and wireless setup, on-site operation, and troubleshooting.	Belimo Assistant 2
	Adapter for Service-Tool ZTH	MFT-C
	Connecting cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin for connection to service socket	ZK1-GEN
	Connecting cable 5 m, A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal	ZK2-GEN
Electrical accessories	Description	Type
	Auxiliary switch 2x SPDT add-on	S2A-H
	MP-Bus power supply for MP actuators	ZN230-24MP
Gateways	Description	Type
	Gateway MP to BACnet MS/TP	UK24BAC
	Gateway MP to Modbus RTU	UK24MOD

## 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 (▲).

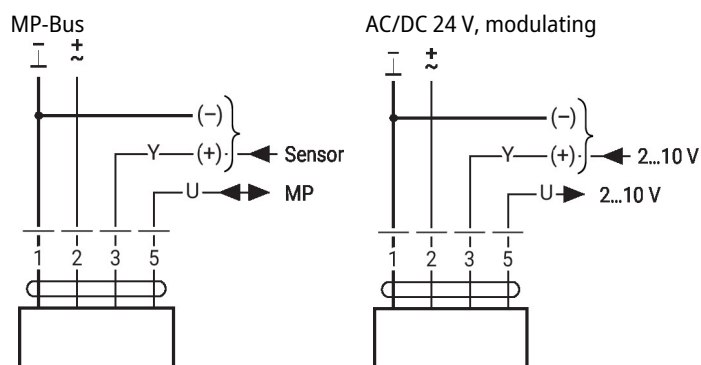
### Wire colours:

1 = black

2 = red

3 = white

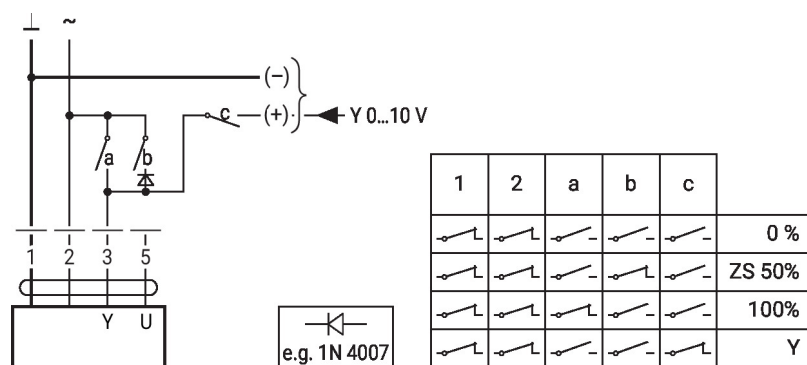
5 = orange



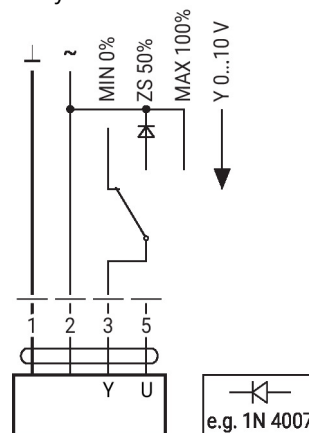
## Further electrical installations

### Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts



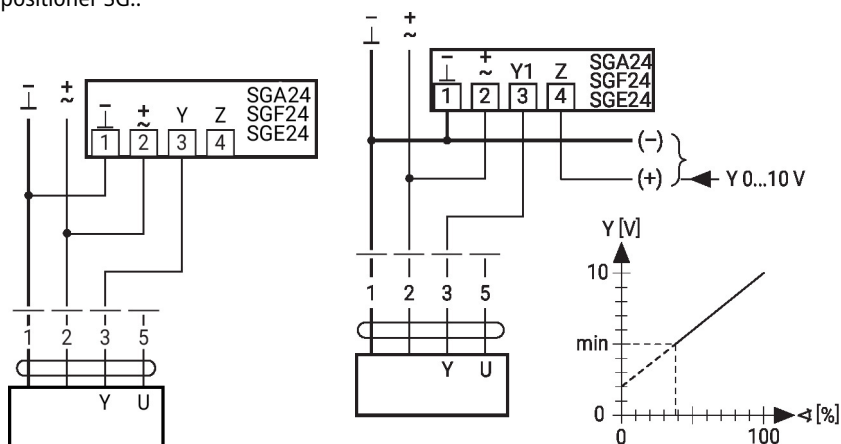
Override control with AC 24 V with rotary switch



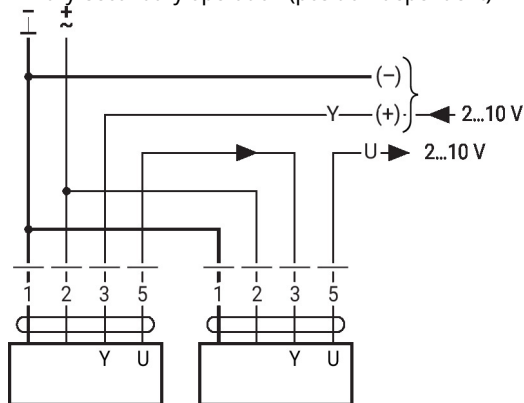
### Functions with basic values (conventional mode)

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

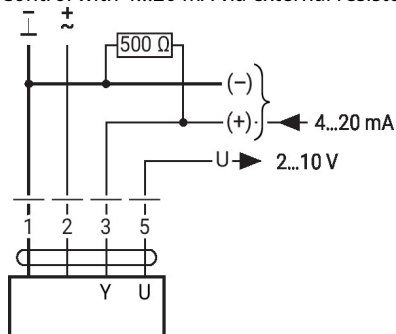
Minimum limit with positioner SG..



### Primary/secondary operation (position-dependent)



### Control with 4...20 mA via external resistor



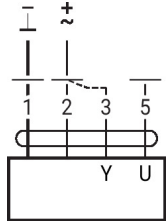
### Caution:

The operating range must be set to DC 2...10 V.

The 500 Ohm resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V.

## Functions with basic values (conventional mode)

### Functional check

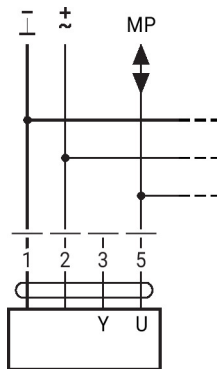


### Procedure

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

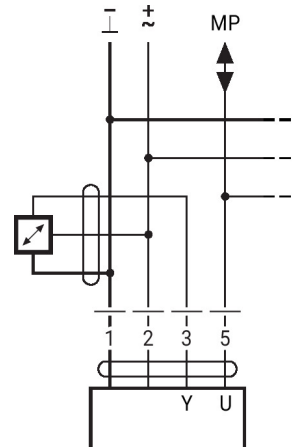
## MP-Bus

### Connection on the MP-Bus



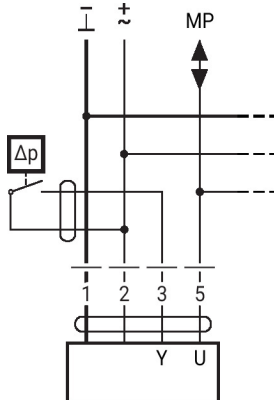
Max. 8 MP-Bus nodes

### Connection of active sensors



- Supply AC/DC 24 V
- Output signal 0...10 V (max. 0...32 V)
- Resolution 30 mV

### Connection of external switching contact

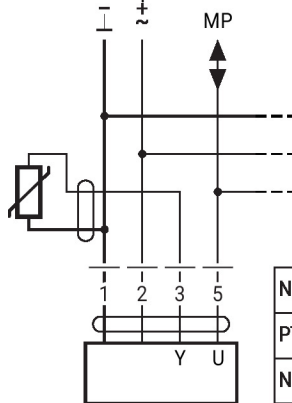


- Switching current 16 mA @ 24 V
- Start point of the operating range must be parametrised on the MP actuator as  $\geq 0.5$  V

## Further electrical installations

### MP-Bus

Connection of passive sensors



Ni1000	-28...+98°C	850...1600 Ω <sup>2)</sup>
PT1000	-35...+155°C	850...1600 Ω <sup>2)</sup>
NTC	-10...+160°C <sup>1)</sup>	200 Ω...60 kΩ <sup>2)</sup>

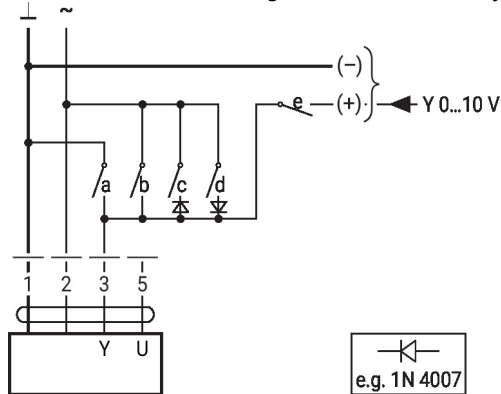
1) Depending on the type

2) Resolution 1 Ohm

Compensation of the measured value is recommended

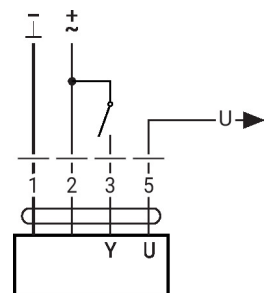
### Functions with specific parameters (Parametrisation necessary)

Override control and limiting with AC 24 V with relay contacts

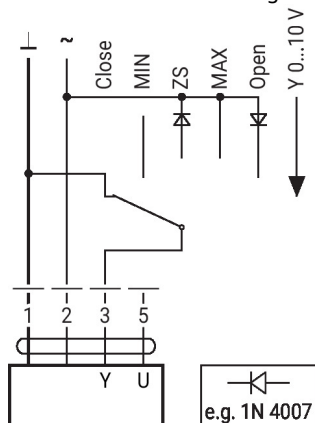


1	2	a	b	c	d	e	
							Close
							MIN
							ZS
							MAX
							Open
							Y

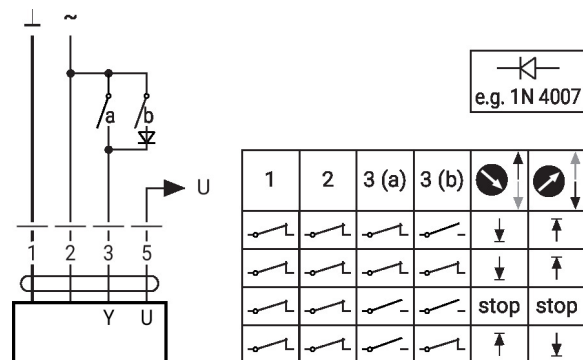
Control open/close



Override control and limiting with AC 24 V with rotary switch



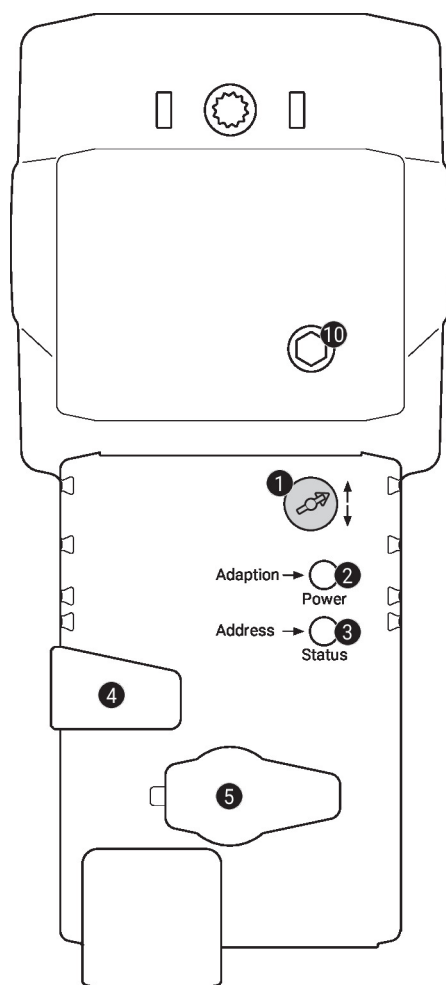
Control 3-point with AC 24 V



#### Caution:

The "Close" function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

## 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 button: Triggers stroke adaptation, followed by standard mode

### 3 Push-button and LED display yellow

Off: Standard mode

On: Adaptation or synchronisation process active

Flickering: MP-Bus communication active

Flashing: Request for addressing from MP client

Press button: Confirmation of the addressing

### 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

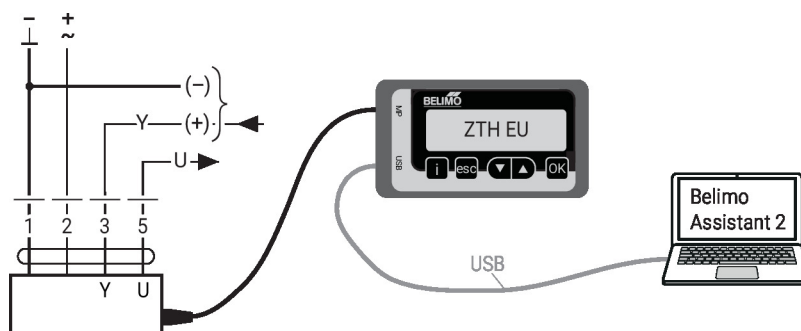
Clockwise: Actuator stem extends

Counterclockwise: Actuator stem retracts

## Service

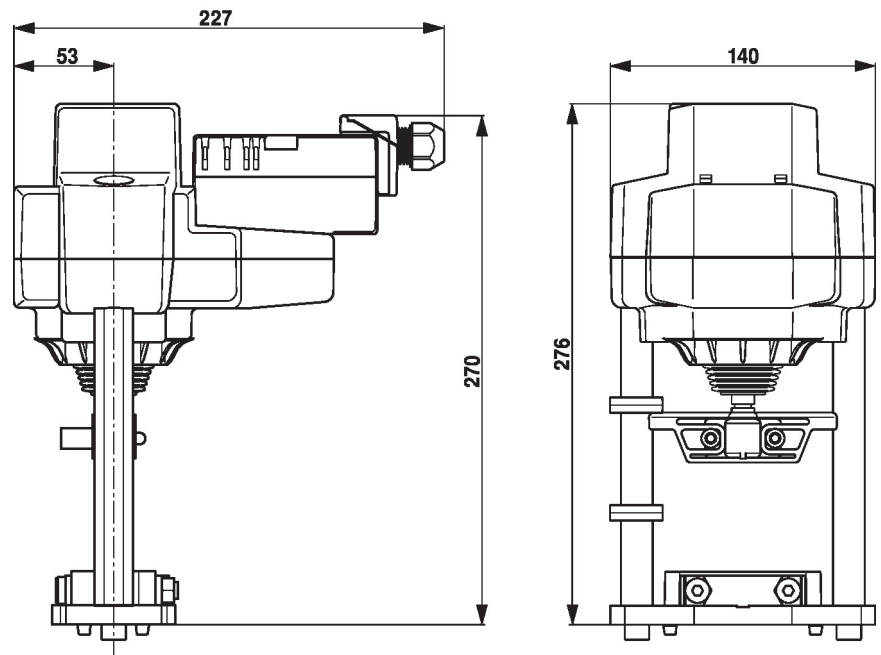
**Wired connection** The device can be parametrised by ZTH EU via the service socket.  
For an extended parametrisation, Belimo Assistant 2 can be connected.

Connection ZTH EU / Belimo Assistant 2





## Dimensions



## Further documentation

- The complete product range for water applications
- Installation instructions for actuators and/or globe valves
- Data sheets for globe valves
- Notes for project planning 2-way and 3-way globe valves
- General notes for project planning
- Tool connections
- Introduction to MP-Bus Technology
- Overview MP Cooperation Partners
- Quick Guide – Belimo Assistant 2