

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

- Actuating force 500 N
- Nominal voltage AC/DC 24 V
- Control modulating, communicative, hybrid
- Stroke 15 mm
- Conversion of sensor signals
- Communication via BACnet MS/TP, Modbus RTU, Belimo-MP-Bus or conventional control



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	2 W
	Power consumption in rest position	1.5 W
	Power consumption for wire sizing	4 VA
	Connection supply / control	Cable 1 m, 6 x 0.75 mm <sup>2</sup>
<b>Data bus communication</b>	Communicative control	BACnet MS/TP Modbus RTU (default setting) MP-Bus
	Number of nodes	BACnet / Modbus see interface description MP-Bus max. 8
<b>Functional data</b>	Actuating force motor	500 N
	Operating range Y	2...10 V
	Operating range Y variable	0.5...10 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...10 V
	Position accuracy	±5%
	Manual override	with push-button, can be locked
	Stroke	15 mm
	Running time motor	150 s / 15 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 gear disengagement button
	Override control, controllable via bus communication	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position) = 50%
	Override control variable	MAX = (MIN + 33%)...100% ZS = MIN...MAX
Sound power level, motor	45 dB(A)	
Position indication	Mechanically, 5...15 mm stroke	
<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>Weight</b>	Weight	1.2 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**

<b>Mode of operation</b>	The actuator is fitted with an integrated interface for BACnet MS/TP, Modbus RTU and MP-Bus. It receives the digital positioning signal from the control system and returns the current status.
<b>Converter for sensors</b>	Connection option for a sensor (passive, active or with switching contact). In this way, the analogue sensor signal can be easily digitised and transferred to the bus systems : BACnet, Modbus or MP-Bus.
<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. The communication parameters of the bus systems (address, baud rate etc.) are set with the ZTH EU. Pressing the "Address" button on the actuator while connecting the supply voltage, resets the communication parameters to the factory setting. Quick addressing: The BACnet and Modbus address can alternatively be set using the buttons on the actuator and selecting 1...16. The value selected is added to the «Basic address» parameter and results in the effective BACnet and Modbus address.
<b>Combination analogue - communicative (hybrid mode)</b>	With conventional control by means of an analogue positioning signal, BACnet or Modbus can be used for the communicative position feedback
<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 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 (4 mm), which is inserted into the top of the actuator. The stroke shaft 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 positioning signal.
<b>Adaptation and synchronisation</b>	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)
<b>Setting direction of motion</b>	When actuated, the stroke direction switch changes the running direction in normal operation.

**Accessories**

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.

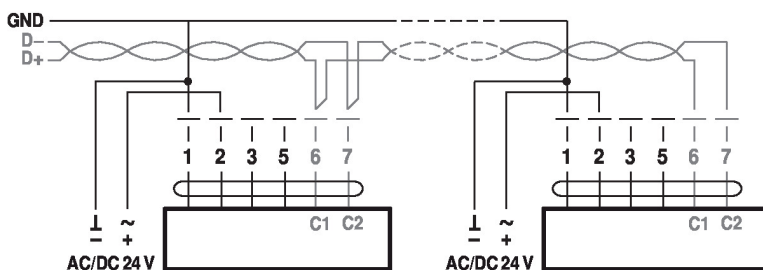
Direction of stroke switch factory setting: Actuator stem retracted (▲).

The wiring of the line for BACnet MS/TP / Modbus RTU is to be carried out in accordance with applicable RS485 regulations.

Modbus / BACnet: Supply and communication are not galvanically isolated. Connect earth signal of the devices with one another.

**Wiring diagrams**

BACnet MS/TP / Modbus RTU



**Cable colours:**

- 1= black
- 2 = red
- 3 = white
- 5 = orange
- 6 = pink
- 7 = grey

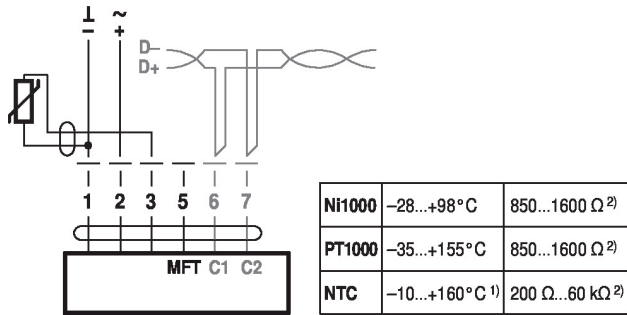
BACnet / Modbus signal

assignment:

C1 = D- = A

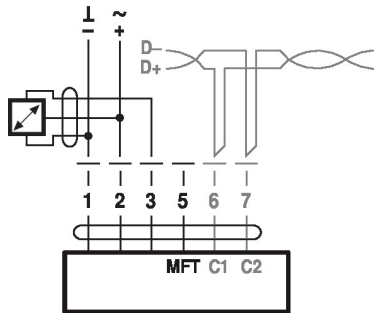
C2 = D+ = B

Connection with passive sensor, e.g. Pt1000, Ni1000, NTC



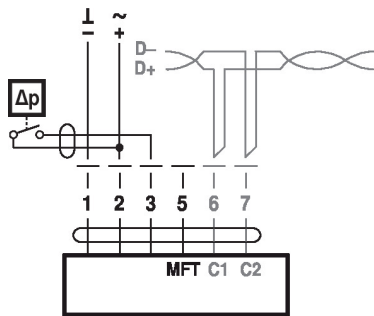
- 1) depending on type
  - 2) Resolution 1 Ohm
- Compensation of the measured value is recommended

Connection with active sensor, e.g. 0...10 V @ 0...50°C



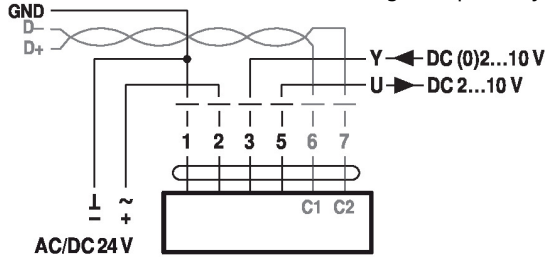
Possible voltage range:  
0...32 V (resolution 30 mV)

Connection with switching contact, e.g. Δp monitor

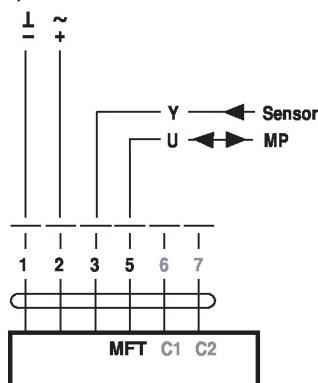


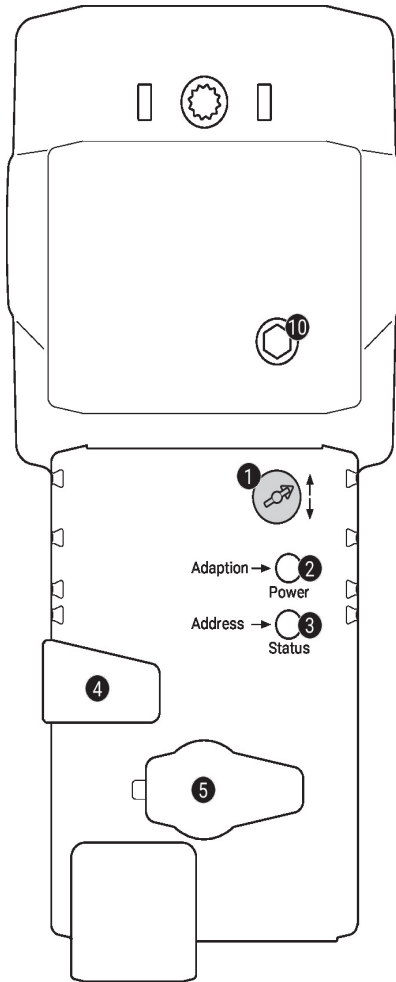
Requirements for switching contact:  
The switching contact must be able to accurately switch a current of 16 mA @ 24 V.

Modbus RTU / BACnet MS/TP with analogue setpoint (hybrid mode)



Operation on the MP-Bus



**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

Flashing:              In address mode: Pulses according to set address (1...16)  
When starting: Reset to factory setting (Communication)

Press                    In standard mode: Triggers stroke adaptation

button:                In address mode: Confirmation of set address (1...16)

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

Off:                      Standard mode

On:                      Adaptation or synchronisation process active  
or actuator in address mode (LED display green flashing)

Flickering:            BACnet / Modbus communication active

Press                    In operation (>3 s): Switch address mode on and off

button:                In address mode: Address setting by pressing several times  
When starting (>5 s): Reset to factory setting (Communication)

**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

**10 Manual override**

Clockwise:                      Actuator stem extends

Counterclockwise:            Actuator stem retracts

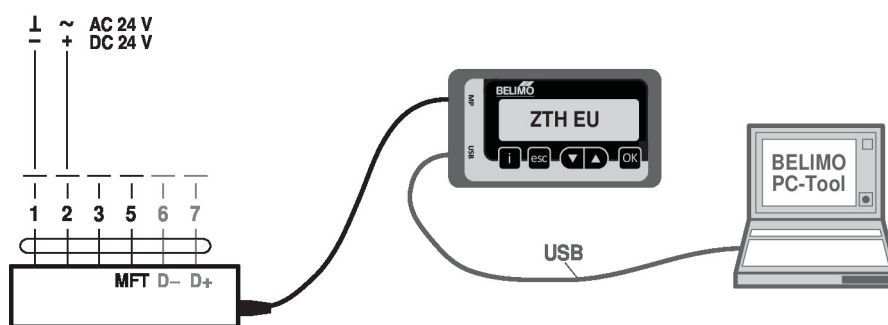
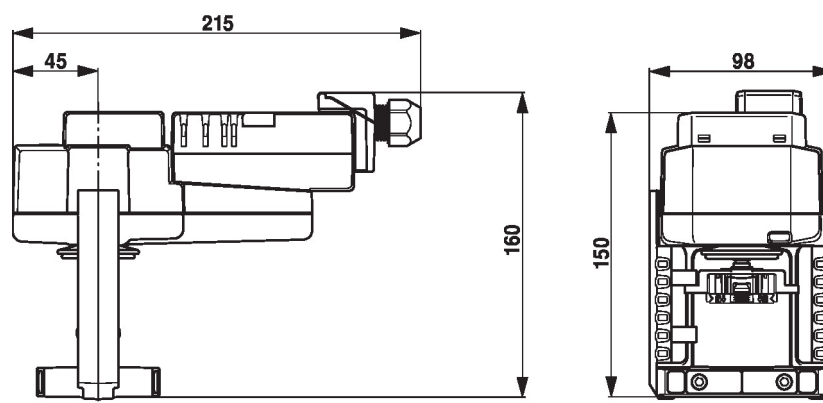
**Service**
**Quick addressing**

1. Press the "Address" button until the green "Power" LED is no longer illuminated. LED flashes in accordance with the previously set address.
2. Set the address by pressing the "Address" button the corresponding number of times (1...16).
3. The green LED flashes in accordance with the address that has been entered (...16). If the address is not correct, then this can be reset in accordance with Step 2.
4. Confirm the address setting by pressing the green "Adaption" button.

If no confirmation occurs for 60 seconds, then the address procedure is ended. Any address change that has already been started will be discarded.

The resulting BACnet MS/TP and Modbus RTU address is made up of the set basic address plus the short address (e.g. 100+7=107).

**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.


**Dimensions**

**Further documentation**

- Tool connections
- Description Protocol Implementation Conformance Statement PICS
- Description Modbus register
- Overview MP Cooperation Partners
- MP Glossary
- Introduction to MP-Bus Technology
- 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