

- Actuating force 1500 N
- Nominal voltage AC/DC 24 V
- Control modulating, communicative, hybrid
- Stroke 20 mm
- Communication via BACnet MS/TP, Modbus RTU, Belimo-MP-Bus or conventional control
- Conversion of sensor signals



Picture may differ from product

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	2 W
Power consumption in rest position	1.5 W
Power consumption for wire sizing	3.5 VA
Connection supply / control	Cable 1 m, 6x 0.75 mm ²

Data bus communication

Communicative control	BACnet MS/TP Modbus RTU (factory setting) MP-Bus
Number of nodes	BACnet / Modbus see interface description MP-Bus max. 8

Functional data

Actuating force motor	1500 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	20 mm
Running time motor	150 s / 20 mm
Running time motor variable	90...150 s
Sound power level, motor	35 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, controllable via bus communication	MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position) = 50%
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Override control variable	MAX = (MIN + 33%)...100% ZS = MIN...MAX
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Position indication	Mechanical, 5...20 mm stroke
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Safety data

Protection class IEC/EN	III, Safety Extra-Low Voltage (SELV)
Power source UL	Class 2 Supply
Degree of protection IEC/EN	IP54

Technical data

Safety data	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	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, 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 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.
- 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

Operating mode	The actuator is fitted with an integrated interface for BACnet MS/TP, Modbus RTU and MP-Bus. It receives the digital control signal from the control system and returns the current status.
Converter for sensors	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.
Configurable device	The factory settings cover the most common applications. Single parameters can be modified with Belimo Assistant 2.
Combination analogue - communicative (hybrid mode)	With conventional control by means of an analogue control signal, BACnet or Modbus can be used for the communicative position feedback
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.

Product features

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 (4 mm), which is inserted into the top of the actuator. The stroke shaft 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.
Position indication	The stroke is indicated mechanically on the bracket with tabs. The stroke range adjusts itself automatically during operation.
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 Belimo Assistant 2. 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 made using Belimo Assistant 2.
Setting direction of motion	When actuated, the direction-of-stroke switch changes the direction of motion in normal operation.

Accessories

Tools	Description	Type
Service tool for wired and wireless setup, on-site operation and troubleshooting.		Belimo Assistant 2
Belimo Assistant Link Bluetooth and USB to NFC and MP-Bus converter for configurable and communicative devices		LINK.10
Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: 6-pin for connection to service socket		ZK1-GEN
Connecting cable 5 m, A: RJ11 6/4 LINK.10, B: free wire end for connection to MP/PP terminal		ZK2-GEN
Electrical accessories	Description	Type
Stem heater for LV.., NV.., SV.. actuator		ZH24-1-A

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 RS-485 regulations.

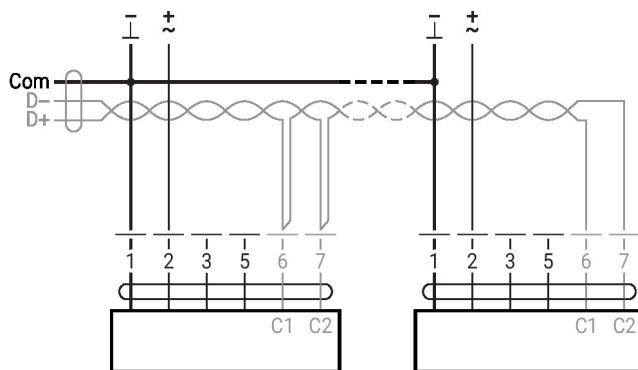
Modbus / BACnet: Supply and communication are not galvanically isolated. COM and ground of the devices must be connected to each other.

Electrical installation

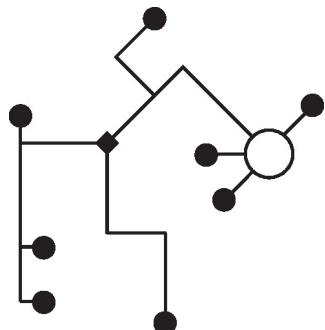
Wire colours:
 1 = black
 2 = red
 3 = white
 5 = orange
 6 = pink
 7 = grey

Functions:
 C1 = D- (wire 6)
 C2 = D+ (wire 7)

BACnet MS/TP / Modbus RTU

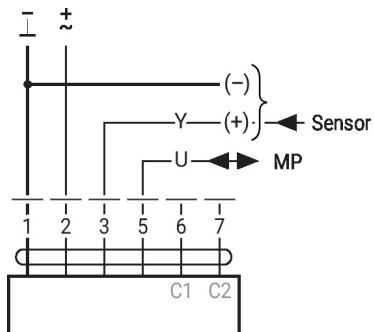
**Further electrical installations****MP-Bus**

MP-Bus Network topology

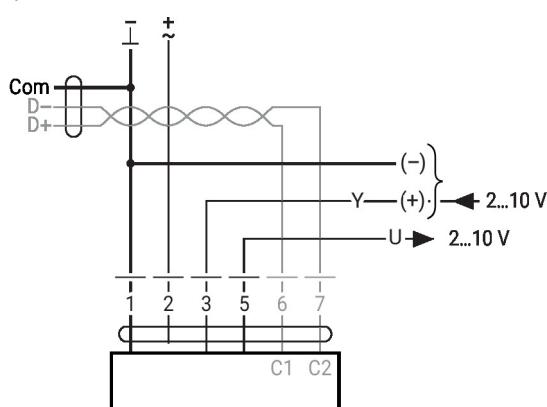


There are no restrictions for the network topology (star, ring, tree or mixed forms are permitted). Supply and communication in one and the same 3-wire cable

- no shielding or twisting necessary
- no terminating resistors required

MP-Bus**Functions with specific parameters (configuration necessary)**

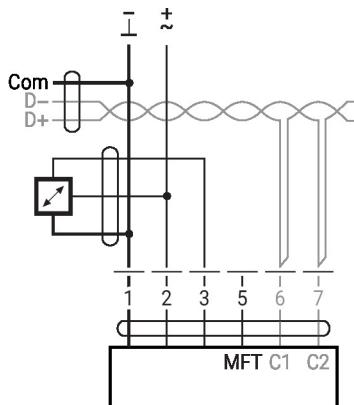
Modbus RTU / BACnet MS/TP with analogue setpoint (hybrid operation)



Further electrical installations

Sensor connection

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

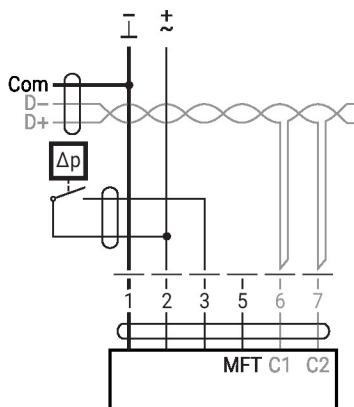


Possible input voltage range:

0...10 V

Resolution 30 mV

Connection with switching contact, e.g. differential pressure switch

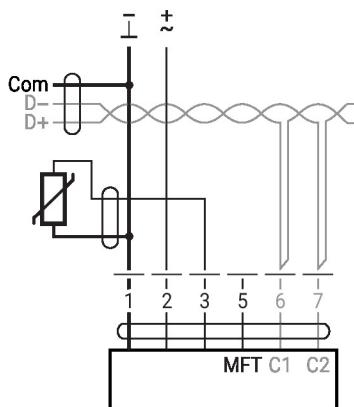


Switching contact requirements:

The switching contact must be able to switch a current of 16 mA at 24 V accurately.

Start point of the operating range must be configured on the MOD actuator as ≥ 0.5 V.

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



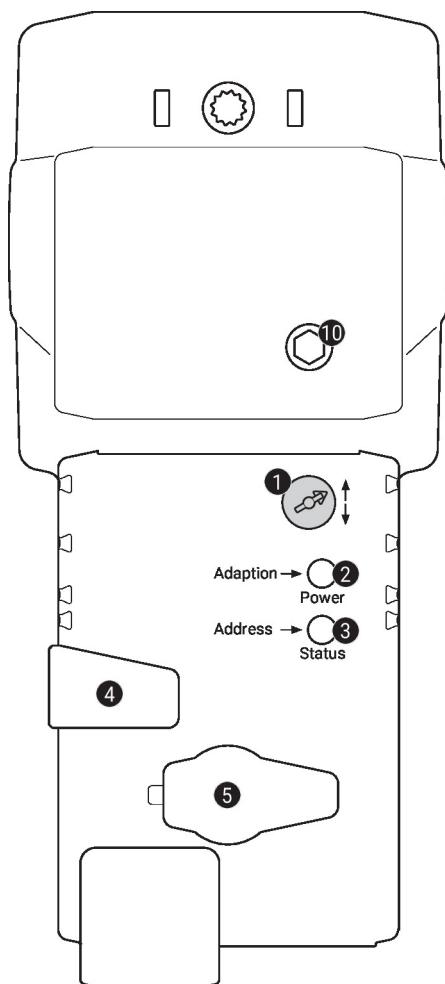
Ni1000	-28...+98°C	850...1600 Ω ²⁾
PT1000	-35...+155°C	850...1600 Ω ²⁾
NTC	-10...+160°C ¹⁾	200 Ω...60 kΩ ²⁾

1) depending on type

2) Resolution 1 Ohm

Compensation of the measured value is recommended

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 button: In standard mode: Triggers stroke adaptation
 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 button: In operation (>3 s): Switch address mode on and off
 In address mode: Address setting by pressing several times
 When starting (>5 s): Reset to factory setting (Communication)

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 configuration and service tools

10 Manual override

Clockwise: Actuator stem extends
 Counterclockwise: Actuator stem retracts

Service

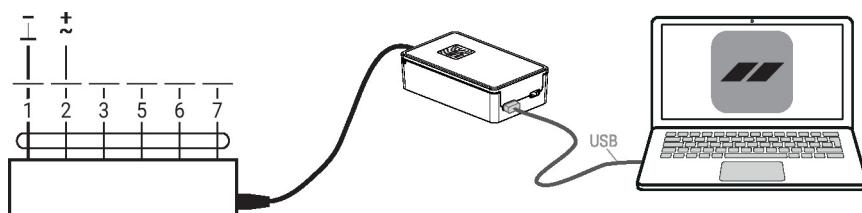
Using Belimo Assistant 2, device parameters can be modified. Belimo Assistant 2 can operate on a smartphone, tablet or PC. The available connection options vary depending on the hardware on which Belimo Assistant 2 is installed.

For more information about Belimo Assistant 2, refer to the Quick Guide – Belimo Assistant 2.



Wired connection

Belimo devices can be accessed by connecting Belimo Assistant Link to the USB port on a PC or laptop and to the Service Socket or MP-Bus wire on the device.



Service

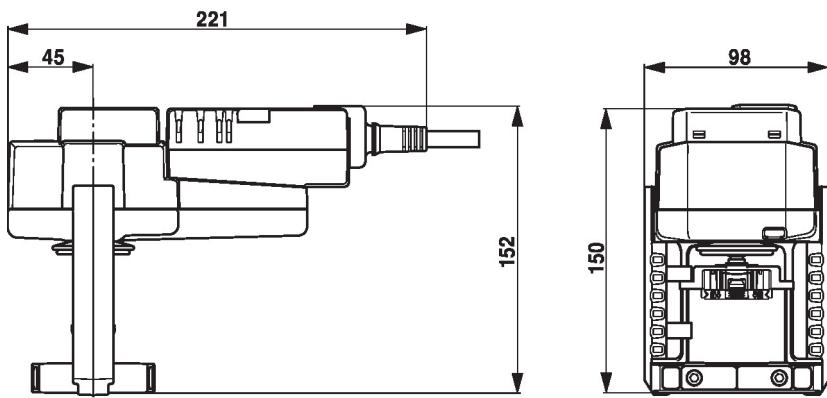
Quick addressing

1. Press the "Address" button until the green "Power" LED is no longer illuminated. The green "Power" 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 (1...16). If the address is not correct, it can be reset in accordance with step 2.
4. Confirm the address setting by pressing the green "Adaptation" button.

If the address is not confirmed within 60 seconds, the address procedure will be 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).

Dimensions



Further documentation

- Tool connections
- BACnet Interface description
- Modbus Interface description
- 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
- Quick Guide – Belimo Assistant 2