

Stainless steel globe valve, 3-way,
Internal thread

- For open and closed cold and warm water systems
- For modulating control of air-handling and heating systems on the water side



Type overview

| Type | DN [] | Rp ["] | kvs [m ³ /h] | Stroke [] | PN [] | Sv min. [] |
|---------|-----------|-----------|-----------------------------|---------------|-----------|----------------|
| H315S-G | 15 | 1/2 | 1.6 | 10 mm | 25 | 100 |
| H315S-J | 15 | 1/2 | 4.0 | 10 mm | 25 | 100 |
| H320S-K | 20 | 3/4 | 6.3 | 10 mm | 25 | 100 |
| H325S-L | 25 | 1 | 10 | 15 mm | 25 | 100 |
| H332S-M | 32 | 1 1/4 | 16 | 20 mm | 25 | 100 |
| H340S-N | 40 | 1 1/2 | 25 | 20 mm | 25 | 100 |
| H350S-P | 50 | 2 | 40 | 20 mm | 25 | 100 |

Technical data

| | | | |
|------------------------|-----------------------|--|--------------------------|
| Functional data | Fluid | Cold, warm and hot water, water with glycol up to max. 50% vol. | |
| | Fluid temperature | 0...130 °C | |
| | Flow characteristic | Control path A – AB: equal percentage (VDI/VDE 2173) n(gl) = 3, optimised in the opening range; Bypass B – AB: Linear (VDI/VDE 2173) | |
| | Leakage rate | Control path A – AB: max. 0.02% of the kvs value; Bypass B – AB: max. 0.02% of the kvs value (EN 1349 and EN 60534-4) | |
| | Closing point | Top (▲) | |
| | Pipe connectors | Internal thread according to ISO 7-1 | |
| | Installation position | upright to horizontal (in relation to the stem) | |
| | Servicing | maintenance-free | |
| | Materials | Housing | Stainless steel AISI 304 |
| | | Closing element | stainless steel AISI 304 |
| Stem | | Stainless steel AISI 304 | |
| Stem seal | | PTFE+FFKM | |
| Seat | | Stainless steel AISI 304 | |

Safety notes



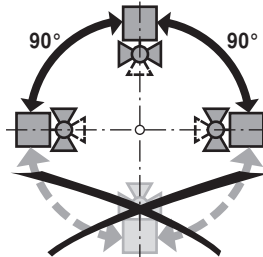
- The valve has been designed for use in stationary heating, ventilation and air-conditioning systems and must not be used outside the specified field of application, especially in aircraft or in any other airborne means of transport.
- Only authorised specialists may carry out installation. All applicable legal or institutional installation regulations must be complied during installation.
- The valve does not contain any parts that can be replaced or repaired by the user.
- The valve may not be disposed of as household refuse. All locally valid regulations and requirements must be observed.
- When determining the flow rate characteristic of controlled devices, the recognised directives must be observed.

Product features

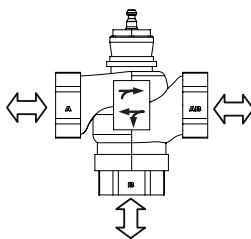
- Mode of operation** The globe valve is adjusted by a globe valve actuator. The actuators are connected by a commercially available modulating or 3-point control system and move the valve cone, which acts as a throttling device, into the opening position dictated by the positioning signal.
- Flow characteristic** An equal percentage flow characteristic is produced by the profile of the valve cone.

Installation notes

- Recommended installation positions** The globe valve may be mounted upright to horizontal. It is not permissible to mount the globe valves with the spindle pointing downwards.

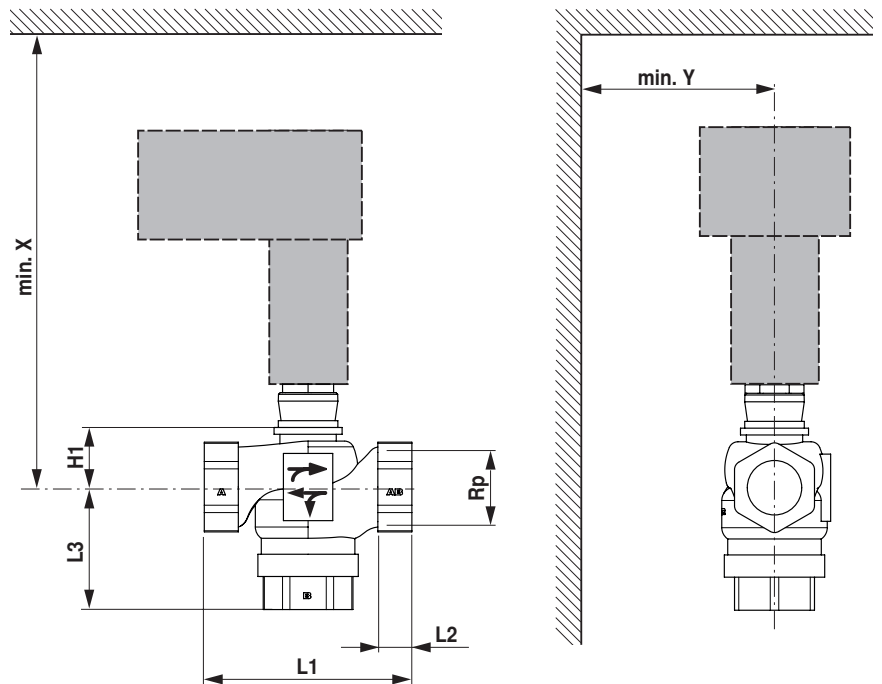


- Water quality requirements** The water quality requirements specified in VDI 2035 must be adhered to. Belimo valves are regulating devices. For the valves to function correctly in the long term, they must be kept free from particle debris (e.g. welding beads during installation work). The installation of a suitable strainer is recommended.
- Servicing** Globe valves and globe valve actuators are maintenance-free. Before any service work on the final controlling device is carried out, it is essential to isolate the globe valve actuator from the power supply (by unplugging the electrical cables if necessary). Any pumps in the part of the piping system concerned must also be switched off and the appropriate slide valves closed (allow all components to cool down first if necessary and always reduce the system pressure to ambient pressure level). The system must not be returned to service until the globe valve and the globe valve actuator have been reassembled correctly in accordance with the instructions and the pipeline has been refilled by professionally trained personnel.
- Fluid velocity** Ensure the differential pressure is within specification especially when fluid velocity is over 2m/s. Running with high fluid velocity and differential pressure outside specification could result in cavitation effects like noise or vibrations.
- Flow direction** Direction of flow in both directions possible.



Dimensions / Weight

Dimensional drawings



X/Y: Minimum distance with respect to the valve centre.
The actuator dimensions can be found on the respective actuator data sheet.

| Type | DN [] | Rp ["] | L1 [mm] | L2 [mm] | L3 [mm] | H1 [mm] | X [mm] | Y [mm] | Weight |
|---------|-----------|-----------|-------------|-------------|-------------|-------------|------------|------------|--------|
| H315S-G | 15 | 1/2 | 81 | 15 | 56 | 29 | 296 | 100 | 1.1 kg |
| H315S-J | 15 | 1/2 | 81 | 15 | 56 | 29 | 296 | 100 | 1.1 kg |
| H320S-K | 20 | 3/4 | 86 | 15 | 56 | 28 | 299 | 100 | 1.2 kg |
| H325S-L | 25 | 1 | 115 | 17 | 64 | 34.5 | 303 | 100 | 1.6 kg |
| H332S-M | 32 | 1 1/4 | 122 | 19 | 76.5 | 35 | 306 | 100 | 2.1 kg |
| H340S-N | 40 | 1 1/2 | 140 | 23 | 83.5 | 43 | 311 | 100 | 2.6 kg |
| H350S-P | 50 | 2 | 158 | 25 | 95 | 56.5 | 318 | 100 | 3.8 kg |

Further documentation

- Data sheets for globe valve actuators
- Installation instructions for valves and/or globe valve actuators
- Notes for project planning 2-way and 3-way globe valves

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

- Actuating force 1000 N
- Nominal voltage AC/DC 24 V
- Control modulating, communicative 2...10 V variable
- Stroke 20 mm
- Conversion of sensor signals
- Communication via Belimo MP-Bus


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 | 1.5 W | |
| | Power consumption in rest position | 0.5 W | |
| | Power consumption for wire sizing | 3 VA | |
| | Connection supply / control | Terminals with cable 1 m, 4 x 0.75 mm ² (Terminal 4 mm ²) | |
| | Parallel operation | Yes (note the performance data) | |
| | Functional data | Actuating force motor | 1000 N |
| | | Communicative control | MP-Bus |
| Operating range Y | | 2...10 V | |
| Input Impedance | | 100 kΩ | |
| Options positioning signal | | Open/close 3-point (AC only) Modulating (DC 0...32 V) | |
| Operating range Y variable | | Start point 0.5...30 V End point 2.5...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 | | 20 mm | |
| Running time motor | | 150 s / 20 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 | | MAX (maximum position) = 100% MIN (minimum position) = 0% ZS (intermediate position, AC only) = 50% | |
| Override control variable | | MAX = (MIN + 33%)...100% MIN = 0%...(MAX - 33%) ZS = MIN...MAX | |
| Sound power level, motor | | 45 dB(A) | |
| Position indication | | Mechanically, 5...20 mm stroke | |
| Safety | Protection class IEC/EN | III Safety Extra-Low Voltage (SELV) | |
| | Protection class UL | UL Class 2 Supply | |
| | Degree of protection IEC/EN | IP54 | |
| | Degree of protection NEMA/UL | NEMA 2 | |
| | 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 E60730-1:02 | | |

Technical data

| | | |
|---------------|--|---|
| Safety | Certification UL note | 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 |
| | Control pollution degree | 3 |
| | Ambient temperature | 0...50°C |
| | Storage temperature | -40...80°C |
| | Ambient humidity | Max. 95% r.H., non-condensing |
| | 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, 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 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

| | |
|------------------------------------|---|
| Mode of operation | <p>Conventional operation: The actuator is connected with a standard modulating signal of 0...10 V and drives to the position defined by the positioning signal. The measuring voltage U serves for the electrical display of the actuator position 0.5...100% and as slave control signal for other actuators.</p> <p>Operation on Bus: The actuator receives its digital positioning 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> |
| Converter for sensors | 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. |
| 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 | <p>Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked).</p> <p>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.</p> |
| High functional reliability | The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached. |
| Combination valve/actuator | Refer to the valve documentation for suitable valves, their permitted fluid temperatures and closing pressures. |

Product features

| | |
|-------------------------------------|--|
| Position indication | The stroke is indicated mechanically on the bracket with tabs. The stroke range adjusts itself automatically during operation. |
| Home position | <p>Factory setting: Actuator spindle is retracted.</p> <p>When valve-actuator combinations are shipped, the direction of motion is set in accordance with the closing point of the valve.</p> <p>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.</p> <p>The actuator then moves into the position defined by the positioning signal.</p> |
| Setting direction of stroke | When actuated, the stroke direction switch changes the running direction in normal operation. |
| Adaption and synchronisation | <p>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).</p> <p>Automatic synchronisation after pressing the gearbox disengagement button is configured. The synchronisation is in the home position (0%).</p> <p>The actuator then moves into the position defined by the positioning signal.</p> <p>A range of settings can be adapted using the PC-Tool (see MFT-P documentation)</p> |

Accessories

| | Description | Type |
|-------------------------------|---|-------------|
| Gateways | Gateway MP zu BACnet MS/TP | UK24BAC |
| | Gateway MP to Modbus RTU | UK24MOD |
| | Gateway MP to LonWorks | UK24LON |
| | Gateway MP to KNX | UK24EIB |
| | Description | Type |
| Electrical accessories | Auxiliary switch 2 x SPDT add-on | S2A-H |
| | 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 |
| | MP-Bus power supply for MP actuators | ZN230-24MP |
| | Connecting board MP-Bus for wiring boxes EXT-WR-FP...-MP | ZFP2-MP |
| | Description | Type |
| Service Tools | Service 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

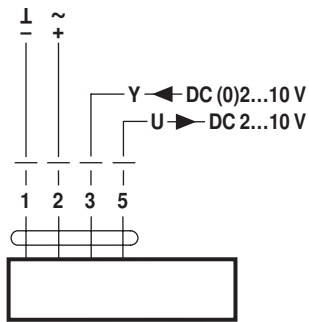
Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of stroke switch factory setting: Actuator spindle retracted (▲).

Electrical installation

Wiring diagrams

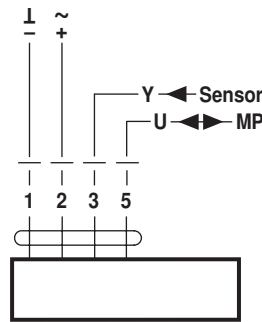
AC/DC 24 V, modulating



Cable colours:

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

Operation on the MP-Bus



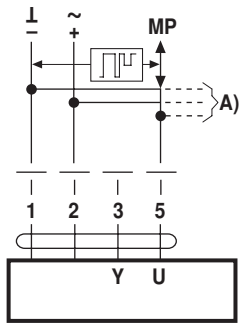
Cable colours:

- 1 = black
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Functions

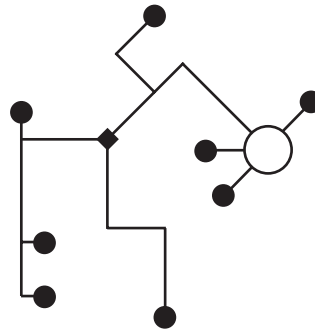
Functions when operated on MP-Bus

Connection on the MP-Bus



A) more actuators and sensors
(max.8)

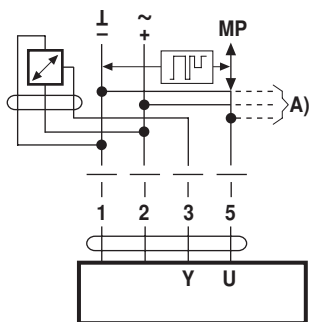
MP-Bus Network topology



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

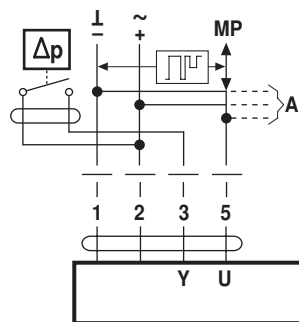
Connection of active sensors



A) more actuators and sensors
(max.8)

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

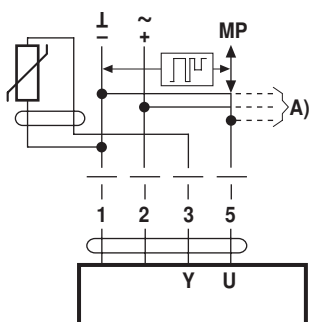
Connection of external switching contact



A) more actuators and sensors
(max.8)

- Switching current 16 mA @ 24 V
- Start point of the operating range must be parameterised on the MP actuator as ≥ 0.5 V

Connection of passive sensors



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

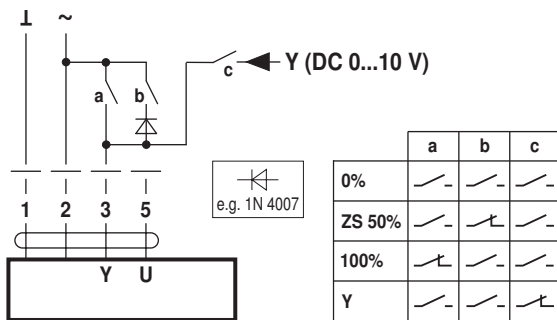
A) more actuators and sensors
(max.8)

- 1) Depending on the type
- 2) Resolution 1 Ohm

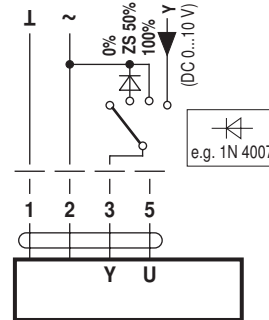
Functions

Functions with basic values (conventional mode)

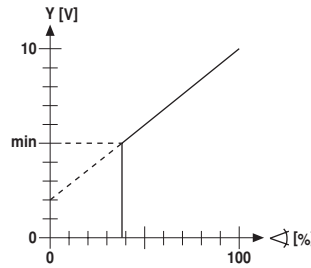
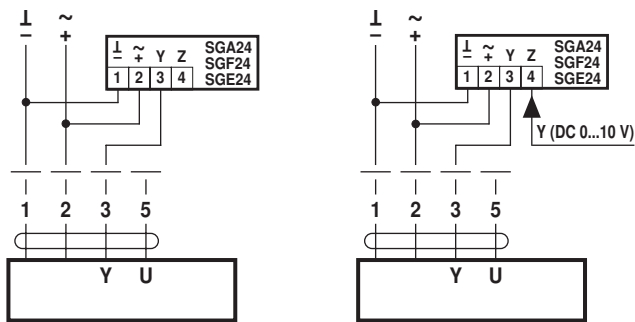
Override control with AC 24 V with relay contacts



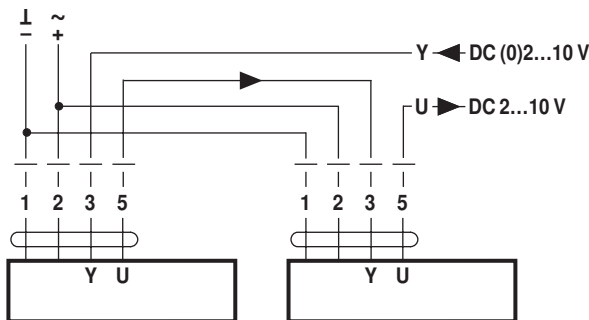
Override control with AC 24 V with rotary switch



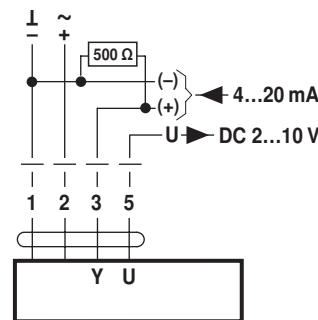
Control remotely 0...100% with positioner SG..
Minimum limit with positioner SG..



Follow-up control (position-dependent)

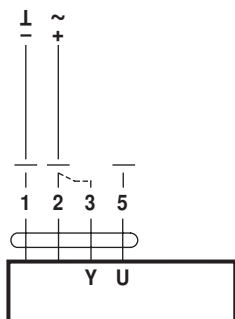


Control with 4...20 mA via external resistor



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



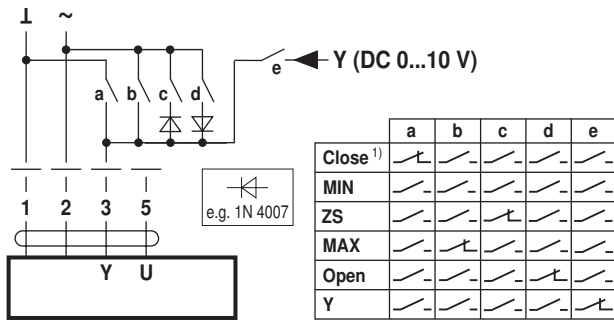
Procedure

1. 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

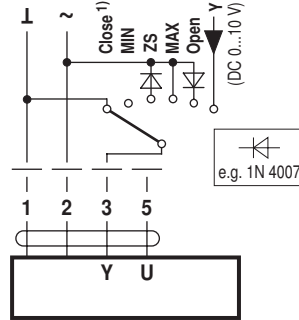
Functions

Functions for devices with specific parameters (Parametrisation necessary)

Override control and limiting with AC 24 V with relay contacts

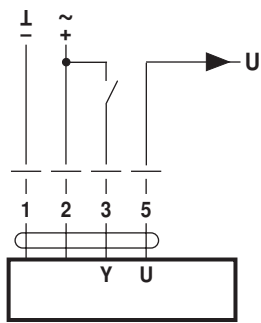


Override control and limiting with AC 24 V with rotary switch

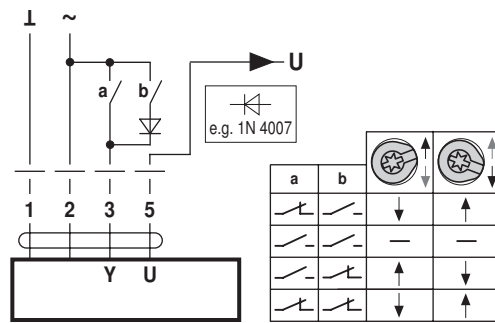


1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

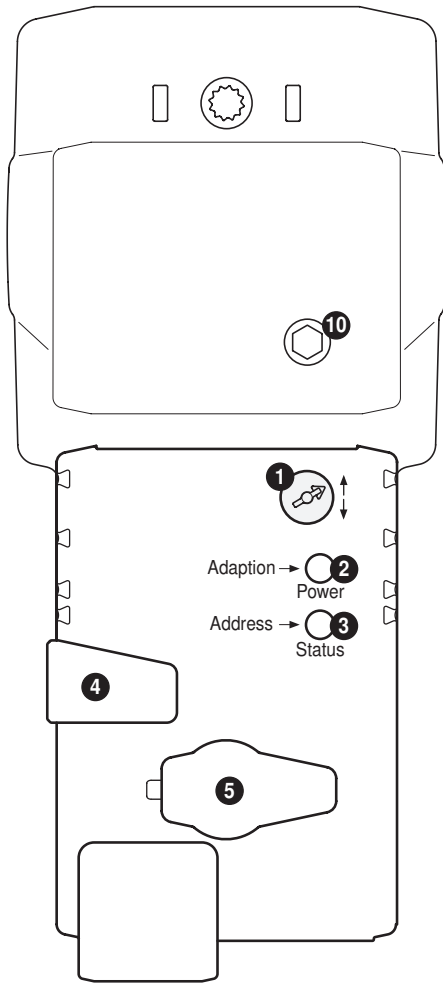
Control open/close



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 button: Triggers stroke adaptation, followed by standard mode
- 3 Push-button and LED display yellow**
Off: Standard mode
Flickering: MP communication active
On: Adaptation process active
Flashing: Request for addressing from MP master
Press button: Confirmation of the addressing
- 4 Gear disengagement button**
Press button: Gear disengages, motor stops, manual override possible
Release button: Gear engages, standard mode
- 5 Service plug**
For connecting parameterisation and service tools
- 10 Manual override**
Clockwise: Actuator spindle extends
Counterclockwise: Actuator spindle retracts

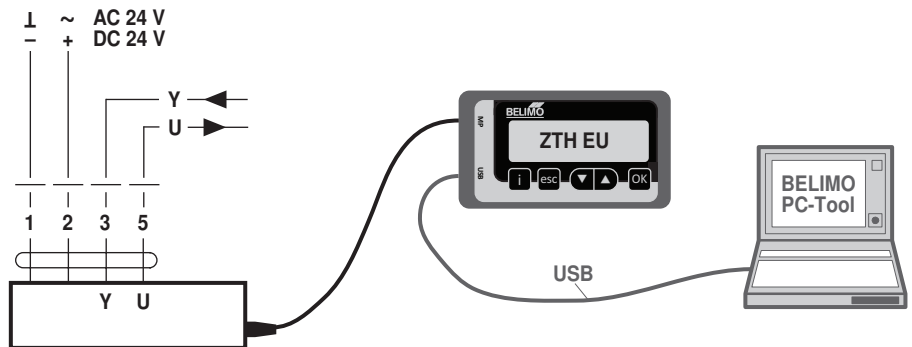
Check power supply connection

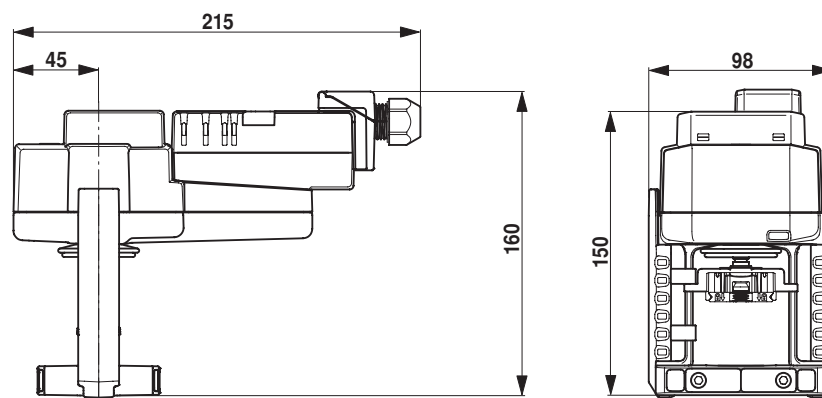
- 2 Off and 3 On** Possible wiring error in power supply

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
- 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