### 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**: 11 W
- **Power consumption in rest position**: 1.5 W
- **Power consumption for wire sizing**: 18 VA
- **Connection supply / control**: Cable 1 m, 4 x 0.75 mm²
- **Parallel operation**: Yes (note the performance data)

**Functional data**
- **Actuating force motor**: 2500 N
- **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**: 50 mm
- **Running time motor**: 35 s / 40 mm (44 s / 50 mm)
- **Running time motor variable**: 44...113 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**: 65 dB(A)
- **Position indication**: Mechanically, 5...50 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
Globe valve actuator (Retrofit), parametrisable, modulating, AC/DC 24 V, 2500 N, Running time motor 44 s

Technical data

<table>
<thead>
<tr>
<th>Safety</th>
<th>Certification UL note</th>
<th>The UL marking on the actuator depends on the production site, the device is UL-compliant in any case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of operation</td>
<td>Type 1</td>
<td></td>
</tr>
<tr>
<td>Rated impulse voltage supply / control</td>
<td>0.8 kV</td>
<td></td>
</tr>
<tr>
<td>Control pollution degree</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0...50°C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40...80°C</td>
<td></td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>Max. 95% r.H., non-condensing</td>
<td></td>
</tr>
<tr>
<td>Servicing</td>
<td>maintenance-free</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Weight</td>
<td>5.6 kg</td>
</tr>
</tbody>
</table>

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 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

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.

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.

Installation on third-party valves

The retrofit actuators for installation on a wide range of valves from various manufacturers are comprised of an actuator, universal valve neck adapter and universal valve stem adapter. Adapt the valve neck and valve stem to begin with, then attach the retrofit actuator to the valve neck adapter, connect to the valve and start up. The valve neck adapter/actuator can be rotated through 360° on the valve neck, provided it is permitted by the size of the installed valve.

Installation on Belimo valves

Use standard actuators from Belimo for mounting on Belimo globe valves.

Manual override

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 (5 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 spindle is retracted.
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. The actuator then moves into the position defined by the positioning signal.

Setting direction of stroke
When actuated, the stroke direction switch changes the running direction in normal operation.

Adaption and synchronisation
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). 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).

Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical accessories</td>
<td></td>
</tr>
<tr>
<td>Auxiliary switch 2 x SPDT add-on</td>
<td>S2A-H</td>
</tr>
<tr>
<td>Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin service socket for Belimo device</td>
<td>ZK1-GEN</td>
</tr>
<tr>
<td>Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal</td>
<td>ZK2-GEN</td>
</tr>
<tr>
<td>Service Tools</td>
<td></td>
</tr>
<tr>
<td>Service Tool, with ZIP-USB function</td>
<td>ZTH EU</td>
</tr>
<tr>
<td>Belimo PC-Tool, Software for adjustments and diagnostics</td>
<td>MFT-P</td>
</tr>
<tr>
<td>Adapter for Service-Tool ZTH</td>
<td>MFT-C</td>
</tr>
</tbody>
</table>

Electrical installation

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

Wiring diagrams

AC/DC 24 V, modulating

Cable colours:
1 = black
2 = red
3 = white
5 = orange
### Functions

#### Functions with basic values (conventional mode)

**Override control with AC 24 V with relay contacts**

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

**Override control with AC 24 V with rotary switch**

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
Globe valve actuator (Retrofit), parametrisable, modulating, AC/DC 24 V, 2500 N, Running time motor 44 s

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

Control open/close

Control 3-point

1) Caution: This 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 process active
   - **Press button:** No function

4. **Gear disengagement button**
   - **Press button:** Gear disengages, motor stops, manual override possible
   - **Release button:** Gear engages, synchronisation starts, followed by standard mode

5. **Service plug**
   - For connecting parameterisation and service tools

10. **Manual override**
    - **Clockwise:** Actuator spindle extends
    - **Counterclockwise:** Actuator spindle retracts

**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

![Connection diagram](attachment:connection_diagram.png)
Globe valve actuator (Retrofit), parametrisable, modulating, AC/DC 24 V, 2500 N, Running time motor 44 s

Dimensions [mm]

Further documentation

- Installation instructions for actuators