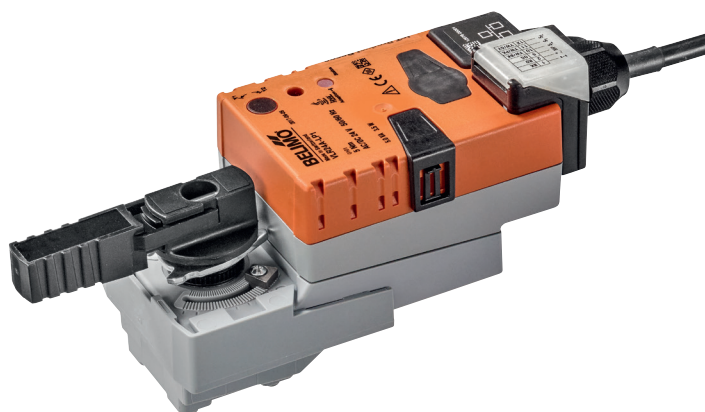


Cloud capable and communicative rotary actuator for ball valves

- Torque motor 40 Nm
- Nominal voltage AC/DC 24 V
- Control modulating, communicative, hybrid, Cloud
- Conversion of sensor signals
- Ethernet 10/100 Mbit/s, TCP/IP, integrated web server
- Communication via BACnet IP, Modbus TCP and Cloud


**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         | 11 W   |
|                        | Power consumption in rest position     | 3 W  |
|                        | Power consumption for wire sizing      | 21 VA  |
|                        | Connection supply / control            | Cable 1 m, 6 x 0.5 mm <sup>2</sup>   |
|                        | Connection control Ethernet            | RJ45 socket  |
|                        | Parallel operation                     | Yes (note the performance data)  |
| <b>Functional data</b> | Torque motor                           | 40 Nm  |
|                        | Communicative control                  | Cloud<br>BACnet IP<br>Modbus TCP   |
|                        | Operating range Y                      | 2...10 V   |
|                        | Input Impedance                        | 34 kΩ  |
|                        | Operating range Y variable             | 0.5...10 V   |
|                        | Setting fail-safe position             | NC/NO or adjustable 0...100% (POP rotary knob)   |
|                        | Bridging time (PF) variable            | 1...10 s   |
|                        | Position accuracy                      | ±5%  |
|                        | Manual override                        | with push-button   |
|                        | Running time motor                     | 150 s / 90°  |
|                        | Running time motor variable            | 90...150 s   |
|                        | Running time fail-safe                 | 35 s / 90°   |
|                        | Running time fail-safe note            | <35 s @ 0...50° C  |
|                        | Adaptation setting range               | manual   |
|                        | Sound power level, motor               | 52 dB(A)   |
|                        | Sound power level, fail-safe           | 61 dB(A)   |
| Position indication    | Mechanical                             |  |
| <b>Safety</b>          | Protection class IEC/EN                | III Safety Extra-Low Voltage (SELV)  |
|                        | Degree of protection IEC/EN            | IP40   |
|                        | Degree of protection note              | IP54 when using protective cap or protective grommet for RJ45 socket   |
|                        | EMC                                    | CE according to 2014/30/EU   |
|                        | Mode of operation                      | Type 1.AA  |
|                        | Rated impulse voltage supply / control | 0.8 kV   |
|                        | Control pollution degree               | 3  |
|                        | Ambient temperature                    | -30...50° C  |
|                        | Storage temperature                    | -40...80° C  |
|                        | Ambient humidity                       | Max. 95% r.H., non-condensing  |
|                        | Servicing                              | maintenance-free   |
| <b>Mechanical data</b> | Connection flange                      | F05  |
| <b>Weight</b>          | Weight                                 | 2.9 kg   |
| <b>Terms</b>           | Abbreviations                          | POP = Power off position / fail-safe position<br>CPO = Controlled power off / controlled fail-safe<br>PF = Power fail delay time / bridging time |

Safety notes



- The device must not be used outside the specified field of application, especially not 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 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.
- To calculate the torque required, the specifications supplied by the damper manufacturers concerning the cross-section, the design, the installation site and the ventilation conditions must be observed.
- 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

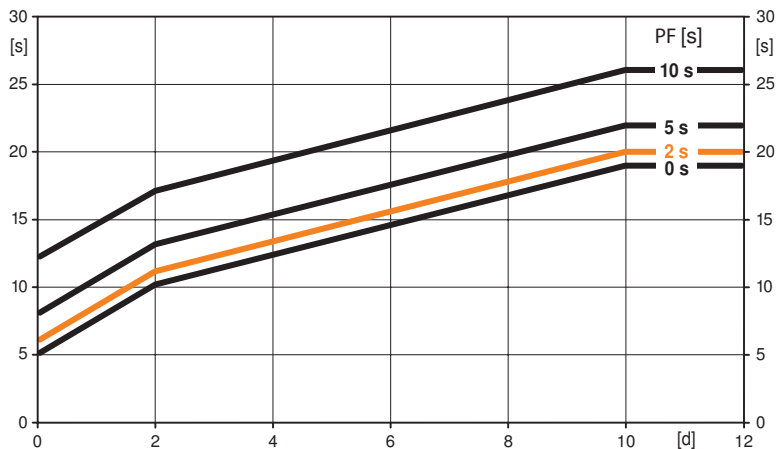
Pre-charging time (start up)

The capacitor actuators require a pre-charging time. This time is used for charging the capacitors up to a usable voltage level. This ensures that, in the event of a power failure, the actuator can move at any time from its current position into the preset fail-safe position.

The duration of the pre-charging time depends mainly on following factors:

- Duration of the power failure
- PF delay time (bridging time)

Typical pre-charging time



| PF [s] | [d] |    |    |    |     |
|--------|-----|----|----|----|-----|
|        | 0   | 1  | 2  | 7  | ≥10 |
| 0      | 5   | 8  | 10 | 15 | 19  |
| 2      | 6   | 9  | 11 | 16 | 20  |
| 5      | 8   | 11 | 13 | 18 | 22  |
| 10     | 12  | 15 | 17 | 22 | 26  |

[s]

[d] = Electricity interruption in days  
 [s] = Pre-charging time in seconds  
 PF[s] = Bridging time

Calculation example: Given an electricity interruption of 3 days and a bridging time (PF) set at 5 s, the actuator requires a pre-charging time of 14 s after the electricity has been reconnected (see graphic).

Delivery condition (capacitors)

The actuator is completely discharged after delivery from the factory, which is why the actuator requires approximately 20 s pre-charging time before initial commissioning in order to bring the capacitors up to the required voltage level.

Converter for sensors

Connection option for two sensors (passive sensor, active sensor or switching contact). The actuator serves as an analogue/digital converter for the transmission of the sensor signal to the higher level system.

## Product features

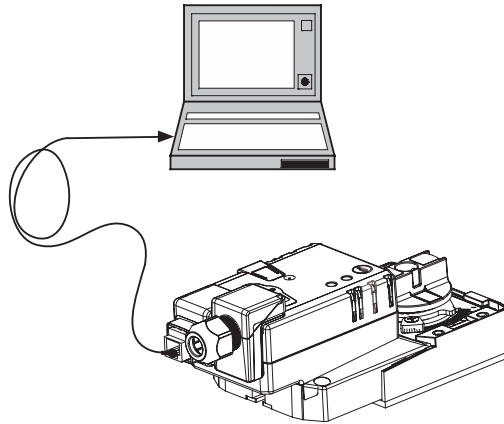
**Communication** The parametrisation can be carried out through the integrated web server (RJ45 connection to the web browser), by communicative means or via the Cloud. Additional information regarding the integrated web server can be found in the separate documentation.

**“Peer to Peer” connection**  
<http://belimo.local:8080>  
 The Notebook must be set to “DHCP”.  
 Make sure that only one network connection is active.

**Standard IP address:**  
<http://192.168.0.10:8080>  
 Static IP address

**Password (read-only):**  
 User name: «guest»  
 Password: «guest»

### Simple direct mounting



Simple direct mounting on the rotary valve or butterfly valve with mounting flange. The mounting orientation in relation to the fitting can be selected in 90° steps.

### Data recording

The recorded data (integrated data recording for 13 months) can be used for analytical purposes.  
 Download csv files via web browser.

### Manual override

Manual control with push-button possible - temporary. The gear is disengaged and the actuator decoupled for as long as the button is pressed.

### Adjustable angle of rotation

Adjustable angle of rotation with mechanical end stops.

### High functional reliability

The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.

### Combination valve/actuator

For valves with the following mechanical specifications in accordance with ISO 5211 F05:  
 - Square stem head SW = 14 mm for form-fit coupling of the rotary actuator.  
 - Hole circle d = 50 mm

### Setting direction of rotation

When actuated, the direction of the rotation switch changes the running direction in normal operation. The direction of the rotation switch has no influence on the fail-safe position which has been set.

### Setting fail-safe position (POP)

The rotary knob fail-safe position can be used to adjust the desired fail-safe position 0...100% in 10% increments. The rotary knob always refers to the adapted angle of rotation range. In the event of a power failure, the actuator will move into the selected fail-safe position.

Settings: The rotary knob must be set to the «Tool» position for retroactive settings of the fail-safe position with the Belimo service tool MFT-P. Once the rotary knob is set back to the range 0...100%, the manually set value will have positioning authority.

### Bridging time

Electrical interruptions can be bridged up to a maximum of 10 s.  
 In the event of a power failure, the actuator will remain stationary in accordance with the set bridging time. If the power failure is greater than the set bridging time, then the actuator will move into the selected fail-safe position.

The bridging time set ex-works is 2 s. This can be modified on site in operation with the use of the Belimo service tool MFT-P.

Settings: The rotary knob must not be set to the «Tool» position!

Only the values need to be entered for retroactive adjustments of the bridging time with the Belimo service tool MFT-P.

### Adaption and synchronisation

An adaption can be triggered manually by pressing the “Adaption” button. Both mechanical end stops are detected during the adaption (entire setting range). The actuator then moves into the position defined by the positioning signal.

Accessories

|                        | Description   | Type     |
|------------------------|---|----------|
| Electrical accessories | Grommet for RJ connection module,   | Z-STRJ.1 |
|                        | Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin service socket for Belimo device | ZK1-GEN  |
| Service Tools          | Description   | Type     |
|                        | Service Tool, with ZIP-USB function   | ZTH EU   |

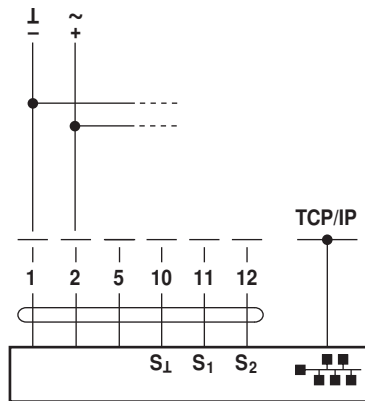
Electrical installation



- Notes**
- Connection via safety isolating transformer.
  - Parallel connection of other actuators possible. Observe the performance data.

Wiring diagrams

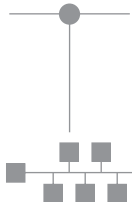
AC/DC 24 V



**Cable colours:**

- 1 = black
- 2 = red
- 5 = orange
- 10 = yellow-black
- 11 = yellow-pink
- 12 = yellow-grey

Web-Browser



Connection of a notebook for parameterisation and manual control via RJ45.

Optional connection via RJ45 (direct connection Notebook / connection via Intranet or Internet) for access to the integrated web server

Functions

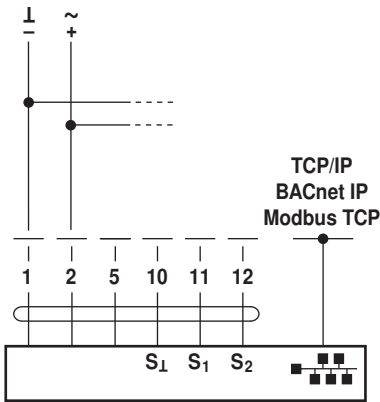


- Notes**
- The connection diagrams shows connections for the first sensor on terminal S1, while the second sensor can be connected identically on terminal S2.
  - Parallel use of different sensor types is permitted.
  - For hybrid operation, S1 is used for the control signal Y and must be configured as an active sensor.

**Functions**

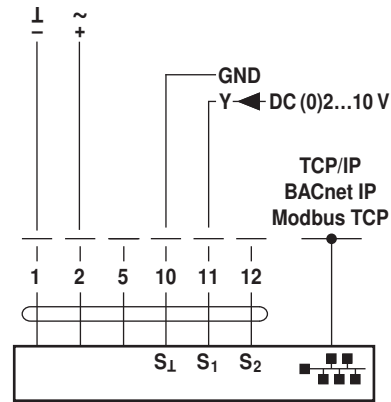
**Functions for devices with specific parameters (Parametrisation necessary)**

TCP/IP (Cloud) / BACnet IP / Modbus TCP

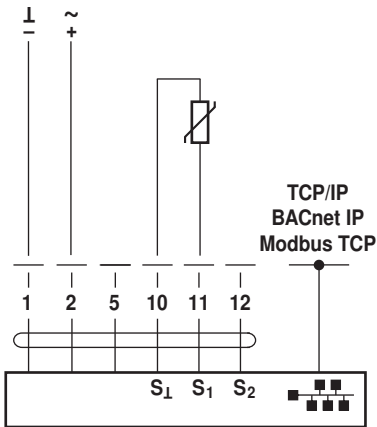


Connection of passive sensors

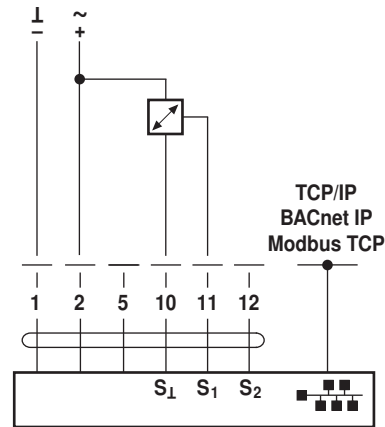
TCP/IP (Cloud) / BACnet IP / Modbus TCP with analogue setpoint (Hybrid operation)



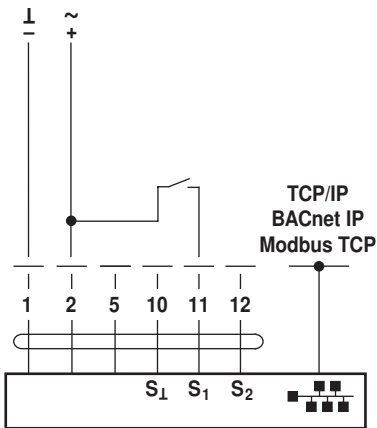
Connection of active sensors



Switching contact connection



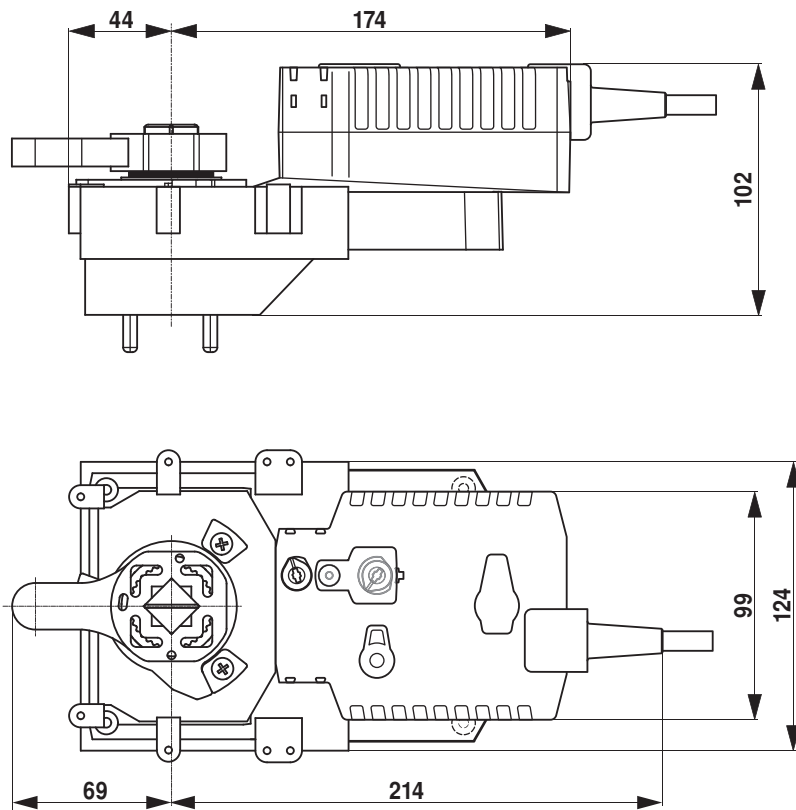
Modulating contact connection



Fail-safe contact connection

## Dimensions [mm]

## Dimensional drawings



## Further documentation

- General notes for project planning
- Instruction Webserver
- Description Protocol Implementation Conformance Statement PICS
- Description Modbus register
- Description clientAPI