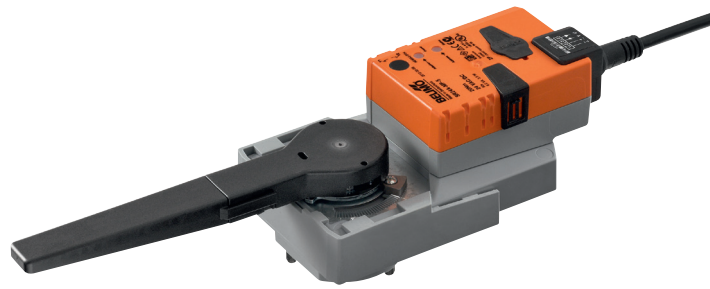


Communicative rotary actuator for rotary valves and butterfly valves

- Nominal torque 20 Nm
- Nominal voltage AC/DC 24 V
- Control Modulating DC (0)2...10 V Variable
- Position feedback DC 2...10 V Variable
- 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 | 3.5 W |
| | Power consumption in rest position | 1.25 W |
| | Power consumption for wire sizing | 6 VA |
| | Connection supply / control | Cable 1 m, 4 x 0.75 mm ² |
| Parallel operation | Yes (note the performance data) | |
| Functional data | Torque motor | Min. 20 Nm |
| | Positioning signal Y | DC 0...10 V |
| | Positioning signal Y note | Input impedance 100 kΩ |
| | Control signal Y variable | Open-close 3-point (AC only) Modulating (DC 0...32 V) |
| | Operating range Y | DC 2...10 V |
| | Operating range Y variable | Start point DC 0.5...30 V End point DC 2.5...32 V |
| | Position feedback U | DC 2...10 V |
| | Position feedback U note | Max. 0.5 mA |
| | Position feedback U variable | Start point DC 0.5...8 V End point DC 2.5...10 V |
| | Position accuracy | ±5% |
| | Manual override | Gear disengagement with push-button, can be locked |
| | Running time motor | 90 s / 90° |
| | Motor running time variable | 90...350 s |
| | Adaption setting range | manual (automatic on first power-up) |
| | Adaption setting range variable | No action Adaption when switched on Adaption 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, integrated, two-section | |
| Safety | Protection class IEC/EN | III Safety extra-low voltage |
| | Protection class UL | UL Class 2 Supply |
| | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2, UL Enclosure Type 2 |
| | EMC | CE according to 2004/108/EC |
| | Certification IEC/EN | IEC/EN 60730-1 and IEC/EN 60730-2-14 |
| | Certification UL | cULus according to UL 60730-1A, UL 60730-2-14 and CAN/CSA E60730-1:02 |
| | Mode of operation | Type 1 |
| | Rated impulse voltage supply / control | 0.8 kV |
| Control pollution degree | 3 | |
| Ambient temperature | -30...50 °C | |

Technical data

| | | |
|------------------------|---------------------------|--------------------------|
| Safety | Non-operating temperature | -40...80 °C |
| | Ambient humidity | 95% r.h., non-condensing |
| | Maintenance | Maintenance-free |
| Mechanical data | Connection flange | F05 |
| Weight | Weight approx. | 1.2 kg |

Safety notes



- This device has been designed for use in stationary heating, ventilation and air conditioning systems and is not allowed to 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 switch for changing the direction of rotation may only be operated by authorised specialists. The direction of rotation must not in particular be reversed in a frost protection circuit.
- 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 is not allowed to be disposed of as household refuse. All locally valid regulations and requirements must be observed.

Product features

| | |
|-------------------------------------|--|
| Principle of operation | <p>Conventional operation: The actuator is connected with a standard modulating signal of DC 0 ... 10V and travels to the position defined by the positioning signal. The measuring voltage U serves for the electrical display of the actuator position 0 ... 100% and as slave control signal for other actuators.</p> <p>Operation on the MP-Bus: The actuator receives its digital positioning signal from the higher level controller via the MP-Bus and travels 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. |
| Parameterisable actuators | The factory settings cover the most common applications. Input and output signals and other parameters can be altered with the PC-Tool MFT-P or with the Service tool ZTH EU. |
| 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. |
| Manual override | Manual override with push-button possible (the gear is disengaged for as long as the button is pressed or remains locked). |
| High functional reliability | The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached. |
| Adjustable angle of rotation | Adjustable angle of rotation with mechanical end stops. |
| Combination valve/actuator | <p>For valves with the following mechanical specifications in accordance with ISO 5211 F05:</p> <ul style="list-style-type: none"> - Square stem head SW = 14 mm for form fit coupling of the rotary actuator. - Hole circle d = 50 mm |
| Home position | <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. Factory setting: Y2 (counter-clockwise rotation).</p> |

Product features

- 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

| | Description | Type |
|---------------------------------------|---|-------------|
| Gateways | Gateway MP for BACnet MS/TP, AC/DC 24 V | UK24BAC |
| | Gateway MP to Modbus RTU, AC/DC 24 V | UK24MOD |
| | Gateway MP for LonWorks®, AC/DC 24 V, LonMark-certified | UK24LON |
| | Gateway MP to KNX/EIB, AC/DC 24 V, EIBA certified | UK24EIB |
| Electrical accessories | Description | Type |
| | Connecting cable 5 m, A+B: RJ12 6/6, To ZTH/ZIP-USB-MP | ZK1-GEN |
| | Connection cable 5 m, A: RJ11 6/4, B: Free wire end, To ZTH/ZIP-USB-MP | ZK2-GEN |
| | Connecting board MP bus suitable for wiring boxes EXT-WR-FP..-MP | ZFP2-MP |
| | MP-Bus power supply for MP actuators, AC 230/24V for local power supply | ZN230-24MP |
| | Feedback potentiometer 200 Ohm, add-on | P200A |
| | Feedback potentiometer 500 Ohm, add-on | P500A |
| | Feedback potentiometer 2.8 kOhm, add-on | P2800A |
| Feedback potentiometer 5 kOhm, add-on | P5000A | |
| Service Tools | Description | Type |
| | Service Tool, for MF/MP/Modbus/LonWorks actuators and VAV-Controller | ZTH EU |
| | Belimo PC-Tool, software for adjustments and diagnostics | MFT-P |
| | Adapter to Service-Tool ZTH | MFT-C |

Electrical installation

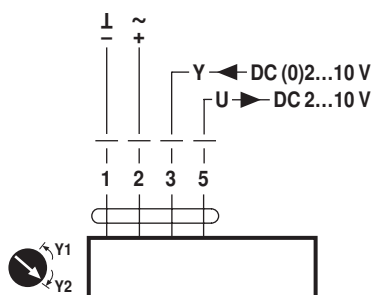


Notes

- Connection via safety isolating transformer.
- Parallel connection of other actuators possible. Observe the performance data.
- Direction of rotation switch is covered. Factory setting: Direction of rotation Y2.

Wiring diagrams

AC/DC 24 V, modulating

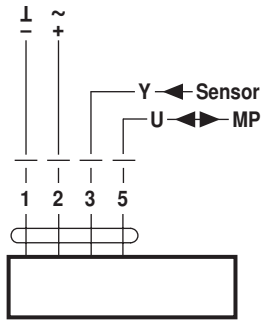


Cable colours:

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

Electrical installation

Operation on the MP-Bus

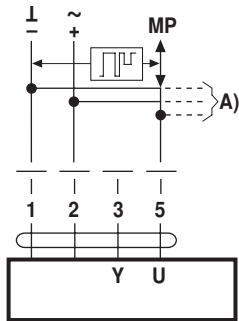


Cable colours:
 1 = black
 2 = red
 3 = white
 5 = orange

Functions

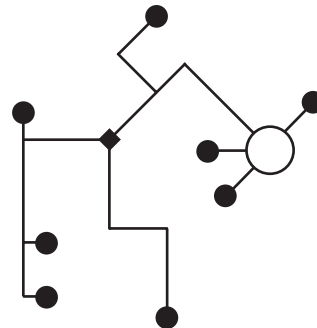
Functions when operated on MP-Bus

Connection on the MP-Bus



A) more actuators and sensors (max.8)

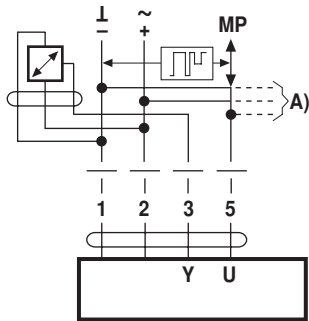
Network topology



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

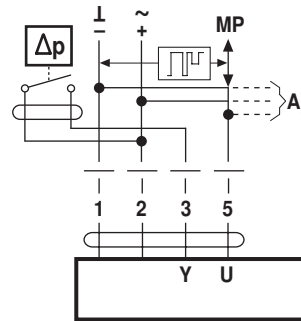
Connection of active sensors



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

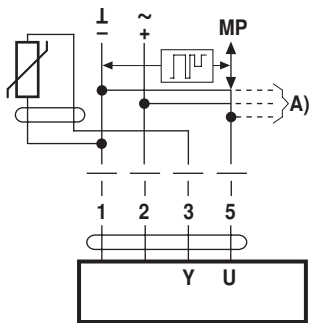
Connection of external switching contact



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 kΩ ²⁾ |

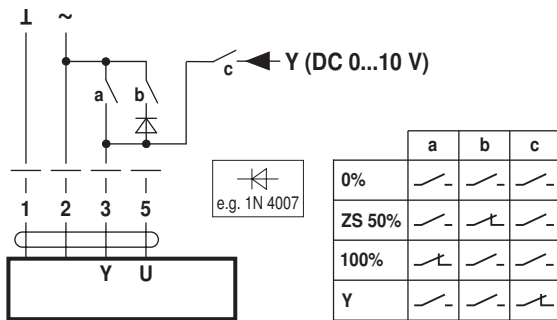
A) more actuators and sensors (max.8)

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

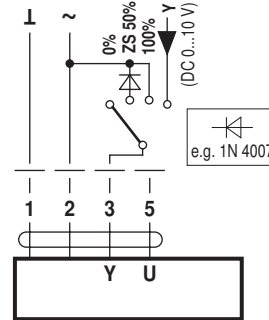
Functions

Functions with basic values (conventional mode)

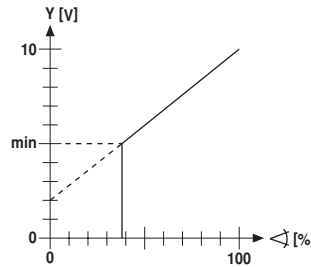
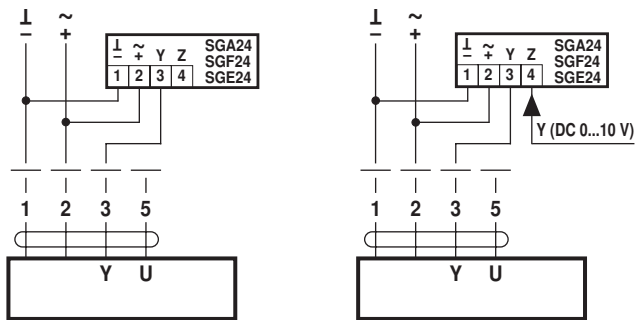
Override control with AC 24 V with relay contacts



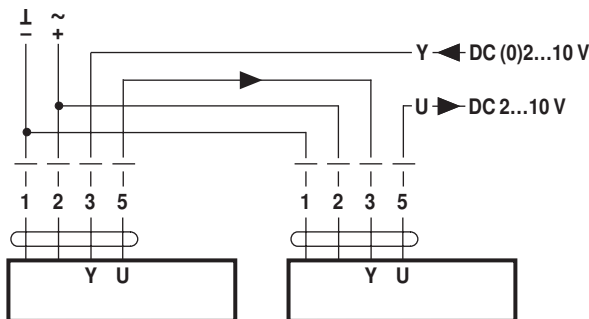
Override control with AC 24 V with rotary switch



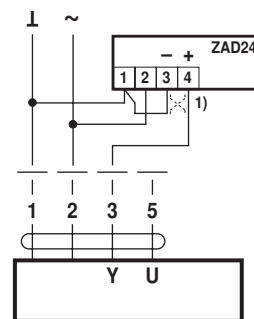
Remote control 0...100% with positioner SG.. Minimum limit with positioner SG..



Follow-up control (position-dependent)

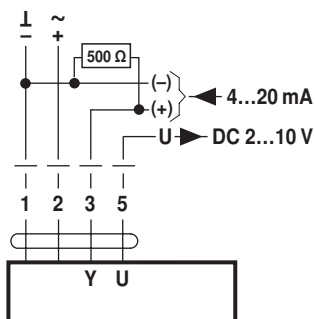


Position indication



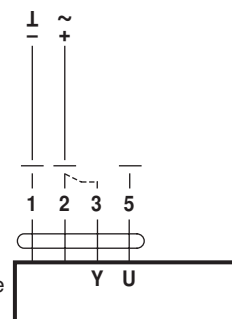
(1) Adapting the direction of rotation

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



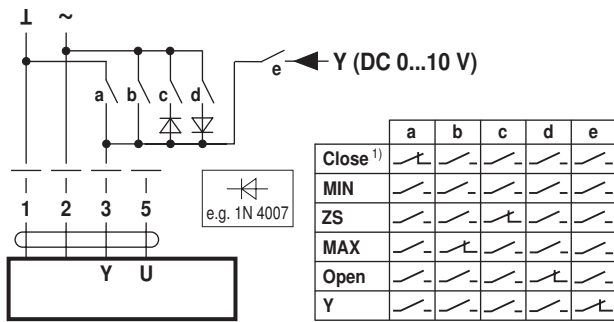
Procedure

1. Connect 24V to connections 1 and 2
2. Disconnect connection 3:
 - with direction of rotation Y1: Actuator rotates to the left
 - with direction of rotation Y2: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
 - Actuator runs in opposite direction

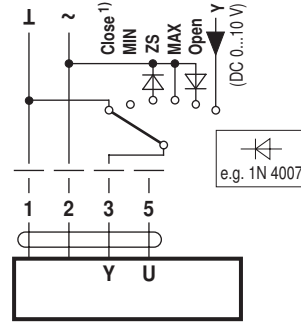
Functions

Functions for actuators with specific parameters (Parametrisation with PC-Tool necessary)

Override control and limiting with AC 24 V with relay contacts

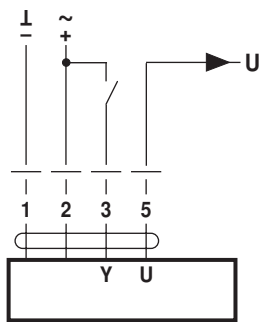


Override control and limiting with AC 24 V with rotary switch

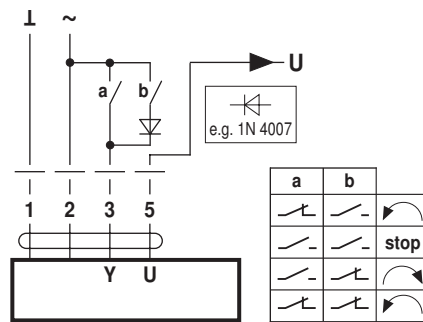


1) **Caution:** This function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

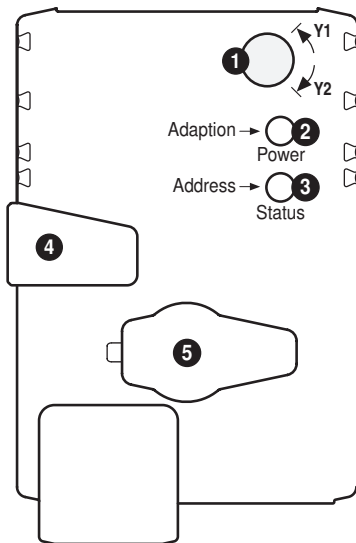
Control open-close



Control 3-point with AC 24 V



Operating controls and indicators



1 Direction of rotation switch

Switch over: Direction of rotation changes

2 Push-button and LED display green

Off: No power supply or malfunction
On: In operation

Press button: Triggers angle of rotation adaptation, followed by standard mode

3 Push-button and LED display yellow

Off: Standard mode
Flickering: MP communication active
On: Adaptation or synchronising 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, synchronisation starts, followed by standard mode

5 Service plug

For connecting parameterisation and service tools

Check power supply connection

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

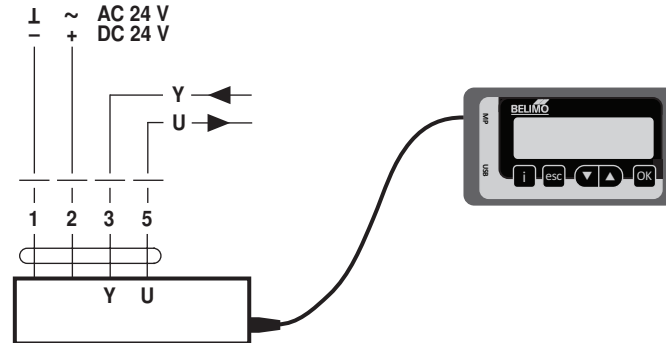
Service



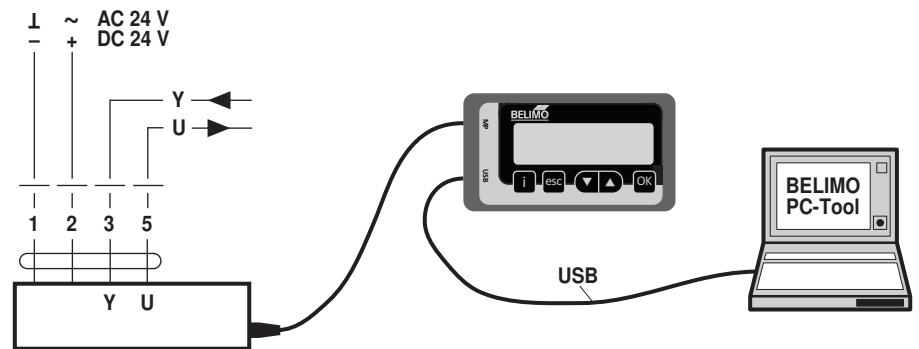
Notes

- The actuator can be parameterised by PC-Tool and ZTH EU via the service socket.

ZTH EU connection

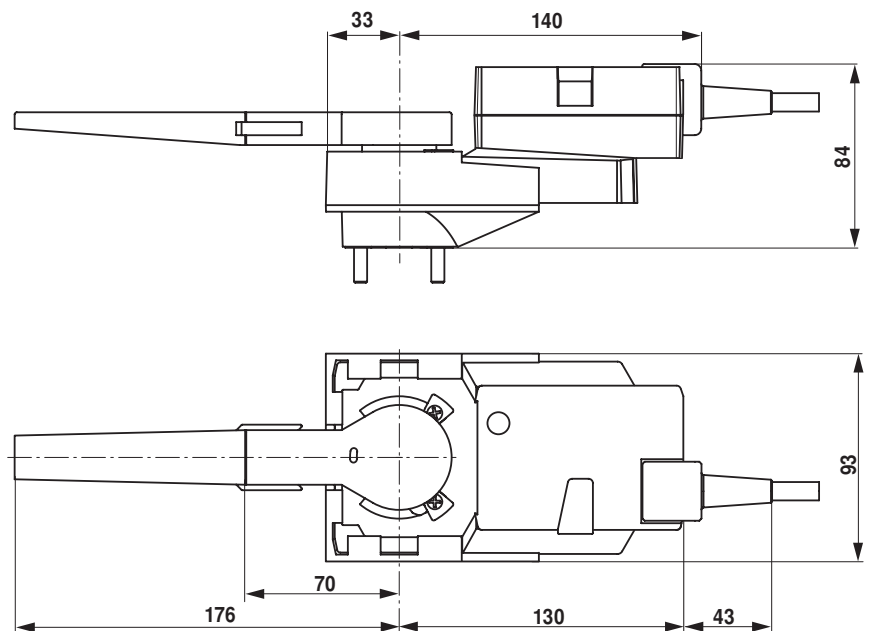


PC-Tool connection



Dimensions [mm]

Dimensional drawings



Further documentation

- Overview Valve-actuator combinations
- Data sheets for rotary valves and butterfly valves
- Installation instructions for actuators and/or rotary valves and butterfly valves
- General notes for project planning