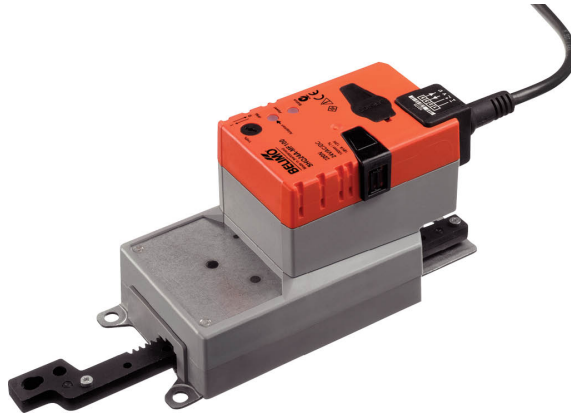


Configurable linear actuator for adjusting dampers and slide valves in technical building installations

- Actuating force 200 N
- Nominal voltage AC/DC 24 V
- Control modulating 2...10 V variable
- Position feedback 2...10 V variable
- Length of Stroke Max. 100 mm, adjustable in 20 mm increments
- Running time motor 7 s variable



## 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  | 13 W   |
|                                   | Power consumption in rest position  | 2 W  |
|                                   | Power consumption for wire sizing   | 23 VA  |
|                                   | Power consumption for wire sizing note  | Imax 20 A @ 5 ms                                       |
|                                   | Connection supply / control   | Cable 1 m, 4 x 0.75 mm <sup>2</sup>                    |
|                                   | Parallel operation  | Yes (note the performance data)                        |
| <b>Functional data</b>            | Actuating force motor   | 200 N  |
|                                   | Actuating force variable  | 25%, 50%, 75% reduziert                                |
|                                   | Operating range Y   | 2...10 V   |
|                                   | Input Impedance   | 100 kΩ   |
|                                   | Operating range Y variable  | Start point 0.5...30 V<br>End point 2.5...32 V         |
|                                   | Operating modes optional  | Open/close<br>Modulating (DC 0...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<br>End point 2.5...10 V          |
|                                   | Position accuracy   | ±5%  |
|                                   | Direction of motion motor   | selectable with switch                                 |
|                                   | Direction of motion note  | Y = 0 V: with switch 0 (retracted) / 1 (extended)      |
|                                   | Direction of motion variable  | electronically reversible                              |
|                                   | Manual override   | with push-button, can be locked                        |
|                                   | Stroke  | 100 mm   |
|                                   | Length of Stroke  | Max. 100 mm, adjustable in 20 mm increments            |
|                                   | Minimum stroke  | 40 mm  |
|                                   | Stroke limitation   | can be limited on both sides with mechanical end stops |
|                                   | Running time motor  | 7 s / 100 mm   |
|                                   | Running time motor variable   | 7...30 s / 100mm                                       |
|                                   | Adaptation setting range  | manual (automatic on first power-up)                   |
| Adaptation setting range variable | No action<br>Adaptation when switched on<br>Adaptation after pushing the manual override button           |  |
| Override control                  | MAX (maximum position) = 100%<br>MIN (minimum position) = 0%<br>ZS (intermediate position, AC only) = 50% |  |

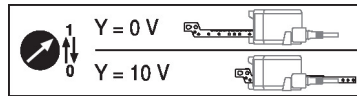
|                        |  |   |
|------------------------|--|---|
| <b>Functional data</b> | Override control variable              | MAX = (MIN + 32%)...100%<br>MIN = 0%...(MAX – 32%)<br>ZS = MIN...MAX  |
|                        | Sound power level, motor               | 56 dB(A)  |
| <b>Safety data</b>     | Protection class IEC/EN                | III, Safety Extra-Low Voltage (SELV)  |
|                        | Power source 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  |
|                        | UL Approval                            | cULus according to UL60730-1A, UL60730-2-14 and CAN/CSA E60730-1<br>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  |
|                        | Pollution degree                       | 3   |
|                        | Ambient humidity                       | Max. 95% RH, non-condensing   |
|                        | Ambient temperature                    | -30...40°C [-22...104°F]  |
|                        | Ambient temperature note               | Caution: +40...+50°C utilisation possible only under certain restrictions. Please contact your supplier.  |
| Storage temperature    | -40...80°C [-40...176°F]               |   |
| Servicing              | maintenance-free                       |   |
| <b>Weight</b>          | 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 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 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.
- The rotary supports and coupling pieces available as accessories must always be used if transverse forces are likely. In addition, the actuator must not be tightly bolted to the application. It must remain movable via the rotary support (refer to «Installation notes»).
- If the actuator is exposed to severely contaminated ambient air, appropriate precautions must be taken on the system side. Excessive deposits of dust, soot etc. can prevent the gear rod from being extended and retracted correctly.
- If not installed horizontally, the manual override button may only be actuated when there is no pressure on the gear rod.
- To calculate the actuating force required for air dampers and slide valves, the specifications supplied by the damper manufacturers concerning the cross section, the design, the installation situation and the ventilation conditions must be observed.
- If a rotary support and/or coupling piece is used, actuation force losses are to be expected.
- Self-adaptation is necessary when the system is commissioned or whenever the stroke limiting is adjusted (press the adaptation push-button).
- 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 control signal of 0...10 V and drives to the position defined by the control signal. Measuring voltage U serves for the electrical display of the damper position 0...100% and as 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.
- Simple direct mounting** The actuator can be directly connected with the application using the enclosed screws. The head of the gear rod is connected to the moving part of the ventilating application individually on the mounting side or with the Z-KS1 coupling piece provided for this purpose.
- Manual override** Manual override with push-button possible (the gear train is disengaged for as long as the button is pressed or remains locked).
- Adjustable stroke** If a stroke limitation will be adjusted, the operating range on this side of the gear rod can be used starting with an extension length of 20 mm and then can be limited respectively in increments of 20 mm by means of the mechanical end stops Z-AS1.  
A minimum permissible stroke of 40 mm must be allowed for.
- High functional reliability** The actuator is overload protected, requires no limit switches and automatically stops when the end stop is reached.
- Home position** 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 detection of the mechanical end stops enables a gentle approach to the end positions, thus protecting the actuator mechanics.  
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 the PC-Tool. 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 adapted using the PC-Tool (see MFT-P documentation)

**Accessories**

| Electrical accessories | Description  | Type     |
|------------------------|--|----------|
|                        | Signal converter voltage/current 100 kΩ Supply AC/DC 24 V                  | Z-UIC    |
|                        | Positioner for wall mounting   | SGA24    |
|                        | Positioner for built-in mounting   | SGE24    |
|                        | Positioner for front-panel mounting  | SGF24    |
|                        | Positioner for wall mounting   | CRP24-B1 |
| Mechanical accessories | Description  | Type     |
|                        | End stop kit, Multipack 20 pcs.  | Z-AS1    |
|                        | Rotary support, for linear actuator, for compensation of transverse forces | Z-DS1    |
|                        | Coupling piece M8  | Z-KS1    |

| Tools | Description   | Type    |
|-------|---|---------|
|       | Service Tool, with ZIP-USB function, for parametrisable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH EU  |
|       | Belimo PC-Tool, Software for adjustments and diagnostics  | MFT-P   |
|       | Adapter for Service-Tool ZTH  | MFT-C   |
|       | Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: 6-pin for connection to service socket   | ZK1-GEN |
|       | Connection cable 5 m, A: RJ11 6/4 ZTH EU, B: free wire end for connection to MP/PP terminal   | ZK2-GEN |

Electrical installation

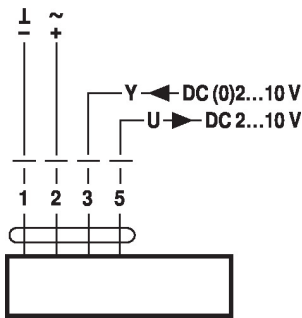


Supply from isolating transformer.

Parallel connection of other actuators possible. Observe the performance data.

Wiring diagrams

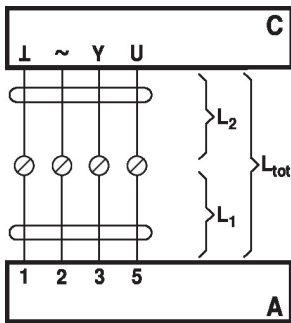
AC/DC 24 V, modulating



Cable colours:

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

Signal cable lengths

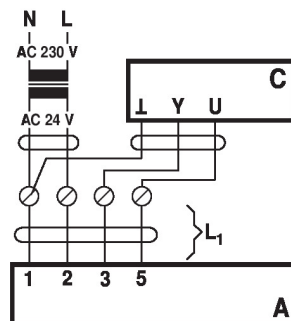


| L <sub>2</sub><br>l / ~ | L <sub>tot</sub> = L <sub>1</sub> + L <sub>2</sub> |       |
|-------------------------|--|-------|
|                         | AC   | DC    |
| 0.75 mm <sup>2</sup>    | ≤30 m  | ≤5 m  |
| 1.00 mm <sup>2</sup>    | ≤40 m  | ≤8 m  |
| 1.50 mm <sup>2</sup>    | ≤70 m  | ≤12 m |
| 2.50 mm <sup>2</sup>    | ≤100 m   | ≤20 m |

- A = Actuator
- C = Control unit (controlling unit)
- L<sub>1</sub> = Connecting cable of the actuator
- L<sub>2</sub> = Customer cable
- L<sub>tot</sub> = Maximum signal cable length

Note:

When several actuators are connected in parallel, the maximum signal cable length must be divided by the number of actuators.



- A = Actuator
- C = Control unit (controlling unit)
- L<sub>1</sub> = Connecting cable of the actuator

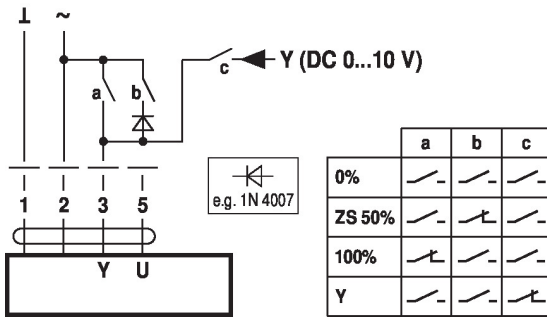
Note:

There are no special restrictions on installation if the supply and the data cable are routed separately.

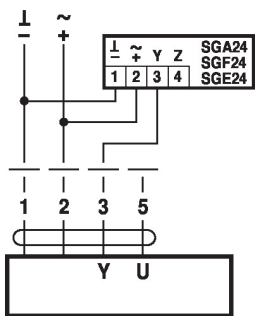
Functions

Functions with basic values (conventional mode)

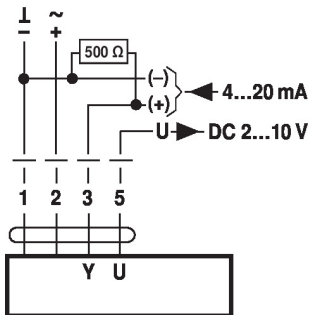
Override control with AC 24 V with relay contacts



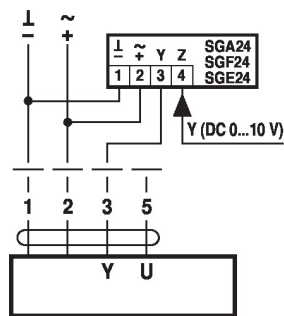
Control remotely 0...100% with positioner SG..



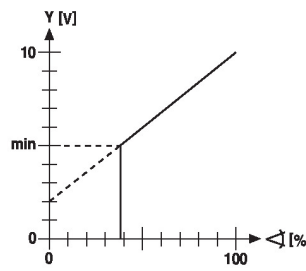
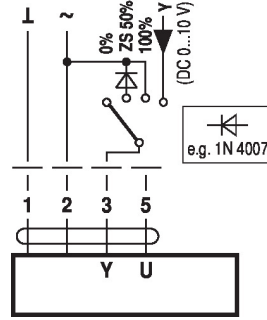
Control with 4...20 mA via external resistor



Minimum limit with positioner SG..



Override control with AC 24 V with rotary switch



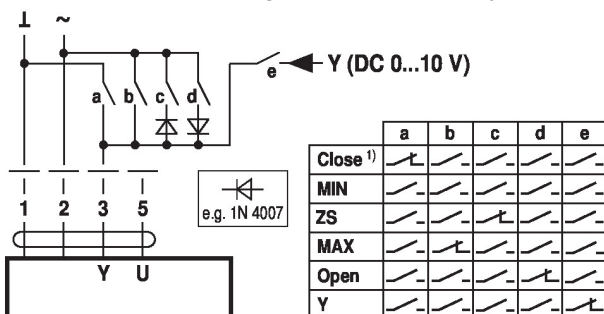
Functional check

Procedure

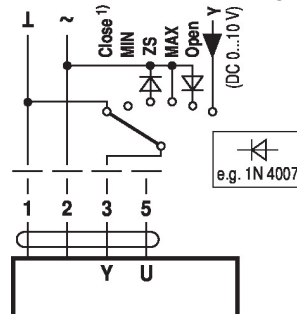
- Apply 24 V to connection 1 and 2
- Disconnect connection 3:
  - for direction of stroke 0: Actuator travels in the direction "retracted"
  - for direction of stroke 1: Actuator travels in the direction "extended"
- Short circuit connections 2 and 3:
  - Actuator runs in the opposite direction

Functions 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



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

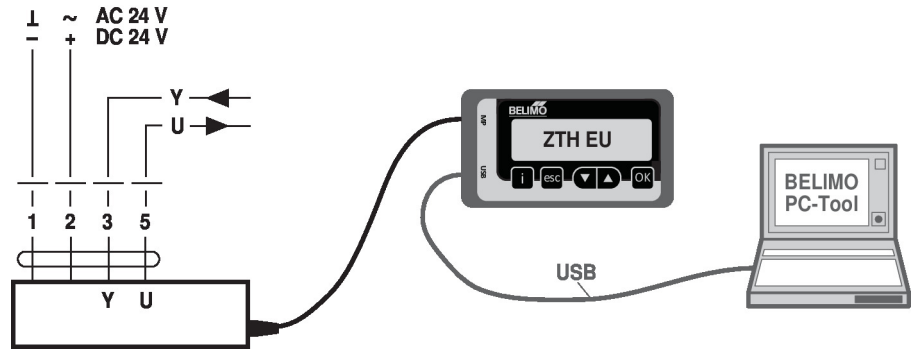


**Negative force** Max. 50% of the actuating force (Caution: Application possible only under certain restrictions. Please contact your supplier.)

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

