

Basic Non Fail-Safe multifunction technology actuator for controlling dampers in typical commercial HVAC applications.

- Torque motor 180 in-lb [20 Nm]
- Nominal voltage AC/DC 24 V
- Control MFT/programmable
- Position feedback 2...10 V



Picture may differ from product



5-year warranty



MFT

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 | 1.3 W |
| | Transformer sizing | 6 VA |
| | Electrical Connection | 18 AWG plenum cable, 1 m, with 1/2" NPT conduit connector, degree of protection NEMA 2 / IP54 |
| | Overload Protection | electronic throughout 0...95° rotation |
| Functional data | Torque motor | 180 in-lb [20 Nm] |
| | Operating range Y | 2...10 V |
| | Operating range Y note | 4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor) |
| | Input impedance | 100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA, 1500 Ω for PWM, On/Off and Floating point |
| | Operating range Y variable | Start point 0.5...30 V End point 2.5...32 V |
| | Operating modes optional | variable (VDC, PWM, on/off, floating point) |
| | Position feedback U | 2...10 V |
| | Position feedback U note | Max. 0.5 mA |
| | Position feedback U variable | VDC variable |
| | Direction of motion motor | selectable with switch 0/1 |
| | Manual override | external push button |
| | Angle of rotation | Max. 95° |
| | Angle of rotation note | adjustable with mechanical stop |
| | Running Time (Motor) | 150 s / 90° |
| | Running time motor variable | 90...350 s |
| | Sound power level, motor | 45 dB(A) |
| | Position indication | Mechanical, 30...65 mm stroke |
| Safety data | Power source UL | Class 2 Supply |
| | Degree of protection NEMA/UL | NEMA 2 |
| | Housing | UL Enclosure Type 2 |

Technical data

| | | |
|--------------------|---------------------|---|
| Safety data | Agency Listing | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02 CE acc. to 2014/30/EU and 2014/35/EU |
| | Quality Standard | ISO 9001 |
| | UL 2043 Compliant | Suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC |
| | Ambient humidity | Max. 95% RH, non-condensing |
| | Ambient temperature | -22...122°F [-30...50°C] |
| | Storage temperature | -40...176°F [-40...80°C] |
| | Servicing | maintenance-free |
| Weight | Weight | 2.6 lb [1.2 kg] |
| Materials | Housing material | UL94-5VA |

Footnotes †Rated Impulse Voltage 800V, Type action 1, Control Pollution Degree 3.

Product features

- Application** For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.
- The actuator is mounted directly to a damper shaft up to 1.05" in diameter by means of its universal clamp. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.
- The default parameters for 2...10 V applications of the ..MFT actuator are assigned during manufacturing. If necessary, custom versions of the actuators can be ordered. The parameters can be changed by two means: pre-set and custom configurations from Belimo or on-site configurations using the Belimo PC-Tool software.
- Operation** The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.
- The actuator provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be manually disengaged with a button on the actuator cover.
- The actuators use a brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator's rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.
- Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.
- For low ambient temperatures, the optional supplemental (-H) Heater add-on is available.
- Typical specification** Modulating control damper actuators shall be electronic direct-coupled type, which require no crank arm and linkage and be capable of direct mounting to a shaft up to 3/4" diameter. Actuators must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500 Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. Actuators shall have brushless DC motor technology and be protected from overload at all angles of rotation. Run time shall be constant and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position indication. Actuators shall be cULus listed, NEMA 4X, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

Accessories

| Tools | Description | Type |
|-------|---|--------|
| | Signal simulator, Power supply AC 120 V | PS-100 |

Accessories

| | Description | Type |
|------------------------|---|--------------|
| Electrical accessories | Connecting cable 16 ft [5 m], A: RJ11 6/4 LINK.10, B: 6-pin for connection to service socket | ZK1-GEN |
| | Connecting cable 10 ft [3 m], A: RJ11 6/4 LINK.10, B: 3-pin Weidmüller and supply connection | ZK4-GEN |
| | Service tool, with ZIP-USB function, for configurable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US |
| | | |
| | Description | Type |
| Electrical accessories | Auxiliary switch 1x SPDT add-on | S1A |
| | Auxiliary switch 2x SPDT add-on | S2A |
| | Auxiliary switch, mercury-free | P475 |
| | Auxiliary switch, mercury-free | P475-1 |
| | Feedback potentiometer 140 Ω add-on, grey | P140A GR |
| | Feedback potentiometer 500 Ω add-on, grey | P500A GR |
| | Feedback potentiometer 1 kΩ add-on, grey | P1000A GR |
| | Feedback potentiometer 2.8 kΩ add-on, grey | P2800A GR |
| | Feedback potentiometer 5 kΩ add-on, grey | P5000A GR |
| | Feedback potentiometer 10 kΩ add-on, grey | P10000A GR |
| | Feedback potentiometer 15 kΩ gray | P15000A-F GR |
| | Transformer, AC 120 V to AC 24 V, 40 VA | ZG-X40 |
| | Cable conduit connector 1/2" | TF-CC US |
| | Cable Gland (NEMA 4 models) | 43442-00001 |
| | Positioner for wall mounting | SGA24 |
| | Positioner for front-panel mounting | SGF24 |
| | | IRM-100 |
| Gateways | Resistor, 500 Ω, 1/4" wire resistor with 6" pigtail wires | ZG-R01 |
| | | ZS-T |
| | Description | Type |
| Gateways | Gateway MP to BACnet MS/TP | UK24BAC |
| | Gateway MP to Modbus RTU | UK24MOD |
| | Gateway MP to LonWorks | UK24LON |
| | | |
| | Description | Type |
| Mechanical accessories | Damper crank arm Slot width 6.2 mm, clamping range ø10...18 mm | KH6 |
| | Damper crank arm Slot width 8.2 mm, clamping range ø10...18 mm | KH8 |
| | Damper crank arm Slot width 8.2 mm, clamping range ø14...25 mm | KH10 |
| | Damper crank arm Slot width 8.2 mm, for ø1.05" | KH12 |
| | Ball joint suitable for damper crank arm KH8 | KG6 |
| | Ball joint suitable for damper crank arm KH8 | KG8 |
| | Ball joint suitable for damper crank arm KH8 / KH10 | KG10A |
| | | SH8 |
| | Push rod for KG10A ball joint L 36", 3/8" diameter | SH10 |
| | | ZG-DC1 |
| | | ZG-DC2 |
| | Weather shield 13x8x6" [330x203x152 mm] (LxWxH) | ZS-100 |
| | Baseplate, for ZS-100 | ZS-101 |
| | Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH) | ZS-150 |
| | Shaft extension 240 mm ø20 mm for damper shaft ø8...22.7 mm | AV8-25 |
| | | TF-P |
| | Mounting bracket for AF.. | ZG-100 |
| | Mounting bracket for AF / NF | ZG-101 |
| | Wrench 0.32 in and 0.39 in [8 mm and 10 mm] | TOOL-06 |
| | Adapter for auxiliary switch and feedback potentiometer, Multipack 20 pcs. | Z-SPA |
| | Actuator arm for standard shaft clamp (one-sided) | AH-25 |
| | | K-AM25 |
| | Shaft clamp reversible, clamping range ø10...20 mm | K-SA |
| | Mounting bracket | ZG-109 |
| | Linkage kit | ZG-110 |

Accessories

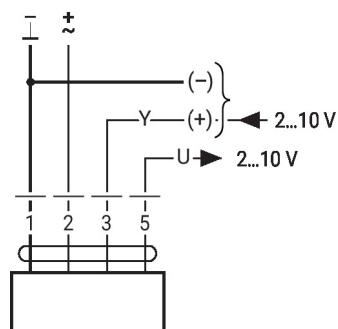
| Description | Type |
|---|-----------|
| Mounting bracket for LF.. | ZG-112 |
| | ZG-JSA-1 |
| | ZG-JSA-2 |
| | ZG-JSA-3 |
| Mounting kit for linkage operation for flat installation | ZG-NMA |
| Linkage kit | ZG-JSL |
| Jackshaft RetroFIT+ Linkage with Belimo Rotary Actuators | |
| Explosion proof housing 16x10x6.435" [406x254x164 mm] (LxWxH), UL and CSA, Class I, Zone 1&2, Groups B, C, D, (NEMA 7), Class III, Hazardous (classified) Locations | ZS-260 |
| Weather shield 17-1/4x8-3/4x5-1/2" [438x222x140 mm] (LxWxH), NEMA 4X, with mounting brackets | ZS-300 |
| Weather shield 17-1/4x8-3/4x5-1/2" [438x222x140 mm] (LxWxH), NEMA 4X, with mounting brackets | ZS-300-5 |
| Shaft extension 1/2" | ZS-300-C1 |
| Shaft extension 3/4" | ZS-300-C2 |
| Shaft extension 1" | ZS-300-C3 |
| Baseplate extension for SM..A to SM../AM../SMD24R | Z-SMA |
| | ZG-SGF |









Electrical installation

Wire colors:

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

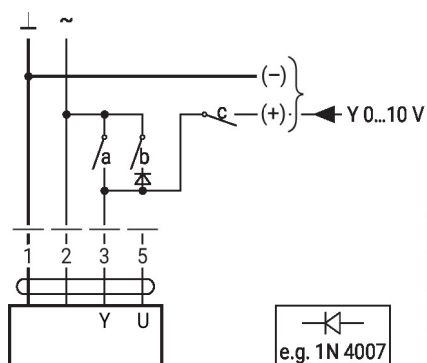
AC/DC 24 V, modulating



| 1 | 2 | 3 | 4 | 5 |
|---|---|------|---|---|
|  |  | 2 V |  |  |
|  |  | 10 V |  |  |

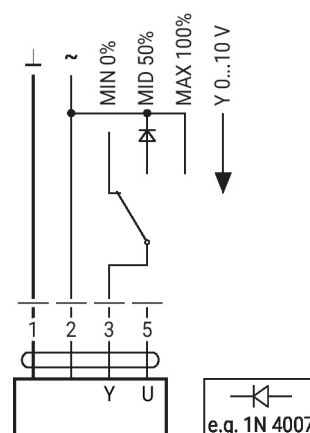
Further electrical installations
Functions with basic values (conventional mode)

Override control with AC 24 V with relay contacts

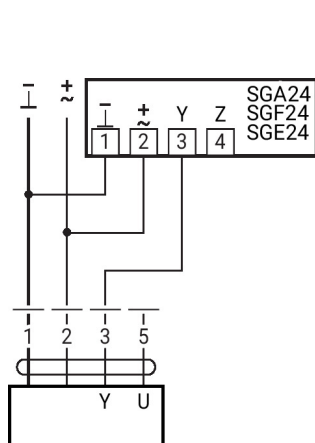


| 1 | 2 | a | b | c | |
|---|---|---|---|---|--------|
| | | | | | 0 % |
| | | | | | ZS 50% |
| | | | | | 100% |
| | | | | | Y |

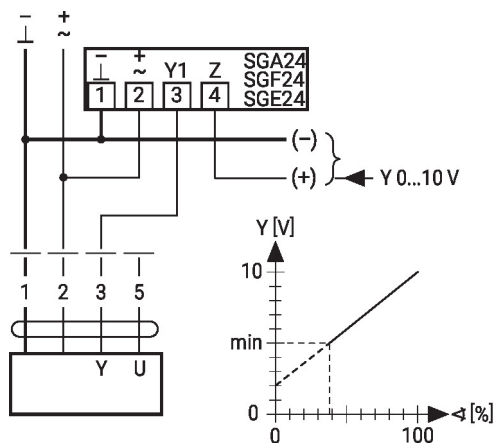
Override control with AC 24 V with rotary switch



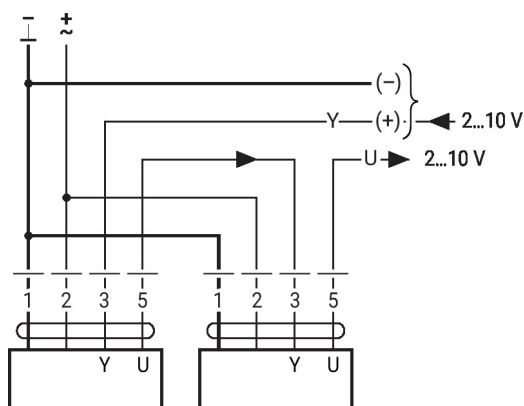
Control remotely 0...100% with positioner SG..



Minimum limit with positioner SG..



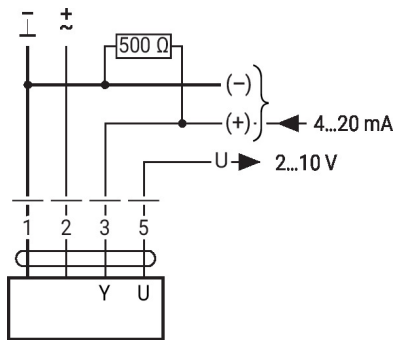
Primary/secondary operation (position-dependent)



Further electrical installations

Functions with basic values (conventional mode)

Control with 4...20 mA via external resistor

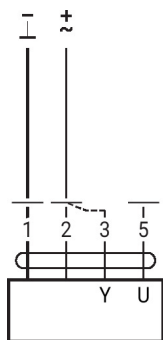


Caution:

The operating range must be set to DC 2...10 V.

The 500 Ohm resistor converts the 4...20 mA current signal to a voltage signal DC 2...10 V.

Functional check



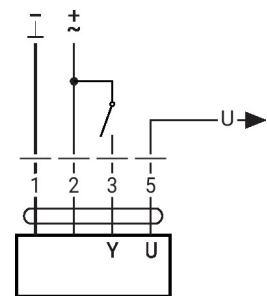
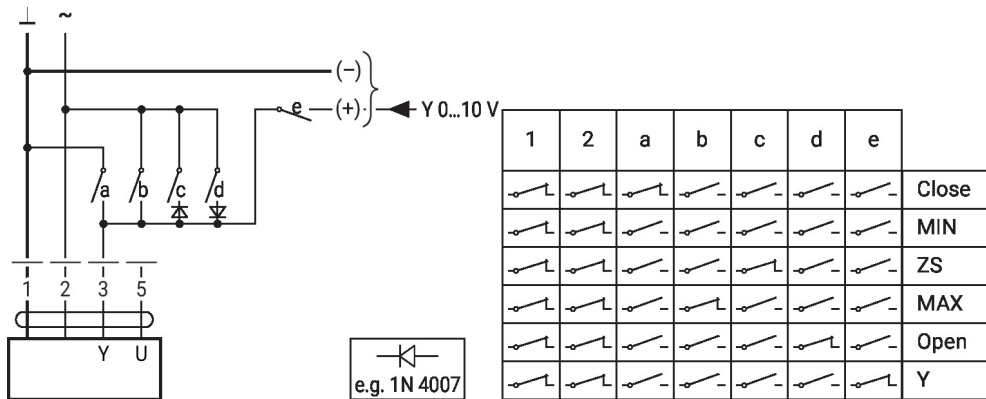
Procedure

1. Connect 24 V to connections 1 and 2
2. Disconnect connection 3:
 - With direction of rotation 0: Actuator rotates to the left
 - With direction of rotation 1: Actuator rotates to the right
3. Short-circuit connections 2 and 3:
 - Actuator runs in opposite direction

Functions with specific parameters (configuration necessary)

Override control and limiting with AC 24 V with relay contacts

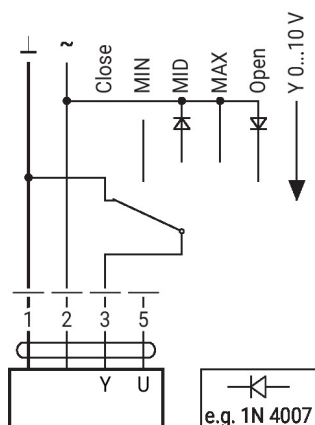
Control on/off



Further electrical installations

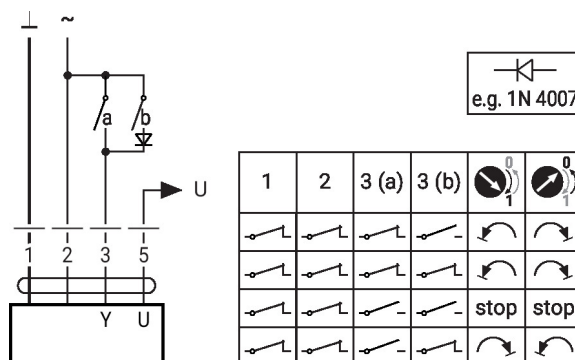
Functions with specific parameters (configuration necessary)

Override control and limiting with AC 24 V with rotary switch



Caution:
The "Close" function is only guaranteed if the start point of the operating range is defined as min. 0.5 V.

Control 3-point with AC 24 V



Dimensions

PC

Ø 1/2" to 1.05" [12.7 to 26.67]

□ 2/5" to 1.05" [10 to 26.67]

