**5**

5-year warranty

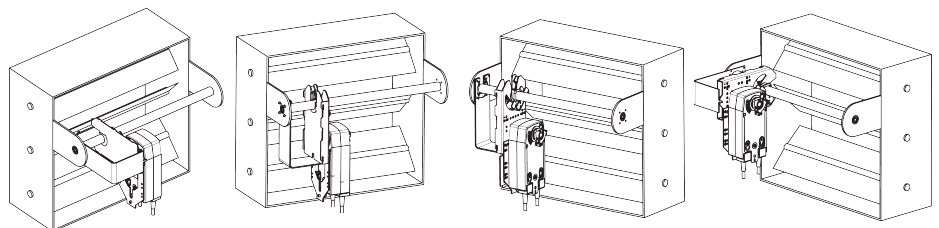## Technical data

| | | |
|---|---|---|
| **Functional data** | Mounting Position | 90° to 180° |
| **Safety data** | Ambient temperature | -22...122°F [-30...50°C] |
| | Storage temperature | -40...176°F [-40...80°C] |
| **Materials** | Housing material | galvanized steel |
| | Stem | steel |
| | Frame, plate, base | galanized steel |
| | Bearing | GF Delrin |
| **Suitable actuators** | Non-Spring | AMB(X)<br>GMB(X)<br>NMB(X) |
| | Electronic fail-safe | NKQB(X) |

\* ZG-121 adapter must be used with EF. \*\* GM/GK not for use with 1/2" shafts. \*\*\* K6-1 clamp must be used with LF. For close-off pressure reference Select Pro or Retrofit Technical Documentation.

For close-off pressure reference Select Pro or retrofit technical documentation.
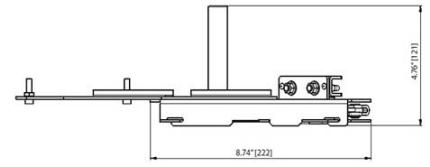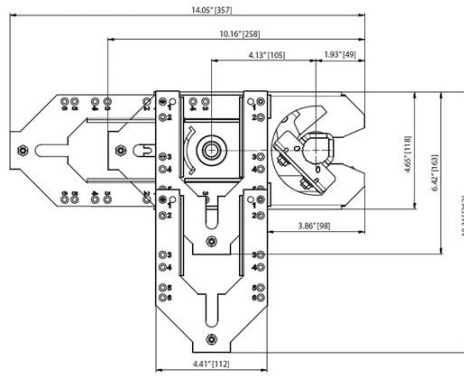
## Product features

**Default/Configuration**
The ZG-JSL linkage can also be configured by moving the anti-rotation plate 90° for space-saving applications. See mounting configurations below. The ZG-JSLA will have a factory mounted actuator on the linkage in the vertical position only.

**Application**
The ZG-JSL jackshaft linkage is designed to easily attach to any part of a jackshaft and allow easy installation of select Belimo actuators. The unique open ended design and clamp insert allows the ZG-JSL to be used with any jackshaft from ½" to ¾" in diameter. Removal of the insert will allow the linkage to attach to a maximum shaft diameter of 1.05". Changing the antirotation plate will allow various actuators to be mounted.

**Operation**
The ¾" diameter built-in steel shaft allows direct coupling to the Belimo series actuators in the chart below. There is a torque reduction when using the ZG-JSL linkage. Verify application requirements before use.

**Flow/Mounting details**



## Dimensions

**Dimensional drawings**

**BELIMO®**

**Modulating, Non-Spring Return, 24 V, Multi-Function Technology®**

Torque min. 180 in-lb for control of damper surfaces up to 45 sq ft.

**5**

**5-year warranty**

CE ◌ LISTED 94 D5 TEMP. IND. & REG. EQUIP. c UL us

**MFT**

## Technical data

| | | |
|---|---|---|
| **Electrical data** | Nominal voltage | AC/DC 24 V |
| | Nominal voltage frequency | 50/60 Hz |
| | Power consumption in operation | 3.5 W |
| | Power consumption in rest position | 1.3 W |
| | Transformer sizing | 6 VA (class 2 power source) |
| | Electrical Connection | 18 GA plenum cable with 1/2" conduit connector, degree of protection NEMA 2 / IP54, 3 ft [1 m] 10 ft [3 m] and 16ft [5 m] |
| | 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 |
| | Options positioning signal | variable (VDC, 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°, adjustable with mechanical stop |
| | Angle of rotation note | adjustable with mechanical stop |
| | Running Time (Motor) | default 150 s, variable 90...350 s |
| | Running time motor variable | 90...350 s |
| | Noise level, motor | 45 dB(A) |
| | Shaft Diameter | 1/2...1.05" round, centers on 1/2" and 3/4" with insert, 1.05" without insert |
| | Position indication | Mechanically, 30...65 mm stroke |
| **Safety data** | Degree of protection IEC/EN | IP54 |
| | Degree of protection NEMA/UL | NEMA 2 UL Enclosure Type 2 |
| | 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 |
| | Ambient temperature | -22...122°F [-30...50°C] |
| | Storage temperature | -40...176°F [-40...80°C] |
| | Ambient humidity | max. 95% r.H., non-condensing |
| | Servicing | maintenance-free |

| | **Weight** | Weight | 1.5 lb [0.67 kg] |
|---|---|---|---|
| | **Materials** | Housing material | UL94-5VA |

## Product features

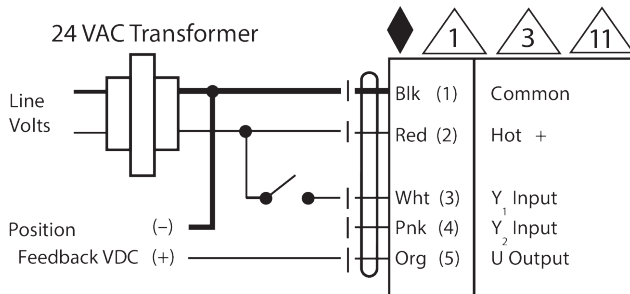| | |
|---|---|
| **Application** | For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications. |
| | The actuator is mounted directly to a damper shaft up to 1.05" in diameter by means of its universal clamp. A crank 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 to 10 VDC 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 1.05" diameter. Actuators must provide modulating 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. Actuators shall have reversing switch and manual override on the cover. Run time shall be constant and independent of torque. Actuators shall be cULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo. |

## Accessories

| **Gateways** | Description | Type |
|---|---|---|
| | Gateway MP to BACnet MS/TP | UK24BAC |
| | Gateway MP to LonWorks | UK24LON |
| | Gateway MP to Modbus RTU | UK24MOD |

| **Electrical accessories** | Description | Type |
|---|---|---|
| | Auxiliary switch 2 x SPDT add-on | S2A |

| **Mechanical accessories** | Description | Type |
|---|---|---|
| | Actuator arm for standard shaft clamp | AH-GMA |
| | Shaft extension 240 mm Ø20 mm for damper shaft Ø 8...22.7 mm | AV8-25 |
| | Clamp NM/AM 1/2", 3/4", 1" | K-AM25 |
| | Shaft clamp reversible, clamping range Ø10...20 mm | K-SA |
| | Wrench 8 mm and 10 mm | TOOL-06 |
| | Base plate extension for SM..A to SM../AM../SMD24R, pcs. | Z-SMA |
| | 17" Mounting Bracket for AF,NF,GM,AM,SM | ZG-100 |
| | Mounting Bracket: AF,NF,LF,GM,AM,NM,SM | ZG-101 |
| | Mounting Bracket: GM,AM,SM | ZG-103 |
| | Mounting Bracket: GM,AM,SM | ZG-104 |
| | 1" diameter jackshaft adaptor (11" L). | ZG-JSA-1 |
| | 1-5/16" diameter jackshaft adaptor (12" L). | ZG-JSA-2 |
| | 1.05" diameter jackshaft adaptor (12" L). | ZG-JSA-3 |

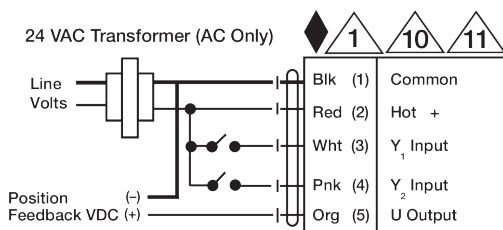| | |
|---|---|
| Mounting kit for linkage operation for flat installation | ZG-NMA |
| Weather shield 13x8x6" [330x203x152 mm] (LxWxH) | ZS-100 |
| Weather shield 16x8-3/8x4" [406x213x102 mm] (LxWxH) | ZS-150 |
| Explosion Proof Housing 16x10x6.435" [406x254x164 mm] (LxWxH), UL and CSA, Class I, Zone 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 |
| Terminal-strip cover for NEMA 2 rating (-T models). | ZS-T |

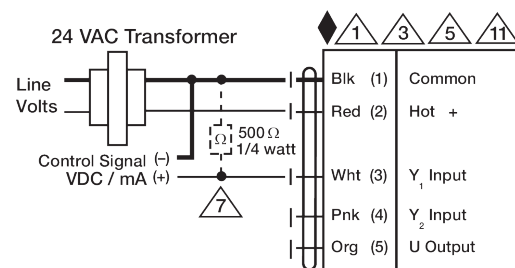| Service tools | Description | Type |
|---|---|---|
| | Connection cable 10 ft [3 m], A: RJ11 6/4 ZTH EU, B: 3-pin Weidmüller and supply connection | ZK4-GEN |
| | Service Tool, with ZIP-USB function, for parametrisable and communicative Belimo actuators, VAV controller and HVAC performance devices | ZTH US |

## Electrical installation

(A) Actuators with appliance cables are numbered.

(1) Provide overload protection and disconnect as required.

(3) Actuators may also be powered by 24 VDC.

(5) Only connect common to negative (-) leg of control circuits.

(7) A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.

(8) Control signal may be pulsed from either the Hot (Source) or Common (Sink) 24 V line.

(10) For triac sink the Common connection from the actuator must be connected to the Hot connection of the controller. Position feedback cannot be used with a triac sink controller; the actuator internal common reference is not compatible.

(11) Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.

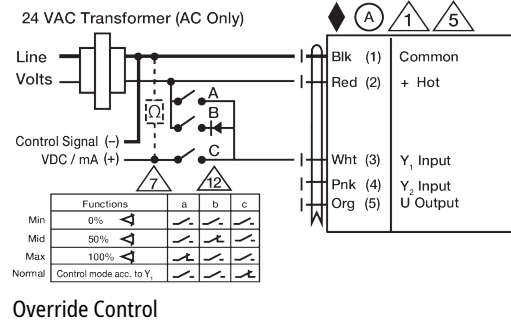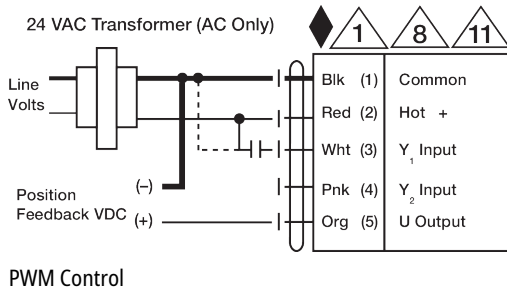(12) IN4004 or IN4007 diode. (IN4007 supplied, Belimo part number 40155).



On/Off



Floating Point



VDC/mA Control

24 VAC Transformer (AC Only) ◆ △1 △8 △11

Line Volts

| | Blk (1) | Common |
| | Red (2) | Hot + |
| | Wht (3) | Y₁ Input |
| | Pnk (4) | Y₂ Input |
| | Org (5) | U Output |

Position Feedback VDC (−) (+)

**PWM Control**

24 VAC Transformer (AC Only) ◆ Ⓐ △1 △5

Line Volts

Control Signal (−)
VDC / mA (+)

| | Blk (1) | Common |
| | Red (2) | + Hot |
| | Wht (3) | Y₁ Input |
| | Pnk (4) | Y₂ Input |
| | Org (5) | U Output |

| Functions | | a | b | c |
|---|---|---|---|---|
| Min | 0% | | | |
| Mid | 50% | | | |
| Max | 100% | | | |
| Normal | Control mode acc. to Y₁ | | | |

**Override Control**

## Dimensions

**Dimensional drawings**  ⌀ 1/2" to 1.05" [12.7 to 26.67]
▢ 2/5" to 1.05" [10 to 26.67]



2.49" [63.4]
1.18" [30]
4.06" [103]
4.3" [109]
5.2" [131]
2" [50.8]

3.46" [88]
8.3" [211]