



5-year warranty



## Technical data

|                        |                                    |                                                                                                                                                                                               |
|------------------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Electrical data</b> | Nominal voltage                    | AC/DC 24 V                                                                                                                                                                                    |
|                        | Nominal voltage frequency          | 50/60 Hz                                                                                                                                                                                      |
|                        | Power consumption in operation     | 11 W                                                                                                                                                                                          |
|                        | Power consumption in rest position | 3 W                                                                                                                                                                                           |
|                        | Transformer sizing                 | 21 VA (class 2 power source)                                                                                                                                                                  |
|                        | Electrical Connection              | 18 GA appliance or plenum cables, 3 ft [1 m], 10 ft [3 m] or 16ft [5 m], with or without 1/2" conduit connector                                                                               |
|                        | Overload Protection                | electronic throughout 0...95° rotation                                                                                                                                                        |
|                        | Electrical Protection              | actuators are double insulated                                                                                                                                                                |
| <b>Functional data</b> | Torque motor                       | 360 in-lb [40 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 (0.1 mA), 500 Ω                                                                                                                                                                        |
|                        | Position feedback U                | 2...10 V                                                                                                                                                                                      |
|                        | Position feedback U note           | Max. 0.5 mA                                                                                                                                                                                   |
|                        | Setting Fail-Safe Position         | adjustable with dial 0...100% in 10% increments                                                                                                                                               |
|                        | Bridging time (PF)                 | 2 s                                                                                                                                                                                           |
|                        | Pre-charging time                  | 5...20 s                                                                                                                                                                                      |
|                        | Direction of motion motor          | selectable with switch 0/1                                                                                                                                                                    |
|                        | Direction of motion fail-safe      | reversible with switch                                                                                                                                                                        |
|                        | 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 or 150 s                                                                                                                                                                                   |
|                        | Running time fail-safe             | <35 s                                                                                                                                                                                         |
|                        | Noise level, motor                 | 52 dB(A)                                                                                                                                                                                      |
|                        | Noise level, fail-safe             | 61 dB(A)                                                                                                                                                                                      |
|                        | Shaft Diameter                     | 1/2...1.05" round, centers on 3/4" with insert, 1.05" without insert                                                                                                                          |
| Position indication    | Mechanically, 30...65 mm stroke    |                                                                                                                                                                                               |
| <b>Safety data</b>     | Degree of protection IEC/EN        | IP54                                                                                                                                                                                          |
|                        | Degree of protection NEMA/UL       | NEMA 2                                                                                                                                                                                        |
|                        | Enclosure                          | UL Enclosure Type 2                                                                                                                                                                           |
|                        | Agency Listing                     | cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU<br>Listed to UL 2043 - suitable for use in air plenums per Section 300.22(C) of the NEC and Section 602 of the IMC |

|                    |                     |                             |
|--------------------|---------------------|-----------------------------|
| <b>Safety data</b> | Quality Standard    | ISO 9001                    |
|                    | Ambient temperature | -22...122°F [-30...50°C]    |
|                    | Storage temperature | -40...176°F [-40...80°C]    |
|                    | Ambient humidity    | Max. 95% RH, non-condensing |
|                    | Servicing           | maintenance-free            |
| <b>Materials</b>   | Housing material    | UL94-5VA                    |

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

## Product features

**Application** For fail-safe, modulating control 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 actuator operates in response to a DC 2...10 V<sub>or</sub>, with the addition of a 500Ω resistor, a 4...20 mA control input from an electronic controller or positioner. A DC 2...10 V feedback signal is provided for position indication.

A common installation technique for control of multi-section dampers is to use the U5 position feedback of one actuator (Master) to control multiple actuators (Slaves). Belimo refers to this as Master/Slave control. The only requirement is that the actuators are installed on MECHANICALLY SEPARATE damper shafts.

**Operation** The GK..24-SR actuator provides 95° of rotation and a visual indicator shows the position of the actuator. When reaching the damper or actuator end position the actuator automatically stops. The gear can be manually disengaged by pressing the button located on the actuator cover. The GK..24-SR actuators use a brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuators rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in a holding mode. The actuator is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement. Add-on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.

Fail-Safe Indication

Green LED status indicator light sequence:

On: operation ok, no faults

Blinking: fail-safe mechanism is active

Off: fault is detected or not in operation / capacitors charging

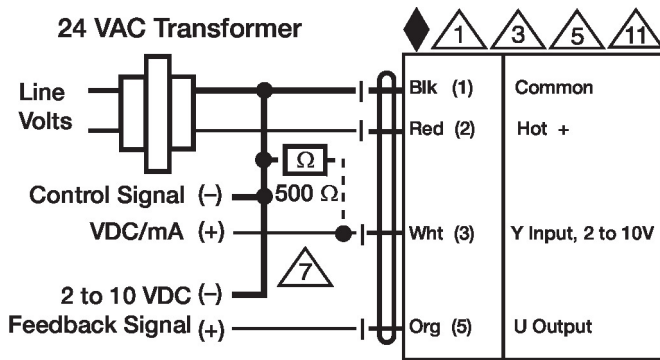
**Typical specification** Modulating control, electrical fail-safe damper actuators shall be electronic direct-coupled type, which require no crank arm and linkage and be capable of direct mounting to shaft up to 1.05" diameter. Actuators must provide modulating damper control response to a 2 to 10 VDC 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. A 2 to 10 VDC feedback signal shall be provided for position feedback. 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**

| Electrical accessories | Description                                                                                                                                                         | Type       |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
|                        | <p>DC Voltage Input Rescaling Module</p>                                                                                                                            | IRM-100    |
|                        | Feedback potentiometer 10 kΩ add-on, grey                                                                                                                           | P10000A GR |
|                        | Feedback potentiometer 1 kΩ add-on, grey                                                                                                                            | P1000A GR  |
|                        | Feedback potentiometer 140 Ω add-on, grey                                                                                                                           | P140A GR   |
|                        | Feedback potentiometer 2.8 kΩ add-on, grey                                                                                                                          | P2800A GR  |
|                        | Auxiliary switch, mercury-free                                                                                                                                      | P475       |
|                        | Auxiliary switch, mercury-free                                                                                                                                      | P475-1     |
|                        | Feedback potentiometer 5 kΩ add-on, grey                                                                                                                            | P5000A GR  |
|                        | Feedback potentiometer 500 Ω add-on, grey                                                                                                                           | P500A GR   |
|                        | Signal simulator, Power supply AC 120 V                                                                                                                             | PS-100     |
|                        | <p>Convert Pulse Width Modulated Signal to a 2...10 V Signal for Belimo Proportional Actuators</p>                                                                  | PTA-250    |
|                        | Auxiliary switch 1 x SPDT add-on                                                                                                                                    | S1A        |
|                        | Auxiliary switch 2 x SPDT add-on                                                                                                                                    | S2A        |
|                        | Positioner for wall mounting                                                                                                                                        | SGA24      |
|                        | Positioner for front-panel mounting                                                                                                                                 | SGF24      |
|                        | Cable conduit connector 1/2"                                                                                                                                        | TF-CC US   |
|                        | Resistor, 500 Ω, 1/4" wire resistor with 6" pigtail wires                                                                                                           | ZG-R01     |
|                        | Resistor kit, 50% voltage divider                                                                                                                                   | ZG-R02     |
|                        | Transformer, AC 120 V to AC 24 V, 40 VA                                                                                                                             | ZG-X40     |
|                        | Adapter for auxiliary switch and feedback potentiometer                                                                                                             | Z-SPA      |
| 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     |
|                        | Ball joint suitable for damper crank arm KH8 / KH10, Multipack 10 pcs.                                                                                              | KG10A      |
|                        | Standard GK/GM clamp (1/2" to 1.05").                                                                                                                               | K-GM20     |
|                        | Damper crank arm Slot width 8.2 mm, clamping range Ø14...25 mm                                                                                                      | KH10       |
|                        | Push rod for KG10A ball joint 36" L, 3/8" diameter                                                                                                                  | SH10       |
|                        | Wrench 0.512 in. [13 mm]                                                                                                                                            | TOOL-07    |
|                        | <p>17" Mounting Bracket for AF,NF,GM,AM,SM</p>                                                                                                                      | ZG-100     |
|                        | <p>Mounting Bracket: AF,NF,LF,GM,AM,NM,SM</p>                                                                                                                       | ZG-101     |
|                        | <p>Mounting Bracket: GM,AM,SM</p>                                                                                                                                   | ZG-103     |
|                        | <p>Mounting Bracket: GM,AM,SM</p>                                                                                                                                   | ZG-104     |
|                        | <p>Mounting Bracket: ZS-260 Right Angle</p>                                                                                                                         | ZG-109     |
|                        | <p>Linkage kit</p>                                                                                                                                                  | ZG-110     |
|                        | Damper clip for damper blade, 3.5" width.                                                                                                                           | ZG-DC1     |
|                        | Damper clip for damper blade, 6" width.                                                                                                                             | ZG-DC2     |
|                        | Mounting kit for linkage operation for flat installation                                                                                                            | ZG-GMA     |
|                        | 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   |
|                        | Base plate extension for GM..A to GM..                                                                                                                              | Z-GMA      |
|                        | Weather shield 330x203x152 mm [13x8x6"] (LxBxH)                                                                                                                     | ZS-100     |
|                        | Base plate, for ZS-100                                                                                                                                              | ZS-101     |
|                        | Weather shield 406x213x102 mm [16x8-3/8x4"] (LxWxH)                                                                                                                 | ZS-150     |
|                        | Explosion proof housing 406x254x164 mm [16x10x6.435"] (LxBxH), UL and CSA, Class I, Zone 1&2, Groups B, C, D, (NEMA 7), Class III, Hazardous (classified) Locations | ZS-260     |
|                        | Weather shield 438x222x140 mm [17-1/4x8-3/4x5-1/2"] (LxBxH), NEMA 4X, with mounting brackets                                                                        | ZS-300     |
|                        | Weather shield 438x222x140 mm [17-1/4x8-3/4x5-1/2"] (LxBxH), 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  |
|                        | Anti-rotation bracket EFB(X)/GKB(X)/GMB(X).                                                                                                                         | EF-P       |
|                        | Jackshaft mounting bracket.                                                                                                                                         | ZG-120     |

Electrical installation

- ⚠ Warning! Live electrical components!**  
During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.
- ◆ Meets cULus requirements without the need of an electrical ground connection.
- ⚠ Provide overload protection and disconnect as required.
- ⚠ Actuators may also be powered by DC 24 V.
- ⚠ Only connect common to negative (-) leg of control circuits.
- ⚠ A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- ⚠ Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.



2...10 V / 4...20 mA Control

Dimensions

