**Power Supply**
- 24 VAC, ±20%, 50/60 Hz, 24 VDC, ±10%
- Power consumption in operation: 4.5 W
- Power consumption in rest position: 2 W
- Transformer sizing: 6.5 VA (class 2 power source)

**Shaft Diameter**
- 1/2...1.05" round, centers on 1/2" and 3/4" with insert, 1.05" without insert

**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 16 ft [5 m]

**Overload Protection**
- electronic throughout 0...95° rotation

**Operating Range**
- 2...10 V, 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

**Position Feedback**
- 2...10 V, Max. 0.5 mA

**Angle of rotation**
- Max. 95°, adjustable with mechanical stop

**Torque motor**
- 360 in-lb [40 Nm]

**Manual override**
- external push button

**Running Time (Motor)**
- 150 s, constant, independent of load

**Ambient humidity**
- max. 95% r.H., non-condensing

**Ambient temperature**
- -22...122°F [-30...50°C]

**Storage temperature**
- -40...176°F [-40...80°C]

**Degree of Protection**
- IP54, NEMA 2, UL Enclosure Type 2

**Housing material**
- UL94-5VA

**Agency Listing**
- cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU

**Noise level, motor**
- 45 dB(A)

**Servicing**
- maintenance-free

**Quality Standard**
- ISO 9001

**Weight**
- 4.2 lb [1.9 kg]

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**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 directly coupled to the damper shaft. The actuator operates 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. A 2 to 10 VDC feedback signal is provided for position indication or master-slave applications.

**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.

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**Dimensions (Inches [mm])**

- 1/2" to 1.05" [12.7 to 26.67]
- 2/5" to 1.05" [10 to 26.67]

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>K-GM20</td>
<td>Standard GK/GM clamp (1/2&quot; to 1.05&quot;).</td>
</tr>
<tr>
<td>ZG-102</td>
<td>Dual actuator mounting bracket.</td>
</tr>
<tr>
<td>Z-GMA</td>
<td>Base plate extension</td>
</tr>
<tr>
<td>ZG-JMA</td>
<td>Mounting kit for linkage operation</td>
</tr>
<tr>
<td>ZS-100</td>
<td>Weather shield - galvaneal 13x8x6&quot; (LxWxH).</td>
</tr>
<tr>
<td>ZS-150</td>
<td>Weather shield - PC w/ foam seal 16x8-3/8x4&quot; (LxWxH).</td>
</tr>
<tr>
<td>ZS-260</td>
<td>Explosion proof housing.</td>
</tr>
<tr>
<td>ZS-300</td>
<td>NEMA 4X, 304 stainless steel enclosure.</td>
</tr>
<tr>
<td>TOOL-07</td>
<td>13 mm wrench.</td>
</tr>
<tr>
<td>ZG-GMA</td>
<td>Mounting kit for linkage operation</td>
</tr>
<tr>
<td>ZG-JSA-1</td>
<td>1&quot; diameter jackshaft adaptor (11&quot; L).</td>
</tr>
<tr>
<td>ZG-R01</td>
<td>4 to 20 mA adaptor, 500Ω, 1/4 W resistor w 6” pigtail wires.</td>
</tr>
<tr>
<td>S2A</td>
<td>Auxiliary switch for damper actuators and rotary actuators</td>
</tr>
<tr>
<td>S1A</td>
<td>Auxiliary switch for damper actuators and rotary actuators</td>
</tr>
<tr>
<td>PTA-250</td>
<td>Pulse width modulation interface for modulating actuators.</td>
</tr>
<tr>
<td>PS-100</td>
<td>Low voltage and control signal simulator.</td>
</tr>
<tr>
<td>P1000A GR</td>
<td>Feedback potentiometer for damper actuators and rotary actuators</td>
</tr>
<tr>
<td>NSV24 US</td>
<td>Battery back-up module for non-spring return actuators.</td>
</tr>
<tr>
<td>IRM-100</td>
<td>Input rescaling module for modulating actuators.</td>
</tr>
</tbody>
</table>

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.

Wiring Diagrams

- Provide overload protection and disconnect as required.
- Actuators may also be powered by 24 VDC.
- Only connect common to negative (-) leg of control circuits.
- A 500 Ω resistor (ZG-R01) converts the 4 to 20 mA control signal to 2 to 10 VDC.
- Actuators may be connected in parallel if not mechanically linked. Power consumption and input impedance must be observed.