

M9109-GGx-2 Series Proportional Electric Non-spring Return Actuators

The M9109-GGx-2 direct-mount electric actuators operate on 24 VAC power and are available for use with proportional controllers. These non-spring return actuators are easily installed on a Variable Air Volume (VAV) box and a damper with a steel shaft up to 1/2 in. (13 mm) in diameter or 3/8 in. (10 mm) square. They may be field mounted to a VG1000 Series ball valve using the M9000-512 Valve Linkage Kit.

The M9109-GGx-2 models have an 80 lb-in (9 N·m) running torque. They have a nominal 60-second travel time for 90° of rotation at 60 Hz (72 seconds at 50 Hz) with a load-independent rotation time. The M9109-GGC-2 model is available with integral auxiliary switches to perform switching functions at any angle within the selected rotation range. Position feedback is available through a 0 (2) to 10 VDC signal.



Figure 1: M9109 Non-spring Return Actuator

Features and Benefits	
<input type="checkbox"/> 35 dBA Noise Rating	Meets audibility requirements for open ceilings
<input type="checkbox"/> Synchronous Drive	Provides constant rotation time independent of load
<input type="checkbox"/> Direct-shaft Mount with Single-screw Coupler	Simplifies installation and provides three-point shaft gripping
<input type="checkbox"/> Magnetic Clutch	Provides torque protection for the damper and actuator
<input type="checkbox"/> Jumper-selectable Rotation Direction	Simplifies installation
<input type="checkbox"/> Adjustable Rotation Stops	Allow application versatility with 30 to 90° Clockwise (CW) or Counterclockwise (CCW) rotation
<input type="checkbox"/> 1/2 in. National Pipe Thread (NPT) Threaded Conduit Opening	Meets electrical code requirements and allows the use of armored cable
<input type="checkbox"/> Manual Gear Release	Simplifies setup and field adjustments
<input type="checkbox"/> Output Position Feedback	Provides simple, closed-loop control with accurate position sensing

Application

IMPORTANT: This device is not designed or intended to be used in or near environments where explosive vapors or gases could be present or environments where substances corrosive to the device's internal components could be present.

The M9109-GGx-2 is used to position balancing, control, round, and zone dampers in typical HVAC applications. They are also used to position the blades in a VAV box. The actuator can regulate the flow of hot or chilled water, 50% glycol solutions, and low-pressure steam when coupled to a 1/2 and 3/4 in. Two-Way, and 1/2 in. Three-Way ball valve with linkage.

The M9109-GGx-2 mounts directly on the duct surface, round damper, or small rectangular damper with an anti-rotation bracket and two sheet metal screws (included). Additional linkages or couplers are not required.

Operation

IMPORTANT: The M9109-GGx-2 Series actuators are intended to control equipment under normal operating conditions. Where failure or malfunction of an M9109-GGx-2 actuator could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory) intended to warn of, or protect against, failure or malfunction of the M9109-GGx-2 actuator must be incorporated into and maintained as part of the control system.

A controller provides a control signal to the actuator depending upon the desired movement of the damper blade. This signal causes the motor to rotate in the proper direction and the damper blade to open or close. The M9109-GGx-2 models have an auto shutoff to avoid excessive wear or drive time on the motor.

The actuator rotates at a nominal rate of 1.5° per second (90° in 60 seconds) at 60 Hz input. The actuator rotation is field adjustable from 30 to 90°. Determine the actual rotation time for actuators using less than 90° rotation and use that value with the controller software. For example, 40 seconds is used for 60° rotation.

Dimensions

See Figure 2 for the actuator dimensions.

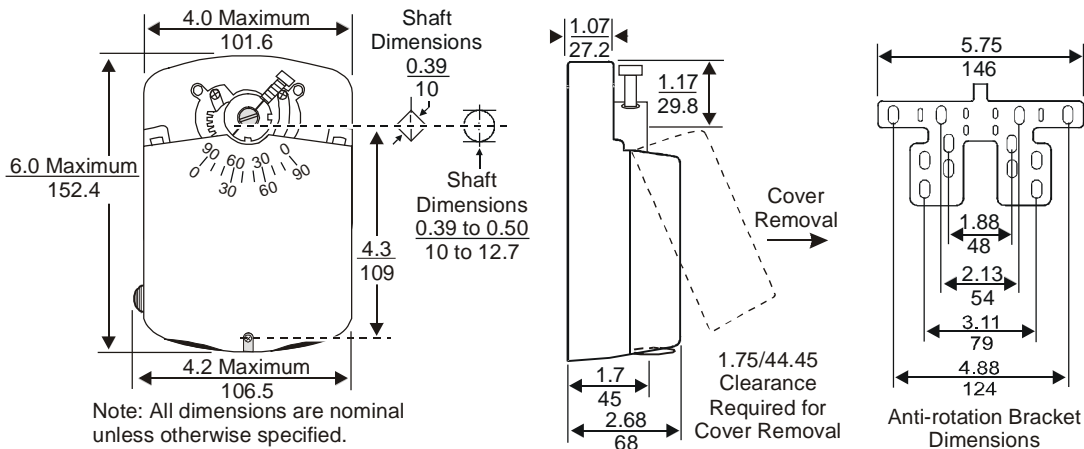


Figure 2: Actuator and Anti-Rotation Bracket Dimensions, in. (mm)

Ordering Information

Table 1: Actuator Models and Accessories

Product Code Number	Description
M9109-GGA-2	80 lb·in (9 N·m) electric non-spring return actuator for proportional control with 0(2) to 10 VDC feedback
M9109-GGC-2	80 lb·in (9 N·m) electric non-spring return actuator for proportional control with two SPDT 24 VAC auxiliary switches and 0(2) to 10 VDC feedback
DMPR-KC003	Blade Pin Extension without Bracket for Johnson Controls D-1300 damper direct-mount applications Note: Available with damper and may also be ordered separately
DMPR-KR003	Sleeve Pin Kit for Johnson Controls round dampers with a 5/16 in. (8 mm) diameter shaft Note: Available with damper and may also be ordered separately
M9000-105	Pluggable 3-Terminal Block
M9000-106	Pluggable 4-Terminal Block
M9000-160	Replacement anti-rotation bracket for an M9109 actuator
M9000-512	Valve Linkage Kit for field mounting an M9109 actuator to a 1/2 and 3/4 in. two-way and three-way VG1000 Series ball valve

Technical Specifications

Product	M9109-GGx-2 Series Proportional Electric Non-spring Return Actuators
Power Requirements	20 to 30 VAC at 50/60 Hz; 3.2 VA supply, Class 2
Input Signal	0 to 10 VDC or 0 to 20 mA
Input Signal Adjustments	(Voltage Input or Current Input): Jumper Selectable: 0 (2) to 10 VDC or 0 (4) to 20 mA Factory Setting: 0 to 10 VDC, CW rotation with signal increase Action is jumper selectable Direct (CW) or Reverse (CCW) with signal increase.
Input Impedance	Voltage Input, 150,000 ohms; Current Input, 500 ohms
Feedback Signal	0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA) Corresponds to input signal span selection.
Auxiliary Switch Rating	GGC: Two Single-Pole, Double-Throw (SPDT) switches rated at 24 VAC, 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2
Mechanical Output	Running Torque: 80 lb-in (9 N·m)
Cycles	100,000 full cycles; 2,500,000 repositions rated at 80 lb-in (9 N·m)
Audible Noise Rating	35 dBA maximum at 1 m
Rotation Range	Adjustable from 30 to 90° CW or CCW; mechanically limited to 93°
Rotation Time	Nominal 60 seconds at 60 Hz and 72 seconds at 50 Hz for 90°
Electrical Connection	1/4 in. spade terminals (To order optional pluggable terminal blocks, see Table 2.)
Mechanical Connection	3/8 to 1/2 in. (10 to 12.7 mm) round steel shaft or 3/8 in. (10 mm) square steel shaft
Enclosure	NEMA 2, IP32
Ambient Operating Conditions	-4 to 125°F (-20 to 52°C); 90% RH maximum, noncondensing
Ambient Storage Conditions	-40 to 176°F (-40 to 80°C); 90% RH maximum, noncondensing
Dimensions (H x W x D)	5.9 x 4.2 x 2.64 in. (150.1 x 106.5 x 67 mm)
Shipping Weight	2.4 lb (1.08 kg)
Agency Compliance	UL Listed, File E27734, CCN XAPX CSA Certified, File LR85083, Class 3221 02 CE Mark, EMC Directive 89/336/EEC

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.



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