

## M9106-xGx-2 Series Electric Non-Spring-Return Actuators

### Description

The M9106-xGx-2 Series direct-mount electric actuators operate on AC 24 V power and are available for use with on/off, floating, or proportional controllers. These non-spring-return actuators are easily installed on a VAV box, a damper with a round shaft up to 1/2 in. (13 mm) in diameter, or a square shaft up to 3/8 in. (10 mm). The M9106 with an M9000-520 linkage can also be used to position VG1000 Series 1/2 in. (DN15) to 1-1/2 in. (DN40) ball valves.

The M9106 Series models have 53 lb-in (6 N·m) running torque. These actuators 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 M9106-xGC-2 models are available with integral auxiliary switches to perform switching functions at any angle within the selected rotation range. The -GGx models feature DC 0(2) to 10 V position feedback, and the -AGF models provide 10,000 ohm position feedback.

### Features

- simple direct coupling reduces installation and commissioning time and improves reliability by eliminating damper linkages; single screw coupling provides three-point shaft gripping
- designed for zone damper and ball valve actuator applications
- small, compact design allows installation in tight-fitting locations
- on/off, floating, and proportional control inputs
- 60-second running time at 60 Hz
- long life brushless synchronous drive motor technology provides constant running time independent of load
- robust 53 lb-in (6 N·m) torque rating

- whisper quiet 35 dBA noise rating
- magnetic clutch provides over torque protection over the entire range of rotation
- -4 to 125°F (-20 to 52 °C) ambient temperature rating
- 100,000 full stroke cycle, 2,500,000 reposition rating
- manual gear release simplifies setup and field adjustments
- 1/2 in. NPT threaded conduit opening meets electrical code requirements and allows the use of flexible armored cable
- position feedback (-GGX models) provides simple, closed-loop control with accurate position sensing
- adjustable rotation stops allow application versatility with 30 to 90° clockwise or counterclockwise rotation

### Applications

The M9106 actuators are used to position balancing, control, round, and zone dampers in typical HVAC applications. The M9106 can also be used with an M9000-520 linkage to control 1/2 in. (DN15) to 1-1/2 in. (DN40) VG1000 Series ball valves. The M9106 Series actuator 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.

Refer to the damper or VAV box manufacturer's information to select the proper timing for the actuator. Refer to the appropriate application note for specific wiring diagrams and information.



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Electric Non-Spring-Return Actuator**

Refer to the *M9106-xGx-2 Electric Non-Spring-Return Actuators Product Bulletin (LIT-2681123)* or the *M9106-xGx-2 Electric Non-Spring-Return Actuators Installation Instructions (Part No. 34-636-1085)* for important product application information.

### Repair Information

If the M9106-xGx-2 Series Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls® representative.

### Selection Chart

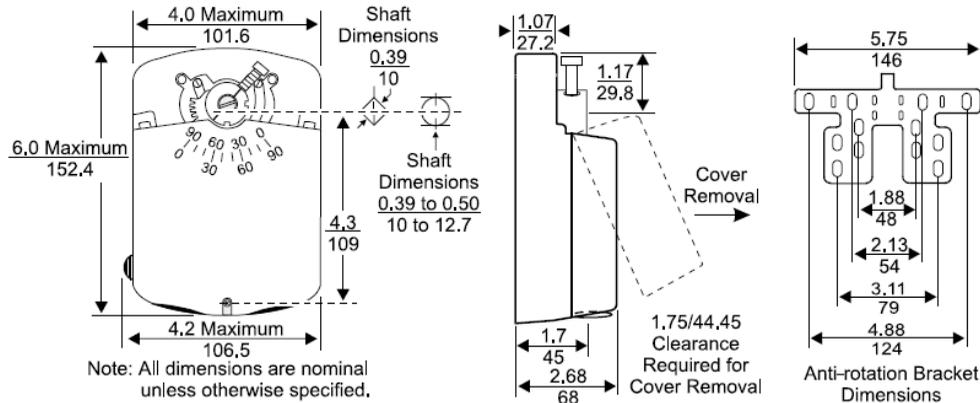
Code Number	Control Type	Torque / Timing / Voltage	Auxiliary Switches	Comments
M9106-AGA-2 <sup>1</sup>	Floating	53 lb-in (6 N·m) 60 seconds at 60 Hz AC 24 V 50/60 Hz	None	
M9106-AGC-2 <sup>1</sup>			2-SPDT	
M9106-AGF-2 <sup>1</sup>	Floating with resistive feedback		None	10,000 ohm feedback pot
M9106-GGA-2	DC 0(2) to 10 V		None	DC 0(2) to 10 V feedback
M9106-GGC-2	DC 0(4) to mA proportional		2-SPDT	
M9106-IGA-2	On/off / floating with timeout		None	Adjustable timing 1, 1.5, 2, 5.5, or 11 minutes
M9106-IGC-2		2-SPDT		

1. To avoid excessive wear or drive time on the motor for the -AGx models, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall). The -GGx and -IGx models have an auto shutoff to avoid excessive wear or drive time on the motor.

**M9106-xGx-2 Series Electric Non-Spring-Return Actuators (Continued)**

**Accessories**

Code Number	Description
<b>CBL-2000-1</b>	20 in. (0.5 m) wiring harness, UL accepted for plenum use, connects the M9106 and DPT-2015 to the VAV controller
<b>CBL-2000-2</b>	20 in. (0.5 m) plenum rated wiring harness
<b>CBL-2000-3</b>	72 in. (1.8 m) plenum rated wiring harness
<b>DPT-2015-0</b>	0 to 1.5 in. W.C. (0 to 374 Pa) differential pressure transmitter
<b>DMPR-KC003</b>	Square head blade pin extension without bracket supplied with Johnson Controls CD-1300 dampers and may be ordered separately for all direct-mount applications
<b>DMPR-KC010</b>	Adjustable blade position indicator switch kit with total switching load limited to 2,000 VA for the following applications: Pilot duty: AC 24 V, 50 VA; AC 125/250/277 V, 125 VA Motor load: AC 125/250/277 V, 1/3 hp Resistive load: AC 125 V, 11 A; AC 250 V, 8 A; AC 277 V, 7 A (all maximum values)
<b>DMPR-KC011</b>	Hex head blade pin extension without bracket
<b>DMPR-KC012</b>	Hex head blade pin extension with bracket
<b>DMPR-KC213</b>	Damper jackshaft 1/2 in. diameter, 1 panel
<b>DMPR-KC214</b>	Damper jackshaft 1/2 in. diameter, 2 panel
<b>M9000-105</b>	Pluggable 3-terminal block
<b>M9000-106</b>	Pluggable 4-terminal block
<b>M9000-160</b>	Replacement anti-rotation bracket for M9106 Series actuators
<b>M9000-200</b>	Commissioning tool provides a control signal to drive on/off, floating, proportional, or resistive actuators
<b>M9000-520</b>	Valve linkage kit for field mounting an M9106 Series actuator to a 1/2 in. (DN15) to 1-1/2 in. (DN40) VG1000 Series ball valve



Dimensions, in./mm

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products. © 2014 Johnson Controls, Inc.

## M9106-xGx-2 Series Electric Non-Spring-Return Actuators (Continued)

### Technical Specifications

M9106-xGx-2 Series Electric Non-Spring-Return Actuators		
<b>Power Requirement</b>	AGx: AC 20-30 V at 50/60 Hz, 2.5 VA supply, Class 2 IGx: AC 20-30 V at 50/60 Hz, 2.8 VA supply, Class 2 GGx: AC 20-30 V at 50/60 Hz, 3.2 VA supply, Class 2	
<b>Control Type</b>	AGx: floating IGx: on/off, floating GGx: DC 0(2) to 10 V or DC 0(4) to 20 mA proportional	
<b>Input Signal</b>	AGx and IGx: AC 20 to 30 V at 50/60 Hz GGx: DC 0 to 10 V or DC 0(4) to 20 mA	
<b>Input Signal Adjustments:</b>	AGx and IGx: CW and COM Terminals, CW rotation; CCW and COM terminals, CCW rotation GGx (voltage input or current input): Jumper selectable: DC 0(2) to 10 V or DC 0(4) to 20 mA Factory setting: DC 0 to 10 V, CW rotation with signal increase Action is jumper selectable direct (CW) or reverse (CCW) with signal increase.	
<b>Input Impedance</b>	AGx: 200 ohms, nominal IGx: 160 ohms, nominal GGx: voltage input, 150,000 ohms; current input, 500 ohms	
<b>Feedback Signal</b>	AGF: 10,000 ohm potentiometer, 1 W GGx: DC 0 to 10 V or DC 2 to 10 V for 90° (1 mA); Corresponds to input signal span selection	
<b>Auxiliary Switch Rating</b>	xGC: two single-pole, double-throw (SPDT) switches rated at AC 24 V, 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2	
<b>Torque Rating</b>	1, 1.5, and 2 minute settings: 53 lb-in (6 N·m) 5.5 and 11 minute settings: 35 lb-in (4 N·m)	
<b>Cycle Life</b>	100,000 full cycles; 2,500,000 repositions rated at 53 lb-in (6 N·m)	
<b>Audible Noise Rating</b>	35 dBA maximum at 39.4 in. (1 m)	
<b>Rotation Range</b>	Adjustable from 30 to 90°, CW or CCW	
<b>Rotation Time</b>	IGx: adjustable with switch settings (factory set for 1 minute) 60, 90, 120, 330, or 660 seconds (1, 1.5, 2, 5.5 or 11 minutes) at 60 Hz and 72, 108, 144, 396, or 792 seconds at 50 Hz All other models: nominal 60 seconds at 60 Hz and 72 seconds at 50 Hz for 90°	
<b>Electrical Connection</b>	1/4 in. spade terminals (to order optional pluggable terminal blocks, see <a href="#">Accessories</a> )	
<b>Mechanical Connection</b>	3/8 to 1/2 in. (10 to 12.7 mm) round shaft or 3/8 in. (10 mm) square shaft	
<b>Enclosure Rating</b>	NEMA 2, IP32	
<b>Ambient Operating Rating</b>	-4 to 125°F (-20 to 52°C); 90% RH maximum, noncondensing	
<b>Ambient Storage Rating</b>	IGx: -40 to 186°F (-40 to 86°C); 90% RH maximum, noncondensing All other models: -40 to 176°F (-40 to 80°C); 90% RH maximum, noncondensing	
<b>Shipping Weight</b>	2.4 lb (1.08 kg)	
<b>Compliance</b> 	<b>United States</b>	UL 873 Listed, File E27734, CCN XAPX
	<b>Canada</b>	CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02
	<b>Europe</b>	CE Mark - Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC.