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M9102-AGA-2S, -3S and M9104-xGA-2S, -3S Series

# Electric Non-Spring Return Actuators

## Description

The M9102 and M9104 Series Actuators are direct-mount, non-spring return electric actuators that operate on AC 24 V power. These synchronous motor-driven actuators provide floating control (AGA), floating control with automatic shutoff (IGA), and proportional control with selectable 0-10 or 2-10 VDC (GGA). The -2S models are equipped with plenum cables, and the -3S models are equipped with terminal blocks.

All models are compact in size and are easily installed on Variable Air Volume (VAV) boxes, Variable Volume and Temperature (VVT) two-position zone applications, or small- to medium-sized dampers with a round shaft up to 1/2 in. (13 mm) in diameter or a 3/8 in. (10 mm) square shaft.

The M9102 Series Electric Non-Spring Return Actuators provide a running torque of 18 lb-in (2 N-m), and the nominal travel time is 30 seconds at 60 Hz (36 seconds at 50 Hz) for 90° of rotation. The M9104 Series Electric Non-Spring Return Actuators provide a running torque of 35 lb-in (4 N-m), and the nominal travel time is 60 seconds at 60 Hz (72 seconds at 50 Hz) for 90° of rotation.

Refer to the *M9102-AGA-2S, -3S and M9104-xGA-2S, -3S Series Electric Non-Spring Return Actuators Product Bulletin (LIT-1201742)* for important product application information.

## Features

- two torques available: 18 and 35 lb-in (2 and 4 N-m) — offer the most suitable choice for the specific application
- short 30-second travel time available — provides a quick response for two-position zone applications
- 35 dBA nominal audible noise rating — meets the audible noise requirements for open ceiling environments
- synchronous drive — provides a constant rotation time that is independent of the load
- 100,000 cycle rating — provides years of trouble-free service
- direct shaft mounting with single-screw coupler — reduces installation time and provides three-point shaft gripping
- magnetic clutch — protects the actuator gear train and the damper from damage due to excessive torque during a stall condition
- manual gear release — simplifies actuator setup and adjustments in the field
- plenum cable or screw terminal electric connections — make wiring quick and easy

- floating, floating with timeout, and proportional 0(2)...10 VDC control inputs available — offer a full range of control input options
- small, compact design — allows installation in tight-fitting locations

## Applications

The M9102 and M9104 Series Electric Non-Spring Return Actuators are designed to position balancing, control, round, and zone dampers in Heating, Ventilating, and Air Conditioning (HVAC) systems. These electric actuators are also designed to position blades in a VAV box, or they can be used in VVT two-position zone applications.

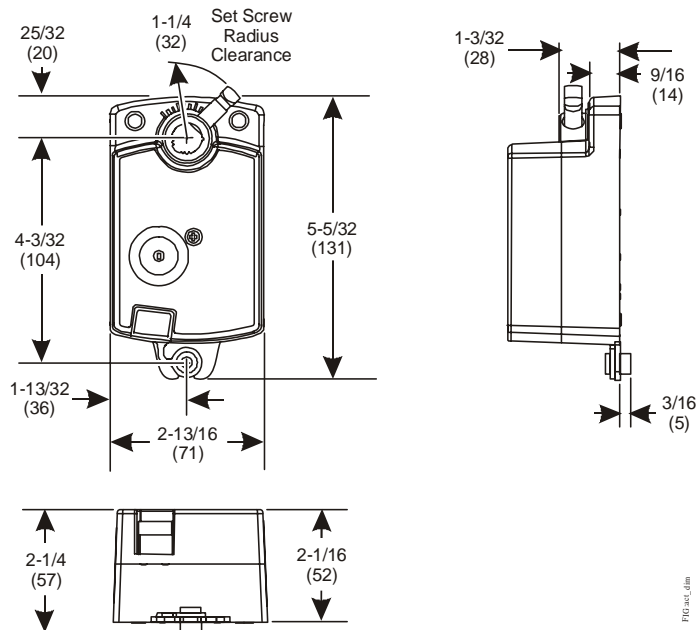
Each actuator mounts directly to the surface in any convenient orientation using a single No. 10 self-drilling sheet metal screw (included with the actuator). No additional linkages or couplers are required. Electrical connections on the actuator are clearly labeled to simplify installation.

## Repair Information

If the M9102 or M9104 Series Electric Non-Spring Return Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls® representative.



**M9102/M9104 Series Electric Non-Spring Return Actuator**



**M9102/M9104 Series Electric Non-Spring Return Actuator Dimensions, in. (mm)**

## Electric Non-Spring Return Actuators (Continued)

### Selection Chart

Code Number	Control Type	Running Torque	Travel Time	Electrical Connections
M9102-AGA-2S	Floating	18 lb-in (2 N-m)	30 Seconds at 60 Hz	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm <sup>2</sup> ) conductors and .25 in. (6 mm) ferrule ends
M9102-AGA-3S	Floating	18 lb-in (2 N-m)	30 Seconds at 60 Hz	M3 Screw Terminals
M9104-AGA-2S	Floating	35 lb-in (4 N-m)	60 Seconds at 60 Hz	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm <sup>2</sup> ) conductors and .25 in. (6 mm) ferrule ends
M9104-AGA-3S	Floating	35 lb-in (4 N-m)	60 Seconds at 60 Hz	M3 Screw Terminals
M9104-IGA-2S	Floating or On/Off	35 lb-in (4 N-m)	60 Seconds at 60 Hz	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm <sup>2</sup> ) conductors and .25 in. (6 mm) ferrule ends
M9104-IGA-3S	Floating or On/Off	35 lb-in (4 N-m)	60 Seconds at 60 Hz	M3 Screw Terminals
M9104-GGA-2S	Proportional	35 lb-in (4 N-m)	60 Seconds at 60 Hz	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm <sup>2</sup> ) conductors and .25 in. (6 mm) ferrule ends
M9104-GGA-3S	Proportional	35 lb-in (4 N-m)	60 Seconds at 60 Hz	M3 Screw Terminals

### Accessories

Code Number	Description
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### Technical Specifications

M9102-AGA-2S, -3S and M9104-xGA-2S, -3S Series Electric Non-Spring Return Actuators		
Power Requirements	M910x-AGA-xS	AC 24 V +25%/-20% at 50/60 Hz, 2.1 VA Supply, Class 2, Safety Extra-Low Voltage (SELV)
	M9104-IGA-xS	AC 24 V +25%/-20% at 50/60 Hz, 3.0 VA Supply, Class 2, SELV
	M9104-GGA-xS	AC 24 V +25%/-20% at 50/60 Hz, 3.6 VA Supply, Class 2, SELV
Control Type	M910x-AGA-xS	Floating Control without Timeout
	M9104-IGA-xS	Floating or On/Off Control with Timeout
	M9104-GGA-xS	Proportional Control
Input Signal	M910x-AGA-xS	AC 24 V +25%/-20% at 50/60 Hz, Class 2, SELV without Timeout
	M9104-IGA-xS	AC 24 V +25%/-20% at 50/60 Hz, Class 2, SELV with Timeout
	M9104-GGA-xS	0(2) to 10 VDC or 0(4) to 20 mA with field-furnished 500 ohm resistor
Feedback Signal	M9104-GGA-2S	0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA) Corresponds to input signal span selection
Motor Input Impedance		200 ohms Nominal
Running Torque	M9102 Series	18 lb-in (2 N-m)
	M9104 Series	35 lb-in (4 N-m)
Travel Time	M9102 Series	30 Seconds at 60 Hz (36 Seconds at 50 Hz) for 90° of Rotation
	M9104 Series	60 Seconds at 60 Hz (72 Seconds at 50 Hz) for 90° of Rotation
Rotation Range		93° ± 3°, CW or CCW
Cycles		100,000 Full Stroke Cycles; 2,500,000 Repositions at Rated Running Torque
Audible Noise Rating		35 dBA Nominal at 39-13/32 in. (1 m)
Electrical Connections	M9102-AGA-2S	48 in. (1.2 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm <sup>2</sup> ) conductors and .25 in. (6 mm) ferrule ends
	M9104-xGA-2S	
	M9102-AGA-3S, M9104-xGA-3S	M3 Screw Terminals
Mechanical Connections		Up to 1/2 in. (13 mm) Diameter Round Damper Shaft or 3/8 in. (10 mm) Square Damper Shaft
Enclosure	M9102-AGA-2S, M9104-xGA-2S	NEMA 2, IP42
	M9102-AGA-3S, M9104-xGA-3S	NEMA 1, IP40
Ambient Conditions	Operating	-4 to 140°F (-20 to 60°C); 90% RH Maximum, Noncondensing
	Storage	-20 to 150°F (-29 to 66°C); 90% RH Maximum, Noncondensing
Compliance	North America	UL Listed, File E27734, CCN XAPX (United States) and XAPX7 (Canada) Actuator Housing is Plenum Rated per CSA C22.2 No. 236/UL 1995, Heating and Cooling Equipment
	European Union	CE Mark, EMC Directive 89/336/EEC
	Australia and New Zealand	C-Tick Mark Australia/NZ Emissions Compliant
Shipping Weight		1.0 lb (0.5 kg)