

# M9102-AGA-2S, -3S and M9104-xxA-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 or 100 to 240 VAC power. These motor-driven actuators provide floating control (AGA), floating control with automatic shutoff (IGA), proportional control with selectable 0-10 or 2-10 VDC (GGA), and line voltage power supply (IUA). 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 VAV boxes, Variable Air Volume and Temperature (VVT) two-position zone 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 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)
- Short 30-Second Travel Time Available
- 35 dBA Maximum Audible Noise Rating at 1 Meter
- Synchronous Drive (AGA, IGA, GGA models)
- 100,000 Cycle Rating
- Direct Shaft Mounting with Single-Screw Coupler
- Magnetic Clutch
- Manual Gear Release
- Plenum Cable or Screw Terminal Electric Connections
- Floating, Floating with Timeout, and Proportional 0(4) to 10 VDC Control Inputs Available
- Small, Compact Design

## Applications

The M9102 and M9104 Series Electric Non-Spring Return Actuators are designed to position balancing, control, round, and zone dampers in 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.

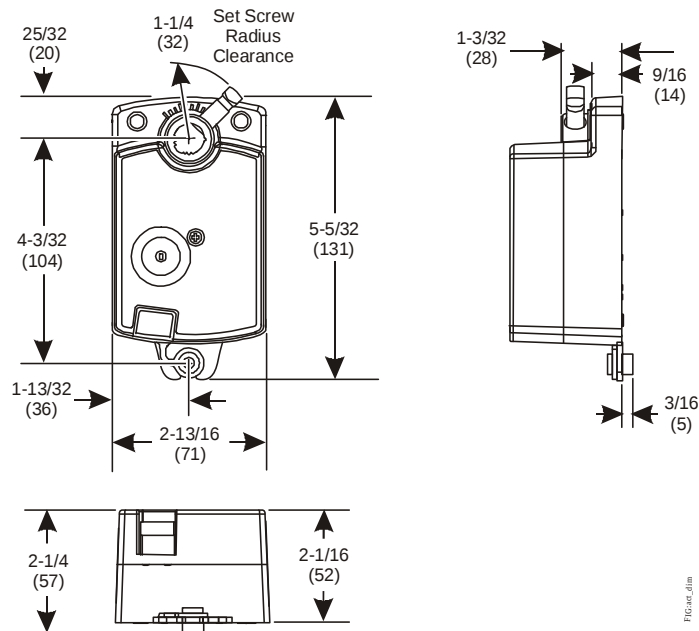
Each actuator mounts directly to the surface in any convenient orientation using a single No. 10 standard sheet metal screw (included with the actuator). No additional linkages or couplers are required. Electrical connections on the actuator are clearly labeled to simplify installation.

## 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 Series Electric Non-Spring Return Actuator**



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

## M9102-AGA-2S, -3S and M9104-xxA-2S, -3S Series Electric Non-Spring Return Actuators (Continued)

### Selection Chart

| Code Number  | Control Type       | Running Torque   | Travel Time                                | Power Supply (VA rating) | Electrical Connections                                                                                                                      |
|--------------|--------------------|------------------|--------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| M9102-AGA-2S | Floating           | 18 lb·in (2 N·m) | 30 Seconds at 60 Hz<br>36 Seconds at 50 Hz | 2.5                      | 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<br>36 Seconds at 50 Hz | 2.5                      | M3 Screw Terminals                                                                                                                          |
| M9104-AGA-2S | Floating           | 35 lb·in (4 N·m) | 60 Seconds at 60 Hz<br>72 Seconds at 50 Hz | 2.1                      | 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<br>72 Seconds at 50 Hz | 2.1                      | M3 Screw Terminals                                                                                                                          |
| M9104-IGA-2S | Floating or On/Off | 35 lb·in (4 N·m) | 60 Seconds at 60 Hz<br>72 Seconds at 50 Hz | 3.0                      | 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<br>72 Seconds at 50 Hz | 3.0                      | M3 Screw Terminals                                                                                                                          |
| M9104-GGA-2S | Proportional       | 35 lb·in (4 N·m) | 60 Seconds at 60 Hz<br>72 Seconds at 50 Hz | 2.9                      | 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<br>72 Seconds at 50 Hz | 2.9                      | M3 Screw Terminals                                                                                                                          |
| M9104-IUA-2S | Floating or On/Off | 35 lb·in (4 N·m) | 60 Seconds at 50/60 Hz                     | 7.5 (0.07A)              | 48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 18 AWG (1.02 mm <sup>2</sup> ) conductors for 3/8 in. (10 mm) flexible metal conduit |

### Accessories

| Code Number             | Description                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| DMPR-KC003 <sup>1</sup> | 7 in. (178 mm) blade pin extension without bracket for Johnson Controls direct-mount damper applications                            |
| DMPR-KR003 <sup>1</sup> | Sleeve pin kit for Johnson Controls round dampers with a 5/16 in. (8 mm) diameter shaft                                             |
| M9000-200               | Commissioning tool that provides a control signal to drive 24 V on/off, floating, proportional, and/or resistive electric actuators |
| M9104-100               | Connector for 3/8 in. (10 mm) flexible metal conduit                                                                                |

1. Furnished with the damper and may be ordered separately.

## M9102-AGA-2S, -3S and M9104-xxA-2S, -3S Series Electric Non-Spring Return Actuators (Continued)

### Technical Specifications

|                        |                              |                                                                                                                                                                                                             |
|------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power Requirements     | M910x-AGA-xS                 | AC 24 V +25%/-20% at 50/60 Hz, 2.1 VA, Class 2, Safety Extra-Low Voltage (SELV)                                                                                                                             |
|                        | M9104-IGA-xS                 | AC 24 V +25%/-20% at 50/60 Hz, 3.0 VA, Class 2, SELV                                                                                                                                                        |
|                        | M9104-GGA-xS                 | AC 24 V +25%/-20% at 50/60 Hz, 2.9 VA, Class 2, SELV                                                                                                                                                        |
|                        | M9104-IUA-2S                 | AC 100 to 240 V (-15%+10%) at 60 Hz, 0.07A, and 7.5 VA Supply                                                                                                                                               |
| Control Type           | M910x-AGA-xS                 | Floating Control without Timeout                                                                                                                                                                            |
|                        | M9104-IGA-xS                 | Floating or On/Off Control with Timeout                                                                                                                                                                     |
|                        | M9104-GGA-xS                 | Proportional Control                                                                                                                                                                                        |
|                        | M9104-IUA-2S                 | Floating or On/Off Control with Timeout                                                                                                                                                                     |
| 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                                                                                                                                       |
|                        | M9104-IUA-2S                 | AC 100 to 240 V (-15%+10%) at 50/60 Hz, and 7.5 VA Supply                                                                                                                                                   |
| Feedback Signal        | M9104-GGA-2S                 | 0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA)<br>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                                                                                                                                               |
|                        | M9104 (IUA)                  | 60 Seconds at 50/60 Hz for 90° of Rotation                                                                                                                                                                  |
| Rotation Range         |                              | 93° ±3°, CW or CCW                                                                                                                                                                                          |
| Cycles                 |                              | 100,000 Full Stroke Cycles;<br>2,500,00 Repositions at Rated Running Torque                                                                                                                                 |
| Audible Noise Rating   |                              | 35 dBA at 39-13/32 in. (1 m) Maximum                                                                                                                                                                        |
| Electrical Connections | M9102-AGA-2S<br>M9104-xxA-2S | 48 in. (1.02 m) UL 444 Type CMP Plenum Rated Cable with 18 AWG (1.02 mm) Conductors and 1/4 in. (6 mm) Ferrule Ends                                                                                         |
|                        | M9102-AGA-3S<br>M9104-xGA-3S | M3 Screw Terminals                                                                                                                                                                                          |
|                        | M9104-IUA-2S                 | 48 in. (1.2 mm) with 18 AWG (1.02 mm <sup>2</sup> ) Conductors and Connector for 3/8 in. (10 mm) Flexible Metal Conduit                                                                                     |
|                        |                              |                                                                                                                                                                                                             |
| 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<br>M9104-xxA-2S | NEMA 1, IP42                                                                                                                                                                                                |
|                        | M9102-AGA-3S<br>M9104-xxA-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             | United States                | UL Listed, CCN XAPX, File 27734<br>Plenum rated, UL2043, suitable for use in other environmental spaces (plenums) in accordance with section 300.22.(c) of the National Electrical Code                     |
|                        | Canada                       | cUL Listed, CCN XAPX7, File 27734<br>Plenum Rated Per CSA 22.2 No. 236/UL 1995, Heating and Cooling Equipment                                                                                               |
|                        | Europe                       | 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 and the Low Voltage Directive 2006/95/EC. |
|                        | Australia and New Zealand    | C-Tick Mark, Australia/NZ Emissions Compliant                                                                                                                                                               |
| Shipping Weight        |                              | 1.0 lb (0.5 kg)                                                                                                                                                                                             |