

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 shut-off (IGA), and proportional control with selectable DC 0...10 V or DC 2...10 V (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.

Features

- simple direct coupling reduces installation and commissioning time and improves reliability by eliminating damper linkages; single screw coupling provides three-point shaft gripping.
- small, compact design allows installation in tight-fitting locations designed for zone damper actuator applications

- on-off, floating and proportional control inputs
- 30 or 60 second running time at 60 Hz
- long life brushless synchronous drive motor technology provides constant running time independent of load
- 18 lb-in (2 Nm) and 35 lb-in (4 Nm) 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, 1,500,000 reposition rating
- manual gear release simplifies setup and field adjustments
- position feedback (GGX models) provides simple, closed-loop control with accurate position sensing

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.



M9104 Series
Electric Non-spring Return Actuator

Repair Information

If the M9102/M9104 Electric Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls® representative.

Selection Charts

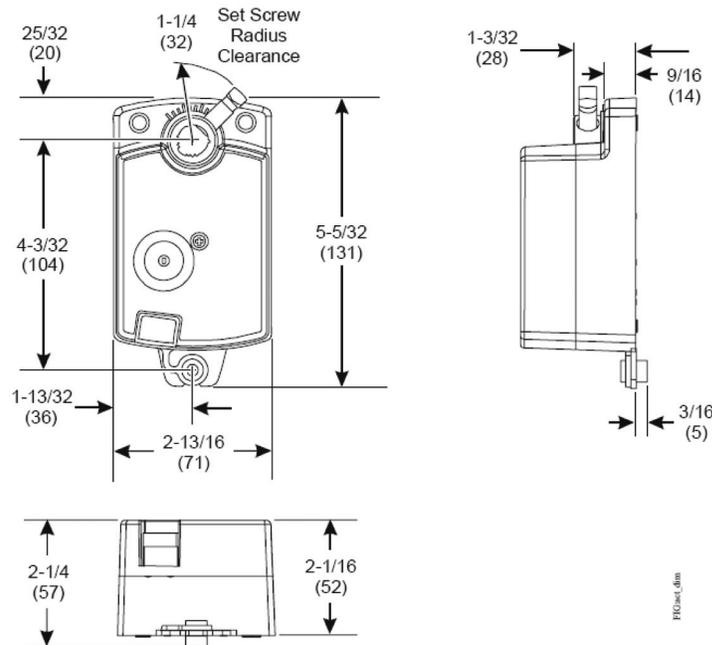
M9102-xGA-2S, -3S and M9104-xGA-2S, -3S Series Electric Non-spring Return Actuators

Code Number	Control Type	Torque / Timing / Voltage	Auxiliary Switches	Comments
M9102-AGA-2S	Floating	18 lb-in (2 Nm)	None	48 in. (1.2 m) 18 AWG UL CMP Plenum Cable
M9102-AGA-3S	without Timeout	30 second at 60 Hz		M3 Screw Terminals
M9102-IGA-2S	On-Off / Floating	AC 24 V 50/60 Hz	None	48 in. (1.2 m) 18 AWG UL CMP Plenum Cable
M9102-IGA-3S	with Timeout			M3 Screw Terminals
M9104-AGA-2S	Floating	35 lb-in (4 Nm)	None	48 in. (1.2 m) 18 AWG UL CMP Plenum Cable
M9104-AGA-3S	without Timeout	60 second at 60 Hz		M3 Screw Terminals
M9104-IGA-2S	On-Off / Floating	AC 24 V 50/60 Hz	None	48 in. (1.2 m) 18 AWG UL CMP Plenum Cable
M9104-IGA-3S	with Timeout			M3 Screw Terminals
M9104-GGA-2S	DC 0(2)...10V	Proportional	None	48 in. (1.2 m) 18 AWG UL CMP Plenum Cable
M9104-GGA-3S	DC 0(4)...20 mA			M3 Screw Terminals

M9102-xGA-2S, -3S and M9104-xGA-2S, -3S Series Electric Non-spring Return Actuators (Continued)

Accessories for M9102/M9104 Electric Actuators

Code Number	Description
DMPR-KC003	Square Head Blade Pin Extension without Bracket
DMPR-KC010	Adjustable Blade Position Indicator Switch Kit with total switching load limited to 2000 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)
DMPR-KC011	Hex Head Blade Pin Extension without Bracket
DMPR-KC012	Hex Head Blade Pin Extension with Bracket
DMPR-KR003	Sleeve Pin Kit for use with Johnson Controls round dampers with a 5/16 in. (8 mm) shaft; furnished with the damper and may be ordered separately
M9000-200	Commissioning Tool provides a control signal to drive on/off, floating, proportional, or resistive actuators



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

M9102-xGA-2S, -3S and M9104-xGA-2S, -3S Series Electric Non-spring Return Actuators (Continued)

Technical Specifications

M9102-xGA-2S, -3S and M9104-xGA-2S, -3S Series Electric Non-spring Return Actuators	
Power Requirement	AGA: AC 19...30 V at 50/60 Hz, 2.1 VA supply, Class 2 IGA: AC 19...30 V at 50/60 Hz, 3.0 VA supply, Class 2 GGA: AC 19...30 V at 50/60 Hz, 3.6 VA supply, Class 2
Control Type	AGA: Floating IGA: On-Off / Floating GGA: DC 0(2)...10 V or DC 0(4)...20 mA proportional
Input Signal	AGx: AC 19...30 V at 50/60 Hz IGA: AC 19...30 V at 50/60 Hz GGA: DC 0(2)...10 V GGA: DC 0(4)...20 mA with 500 ohm field supplied resistor
Input Signal Adjustments	AGx: CW and COM Terminals, CW rotation; CCW and COM Terminals, CCW rotation GGx: Selectable DC 0(2)...10 V Factory Setting: DC 0...10 V, CW rotation with signal increase Action is selectable Direct (CW) or Reverse (CCW) with signal increase.
Input Impedance	AGA: 250 Ohm (30 second model), 200 Ohm (60 second model) IGA: 250 Ohm (30 second model), 200 Ohm (60 second model) GGA: Voltage Input, 150,000 ohms
Feedback Signal	GGx: DC 0...10 V or DC 2...10 V for 90° (10 VDC at 1 mA); Corresponds to input signal span selection
Auxiliary Switch Rating	No auxiliary switches are available
Torque Rating	M9102: 18 lb-in (2 N·m) M9104: 35 lb-in (4 N·m)
Cycle Life	100,000 full cycles; 2,500,000 repositions rated at 80 lb-in (9 N·m)
Audible Noise Rating	35 dBA maximum at 39.4 in. (1 m)
Rotation Range	93°, CW or CCW
Rotation Time	M9102: 30 seconds at 60 Hz and 36 seconds at 50 Hz for 90° M9104: 60 seconds at 60 Hz and 72 seconds at 50 Hz for 90°
Electrical Connection	M910x-xGA-2S: 48 in. (1.2 m) 18 AWG UL CMP Plenum Cable with 1/4 in. (6 mm) Stripped Wire Leads M910x-xGA-3S: M3 Screw Terminals
Mechanical Connection	3/8 to 1/2 in. (10 to 12.7 mm) round shaft or 3/8 in. (10 mm) square shaft
Enclosure Rating	M910x-xGA-2S: NEMA 2, IP42 M910x-xGA-3S: NEMA 1, IP40
Ambient Operating Rating	-4 to 140°F (-20 to 60°C); 90% RH Maximum, Noncondensing
Ambient Storage Rating	-20 to 150°F (-29 to 66°C); 90% RH Maximum, Noncondensing
Shipping Weight	1.0 lb (0.5 kg)
Agency Compliance	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 CE Mark, EMC Directive 89/336/EEC C-Tick Mark Australia/NZ Emissions Compliant