

M9206 Series Electric Spring Return Actuators

The M9206 Series direct-mount, spring return electric actuators operate on 24 VAC or VDC power and are available for use with on/off, floating, or proportional controllers. These bidirectional actuators do not require a damper linkage, and are easily installed on a damper with a round shaft up to 1/2 in. (12.7 mm) diameter or a square shaft up to 3/8 in. (10 mm). They may also be mounted to ball valves using an M9000-51x linkage kit.

The M9206 models deliver 53 lb-in (6 N-m) of torque. The angle of rotation is mechanically adjustable. Integral line voltage auxiliary switches are available to indicate end-stop position or to perform switching functions within the selected rotation range. Position feedback is provided on proportional models through a proportional DC voltage signal.



Figure 1: M9206 Electric Spring Return Actuator

Features and Benefits	
<input type="checkbox"/> Automatic Stroke Calibration at Installation	Self adjusts, reducing installation time and cost
<input type="checkbox"/> 0 (2) to 10 VDC, 6 to 9 VDC, or 0 (4) to 20 mA Input	Eliminates the need for an externally wired 500 ohm resistor
<input type="checkbox"/> Reversible Mounting Design	Provides Clockwise (CW) or Counterclockwise (CCW) return-to-normal positioning if a power loss occurs
<input type="checkbox"/> Electronic Stall Detection Throughout Entire Range	Increases actuator life by deactivating the actuator motor when an overload is detected
<input type="checkbox"/> Removable Coupler	Allows actuator stroke adjustment and/or adapts to a shorter damper shaft
<input type="checkbox"/> 1/2 in. Conduit Connector with 48 in. Wire Leads	Meets local code requirements for wiring and allows easy field wiring on retrofit jobs
<input type="checkbox"/> Auxiliary Switches (Optional)	Provide adjustable switch points with line voltage capability, including pilot duty rating
<input type="checkbox"/> 20 VDC at 25 mA Power Supply Output (Optional)	Provides power for external devices, making the actuator an ideal replacement for many competing products

Application

M9206 actuators are designed to position air dampers and valves in Heating, Ventilating, and Air Conditioning (HVAC) systems. Applications include:

- positioning return air, exhaust, or outdoor air dampers
- controlling face and bypass dampers
- positioning valves when used with a ball valve linkage

Refer to the manufacturer's information to properly size the damper, valve, and/or actuator.

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.

Operation

IMPORTANT: The M9206 Series actuator is intended to control equipment under normal operating conditions. Where failure or malfunction of an M9206 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 a malfunction of an M9206 must be incorporated into and maintained as part of the control system.

M9206 actuators operate on 24 VAC at 50/60 Hz or 24 VDC. They use a stepper motor with stall detection circuitry that operates throughout the entire stroke. The proportional actuators employ noise-filtering techniques on the control signal to eliminate repositioning due to line noise.

Rotation is mechanically limited to 93° by integral end-stops. An anti-rotation bracket prevents lateral movement of the actuator.

Dimensions

Refer to Figure 2 for actuator dimensions.

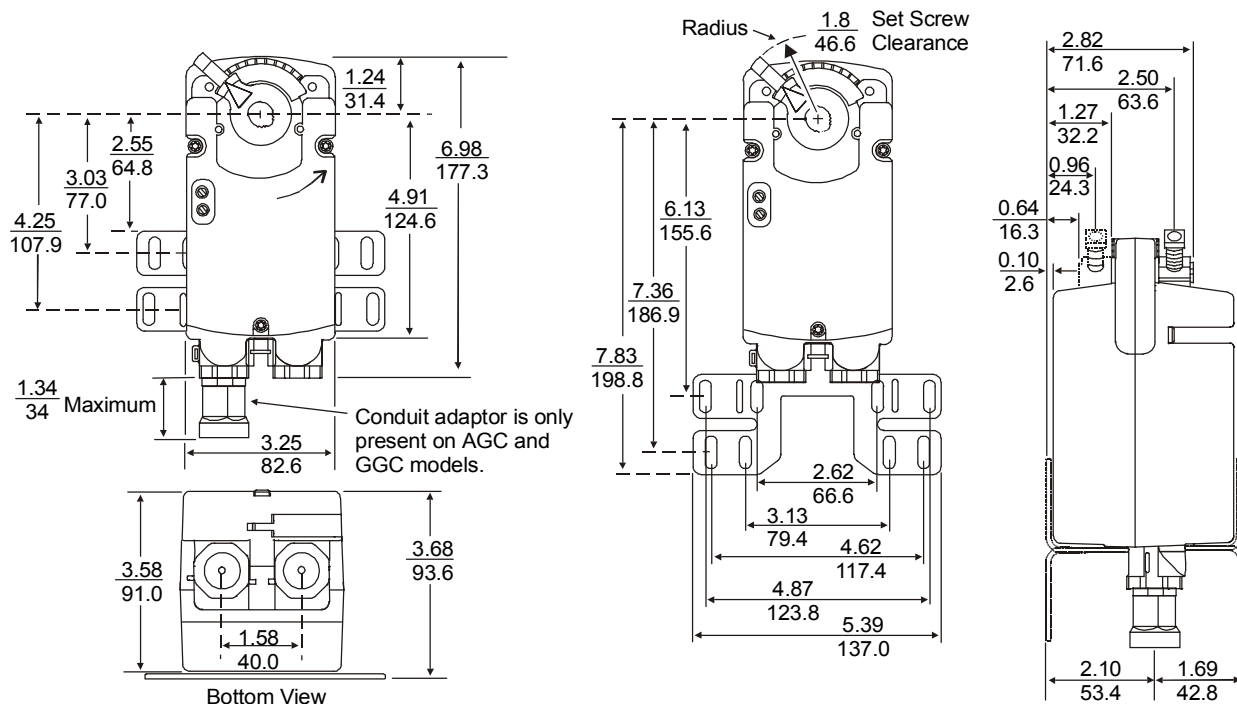


Figure 2: Actuator and Anti-rotation Bracket Dimensions, in. (mm)

Repairs and Replacement

Field repairs must not be made. To order a replacement or an accessory, refer to the *Ordering Information* section.

Ordering Information

Contact the nearest Johnson Controls representative, and specify the desired product code number from Table 1 or Table 2.

Table 1: Actuators

M9206 Series Electric Spring Return Actuator	53 lb-in (6 N·m)									
	M9206-AGA-2	M9206-AGA-2MP	M9206-AGC-2	M9206-AGC-2MP	M9206-BGA-2	M9206-BGC-2	M9206-GGA-2	M9206-GGA-2MP	M9206-GGC-2	M9206-GGC-2MP
On/Off Control	*	*	*	*	■	■				
Floating Control	■	■	■	■						
Proportional Control							■	■	■	■
Feedback										
0 (2) to 10 or 6 to 9 VDC							■	■	■	■
2 Auxiliary Switches			■	■		■			■	■
Power Supply Output										
20 VDC at 25 mA		■		■				■		■

* May be wired for two-wire, on/off control.

Table 2: Accessories

Product Code Number	Description
DMPR-KR003*	Sleeve Pin Kit for Johnson Controls round dampers with a 5/16 in. diameter shaft
DMPR-KC003*	Blade Pin Extension without Bracket for Johnson Controls CD-1300 direct-mount applications
M9000-156	Mounting Kit for retrofitting a number of Honeywell® economizer damper actuator installations; provides for remote-mount, linkage-driven application of M9204 and M9206 actuators with existing linkages
M9000-157	Universal Mounting Kit provides for remote-mount, linkage-driven application of M9204 and M9206 actuators in a new or retrofit damper and actuator assembly.
M9000-161	Replacement anti-rotation bracket for M9206 Series actuators
M9000-200	Commissioning Tool provides a control signal to drive on/off, floating, proportional, or resistive actuators.
M9000-513	Valve Linkage Kit for field mounting an M9206 actuator to 1/2 and 3/4 in. 2-way and 1/2 in. 3-way VG1000 Series ball valves
M9206-600	Repair Kit includes a coupler, set screw, and locking clip for mounting an M9206 actuator to a 3/8 to 1/2 in. (10.0 to 12.7 mm) round shaft or a 3/8 in. (10 mm) square shaft.
M9206-601	Repair Kit includes a coupler, set screw, and locking clip for mounting an M9206 actuator to a 3/8 to 5/8 in. (10 to 16 mm) round shaft or a 3/8 to 9/16 in. (10 to 14 mm) square shaft.
M9206-602	Locking Clip for the M9206 actuator coupler (bag of 5)
Y65A13-0	40 VA Transformer, 120/24 VAC, 60 Hz
Y65S13-0	40 VA Transformer, 240/24 VAC, 60 Hz

* Furnished with the damper and may be ordered separately.

Technical Data

Product	M9206 Series Electric Spring Return Actuators
Power Requirements	20 to 30 VAC at 50/60 Hz or 24 VDC $\pm 10\%$, Class 2, 16 VA supply at 32 to 140°F (0 to 60°C) 22 VA supply at -22 to 32°F (-30 to 0°C) 25 VA supply at -40 to -22°F (-40 to -30°C)
Input Signal	AGx: 20 to 30 VAC at 50/60 Hz or 24 VDC $\pm 10\%$, 4.8 mA AGx and BGx (On/Off): 20 to 30 VAC at 50/60 Hz or 24 VDC $\pm 10\%$, 533 mA at 32 to 140°F (0 to 60°C) 733 mA at -22 to 32°F (-30 to 0°C) 833 mA at -40 to -22°F (-40 to -30°C) GGx: 0 (2) to 10 VDC, 6 to 9 VDC, or 0 (4) to 20 mA
Input Signal Adjustments	GGx (Voltage Input or Current Input): Factory Setting: 0 to 10 VDC, CW rotation with signal increase Switch Selectable: 0 (2) to 10 VDC, 6 to 9 VDC, or 0 (4) to 20 mA Direction of Action: Switch selectable direct or reverse with signal increase
Input Impedance	GGx: Voltage Input, 200,000 ohms; Current Input, 500 ohms
Feedback Signal	GGx: 0 (2) to 10 VDC for 90° (10 VDC at 2 mA) or 6 to 9 VDC Corresponds to input signal selection and also rotation limits
Power Supply Output	17 to 22 VDC at 25 mA (-2MP models)
Auxiliary Switch Rating	xGC Models: Two Single-Pole, Double-Throw (SPDT), double insulated switches Rating per Switch: 24 VAC, 50 VA pilot duty 120 VAC, 5.8 A resistive, 1/4 hp, 275 VA pilot duty 240 VAC, 2.9 A resistive, 1/4 hp, 275 VA pilot duty
Spring Return	Direction is selectable with the mounting position of the actuator: CCW actuator face away from the damper for CCW spring return; CW actuator face away from the damper for CW spring return
Mechanical Output	Running Torque: 53 lb-in (6 N·m)
Rotation Range	Adjustable from 34.5 to 90°, mechanically limited to 93°
Rotation Time	90 seconds for 93° with 0 to 53 lb-in (0 to 6 N·m)
Cycles	60,000 full stroke cycles; 1,500,000 repositions rated at 53 lb-in (6 N·m)
Electrical Connection	Actuator: 48 in. (1.2 m) cable with 20 AWG wire leads Auxiliary Switches: 48 in. (1.2 m) cable with 18 AWG wire leads
Mechanical Connection	3/8 to 1/2 in. (10.0 to 12.7 mm) diameter round shaft 3/8 in. (10 mm) square shaft
Enclosure	NEMA 2, IP42
Ambient Conditions	Operating: -40 to 140°F (-40 to 60°C); 10 to 90% RH, non-condensing Storage: -85 to 185°F (-65 to 85°C); 5 to 95% RH, non-condensing
Dimensions (H x W x D)	xGC Models: 8.32 x 3.25 x 3.58 in. (211.3 x 82.6 x 91.0 mm) with conduit adaptor All Other Models: 6.98 x 3.25 x 3.58 in. (177.3 x 82.6 x 91.0 mm)
Shipping Weight	3.45 lb (1.56 kg)
Agency Compliance	UL 873 Listed, File E27734, CCN XAPX CSA C22.2 No. 139 Certified, File LR85083, Class 3221 02 CE Mark: EMC Directive 89/336/EEC; Low Voltage Directive 73/23/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, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



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