

M9220-xxx-RK Electric Spring-Return Actuators

Description

The M9220-xxx-RK Electric Spring-Return Actuators operate with these available power options:

- AC 24 V at 50/60 Hz or DC 24 V (BGx and GGx)
- AC 120 V at 60 Hz (BAX)

These direct-mount, bidirectional actuators do not require a damper linkage, and are easily installed on dampers with 3/4 to 1-1/16 in. (19 to 27 mm) round shafts, or 5/8 and 3/4 in. (16, 18, and 19 mm) square shafts using the standard shaft clamp included with the actuator. An optional M9220-601 Coupler Kit is available for 1/2 to 3/4 in. (12 to 19 mm) round shafts, or 3/8 and 1/2 in. (10, 12, and 14 mm) square shafts.

A single M9220 Electric Spring-Return Actuator provides a running and spring-return torque of 177 lb-in (20 N·m). Two or three models mounted in tandem deliver twice or triple the torque. Integral line voltage auxiliary switches are available on the -xxC models to indicate end-stop position or to perform switching functions within the selected rotation range.

Refer to the *M9220-xxx-3 Electric Spring-Return Actuators Product Bulletin (LIT-12011057)* for important product application information.

Features

- Available torques of 177 lb-in (20 N·m) for single actuators, 354 lb-in (40 N·m) for two models, and 531 lb-in (60 N·m) for three models mounted in tandem—offer a selection that is most suitable for the application.
- Reversible mounting design—simplifies installation and enables the actuator to spring return in either direction.
- Electronic stall detection throughout entire rotation range—extends the life of the actuator by deactivating the actuator motor when an overload condition is detected.
- Removable coupler—adapts to a shorter damper shaft.
- Integral 36 in. (0.91 m) halogen-free cables with colored and numbered conductors—simplify field wiring.
- Integral auxiliary switches (xxC models)—provide one fixed and one adjustable switch point with line voltage capability.
- NEMA 2 (IP54) rated aluminum enclosure—protects the internal components of the actuator from dirt and moisture.
- Easy-to-use locking manual override with auto release and crank storage—allows for manual positioning of the actuator hub.
- Integral Connectors for 3/8 in. flexible metal conduit—simplify installation and field wiring.
- Microprocessor-controlled brushless DC motor (-GGx types)—provides constant run-time independent of torque.



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Applications

The M9220-xxx-RK Electric Spring-Return Actuators provide reliable control of dampers and valves in HVAC systems. The M9220-xxx-RK Actuators are available for use with on/off, floating, and proportional controllers.

Repair Information

If the M9220-xxx-RK 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	Auxiliary Switches	Power Requirements
M9220-BAA-RK	On/Off	None	AC 120 V at 60 Hz
M9220-BAC-RK	On/Off	Two	AC 120 V at 60 Hz
M9220-BGA-RK	On/Off	None	AC 24 V at 50/60 Hz or DC 24 V
M9220-BGC-RK	On/Off	Two	AC 24 V at 50/60 Hz or DC 24 V
M9220-GGA-RK	Proportional	None	AC 24 V at 50/60 Hz or DC 24 V

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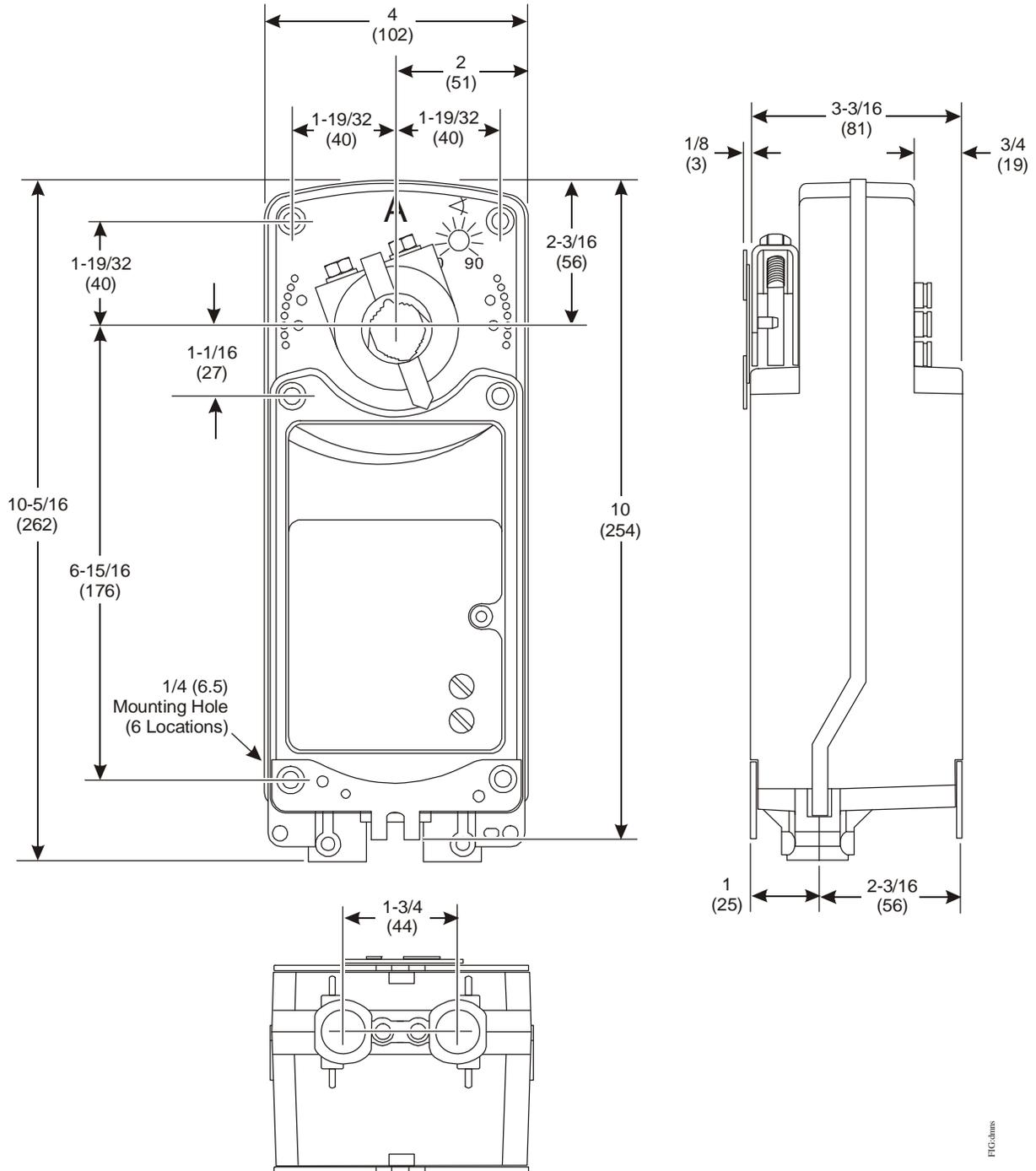
Accessories

Code Number	Description
DMPR-KC003 ¹	7 in. (178 mm) Blade Pin Extension (without bracket) for Johnson Controls direct-mount damper applications (quantity 5)
M9000-153	Crankarm (quantity 1)
M9000-158	Tandem Mounting Kit used to mount two models of M9220-xxx-RK Proportional Electric Spring-Return Actuators (quantity 1)
M9000-170	Remote Mounting Kit, horizontal. Kit includes mounting bracket, M9000-153 Crankarm, ball joint, and mounting bolts (quantity 1).
M9000-171	Remote Mounting Kit, vertical. Kit includes mounting bracket, M9000-153 Crankarm, ball joint, and mounting bolts (quantity 1).
M9000-200	Commissioning tool that provides a control signal to drive 24 V on/off, floating, proportional, and/or resistive electric actuators (quantity 1)
M9000-320	Weather Shield Enclosure - NEMA 3R Enclosure for protecting a single M9220 Actuator from rain, sleet, or snow (quantity 1)
M9000-400	Jackshaft Linkage Kit. Open-ended design enables clamping onto a jackshaft without requiring access to the ends of the jackshaft (quantity 1).
M9000-604	Replacement Anti-Rotation Bracket Kit (with screws) for M9220-xxx-RK Proportional Electric Spring-Return Actuators (quantity 1)
M9200-100	Threaded Conduit Adapter, 1/2 NPSM, for M9220 and M9208 Series Actuators (quantity 5)
M9220-601	Replacement Coupler Kit (with Locking Clip) for mounting M9220-xxx-RK Proportional Electric Spring-Return Actuators on dampers with 1/2 to 3/4 in. or 12 to 19 mm round shafts, or 3/8 and 1/2 in. or 10, 12, and 14 mm square shafts (quantity 1)
M9220-602	Replacement locking clips for M9220-xxx-RK Proportional Electric Spring-Return Actuators (five per bag)
M9220-603	Adjustable Stop Kit for M9220-xxx-RK Proportional Electric Spring-Return Actuators (quantity 1)
M9220-604	Replacement manual override cranks for M9220-xxx-RK Proportional Electric Spring-Return Actuators (five per bag)
M9220-610	Replacement Shaft Gripper, 10 mm square shaft with locking clip (quantity 1)
M9220-612	Replacement Shaft Gripper, 12 mm square shaft with locking clip (quantity 1)
M9220-614	Replacement Shaft Gripper, 14 mm square shaft with locking clip (quantity 1)

1. Furnished with the damper and may be ordered separately

M9220-xxx-RK Electric Spring-Return Actuators (Continued)

Dimensions



M9220-xxx-RK Electric Spring-Return Actuator Dimensions, in. (mm)

FIG. 44mm

M9220-xxx-RK Electric Spring-Return Actuators (Continued)

Technical Specifications

M9220-xxx-RK Electric Spring-Return Actuators (Part 1 of 2)		
Product Codes		M9220-Bxx-RK Models: On/Off M9220-GGA-RK Models: Proportional
Power Requirements	GGA Models	AC 24 V (19.2 to 30 V) at 50/60 Hz: Class 2, 15.5 VA running, 7.7 VA holding position; DC 24 V (21.6 to 26.4 V): Class 2, 6.7 W running, 2.9 W holding position
	Bx Models	AC 120 V (AC 102 to 132 V) at 60 Hz: 0.25 A running, 0.13 A holding position
	BGx Models	AC 24 V (19.2 to 30 V) at 50/60 Hz: Class 2, 24.6 VA running, 7.7 VA holding position; DC 24 V (21.6 to 26.4 V): Class 2, 17.6 W running, 2.8 W holding position
Transformer Sizing Requirements	GGA Models	20 VA minimum per actuator
	Bxx Models	25 VA minimum per actuator
Input Signal/Adjustments	GGA Models	Factory set DC 0 to 10 V, CW rotation with signal increase; Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with field furnished 500 Ohm, 0.25 W minimum resistor; switch selectable direct or reverse action with signal increase
Control Input Impedance	GGA Models	Voltage Input: 200,000 Ohms; Current Input: 500 Ohms with field furnished 500 Ohm resistor
Feedback Signal	GGA Models	0 (2) to 10 VDC for desired rotation range up to 90°; Corresponds to rotation limits, 1 mA maximum
Auxiliary Switch Rating	xxC Models	Two single-pole, double-throw (SPDT), double-insulated switches with gold flash contacts: AC 24 V, 50 VA Pilot Duty; AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty; AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Direction is selectable with mounting position of actuator: Side A, actuator face away from damper for CCW Spring Return; Side B, actuator face away from damper for CW Spring Return
Running and Spring Return Torque		177 lb-in (20 N-m) for a single actuator; 354 lb-in (40 N-m) for two models mounted in tandem 531 lb-in (60 N-m) for three models mounted in tandem
Valid Tandem Combinations		Two M9220-Bxx-RK One M9220-GGA-RK master with one or two M9220-GGA-RK slaves
Rotation Range		Adjustable from 30 to 90° CW or CCW with optional M9220-603 Adjustable Stop Kit; mechanically limited to 90°
Rotation Time Power On (Running)	GGA Models	150 seconds for 0 to 177 lb-in (0 to 20 N-m) at all operating conditions; independent of load
	BGx Models	24 to 57 seconds for 0 to 177 lb-in (0 to 20 N-m) at all operating conditions; 35 seconds nominal at full rated load
Rotation Time Power Off (Spring Returning)	GGA Models	20 seconds for 0 to 177 lb-in (0 to 20 N-m) at room temperature
	BGx Models	11 to 15 seconds for 0 to 177 lb-in (0 to 20 N-m) at room temperature; 35 seconds maximum for 0 to 177 lb-in (0 to 20 N-m) at -22°F (-30°C) 130 seconds maximum for 0 to 177 lb-in (0 to 20 N-m) at -40°F (-40°C)
Cycles		60,000 full stroke cycles; 1,500,000 repositions
Audible Noise Rating (AGx, HGx, GGx Models)	Power On (Running)	< 40 dBA at 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 55 dBA at 39-13/32 in. (1 m)
Audible Noise Rating (BGx Models)	Power On (Running)	< 66 dBA at 39-13/32 in. (1 m)
	Power On (Holding)	< 18 dBA at 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 66 dBA at 39-13/32 in. (1 m)
Electrical Connections	Actuator (All Models)	3 ft (0.91 m) halogen-free cable with 18 AWG (0.75 mm ²) wire leads
	Auxiliary Switches (xxC Models)	3 ft (0.91 m) halogen-free cable with 18 AWG (0.75 mm ²) wire leads
Conduit Connections		Integral connectors for 3/8 in. (10 mm) flexible metal conduit
Mechanical Connections	Standard Shaft Clamp Included with Actuator	3/4 to 1-1/16 in. (19 to 27 mm) diameter round shafts, or 5/8 and 3/4 in. (16, 18, and 19 mm) square shafts
Aluminum Enclosure		NEMA 2 (IP54) for all mounting orientations
Ambient Conditions	Operating	-40 to 131°F (-40 to 55°C); 90% RH maximum, noncondensing
	Storage	-85 to 185°F (-65 to 85°C); 95% RH maximum, noncondensing
Dimensions		See <i>Dimensions</i> .

M9220-xxx-RK Electric Spring-Return Actuators (Continued)

M9220-xxx-RK Electric Spring-Return Actuators (Part 2 of 2)		
Compliance 	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2, Particular Requirements for Electric Actuators. (Models: All)
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment (Models: All).
	Europe	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 and Low Voltage Directive 2006/95/EC.
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant (Models: All)
Shipping Weight	xGx Models	6.4 lb (2.9 kg)
	BAX Models	7.6 lb (3.5 kg)