

## M9203-xxx-RK Series Electric Spring-Return Actuators

### Description

The M9203-xxx-RK Series Electric Spring-Return Actuators provide control of dampers in HVAC systems. All actuators in this series provide 27 lb-in (3 N·m) rated torque. A mechanical spring-return system provides rated torque with and without power applied to the actuator. The series includes the following control options:

- On/Off, 24 V, 85 to 264 VAC power
- On/Off and Floating Point, 24 V power
- Proportional, 24 V power, for 0(2) to 10 VDC or 0(4) to 20 mA Control Signal

These actuators are configured for direct mounting and do not require a damper linkage. Actuators can be mounted directly to a damper shaft from 1/4 to 1/2 in. (6 to 12 mm) diameter with a universal clamp. An accessory crankarm and remote mounting kit are available for applications where the actuator cannot be direct-coupled to the damper shaft. An optional line voltage auxiliary switch indicates an end-stop position or performs switching functions within the selected rotation range.

Refer to the *M9203-xxx-2(Z) Series Electric Spring-Return Actuators Product Bulletin (LIT-12011674)* for important product application information.

### Features

- 27 lb-in (3 N·m) rated torque
- direct-coupled design
- reversible mounting
- electronic stall detection
- double-insulated construction
- microprocessor-controlled brushless DC motor (-GGx types)
- external mode selection switch (-GGx types)
- integral cable with colored and numbered conductors
- integral 1/2 in. (13 mm) threaded conduit connectors
- optional integrated auxiliary switch
- plenum rated models
- override control (proportional models only)
- Underwriters Laboratories Inc.® (UL), CE, and C-Tick compliance
- manufactured under International Standards Organization (ISO) 9001 quality control standards
- 5-year warranty



**M9203-xxx-RK Series Electric Spring-Return Actuator**

### Accessories and Replacement Parts

Code Number	Description
DMPR-KC003 <sup>1</sup>	7 in. (178 mm) blade pin extension (without bracket) for Johnson Controls® direct-mount damper applications (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)
M9000-321	Weather Shield Kit for damper application of M9203 and M9208 Series Electric Spring-Return Actuators (quantity 1)
M9000-400	Jackshaft Linkage Adapter Kit (quantity 1)
M9000-604	Replacement Anti-Rotation Bracket Kit for M9203, M9208, M9210, and M9220 Series Electric Spring-Return Actuators (quantity 1)
M9000-606	Position indicator for damper applications (quantity 5)
M9203-100	Remote Mounting Kit with Crankarm Kit (quantity 1)
M9203-110	Universal Mounting Kit without Crankarm Kit (quantity 1)
M9203-115	Universal Mounting Kit with Crankarm Kit (quantity 1)
M9203-150	Crankarm Kit (quantity 1)
M9203-250	Remote Mounting Kit with Crankarm Kit and damper linkage for D1300 Dampers (quantity 1)
M9203-601	Replacement Standard Coupler Kit (with retainer) for mounting M9203 Series Electric Spring-Return Actuators (quantity 1)
M9203-602	Replacement retainer for M9203 Series Electric Spring-Return Actuators (quantity 5)
M9203-603	Adjustable Stop Kit for M9203 Series Electric Spring-Return Actuators (quantity 1)

1. Furnished with the damper and may be ordered separately

## M9203-xxx-RK Series Electric Spring-Return Actuators (Continued)

### Selection Chart

Code Number	Rotation Time (Seconds) for 90°		Power Requirements		Power Consumption			Input Signal	Position Feedback	Auxiliary Switch	Electrical Connection			
	Power On — Running	Power Off — Spring Return	24 VAC +/- 20%, VDC +/-10%	85 to 264 VAC	VA Rating, Transformer Sizing	VA: Running (Holding)	Current: Running (Holding)	On/Off	0(2) to 10 VDC 0(4) to 20 mA (with 500 Ohm Resistor)	0(2) to 10 VDC	1 SPDT, 5.0 A (2.9 A Inductive) at 240 V	3 ft. (0.91 m) 18 AWG Appliance Cable	3 ft. (0.91 m) 19 AWG Plenum Cable	1/2 in. (13 mm) Conduit Connectors
M9203-BGA-RK	< 75	< 25	■		6	5.0 (2.5)	—	■				■		■
M9203-BGB-RK	< 75	< 25	■		6	5.0 (2.5)	—	■			■	■		■
M9203-BUA-RK	< 75	< 25		■		—	0.06 (0.02)	■				■		■
M9203-BUB-RK	< 75	< 25		■		—	0.06 (0.02)	■			■	■		■
M9203-GGA-RK	150	< 25	■		6	4.7 (2.7)	—		■	■			■	■

## M9203-xxx-RK Series Electric Spring-Return Actuators (Continued)

### Technical Specifications

M9203-GGA-RK Series Proportional Electric Spring-Return Actuator		
<b>Power Requirements</b>		AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 4.7 VA running, 2.7 VA holding position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 1.8 W running, 1 W holding position Minimum transformer size: 6 VA per actuator
<b>Input Signal / Adjustments</b>		Factory set at 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
<b>Control Input Impedance</b>		Voltage input: 100,000 Ohms Current input: 500 Ohms with field-furnished 500 Ohm resistor
<b>Feedback Signal</b>		DC 0 (2) to 10 V for desired rotation range up to 95° Corresponds to rotation limits, 0.5 mA at 10 V maximum
<b>Spring Return</b>		Direction is selectable with mounting position of actuator: Actuator face labeled A is away from damper or valve: CCW spring return Actuator face labeled B is away from damper or valve: CW spring return
<b>Rated Torque</b>	<b>Power On (Running)</b>	27 lb-in (3 N·m) all operating temperatures
	<b>Power Off (Spring Returning)</b>	27 lb-in (3 N·m) all operating temperatures
<b>Rotation Range</b>		Maximum full stroke: 95° Adjustable stop: 35° to 95° maximum position
<b>Rotation Time for 90 Degrees of Travel</b>	<b>Power On (Running) -GGA-RK Models</b>	150 seconds constant for 0 to 27 lb-in (3 N·m) load, at all operating conditions
	<b>Power Off (Spring Returning)</b>	12 to 17 seconds for 0 to 27 lb-in (3 N·m) load, at room temperature 16 seconds nominal at full rated load 22 seconds maximum with 27 lb-in (3 N·m) load, at -22°F (-30°C)
<b>Life Cycles</b>		60,000 full stroke cycles with 27 lb-in (3 N·m) load 1,500,000 repositions with 27 lb-in (3 N·m) load
<b>Audible Noise Rating</b>	<b>Power On (Running) -GGA-RK Models</b>	< 28 dBA at 27 lb-in (3 N·m) load, at a distance of 39-13/32 in. (1 m)
	<b>Power On (Holding)</b>	< 20 dBA at a distance of 39-13/32 in. (1 m)
	<b>Power Off (Spring Returning)</b>	< 56 dBA at 27 lb-in (3 N·m) load, at a distance of 39-13/32 in. (1 m)
<b>Electrical Connections</b>		3 ft. (0.91 m) UL 444 Type CMP plenum rated cable with 19 AWG (0.75 mm <sup>2</sup> ) conductors and 0.25 in. (6 mm) ferrule ends
<b>Conduit Connections</b>		Integral 1/2 in. (13 mm) threaded conduit connectors
<b>Mechanical Connections</b>	<b>Round Shafts</b>	Range of sizes: 1/4 to 1/2 in. (6 to 12 mm)
	<b>Square Shafts</b>	Range of sizes: 1/4 to 5/16 in. (6 to 8 mm)
<b>Enclosure Rating</b>		NEMA 2 (IP54) for all mounting orientations
<b>Ambient Conditions</b>	<b>Standard Operating</b>	-22 to 140°F (-30 to 60°C); 90% RH maximum, noncondensing
	<b>Storage</b>	-40 to 185°F (-40 to 85°C); 95% RH maximum, noncondensing
<b>Dimensions</b>		6.38 x 3.23 x 2.26 in. (162 x 82 x 57.5 mm)
	<b>United States</b>	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)
	<b>Canada</b>	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)
	<b>Europe</b>	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.
	<b>Australia and New Zealand</b>	C-Tick Mark, Australia/NZ Emissions Compliant. (Models: All)
<b>Shipping Weight</b>		-GGA Models: 2.0 lb (0.9 kg)

## M9203-xxx-RK Series Electric Spring-Return Actuators (Continued)

M9203-Bxx-RK Series On/Off Electric Spring-Return Actuators		
Power Requirements	-BGx-RK Models	AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 5 VA running, 1.6 VA holding position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe), 2.8 W running, 0.8 W holding position Minimum transformer size: 6 VA per actuator
	-BUX-RK Models	AC 100 to 240 V (AC 85 V to 264 V) at 50/60 Hz: 0.06 A running, 0.02 A holding position
Auxiliary Switch Rating	-xxB Models	One Single-Pole, Double-Throw (SPDT), double-insulated switch with silver 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: Actuator side A is away from damper or valve: CCW Spring Return Actuator side B is away from damper or valve: CW Spring Return
Rated Torque	Power On (Running)	27 lb-in (3 N·m) all operating temperatures
	Power Off (Spring Returning)	27 lb-in (3 N·m) all operating temperatures
Rotation Range		Maximum full stroke: 95° Adjustable stop: 35 to 95° maximum position
Rotation Time for 90 Degrees of Travel	Power On (Running) -Bxx-RK Models	53 to 71 seconds for 0 to 27 lb-in (3 N·m) Load, at room temperature 60 seconds nominal at full rated load (0.25 rpm)
	Power Off (Spring Returning)	19 to 23 seconds for 0 to 27 lb-in (3 N·m) load, at room temperature 22 seconds nominal at full rated load 28 seconds maximum with 27 lb-in (3 N·m) load at -22°F (-30°C)
Life Cycles		60,000 full-stroke cycles with 27 lb-in (3 N·m) load
Audible Noise Rating	Power On (Running) -Bxx-RK Models	< 36 dBA at 27 lb-in (3 N·m) load, at a distance of 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at a distance of 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 51 dBA at 27 lb-in (3 N·m) load, at a distance of 39-13/32 in. (1 m)
Electrical Connections	Actuator (All Models)	3 ft. (0.91 m) UL 758 Type AWM halogen-free cable with 18 AWG (0.85 mm <sup>2</sup> ) conductors and 0.25 in. (6 mm) ferrule ends
	Auxiliary Switch (-xxB Models)	3 ft. (0.91 m) UL 758 Type AWM halogen-free cable with 18 AWG (0.85 mm <sup>2</sup> ) conductors and 0.25 in. (6 mm) ferrule ends
Conduit Connections		Integral 1/2 in. (13 mm) threaded conduit connectors
Mechanical Connections	Round Shafts	Range of sizes: 1/4 to 1/2 in. (6 to 12 mm)
	Square Shafts	Range of sizes: 1/4 to 5/16 in. (6 to 8 mm)
Enclosure Rating		NEMA 2 (IP54) for all mounting orientations
Ambient Conditions	Standard Operating	-22 to 140°F (-30 to 60°C); 90% RH maximum, noncondensing
	Storage	-40 to 185°F (-40 to 85°C); 95% RH maximum, noncondensing
Dimensions		6.38 x 3.23 x 2.26 in. (162 x 82 x 57.5 mm)
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		-BxA Models: 2.0 lb (0.9 kg) -BxB Models: 2.4 lb (1.1 kg)