

M9203-xxx-2(Z) Series Electric Spring Return Actuators

Product Bulletin

M9203-AGx-2, M9203-GGx-2, M9203-Bxx-2
M9203-AGx-2Z, M9203-GGx-2Z, M9203-Bxx-2Z

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The M9203-xxx-2(Z) Series Electric Spring Return Actuators provide control of dampers in Heating, Ventilating, and Air Conditioning (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 or 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.



Figure 1: M9203-xxx-2(Z) Series Electric Spring Return Actuator

Table 1: Features and Benefits (Part 1 of 2)

Features	Benefits
27 lb-in (3 N-m) Rated Torque	Provides high torque in a compact package size to expand the range of damper applications in HVAC systems.
Direct-Coupled Design	Requires no crankarm or linkage and is capable of direct mounting to a shaft up to 1/2 in. (12 mm) diameter and centered on a 1/2 in. (12 mm) shaft.
Reversible Mounting	Provides either clockwise or counterclockwise operation.
Electronic Stall Detection	Protects from overload at all angles of rotation. Power consumption is reduced in holding mode. The actuator may be stalled anywhere in its rotation range without the need for mechanical end switches.
Double-Insulated Construction	Eliminates need for electrical ground connection for regulatory agency compliance.
Microprocessor-controlled Brushless DC Motor (-AGx and -GGx types)	Provides constant runtime independent of torque.
External Mode Selection Switch (-AGx and -GGx types)	Permits control logic reversal for Floating Control (-AGx types). Permits calibration, input signal range selection, and control logic reversal for Proportional Control (-GGx types).
Integral Cables with Colored and Numbered Conductors	Simplify installation and field wiring.
Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)	Simplify installation and field wiring.

Table 1: Features and Benefits (Part 2 of 2)

Features	Benefits
Optional Integrated Auxiliary Switch	Provides one integrated, line-voltage-capable Single-Pole, Double-Throw (SPDT) switch with continuously adjustable switch point. Facilitates safety interfacing or signaling.
Plenum Rated Models	Enable use in other environmental air spaces (plenums) in accordance with section 300.22(C) of the National Electric Code.
Override Control (Proportional Models Only)	Supports manual control system override applications through field wiring.
Underwriters Laboratories Inc.® (UL), CE Mark, and C-Tick Compliance	Provides internationally recognized regulatory agency approvals.
Manufactured under International Standards Organization (ISO) 9001 Quality Control Standards	Ensures quality.
5-Year Warranty	Protects consumer investment.

Application

IMPORTANT: Use these M9203-xxx-2(Z) Series Electric Spring Return Actuators only to control equipment under normal operating conditions. Where failure or malfunction of the electric actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the electric actuator.

IMPORTANT: Before specifying M9203-xxx-2(Z) Series Electric Spring Return Actuators for plenum applications, verify acceptance of exposed plastic materials in plenum areas with the local building authority. Building codes for plenum requirements vary by location. Some local building authorities accept compliance to UL 1995, Heating and Cooling Equipment, while others use different acceptance criteria.

M9203-GGx-2(Z) Series Proportional Actuators

M9203-GGx-2(Z) Series Actuators provide proportional modulation of dampers requiring up to 27 lb-in. (3 N-m) in HVAC systems that are controlled by an electronic controller or positioner. The actuator responds to 0 to 10 VDC or 2 to 10 VDC control signals. With the addition of a 500 ohm resistor, the actuator responds to a 0 to 20 mA or 4 to 20 mA signal. A 0 to 10 VDC or 2 to 10 VDC feedback signal indicates position and provides support for master-slave applications.

Manual control system override applications are supported through field wiring, and include:

- override to MIN position
- override to MAX position
- override to MIN, MID, and MAX position

The M9203-GGA-2 and M9203-GGA-2Z actuators include plenum-rated cables and are specially configured for installation in spaces used for environmental air-handling purposes, other than ducts and plenums, as specified in National Fire Protection Association (NFPA) 70: National Electrical Code section 300.22(C), Other Space Used for Environmental Air. The space over a hung ceiling, when used for environmental air handling purposes, is an example of the type of space for which these actuators are configured.

The M9203-GGx-2 actuators have 150 second constant runtime for 90° rotation. The M9203-GGx-2Z actuators have 90 second constant runtime for 90° rotation. When combined with other actuators in a control system, this choice provides flexibility in synchronizing the movement of equipment driven from a single proportional command.

M9203-AGx-2(Z) Series On/Off and Floating Point Actuators

M9203-AGx-2Z Series Actuators provide on/off control or modulation of dampers requiring up to 27 lb-in. (3 N-m) in HVAC systems. Floating point control is provided from a triac or relay. On/off control can be provided from a manual switch, controller, auxiliary switch from a fan motor contactor, or similar device.

The M9203-AGA-2 and M9203-AGA-2Z actuators include plenum-rated cables and are specially configured for installation in spaces used for environmental air-handling purposes other than ducts and plenums as specified in National Fire Protection Association (NFPA) 70: National Electrical Code section 300.22(C), Other Space Used for Environmental Air. The space over a hung ceiling, when used for environmental air handling purposes, is an example of the type of space for which these actuators are configured.

The M9203-AGx-2 actuators have 150 second constant runtime for 90° rotation. The M9203-AGx-2Z actuators have 90 second constant runtime for 90° rotation. When combined with other actuators in a control system, this choice provides flexibility in synchronizing the movement of equipment driven from a single proportional command.

M9203-Bxx-2(Z) Series On/Off Actuators

M9203-Bxx-2(Z) Series Actuators provide on/off control of dampers requiring up to 27 lb-in. (3 N·m) in HVAC systems. On/off control can be provided from a manual switch, controller, auxiliary switch from a fan motor contactor, or similar device.

Operation

M9203-xxx-2(Z) Series Actuators provide 95° of rotation. A graduated scale from -5° to 90° and a position indicator provide visual indication of stroke. When power fails during service, the mechanical spring return system provides rated torque to the connected equipment, returning it to the home position.

M9203-GGx-2(Z) Series Proportional Actuators

M9203-GGx-2(Z) Series Actuators use a brushless DC motor controlled by a microprocessor. The microprocessor drives the motor at constant speed, independent of torque. The microprocessor also monitors the brushless DC motor's rotation to prevent damage to the actuator in a stall condition. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches. Power consumption is reduced in the holding mode.

The M9203-GGB-2 and M9203-GGB-2Z models are provided with one integrated, line-voltage-capable auxiliary SPDT switch. The switch point is independently and continuously adjustable throughout the full range of actuator stroke. Auxiliary switches are double-insulated so an electrical ground is not required.

M9203-AGx-2(Z) Series On/Off and Floating Point Actuators

M9203-AGx-2(Z) Series Actuators use a brushless DC motor controlled by a microprocessor. The microprocessor drives the motor at constant speed, independent of torque. The microprocessor also monitors the brushless DC motor's rotation to prevent damage to the actuator in a stall condition. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches. Power consumption is reduced in the holding mode.

The M9203-AGB-2 and M9203-AGB-2Z models are provided with one integrated, line-voltage-capable auxiliary SPDT switch. The switch point is independently and continuously adjustable throughout the full range of actuator stroke. Auxiliary switches are double-insulated so an electrical ground is not required.

M9203-Bxx-2(Z) Series On/Off Actuators

M9203-Bxx-2(Z) Series Actuators use a DC brush motor controlled by analog electronics. The actuator can be stalled anywhere within its rotation range without the need for mechanical end switches. Power consumption is reduced in the holding mode. Two different voltage ratings are available for On/Off Actuators:

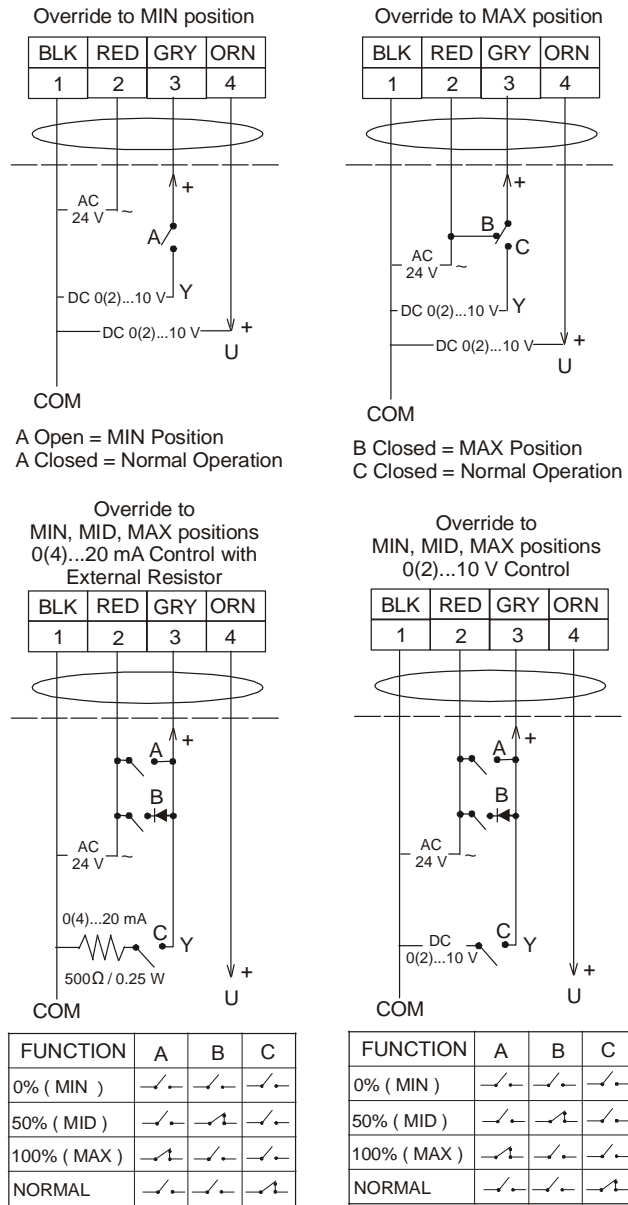
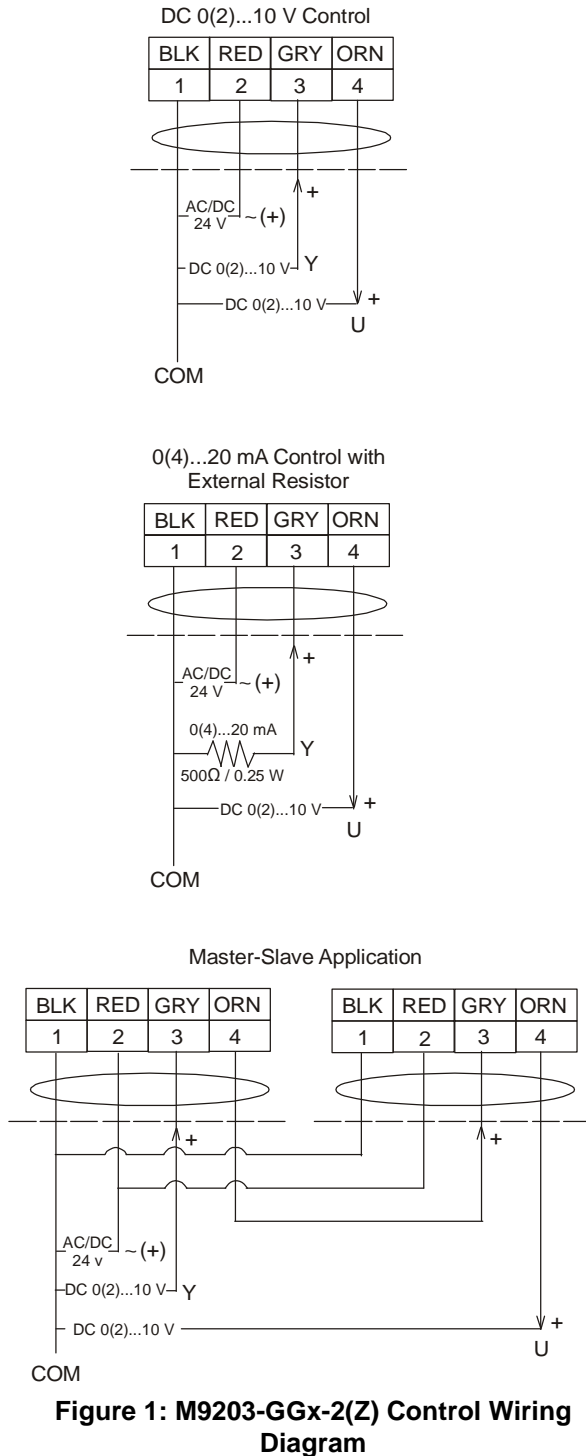
- M9203-BGx-2: AC 24 V 50/60 Hz or DC 24 V power
- M9203-BUx-2(Z): AC 85 to 264 V 50/60 Hz power

The M9203-BUx-2(Z) actuators are double-insulated so an electrical ground is not required.

The M9203-BxB-2(Z) models are provided with one integrated, line-voltage-capable auxiliary SPDT switch. The switch point is independently and continuously adjustable throughout the full range of actuator stroke. Auxiliary switches are double-insulated so an electrical ground is not required.

Wiring Diagrams

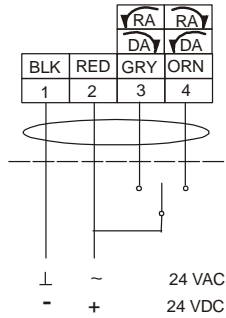
M9203-GGx-2(Z) Series Proportional Actuators



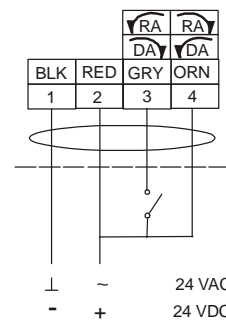
IMPORTANT: Do not install multiple M9203-GGx-2(Z) Series Actuators connected to the same mechanical load. Master-slave application of M9203-GGx-2(Z) Series Actuators requires that each actuator be connected to independent loads.

M9203-AGx-2(Z) Series On/Off and Floating Point Actuators

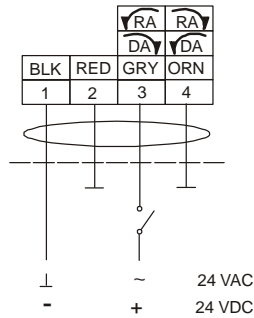
Floating Control, Four Wire



Open/Close, Single Wire Control



On/Off Control, Two Wire



Floating Control, Multiple Actuators with One Transformer

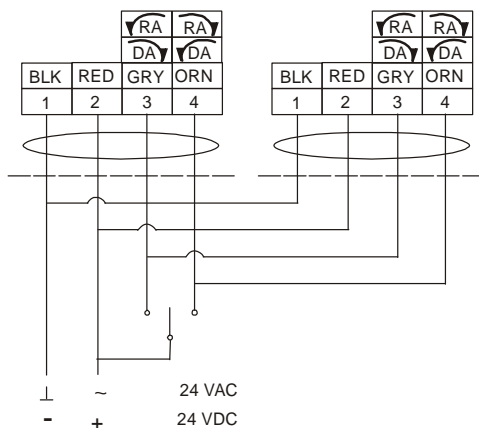


Figure 3: M9203-AGx-2(Z) Control Wiring Diagrams

M9203-Bxx-2(Z) Series On/Off Actuators

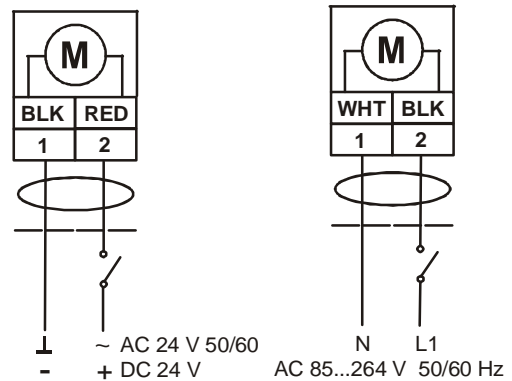


Figure 4: M9203-Bxx-2(Z) Control Wiring Diagrams

M9203-xxx-2(Z) Auxiliary Switch

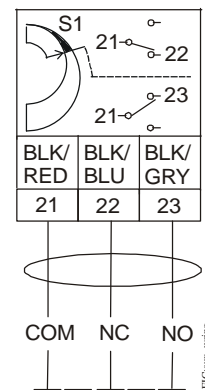


Figure 5: M9203-xxx-2(Z) Auxiliary Switch Wiring Diagram

Dimensions

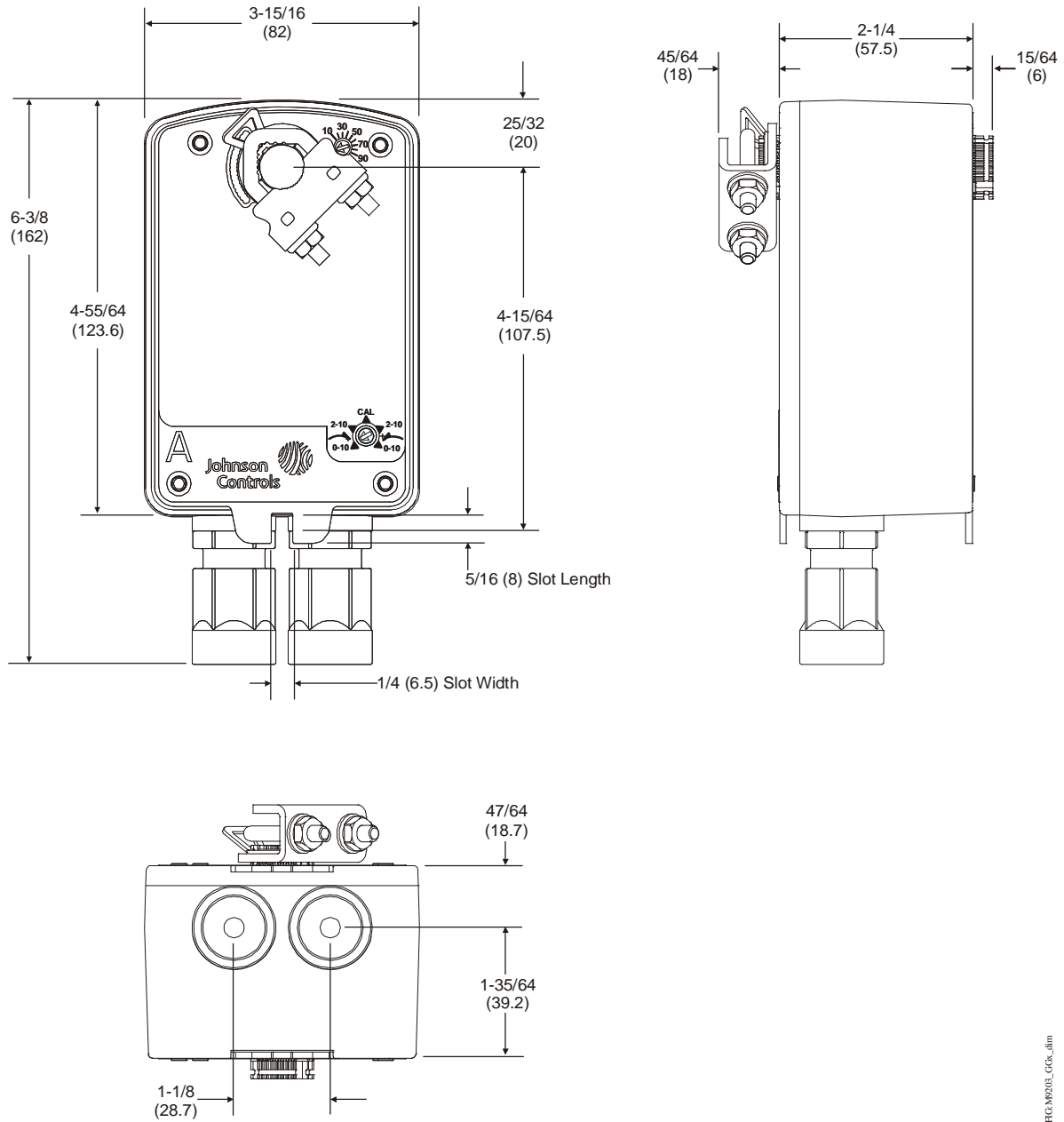


FIG.M9203_C001.dwg

Figure 6: M9203-xxx-2(Z) Series Electric Spring Return Actuator Dimensions, in. (mm)

Ordering Information

Table 2: M9203-xxx-2(Z) Series Electric Spring Return Actuator Models

Code Number	Rotation Time for 90°		Power Requirements		Power Consumption			Input Signal		Position Feedback	Auxiliary Switch	Electrical Connection			
	Power On – Running (Seconds)	Power Off – Spring Return (Seconds)	24 VAC +/- 20%, VDC +/-10%	85 to 264 VAC	VA Rating, Transformer Sizing	VA: Running (Holding)	Amperage: Running (Holding)	On/Off	On/Off and Floating Point			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	48 in. (1.2 m) 18 AWG Appliance Cable
M9203-AGA-2	150	<25	X		6	4.7 (2.7)	---		X					X	X
M9203-AGB-2	150	<25	X		6	4.7 (2.7)	---		X			X	X		X
M9203-AGA-2Z	90	<25	X		6	5.1 (2.8)	---		X					X	X
M9203-AGB-2Z	90	<25	X		6	5.1 (2.8)	---		X			X	X		X
M9203-BGA-2	<75	<25	X		6	5.0 (2.5)	---	X					X		X
M9203-BGB-2	<75	<25	X		6	5.0 (2.5)	---	X				X	X		X
M9203-BUA-2	<75	<25		X		---	.06 (.02)	X					X		X
M9203-BUB-2	<75	<25		X		---	.06 (.02)	X				X	X		X
M9203-BUA-2Z	<30	<25		X		---	.08 (.02)	X					X		X
M9203-BUB-2Z	<30	<25		X		---	.08 (.02)	X				X	X		X
M9203-GGA-2	150	<25	X		6	4.7 (2.7)	---			X	X			X	X
M9203-GGB-2	150	<25	X		6	4.7 (2.7)	---			X	X	X	X		X
M9203-GGA-2Z	90	<25	X		6	5.1 (2.8)	---			X	X			X	X
M9203-GGB-2Z	90	<25	X		6	5.1 (2.8)	---			X	X	X	X		X

Table 3: Accessories and Replacement Parts (Order Separately)

Code Number	Description
DMPR-KC003¹	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	Weathershield Kit for Damper Application of M9203 and M9208 Series Electric Spring Return Actuators (quantity 1)
M9000-341	Weathershield Kit for VG1000 Series Ball Valve application of M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring Return Actuators (quantity 1)
M9000-400	Jackshaft Linkage Adapter Kit (quantity 1)
M9000-560	Ball Valve Linkage Kit for applying M9104, M9203, and M9208 Series Electric Actuators to VG1000 Series Valves (quantity 1)
M9000-561	Thermal Barrier Kit for M9000-560 Ball Valve Linkage. Extends M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring Return Actuators applications to include low pressure steam (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)
M9000-607	Position Indicator for VG1000 Series Ball Valve 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.

Repair Information


A number of replacement parts are available; see Table 3 for more details. If an M9203-xxx-2(Z) Series Electric Spring Return Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls® representative.

Technical Specifications

M9203-GGx-2(Z) Series Proportional Electric Spring Return Actuator (Part 1 of 2)

Power Requirements	-GGx-2 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), 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
	-GGx-2Z 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), 5.1 VA Running, 2.8 VA Holding Position DC 24 V (DC 19.2 V to 28.8 V): Class 2 (North America) or SELV (Europe), 1.9 W Running, 1.1 W Holding Position Minimum Transformer Size: 6 VA per Actuator
Input Signal / Adjustments		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
Control Input Impedance		Voltage Input: 100,000 ohm Current Input: 500 ohm with Field Furnished 500 ohm Resistor
Feedback Signal		DC 0 (2) to 10 V for Desired Rotation Range up to 95° Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum
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 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
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) -GGx-2 Models	150 Seconds Constant for 0 to 27 lb-in. (3 N-m) Load, at all Operating Conditions
	Power On (Running) -GGx-2Z Models	90 Seconds Constant for 0 to 27 lb-in. (3 N-m) Load, at all Operating Conditions
	Power Off (Spring Returning)	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)
Life Cycles		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


M9203-GGx-2(Z) Series Proportional Electric Spring Return Actuator (Part 2 of 2)

Audible Noise Rating	Power On (Running) -GGx-2 Models	<28 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Running) -GGx-2Z Models	<37 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)	<56 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	-GGA-2(Z) Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switch (-xxB Models)	48 in. (1.2 m) UL 758 Type AWM Halogen Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)
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		-GGA Models: 2.0 lb (0.9 kg) -GGB Models: 2.4 lb (1.1 kg)

**M9203-AGx-2(Z) Series On/Off and Floating Point Control Electric Spring Return Actuator
(Part 1 of 2)**

Power Requirements	-AGx-2 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), 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
	-AGx-2Z 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), 5.1 VA Running, 2.8 VA Holding Position DC 24 V (DC 19.2 V to 28.8 V): Class 2 (North America) or SELV (Europe), 1.9 W Running, 1.1 W Holding Position Minimum Transformer Size: 6 VA per Actuator
Input Signal	-AGx-2(Z) Models	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20%/-10% Class 2 (North America) or SELV (Europe) Minimum Pulse Width: 500 msec
Control Input Impedance	-AGx-2(Z) Models	4,700 ohm
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 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
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) -AGx-2 Models	150 Seconds Constant for 0 to 27 lb-in. (3 N-m) Load, at All Operating Conditions
	Power On (Running) -AGx-2Z Models	90 Seconds Constant for 0 to 27 lb-in. (3 N-m) Load, at All Operating Conditions
	Power Off (Spring Returning)	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)
Life Cycles		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

**M9203-AGx-2(Z) Series On/Off and Floating Point Control Electric Spring Return Actuator
(Part 2 of 2)**

Audible Noise Rating	Power On (Running) -AGx-2 Models	<28 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Running) -AGx-2Z Models	<37 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)	<56 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	-AGA-2(Z) Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switch (-xxB Models)	48 in. (1.2 m) UL 758 Type AWM Halogen Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)
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		-AGA Models: 2.0 lb (0.9 kg) -AGB Models: 2.4 lb (1.1 kg)

M9203-Bxx-2(Z) Series On/Off Electric Spring Return Actuators (Part 1 of 2)

Power Requirements	-BGx-2 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-2 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
	-BUx-2Z Models	AC 100 to 240 V (AC 85 V to 264 V) at 50/60 Hz: 0.08 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-2 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 On (Running) -BUx-2Z Models	24 to 28 Seconds for 0 to 27 lb-in. (3 N-m) Load, at Room Temperature 27 Seconds Nominal at Full Rated Load (0.5 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-2 Models	<36 dBA at 27 lb-in. (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Running) -BUx-2Z Models	<45 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)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switch (-xxB Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)
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)

M9203-Bxx-2(Z) Series On/Off Electric Spring Return Actuators (Part 2 of 2)

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 CE	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)

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.



Building Efficiency

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