VA9203-xxx-xx Series Electric Spring-Return Actuators Catalog Page

2019-09-05 LIT-1900692

Description

Figure 1: VA9203 Series Electric pring Return Actuator



The VA9203-xxx-xx Series Electric Spring-Return Ball Valve Actuators are direct-mount valve actuators that operate on AC/DC 24 V power. These bidirectional actuators are used to provide accurate positioning on Johnson Controls® VG1000 Series 1/2, 3/4, and 1 in. (DN15, DN20, and DN25) ball valves in HVAC applications. 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, or 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

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 *VA9203-xxx-xx Series Electric Spring-Return Actuators Product Bulletin (LIT-12011702)* for important product application information.

Features

- Direct mounting with a single screw
- Electronic stall detection
- Double-insulated construction
- Microprocessor-controlled brushless DC motor (-AGx and -GGx types)
- External mode selection switch (-AGx and -GGx types)
- Integral cables with colored and numbered conductors
- Integral connectors for 1/2 in. (13 mm) threaded conduit connector(s)
- Optional integrated auxiliary switch
- Plenum rated models
- Optional thermal barrier
- Available weather shield for field mounting
- Override control (proportional models only)
- Underwriters Laboratories (UL),CE Mark, and C-Tick compliance
- Manufactured under International Standards Organization (ISO) 9001 quality control standards
- 5-year warranty

Accessories and replacement parts

Table 1: Accessories and replacement parts

Code number	Description
M9000-560	Ball valve linkage kit for applying M9203 and M9208 Series Actuators to VG1000 Series Valves (quantity 1)
M9000-561	Thermal barrier extends M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring-Return Actuator applications to include low-pressure steam (quantity 1)

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Table 1: Accessories and replacement parts

Code number	Description
M9000-342	Weather shield kit for VG1000 Series Ball Valve application of VA9104, VA9203, VA9208, and VA9308/9310 Series Electric Actuators (quantity 1)
M9000-607	Position indicator for VG1000 Series Ball Valve applications (quantity 5)
M9000-700	Universal ball valve linkage kit (quantity 1)

Selection chart

Table 2: Selection chart

Code number	Rotation time (seconds) for 90°		Power requirement		Power consumption			Input signal			Position feedback	Auxiliary switch	Electrical connection		
	Power on — running	Power Off — spring return	24 VAC +/- 20% VDC +20%/-10%	85 to 264 VAC +/- 10%	VA rating, transformer sizing	VA: running (holding)	Amperage: running (holding)	On/off	On/off and floating point	0(2) to 10 VDC0(4) to 20 mA (with 500 Ohm resistor)	0(2) to 10 VDC	SPDT, 5.0 A (2.9 A inductive) at 240 V	48 in. (1.2 m) 18 AWG appliance cable	120 in. (3.05 m) 19 AWG plenum cable	Integral 3/8 in. FMC connectors
VA9203-AGA-2Z	90	< 25	■	■	6	5.1 (2.8)	—		■					■	■
VA9203-AGB-2Z	90	< 25	■	■	6	5.1 (2.8)	—		■			■	■		■
VA9203-BGA-2	< 75	< 75	■	■	6	5.0 (2.5)	—	■					■		■
VA9203-BGB-2	< 75	< 75	■		6	5.0 (2.5)	—	■				■	■		■
VA9203-BUA-2	< 75	< 75		■	—	—	0.06 (0.02)	■					■		■
VA9203-BUB-2	< 75	< 75		■	—	—	0.06 (0.02)	■				■	■		■
VA9203-GGA-2Z	90	< 25	■		6	5.1 (2.8)	—			■	■			■	■
VA9203-GGB-2Z	90	< 25	■		6	5.1 (2.8)	—			■	■	■	■		■

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Technical specifications

Table 3: VA9203-GGx-2Z Series Proportional Electric Spring-Return Actuator

Specification		Description
Power requirements		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
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 Ohms Current input: 500 Ohms 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 valve: ccw spring return Actuator face labeled b is away from 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)	90 seconds constant for 0 lb·in to 27 lb·in (3 N·m) load, at all operating conditions
	Power off (spring returning)	12 to 17 seconds for 0 lb·in to 27 lb·in (3 N·m) load, at room temperature16 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
Audible noise rating	Power on (running)	< 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-2Z models	120 in. (3.05 m) UL 444 Type CMP plenum rated cable with 19 AWG (0.75 mm^2) conductors and1/4 in. (6 mm) ferrule ends
	-GGB-2Z models	48 in. (1.2 m) UL 758 Type AWM halogen-free cable with 18 AWG (0.85 mm^2) conductors and 1/4 in. (6 mm) ferrule ends
Conduit connections		Integral 1/2 in. (13 mm) threaded conduit connector(s)
Fluid temperature limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), not rated for steam service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), not rated for steam service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier installed	-22°F to 284°F (-30°C to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) saturated steam
Ambient conditions	Standard operating	-22°F to 140°F (-30°C to 60°C); 90% RH maximum, noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH maximum, noncondensing
Enclosure rating		NEMA 2 (IP54) for all mounting directions
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
	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
CE	Europe	CE Mark – Johnson Controls 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
Shipping Weight	-GGA Models	2.0 lb (0.9 kg)
	-GGB Models	2.4 lb (1.1 kg)

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Table 4: VA9203-AGx-2Z Series On/Off and Floating Point Electric Spring-Return Actuators

Specification		Description
Power requirements		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 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe) 1.9 W running, 1.1 W holding holding position Minimum transformer size: 6 VA per actuator
Input Signal/Adjustments		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 ms
Control Input Impedance		4,700 Ohm Control Inputs
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 Valve: CCW Spring Return Actuator Face Labeled B is away from 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°
Rotation Time for 90 Degrees of Travel	Power On (running)	90 Seconds Constant for 0 lb·in to 27 lb·in (3 N·m) Load, at All Operating Conditions
	Power Off (Spring Returning)	12 to 17 Seconds for 0 lb·in 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
Audible Noise Rating	Power On (running)	< 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-2Z Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm^2) Conductors and 1/4 in. (6 mm) Ferrule Ends
	-AGB-2Z Models	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm^2) Conductors and 1/4 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connectors
Fluid Temperature Limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22°F to 284°F (-30°C to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
Ambient Conditions	Standard Operating	-22°F to 140°F (-30°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
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
	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
CE	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping Weight	-AGA Models	2.0 lb (0.9 kg)
	-AGB Models	2.4 lb (1.1 kg)

Table 5: VA9203-Bxx-x Series On/Off Electric Spring-Return Actuator

Specification		Description
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 V 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-2 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 valve: CCW Spring Return Actuator face labeled B is away from 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°
Rotation time for 90 degrees of travel	Power on (running) Bxx-2 models	53 to 71 seconds constant for 0 lb·in 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)	37 to 46 seconds for 0 lb·in to 27 lb·in (3 N·m) load, at room temperature 44 seconds nominal at full rated load 75 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)	< 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)	< 35 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 switches (-xxB-2 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 connectors
Fluid temperature limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), not rated for steam service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), not rated for steam service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier installed	-22°F to 284°F (-30°C to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) saturated steam
Ambient conditions	Standard operating	-22°F to 140°F (-30°C to 60°C); 90% RH maximum, noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH maximum, noncondensing
Enclosure rating		NEMA 2 (IP54) for all mounting directions
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
	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
CE	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping weight	-xxA models	2.0 lb (0.9 kg)
	-xxB models	2.4 lb (1.1 kg)

Patents

Patents: https://jcipat.com

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

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Single point of contact

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