Code No. LIT-1900692
Issued January 2, 2014

VA9203-xxx-xx Series Electric Spring-Return Actuators

Description

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

VA9203 Series Electric Spring-Return Valve Actuator

Accessories and Replacement Parts

Code Number	Description
M9000-200	Commissioning Tool that Provides a Control Signal to Drive 24 V On/Off, Floating, Proportional, and/or Resistive Electric Actuators
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)
M9000-341	Weather Shield 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)
M9000-607	Position Indicator for VG1000 Series Ball Valve Applications (Quantity 5)

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 VDC 0(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)	—			■	■	■	■		■

VA9203-xxx-xx Series Electric Spring-Return Actuators (Continued)

Technical Specifications

VA9203-GGx-2Z Series Proportional Electric Spring-Return Actuator		
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 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
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 and 1/4 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 to 203°F (-5 to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22 to 212°F (-30 to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22 to 284°F (-30 to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
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
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
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
	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
	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
Shipping Weight	**-GGA Models**	2.0 lb (0.9 kg)
	-GGB Models	2.4 lb (1.1 kg)

VA9203-xxx-xx Series Electric Spring-Return Actuators (Continued)

VA9203-AGx-2Z Series On/Off and Floating Point Electric Spring-Return Actuators		
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 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
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 to 203°F (-5 to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22 to 212°F (-30 to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22 to 284°F (-30 to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
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
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
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
	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
	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 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)

VA9203-xxx-xx Series Electric Spring-Return Actuators (Continued)

VA9203-Bxx-x Series On/Off Electric Spring-Return Actuator		
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 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 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 to 203°F (-5 to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22 to 212°F (-30 to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22 to 284°F (-30 to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
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
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
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
	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
	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 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)