

VA9109-xGx-4 Series Electric Non-Spring Return Valve Actuators

Product Bulletin

VA9109-AGx-4, VA9109-GGx-4

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The VA9109 Series Actuators are direct-mount, non-spring return electric valve actuators that operate on AC 24 V power. Use these synchronous motor-driven actuators to provide accurate positioning on Johnson Controls® VG1000 Series DN15, DN20, DN25, DN32, DN40, and DN50 (1/2, 3/4, 1, 1-1/4, 1-1/2, and 2 in.) ball valves in HVAC applications.

The VA9109 Series Electric Non-Spring Return Actuators provide a running torque of 80 lb-in (9 N-m). The nominal travel time is 60 seconds at 60 Hz (72 seconds at 50 Hz) for 90° of rotation.

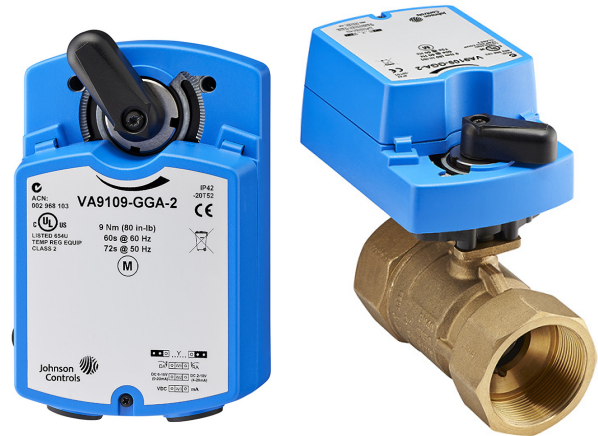


Figure 1: VA9109 Series Electric Non-Spring Return Actuator on VG1000 Series Ball Valves

Table 1: Features and Benefits

Features	Benefits
35 dBA Maximum Audible Noise Rating	Meets the audible noise requirements for open ceiling environments; whisper-quiet operation does not disturb building occupants.
Synchronous Drive	Provides a constant rotation time that is independent of the load.
100,000 Cycle Rating	Provides years of trouble-free service.
Direct Mounting with Single Screw	Reduces installation time and cost.
Manual Override	Allows for manual positioning of the valve, independent of a power supply.
Optional M9000-561 Thermal Barrier	Extends the fluid temperature range to 284°F (140°C) or 15 psig saturated steam.
5-Year Warranty	Protects the consumer investment.

IMPORTANT: Use this VA9109 Series Electric Non-Spring Return Actuator 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: Do not install or use this VA9109 Series Electric Non-Spring Return Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the electric actuator to corrosive environments may damage the internal components of the device, and will void the warranty.

IMPORTANT: Before specifying VA9109 Series Electric Non-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.

Operation

When combined with a controller, the VA9109 Series Electric Non-Spring Return Actuator provides reliable, integrated ball valve control. An AC 24 V (AGx or IGx models) or DC 0 (2) to 10 V (GGx models) input signal from the controller to electric actuator causes the motor to rotate in the proper direction and moves the ball open or closed. When the controller stops sending the input signal, the electric actuator remains in place.

Repair Information

If the VA9109 Series Electric Non-Spring Return Valve Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls representative.

Wiring Diagrams

VA9109-AGx-4 and VA9109-IGx-4

The VA9109-AGx-4 Series Electric Non-Spring Return Valve Actuators require an AC 24 V input signal and work with a variety of controllers. See Figure 2 for proper wiring.

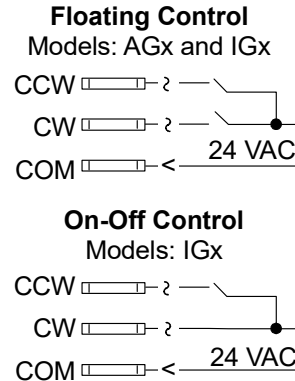


Figure 2: VA9109-AGx-4 and VA9109-IGx-4 Control Wiring Diagram

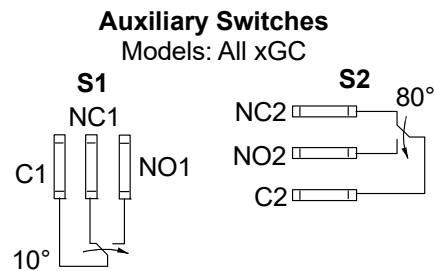


Figure 3: VA9109-AGC Auxiliary Switches

Note: Use a controller and/or software that provides a timeout function at the end of rotation (stall) to avoid excessive wear and drive time on the actuator motor with all VA9109-AGx Series Actuators. The -GGx and -IGx models have an automatic shutoff feature to prevent excessive wear and drive time on the motor.

VA9109-GGx-4

The VA9109-GGx-4 Series Electric Non-Spring Return Valve Actuators require AC 24 V power and a DC 0(2) to 10 V or 0(4) to 20 mA controller input signal. See Figure 4 for proper wiring.

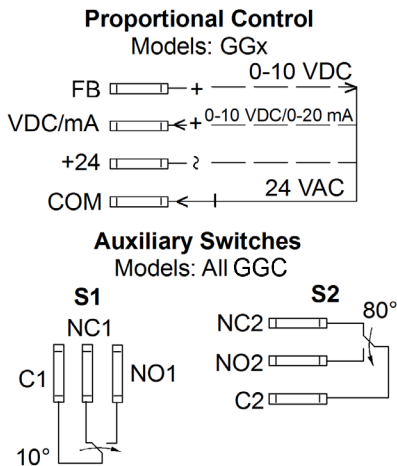


Figure 4: VA9109-GGx-4 Control Wire Diagram

The VA9109-GGx-4 proportional actuators are factory set for direct acting (DA) mode with Jumper W1 in the DA position. Remove Jumper W1 and place it in the reverse acting (RA) position (Figure 5).

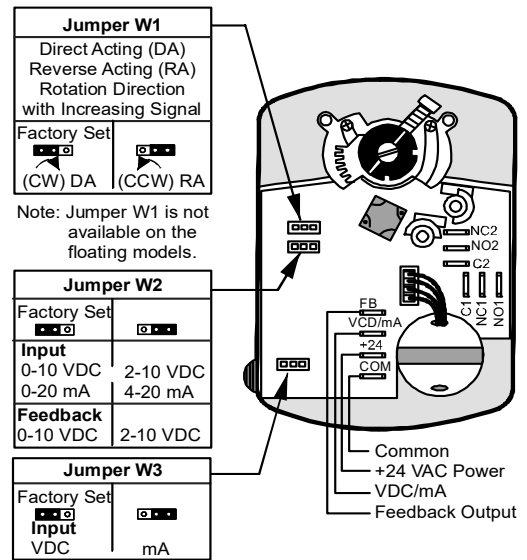


Figure 5: Calibrating GGx Models

Jumpers

The VA9109-GGx-4 proportional actuators are factory set with Jumper W2 in the 0 to 10 VDC position and Jumper W3 in the VDC position.

The VDC/mA terminal is the control input signal. Jumper W3 must be in the VDC position for voltage input and in the mA position for current input. The FB terminal is the feedback output (Figure 5).

Ordering Information

Table 2: Selection Chart

Code Number	Rotation Time For 90°	Power Requirement	Power Consumption	Input Signal			Position Feedback	Electrical Connection	Auxiliary Switch
	Power On – Running (Seconds)	24 VAC + 25%/-15% at 50/60 Hz	VA Rating, Transformer Sizing	On/Off and Floating Point Without Timeout	On/Off and Floating Point With Timeout	0 (2) to 10 VDC 0 (4) to 20 mA (with 500 ohm Resistor)	0(2) to 10 VDC	1/4 in. Spade Terminal	2 x 1.5 A Inductive 24 VAC 3.0 A Resistive 24 VAC
VA9109-AGA-4	60 s at 60 Hz 72 s at 50 Hz	X	2.5	X				X	
VA9109-GGA-4	60 s at 60 Hz 72 s at 50 Hz	X	3.2			X	X	X	
VA9109-IGA-4	60 s at 60 Hz 72 s at 50 Hz	X	2.8		X			X	
VA9109-AGC-4	60 s at 60 Hz 72 s at 50 Hz	X	2.5	X				X	X
VA9109-GGC-4	60 s at 60 Hz 72 s at 50 Hz	X	3.2			X	X	X	X

See Figure 6 for dimensions of the Non-Spring Return VA9109 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve mounted on a VG1000 valve. See Table 3 for specific model linkage dimensions.

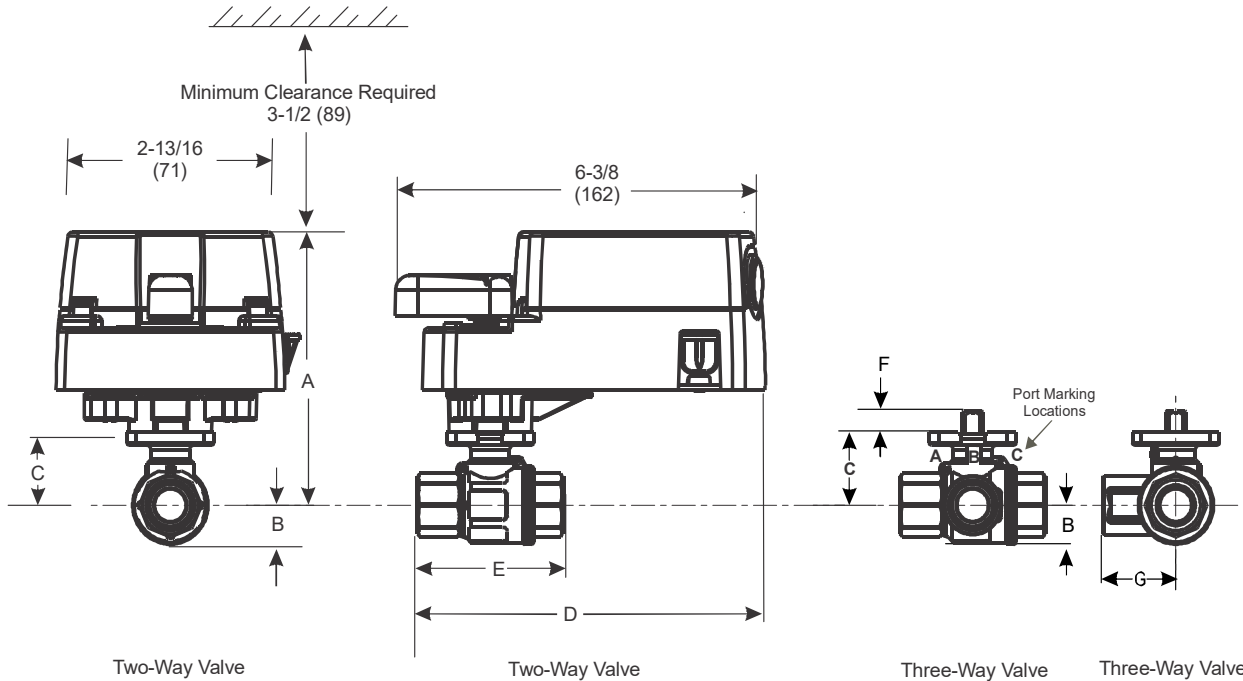


Figure 6: Non-Spring Return VA9109 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve Dimensions, in. (mm)

Table 3: VA9109 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve Dimensions, in. (mm)

Valve Size, in. (DN) ¹	A	B	C	D	E	F	G
1/2 (DN 15)	4-9/16 (116)	21/32 (17)	1-7/32 (31)	5-63/64 (152)	2-33/64 (64)	11/32 (9)	1-1/4 (32)
3/4 (DN20)	4-9/16 (116)	21/32 (17)	1-7/32 (31)	6-7/64 (155)	2-51/64 (71)	11/32 (9)	1-13/32 (36)
1 (DN25)	4-41/64 (118)	3/4 (19)	1-19/64 (33)	6-27/64 (163)	3-13/32 (87)	11/32 (9)	1-11/16 (43)
1-1/4 (DN32)	5-5/64 (129)	1-1/32 (26)	1-23/32 (44)	6-11/16 (170)	3-15/16 (100)	11/32 (9)	2 (51)
1-1/2 (DN40)	5-15/64 (133)	1-9/64 (29)	1-57/64 (48)	6-57/64 (175)	4-21/64 (110)	11/32 (9)	2-1/8 (54)
2 (DN50)	5-7/16 (138)	1-15/32 (37)	2-1/16 (53)	7-1/8 (181)	4-27/32 (123)	11/32 (9)	2-9/16 (65)

1. On models with the flow-characterizing disk, the disk is located in Port A. Port A must be the inlet.

See Figure 7 and Table 4 for VA9109 Valve Actuator dimensions with optional M9000-561 Thermal Barrier installed.

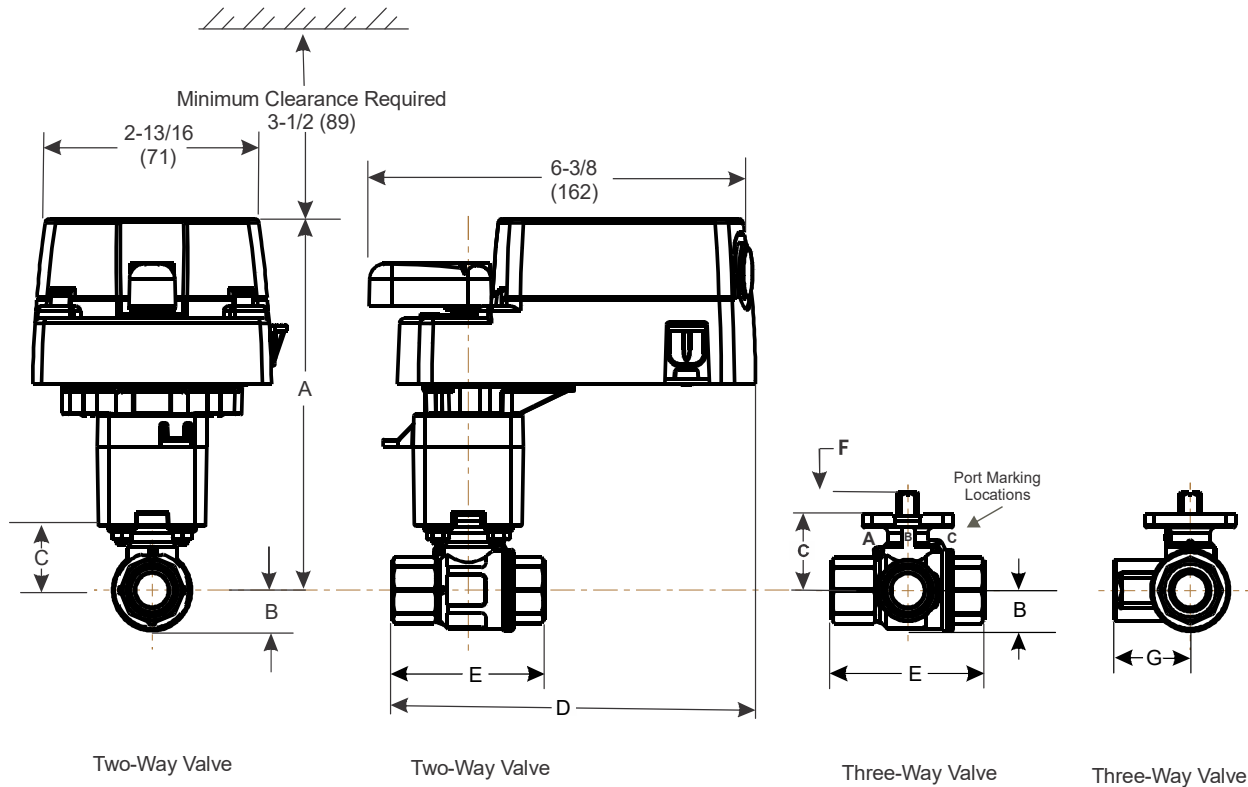


Figure 7: Field-Installed VA9109 Series Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve with Optional M9000-561 Thermal Barrier Dimensions, in. (mm)

Table 4: VA9109 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve with Optional Thermal Barrier Installed Dimensions, in. (mm)

Valve Size, in. (DN) ¹	A	B	C	D	E	F	G
1/2 (DN 15)	5-15/16 (151)	21/32 (17)	1-7/32 (31)	5-63/64 (152)	2-33/64 (64)	11/32 (9)	1-1/4 (32)
3/4 (DN20)	5-15/16 (151)	21/32 (17)	1-7/32 (31)	6-7/64 (155)	2-51/64 (71)	11/32 (9)	1-13/32 (36)
1 (DN25)	6-1/32 (153)	3/4 (19)	1-19/64 (33)	6-27/64 (163)	3-13/32 (87)	11/32 (9)	1-11/16 (43)
1-1/4 (DN32)	6-29/64 (164)	1-1/32 (26)	1-23/32 (44)	6-11/16 (170)	3-15/16 (100)	11/32 (9)	2 (51)
1-1/2 (DN40)	6-39/64 (168)	1-9/64 (29)	1-57/64 (48)	6-57/64 (175)	4-21/64 (110)	11/32 (9)	2-1/8 (54)
2 (DN50)	6-13/16 (173)	1-15/32 (37)	2-1/16 (53)	7-1/8 (181)	4-27/32 (123)	11/32 (9)	2-9/16 (65)

1. On models with the flow-characterizing disk, the disk is located in Port A. Port A must be the inlet.

Table 5: Accessories (Order Separately)


Code Number	Description
M9000-561	Thermal Barrier Extends VA9104, VA9109, VA9203, and VA9208 Series Electric Spring Return Actuator Applications to Include Low Pressure Steam (Quantity 1)
M9000-342	Weathershield Kit for VG1000 Series Ball Valve application of VA9104, VA9203, and VA9208 Series Electric Spring Return Actuators (quantity 1)

Technical Specifications

VA9109 Series Electric Non-Spring Return Valve Actuators (Part 1 of 2)

Power Requirement		24 VAC +25%/-15% at 50/60 Hz
Control Type	VA9109-AGx-4	Floating Control without Timeout
	VA9109-GGx-4	Proportional Control
Control Signal	VA9109-AGx-4	AC 24 V +25%/-20% at 50/60 Hz, Class 2 or SELV without Timeout
	VA9109-GGx-4	DC 0 (2) to 10 V or 0 (4) to 20 mA with Field-Furnished 500 ohm Resistor
Control Input Impedance	VA9109-GGx-4	Voltage Input: 200,000 ohm Current Input: 500 ohm with Field-Furnished 500 ohm Resistor
Running Torque		80 lb-in (9 N·m)
Travel Time	VA9109-xGx-4	60 Seconds at 60 Hz (72 Seconds at 50 Hz) for 90° of Rotation
Rotation Range		93° ±3°, CW or CCW
Cycles		100,000 Full Stroke Cycles; 2,500,000 Repositions at Rated Running Torque
Audible Noise Rating		35 dBA Maximum at 39-13/32 in. (1 m)
Electrical Connections		1/4 in. Spade Terminal
Enclosure		IP32
Ambient Conditions	Operating	-4 to 125°F (-20 to 52°C); 95% RH Maximum, Noncondensing
	Storage	-40 to 176°F (-40 to 80°C); 95% RH Maximum, Noncondensing
Fluid Temperature Limits (Actuator and Valve Assembly)	VG12x1 and VG18x1 Series	23 to 203°F (-5 to 95°C)
	VG12x5 and VG18x5 Series	-22 to 212°F (-30 to 100°C)
	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
Power	VA9109-AGx-4	2.5 VA
	VA9109-GGx-4	3.2 VA
Auxiliary Switch Rating	xGC	Two single pole/double-throw (SPDT) switches rated at 26 VAC 1.5 A inductive, 3.0 A resistive, 35 VA maximum per switch, Class 2

VA9109 Series Electric Non-Spring Return Valve Actuators (Part 2 of 2)

	United States	UL Listed, File E27734, CNN XAPX, UL 873 Temperature Indicating and Regulating Equipment, Suitable for use in Plenums and other air handling spaces. (UL 1995, Heating and Cooling Equipment)
	Canada	cUL Listed, File E27734, CNN XAPX7, UL 873 and CSA C22.2 No. 24-93; Temperature Indicating and Regulating Equipment, Suitable for use in Plenums and other air handling spaces. (CSA 22.2 No. 236/UL 1995 Heating and Cooling Equipment)
	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		1.25 lb (0.55 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.

Product warranty

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

Single point of contact

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