

# VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators

## Description

VG1000 Series Ball Valves are designed to regulate the flow of hot or chilled water and, for some models, low pressure steam in response to the demand of a controller in Heating, Ventilating, and Air Conditioning (HVAC) systems. Available in sizes 1/2 through 2 in. (DN15 through DN50), this family of two- and three-way forged brass valves is factory or field mounted to Johnson Controls® VA9104, M9106, M9109, and M9100 Series Non-Spring Return and VA2202, M9206, and M9210 Series Spring Return Electric Actuators for on/off, floating, or proportional control.

Refer to the *VG1000 Series Forged Brass Ball Valves Product Bulletin (LIT-977132)* for important product application information.

## Features

- forged brass body — provides 580 psig static pressure rating
- 200 psi closeoff pressure rating — provides tight shutoff
- 300 Series stainless steel ball and stem assembly — tolerates high temperature water or 15 psi saturated steam with fluid temperatures of -22 to 284°F (-30 to 140°C) or where a higher degree of corrosion protection is desired
- 500:1 rangeability — provides accurate control under all load conditions

## Repair Information

If the VG1000 Series Ball Valve fails to operate within its specifications, replace the unit. For a replacement valve, contact the nearest Johnson Controls representative.



**VG1000 Series Two-Way, Non-Spring Return, Stainless Steel Ball and Stem Ball Valve Assemblies**

## Selection Charts

### Two-Way Non-Spring Return without Switches

Valve	Size, in.	Cv	Closeoff psig	AC 24 V		
				On/Off (Floating) without Timeout <sup>1</sup>	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
				VA9104-AGA-xS <sup>2</sup> M9106-AGA-2 M9109-AGA-2	VA9104-IGA-xS <sup>2</sup> M9106-IGA-2	VA9104-GGA-xS <sup>2</sup> M9106-GGA-2 M9109-GGA-2
VG1245AD	1/2	1.2 <sup>3</sup>	200	VG1245AD+9T4AGA <sup>4</sup>	VG1245AD+9T4IGA <sup>4</sup>	VG1245AD+9T4GGA <sup>4</sup>
VG1245AE		1.9 <sup>3</sup>		VG1245AE+9T4AGA <sup>4</sup>	VG1245AE+9T4IGA <sup>4</sup>	VG1245AE+9T4GGA <sup>4</sup>
VG1245AF		2.9 <sup>3</sup>		VG1245AF+9T4AGA <sup>4</sup>	VG1245AF+9T4IGA <sup>4</sup>	VG1245AF+9T4GGA <sup>4</sup>
VG1245AG		4.7 <sup>3</sup>		VG1245AG+9T4AGA <sup>4</sup>	VG1245AG+9T4IGA <sup>4</sup>	VG1245AG+9T4GGA <sup>4</sup>
VG1245AL		7.4 <sup>3</sup>		VG1245AL+9T4AGA <sup>4</sup>	VG1245AL+9T4IGA <sup>4</sup>	VG1245AL+9T4GGA <sup>4</sup>
VG1245AN		11.7		VG1245AN+9T4AGA <sup>4</sup>	VG1245AN+9T4IGA <sup>4</sup>	VG1245AN+9T4GGA <sup>4</sup>
VG1245BG	3/4	4.7 <sup>3</sup>	200	VG1245BG+9T4AGA <sup>4</sup>	VG1245BG+9T4IGA <sup>4</sup>	VG1245BG+9T4GGA <sup>4</sup>
VG1245BL		7.4 <sup>3</sup>		VG1245BL+9T4AGA <sup>4</sup>	VG1245BL+9T4IGA <sup>4</sup>	VG1245BL+9T4GGA <sup>4</sup>
VG1245BN		11.7		VG1245BN+9T4AGA <sup>4</sup>	VG1245BN+9T4IGA <sup>4</sup>	VG1245BN+9T4GGA <sup>4</sup>
VG1245CL	1	7.4 <sup>3</sup>	200	VG1245CL+9T4AGA <sup>4</sup>	VG1245CL+9T4IGA <sup>4</sup>	VG1245CL+9T4GGA <sup>4</sup>
VG1245CN		11.7 <sup>3</sup>		VG1245CN+9T4AGA <sup>4</sup>	VG1245CN+9T4IGA <sup>4</sup>	VG1245CN+9T4GGA <sup>4</sup>
VG1245CP		18.7		VG1245CP+9T4AGA <sup>4</sup>	VG1245CP+9T4IGA <sup>4</sup>	VG1245CP+9T4GGA <sup>4</sup>
VG1245DN	1-1/4	11.7 <sup>3</sup>	200	VG1245DN+906AGA	VG1245DN+906IGA	VG1245DN+906GGA
VG1245DP		18.7 <sup>3</sup>		VG1245DP+906AGA	VG1245DP+906IGA	VG1245DP+906GGA
VG1245DR		29.2		VG1245DR+906AGA	VG1245DR+906IGA	VG1245DR+906GGA
VG1245EP	1-1/2	18.7 <sup>3</sup>	200	VG1245EP+906AGA	VG1245EP+906IGA	VG1245EP+906GGA
VG1245ER		29.2 <sup>3</sup>		VG1245ER+906AGA	VG1245ER+906IGA	VG1245ER+906GGA
VG1245ES		46.8		VG1245ES+906AGA	VG1245ES+906IGA	VG1245ES+906GGA
VG1245FR	2	29.2 <sup>3</sup>	200	VG1245FR+909AGA	—	VG1245FR+909GGA
VG1245FS		46.8 <sup>3</sup>		VG1245FS+909AGA	—	VG1245FS+909GGA
VG1245FT		73.7		VG1245FT+909AGA	—	VG1245FT+909GGA

1. To avoid excessive wear or drive time on the motor for the AGx models, use a controller or software that provides a timeout function to remove the signal at the end of rotation (stall).
2. The VA9104 Series Actuator has a 212°F (100°C) fluid temperature limit. For fluid temperatures higher than 212°F, use an M9206 Series Actuator. For NPT end connection valves, you can specify a factory mount M9206 actuator by changing 9T4 in the code number to 906. For example, VG1245AD+9T4IGA becomes VG1245AD+906IGA. For M9206 actuators on Sweat or Press fitting end connection valves, field assembly is required using a M9000-520 linkage.
3. Cv has a characterizing disk.
4. Code numbers shown are for a VA9104-xGA-3S actuator with M3 screw terminals. To specify a 48-in. plenum-rated cable, change 9T4 to 9A4 in the code number for a VA9104-xGA-2S actuator. For example, VG1241AD+9T4AGA becomes VG1241AD+9A4AGA.

## VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators (Continued)

### Two-Way Non-Spring Return with Switches

Valve	Size, in.	Cv	Closeoff psig	AC 24 V		
				On/Off (Floating) without Timeout <sup>1</sup>	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
				M9106-AGC-2 M9109-AGC-2	M9106-IGC-2	M9106-GGC-2 M9109-GGC-2
VG1245AD	1/2	1.2 <sup>2</sup>	200	VG1245AD+906AGC	VG1245AD+906IGC	VG1245AD+906GGC
VG1245AE		1.9 <sup>2</sup>		VG1245AE+906AGC	VG1245AE+906IGC	VG1245AE+906GGC
VG1245AF		2.9 <sup>2</sup>		VG1245AF+906AGC	VG1245AF+906IGC	VG1245AF+906GGC
VG1245AG		4.7 <sup>2</sup>		VG1245AG+906AGC	VG1245AG+906IGC	VG1245AG+906GGC
VG1245AL		7.4 <sup>2</sup>		VG1245AL+906AGC	VG1245AL+906IGC	VG1245AL+906GGC
VG1245AN		11.7		VG1245AN+906AGC	VG1245AN+906IGC	VG1245AN+906GGC
VG1245BG	3/4	4.7 <sup>2</sup>	200	VG1245BG+906AGC	VG1245BG+906IGC	VG1245BG+906GGC
VG1245BL		7.4 <sup>2</sup>		VG1245BL+906AGC	VG1245BL+906IGC	VG1245BL+906GGC
VG1245BN		11.7		VG1245BN+906AGC	VG1245BN+906IGC	VG1245BN+906GGC
VG1245CL	1	7.4 <sup>2</sup>	200	VG1245CL+906AGC	VG1245CL+906IGC	VG1245CL+906GGC
VG1245CN		11.7 <sup>2</sup>		VG1245CN+906AGC	VG1245CN+906IGC	VG1245CN+906GGC
VG1245CP		18.7		VG1245CP+906AGC	VG1245CP+906IGC	VG1245CP+906GGC
VG1245DN	1-1/4	11.7 <sup>2</sup>	200	VG1245DN+906AGC	VG1245DN+906IGC	VG1245DN+906GGC
VG1245DP		18.7 <sup>2</sup>		VG1245DP+906AGC	VG1245DP+906IGC	VG1245DP+906GGC
VG1245DR		29.2		VG1245DR+906AGC	VG1245DR+906IGC	VG1245DR+906GGC
VG1245EP	1-1/2	18.7 <sup>2</sup>	200	VG1245EP+906AGC	VG1245EP+906IGC	VG1245EP+906GGC
VG1245ER		29.2 <sup>2</sup>		VG1245ER+906AGC	VG1245ER+906IGC	VG1245ER+906GGC
VG1245ES		46.8		VG1245ES+906AGC	VG1245ES+906IGC	VG1245ES+906GGC
VG1245FR	2	29.2 <sup>2</sup>	200	VG1245FR+909AGC	—	VG1245FR+909GGC
VG1245FS		46.8 <sup>2</sup>		VG1245FS+909AGC	—	VG1245FS+909GGC
VG1245FT		73.7		VG1245FT+909AGC	—	VG1245FT+909GGC

1. To avoid excessive wear or drive time on the motor for the AGx models, use a controller or software that provides a timeout function to remove the signal at the end of rotation (stall).
2. Cv has a characterizing disk.

## VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators (Continued)

### Technical Specifications

VG1000 Two-Way, Stainless Steel Trim Ball Valves with Non-Spring Return Electric Actuators		
<b>Service<sup>1</sup></b>		Hot Water, Chilled Water, 50/50 Glycol Solutions, and 15 psig (103 kPa) Saturated Steam for HVAC Systems
<b>Fluid Temperature Limits</b>	<b>Water</b>	-22 to 284°F (-30 to 140°C)
	<b>Steam</b>	15 psig (103 kPa) at 250°F (121°C)
<b>Maximum Actuator Fluid Temperature Limits</b>	<b>212°F (100°C)</b>	VA9104 M9104 with M9000-550 Linkage
	<b>284°F (140°C)</b>	M9106 or M9109 with M9000-520 Linkage
<b>Valve Body Pressure/ Temperature Rating</b>	<b>Water</b>	580 psig (3,999 kPa) (PN40)
	<b>Steam</b>	15 psig (103 kPa) Saturated Steam
<b>Maximum Closeoff Pressure</b>		200 psig (1,378 kPa)
<b>Maximum Recommended Operating Pressure Drop</b>		50 psi Maximum Differential Pressure for Valves with Characterized Flow Control Disk and 30 psi Maximum for Quiet Service Ball Valves
<b>Flow Characteristics</b>	<b>Two-Way</b>	Equal Percentage
<b>Rangeability<sup>2</sup></b>		Greater than 500:1
<b>Minimum Ambient Operating Temperature</b>		-4°F (-20°C)
<b>Maximum Ambient Operating Temperature<sup>3</sup> (Limited by the Actuator and Linkage)</b>	<b>M9000-550 Linkage</b>	140°F (60°C): VA9104 and M9104 Series Non-Spring Return Actuators
	<b>M9000-520 Linkage</b>	125°F (52°C): M9106 and M9109 Series Non-Spring Return Actuators
<b>Leakage</b>		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
<b>End Connections</b>		National Pipe Thread (NPT)
<b>Materials</b>	<b>Body</b>	Forged Brass
	<b>Ball</b>	300 Series Stainless Steel
	<b>Blowout-Proof Stem</b>	300 Series Stainless Steel
	<b>Seats</b>	Graphite-Reinforced Polytetrafluoroethylene (PTFE) with Ethylene Propylene Diene Monomer (EPDM) O-Ring Backing
	<b>Stem Seals</b>	EPDM Double O-Rings
	<b>Characterizing Disk</b>	Amodel® AS-1145HS Polyphthalamide Resin

1. Proper water treatment is recommended; refer to the VDI 2035 Standard.

2. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.

3. In steam applications, install the valve with the stem horizontal to the piping and wrap the valve and piping with insulation.