

VG1000 Series

VG1000 Series Two-Way, Stainless Steel Ball and Stem Ball Valves Assemblies

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 VA9203 and VA9208 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 Stainless Steel Trim Ball Valves, Non-Spring Return, VA9104 Actuators without Switches

Fluid Temperatures: -4 to 212°F (-20 to 100°C) Not Rated for Steam Service				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
Actuators with M3 Screw Terminals				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1245AD	1/2	1.2 ²	200	VG1245AD+9T4AGA	VG1245AD+9T4IGA	VG1245AD+9T4GGA
VG1245AE		1.9		VG1245AE+9T4AGA	VG1245AE+9T4IGA	VG1245AE+9T4GGA
VG1245AF		2.9		VG1245AF+9T4AGA	VG1245AF+9T4IGA	VG1245AF+9T4GGA
VG1245AG		4.7		VG1245AG+9T4AGA	VG1245AG+9T4IGA	VG1245AG+9T4GGA
VG1245AL		7.4		VG1245AL+9T4AGA	VG1245AL+9T4IGA	VG1245AL+9T4GGA
VG1245AN		11.7		VG1245AN+9T4AGA	VG1245AN+9T4IGA	VG1245AN+9T4GGA
VG1245BG	3/4	4.7	200	VG1245BG+9T4AGA	VG1245BG+9T4IGA	VG1245BG+9T4GGA
VG1245BL		7.4		VG1245BL+9T4AGA	VG1245BL+9T4IGA	VG1245BL+9T4GGA
VG1245BN		11.7		VG1245BN+9T4AGA	VG1245BN+9T4IGA	VG1245BN+9T4GGA
VG1245CL	1	7.4	200	VG1245CL+9T4AGA	VG1245CL+9T4IGA	VG1245CL+9T4GGA
VG1245CN		11.7		VG1245CN+9T4AGA	VG1245CN+9T4IGA	VG1245CN+9T4GGA
VG1245CP		18.7		VG1245CP+9T4AGA	VG1245CP+9T4IGA	VG1245CP+9T4GGA
Actuators with 48 in. (1.2 m) 18 AWG Plenum Cable				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA
VG1245AD	1/2	1.2	200	VG1245AD+9A4AGA	VG1245AD+9A4IGA	VG1245AD+9A4GGA
VG1245AE		1.9		VG1245AE+9A4AGA	VG1245AE+9A4IGA	VG1245AE+9A4GGA
VG1245AF		2.9		VG1245AF+9A4AGA	VG1245AF+9A4IGA	VG1245AF+9A4GGA
VG1245AG		4.7		VG1245AG+9A4AGA	VG1245AG+9A4IGA	VG1245AG+9A4GGA
VG1245AL		7.4		VG1245AL+9A4AGA	VG1245AL+9A4IGA	VG1245AL+9A4GGA
VG1245AN		11.7		VG1245AN+9A4AGA	VG1245AN+9A4IGA	VG1245AN+9A4GGA
VG1245BG	3/4	4.7	200	VG1245BG+9A4AGA	VG1245BG+9A4IGA	VG1245BG+9A4GGA
VG1245BL		7.4		VG1245BL+9A4AGA	VG1245BL+9A4IGA	VG1245BL+9A4GGA
VG1245BN		11.7		VG1245BN+9A4AGA	VG1245BN+9A4IGA	VG1245BN+9A4GGA
VG1245CL	1	7.4	200	VG1245CL+9A4AGA	VG1245CL+9A4IGA	VG1245CL+9A4GGA
VG1245CN		11.7		VG1245CN+9A4AGA	VG1245CN+9A4IGA	VG1245CN+9A4GGA
VG1245CP		18.7		VG1245CP+9A4AGA	VG1245CP+9A4IGA	VG1245CP+9A4GGA

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 risk.

VG1000 Series Two-Way, Stainless Steel Ball and Stem Ball Valves Assemblies (Continued)

Two-Way Stainless Steel Trim Ball Valves, Non-Spring Return, VA9104 Actuators without Switches with Optional M9000-561 Thermal Barrier

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 PSI Saturated Steam				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
Actuators with M3 Screw Terminals				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1245AD	1/2	1.2 ²	200	VG1245ADH9T4AGA	VG1245ADH9T4IGA	VG1245ADH9T4GGA
VG1245AE		1.9		VG1245AEH9T4AGA	VG1245AEH9T4IGA	VG1245AEH9T4GGA
VG1245AF		2.9		VG1245AFH9T4AGA	VG1245AFH9T4IGA	VG1245AFH9T4GGA
VG1245AG		4.7		VG1245AGH9T4AGA	VG1245AGH9T4IGA	VG1245AGH9T4GGA
VG1245AL		7.4		VG1245ALH9T4AGA	VG1245ALH9T4IGA	VG1245ALH9T4GGA
VG1245AN		11.7		VG1245ANH9T4AGA	VG1245ANH9T4IGA	VG1245ANH9T4GGA
VG1245BG	3/4	4.7	200	VG1245BGH9T4AGA	VG1245BGH9T4IGA	VG1245BGH9T4GGA
VG1245BL		7.4		VG1245BLH9T4AGA	VG1245BLH9T4IGA	VG1245BLH9T4GGA
VG1245BN		11.7		VG1245BNH9T4AGA	VG1245BNH9T4IGA	VG1245BNH9T4GGA
VG1245CL	1	7.4	200	VG1245CLH9T4AGA	VG1245CLH9T4IGA	VG1245CLH9T4GGA
VG1245CN		11.7		VG1245CNH9T4AGA	VG1245CNH9T4IGA	VG1245CNH9T4GGA
VG1245CP		18.7		VG1245CPH9T4AGA	VG1245CPH9T4IGA	VG1245CPH9T4GGA
Actuators with 48 in. (1.2 m) 18 AWG Plenum Cable				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA
VG1245AD	1/2	1.2	200	VG1245ADH9A4AGA	VG1245ADH9A4IGA	VG1245ADH9A4GGA
VG1245AE		1.9		VG1245AEH9A4AGA	VG1245AEH9A4IGA	VG1245AEH9A4GGA
VG1245AF		2.9		VG1245AFH9A4AGA	VG1245AFH9A4IGA	VG1245AFH9A4GGA
VG1245AG		4.7		VG1245AGH9A4AGA	VG1245AGH9A4IGA	VG1245AGH9A4GGA
VG1245AL		7.4		VG1245ALH9A4AGA	VG1245ALH9A4IGA	VG1245ALH9A4GGA
VG1245AN		11.7		VG1245ANH9A4AGA	VG1245ANH9A4IGA	VG1245ANH9A4GGA
VG1245BG	3/4	4.7	200	VG1245BGH9A4AGA	VG1245BGH9A4IGA	VG1245BGH9A4GGA
VG1245BL		7.4		VG1245BLH9A4AGA	VG1245BLH9A4IGA	VG1245BLH9A4GGA
VG1245BN		11.7		VG1245BNH9A4AGA	VG1245BNH9A4IGA	VG1245BNH9A4GGA
VG1245CL	1	7.4	200	VG1245CLH9A4AGA	VG1245CLH9A4IGA	VG1245CLH9A4GGA
VG1245CN		11.7		VG1245CNH9A4AGA	VG1245CNH9A4IGA	VG1245CNH9A4GGA
VG1245CP		18.7		VG1245CPH9A4AGA	VG1245CPH9A4IGA	VG1245CPH9A4GGA

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 risk.

Two-Way Stainless Steel Trim Ball Valves, Non-Spring Return, M9106/M9109 Actuators without Switches (Part 1 of 2)

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 PSI Saturated Steam				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
				M9106-AGA-2 M9109-AGA-2	M9106-IGA-2	M9106-GGA-2 M9109-GGA-2
VG1245AD	1/2	1.2 ²	200	VG1245AD+906AGA	VG1245AD+906IGA	VG1245AD+906GGA
VG1245AE		1.9		VG1245AE+906AGA	VG1245AE+906IGA	VG1245AE+906GGA
VG1245AF		2.9		VG1245AF+906AGA	VG1245AF+906IGA	VG1245AF+906GGA
VG1245AG		4.7		VG1245AG+906AGA	VG1245AG+906IGA	VG1245AG+906GGA
VG1245AL		7.4		VG1245AL+906AGA	VG1245AL+906IGA	VG1245AL+906GGA
VG1245AN		11.7		VG1245AN+906AGA	VG1245AN+906IGA	VG1245AN+906GGA
VG1245BG	3/4	4.7	200	VG1245BG+906AGA	VG1245BG+906IGA	VG1245BG+906GGA
VG1245BL		7.4		VG1245BL+906AGA	VG1245BL+906IGA	VG1245BL+906GGA
VG1245BN		11.7		VG1245BN+906AGA	VG1245BN+906IGA	VG1245BN+906GGA
VG1245CL	1	7.4	200	VG1245CL+906AGA	VG1245CL+906IGA	VG1245CL+906GGA
VG1245CN		11.7		VG1245CN+906AGA	VG1245CN+906IGA	VG1245CN+906GGA
VG1245CP		18.7		VG1245CP+906AGA	VG1245CP+906IGA	VG1245CP+906GGA
VG1245DN	1-1/4	11.7	200	VG1245DN+906AGA	VG1245DN+906IGA	VG1245DN+906GGA
VG1245DP		18.7		VG1245DP+906AGA	VG1245DP+906IGA	VG1245DP+906GGA
VG1245DR		29.2		VG1245DR+906AGA	VG1245DR+906IGA	VG1245DR+906GGA

VG1000 Series Two-Way, Stainless Steel Ball and Stem Ball Valves Assemblies (Continued)

Two-Way Stainless Steel Trim Ball Valves, Non-Spring Return, M9106/M9109 Actuators without Switches (Part 2 of 2)

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 PSI Saturated Steam				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
VG1245EP	1-1/2	18.7	200	VG1245EP+906AGA	VG1245EP+906IGA	VG1245EP+906GGA
VG1245ER		29.2		VG1245ER+906AGA	VG1245ER+906IGA	VG1245ER+906GGA
VG1245ES		46.8		VG1245ES+906AGA	VG1245ES+906IGA	VG1245ES+906GGA
VG1245FR	2	29.2	200	VG1245FR+909AGA	—	VG1245CLH9A4GGA
VG1245FS		48.8		VG1245FS+909AGA	—	VG1245CNH9A4GGA
VG1245FT		73.7		VG1245FT+909AGA	—	VG1245CPH9A4GGA

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 risk.

Two-Way Stainless Steel Trim Ball Valves, Non-Spring Return M9106-/M9109 Electric Actuators with Switches

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 PSI Saturated Steam				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/Off (Floating) without Timeout ¹	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 ²	200	VG1245AD+906AGC	VG1245AD+906IGC	VG1245AD+906GGC
VG1245AE		1.9 ²		VG1245AE+906AGC	VG1245AE+906IGC	VG1245AE+906GGC
VG1245AF		2.9 ²		VG1245AF+906AGC	VG1245AF+906IGC	VG1245AF+906GGC
VG1245AG		4.7 ²		VG1245AG+906AGC	VG1245AG+906IGC	VG1245AG+906GGC
VG1245AL		7.4 ²		VG1245AL+906AGC	VG1245AL+906IGC	VG1245AL+906GGC
VG1245AN		11.7		VG1245AN+906AGC	VG1245AN+906IGC	VG1245AN+906GGC
VG1245BG	3/4	4.7 ²	200	VG1245BG+906AGC	VG1245BG+906IGC	VG1245BG+906GGC
VG1245BL		7.4 ²		VG1245BL+906AGC	VG1245BL+906IGC	VG1245BL+906GGC
VG1245BN		11.7		VG1245BN+906AGC	VG1245BN+906IGC	VG1245BN+906GGC
VG1245CL	1	7.4 ²	200	VG1245CL+906AGC	VG1245CL+906IGC	VG1245CL+906GGC
VG1245CN		11.7 ²		VG1245CN+906AGC	VG1245CN+906IGC	VG1245CN+906GGC
VG1245CP		18.7		VG1245CP+906AGC	VG1245CP+906IGC	VG1245CP+906GGC
VG1245DN	1-1/4	11.7 ²	200	VG1245DN+906AGC	VG1245DN+906IGC	VG1245DN+906GGC
VG1245DP		18.7 ²		VG1245DP+906AGC	VG1245DP+906IGC	VG1245DP+906GGC
VG1245DR		29.2		VG1245DR+906AGC	VG1245DR+906IGC	VG1245DR+906GGC
VG1245EP	1-1/2	18.7 ²	200	VG1245EP+906AGC	VG1245EP+906IGC	VG1245EP+906GGC
VG1245ER		29.2 ²		VG1245ER+906AGC	VG1245ER+906IGC	VG1245ER+906GGC
VG1245ES		46.8		VG1245ES+906AGC	VG1245ES+906IGC	VG1245ES+906GGC
VG1245FR	2	29.2 ²	200	VG1245FR+909AGC	—	VG1245FR+909GGC
VG1245FS		46.8 ²		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 risk.

VG1000 Series Two-Way, Stainless Steel Ball and Stem Ball Valves Assemblies (Continued)

Technical Specifications

VG1000 Two-Way, Stainless Steel Trim Ball Valves with Non-Spring Return Electric Actuators		
Service¹		Hot Water, Chilled Water, 50/50 Glycol Solutions, and 15 psig (103 kPa) Saturated Steam for HVAC Systems
Fluid Temperature Limits	Water	-22 to 284°F (-30 to 140°C)
	Steam	15 psig (103 kPa) at 250°F (121°C)
Maximum Actuator Fluid Temperature Limits	212°F (100°C)	VA9104 M9104 with M9000-550 Linkage
	284°F (140°C)	M9106 or M9109 with M9000-520 Linkage, or VA9104 with M9000-561 Thermal Barrier
Valve Body Pressure/ Temperature Rating	Water	580 psig (3,999 kPa) (PN40)
	Steam	15 psig (103 kPa) Saturated Steam
Maximum Closeoff Pressure		200 psig (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psi Maximum Differential Pressure for Valves with Characterized Flow Control Disk and 30 psi Maximum for Quiet Service Ball Valves
Flow Characteristics	Two-Way	Equal Percentage
Rangeability²		Greater than 500:1
Minimum Ambient Operating Temperature		-4°F (-20°C)
Maximum Ambient Operating Temperature³ (Limited by the Actuator and Linkage)	M9000-550 Linkage	140°F (60°C): VA9104 and M9104 Series Non-Spring Return Actuators
	M9000-520 Linkage	125°F (52°C): M9106 and M9109 Series Non-Spring Return Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
End Connections		National Pipe Thread (NPT)
Materials	Body	Forged Brass
	Ball	300 Series Stainless Steel
	Blowout-Proof Stem	300 Series Stainless Steel
	Seats	Graphite-Reinforced Polytetrafluoroethylene (PTFE) with Ethylene Propylene Diene Monomer (EPDM) O-Ring Backing
	Stem Seals	EPDM Double O-Rings
	Characterizing Disk	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.