VG1000 Series

LIT-1900221

Two-Way, Stainless Steel Trim, NPT End Connection Ball Valves with Spring Return Electric Actuators with Switches

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-way 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
- graphite reinforced Polytetrafluoroethylene (PTFE) Seats include 15% graphite-reinforced ball seals, providing better wear resistance
- 500:1 rangeability provides accurate control under all load conditions
- maintenance-free design performs without failure in excess of 200,000 full stroke cycles in iron-oxide contaminated water

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.

Two-Way, Spring Return, Stainless Steel Ball and Stem Ball Valve Assemblies with End Switches

Selection Charts

Two-Way – Spring Return Valve Open – Normally Open[1]

Valve	Size, in.	Cv	Closeoff psig	AC 24 V			AC 120 V
				Floating with Two Switches	DC 0 to 10 V Proportional with Two Switches	On/Off with End Switch	On/Off with End Switch
				VA2202-AGB-2[2] M9206-AGC-2 M9210-AGC-3	VA2202-GGB-2[2] M9206-GGC-2 M9210-GGB-3	VA2202-BGB-2[2] M9206-BGB-2S M9210-BGC-3	VA2202-BAB-2[2] M9206-BAB-2S M9210-BAC-3
VG1245AD	1/2	1.2[3]	200	VG1245AD+22TAGB	VG1245AD+22TGGB	VG1245AD+22TBGB	VG1245AD+22TBAB
VG1245AE		1.9[3]		VG1245AE+22TAGB	VG1245AE+22TGGB	VG1245AE+22TBGB	VG1245AE+22TBAB
VG1245AF		2.9[3]		VG1245AF+22TAGB	VG1245AF+22TGGB	VG1245AF+22TBGB	VG1245AF+22TBAB
VG1245AG		4.7[3]		VG1245AG+22TAGB	VG1245AG+22TGGB	VG1245AG+22TBGB	VG1245AG+22TBAB
VG1245AL		7.4[3]		VG1245AL+22TAGB	VG1245AL+22TGGB	VG1245AL+22TBGB	VG1245AL+22TBAB
VG1245AN		11.7		VG1245AN+22TAGB	VG1245AN+22TGGB	VG1245AN+22TBGB	VG1245AN+22TBAB
VG1245BG	3/4	4.7[3]	200	VG1245BG+22TAGB	VG1245BG+22TGGB	VG1245BG+22TBGB	VG1245BG+22TBAB
VG1245BL		7.4[3]		VG1245BL+22TAGB	VG1245BL+22TGGB	VG1245BL+22TBGB	VG1245BL+22TBAB
VG1245BN		11.7		VG1245BN+22TAGB	VG1245BN+22TGGB	VG1245BN+22TBGB	VG1245BN+22TBAB
VG1245CL	1	7.4[3]	200	VG1245CL+936AGC	VG1245CL+936GGC	VG1245CL+936BGB	VG1245CL+936BGB
VG1245CN		11.7[3]		VG1245CN+936AGC	VG1245CN+936GGC	VG1245CN+936BGB	VG1245CN+936BGB
VG1245CP		18.7		VG1245CP+936AGC	VG1245CP+936GGC	VG1245CP+936BGB	VG1245CP+936BGB
VG1245DN	1-1/4	11.7[3]	200	VG1245DN+936AGC	VG1245DN+936GGC	VG1245DN+936BGB	VG1245DN+936BGB
VG1245DP		18.7[3]		VG1245DP+936AGC	VG1245DP+936GGC	VG1245DP+936BGB	VG1245DP+936BGB
VG1245DR		29.2		VG1245DR+936AGC	VG1245DR+936GGC	VG1245DR+936BGB	VG1245DR+936BGB
VG1245EP	1-1/2	18.7[3]	200	VG1245EP+936AGC	VG1245EP+936GGC	VG1245EP+936BGB	VG1245EP+936BGB
VG1245ER		29.2[3]		VG1245ER+936AGC	VG1245ER+936GGC	VG1245ER+936BGB	VG1245ER+936BGB
VG1245ES		46.8		VG1245ES+936AGC	VG1245ES+936GGC	VG1245ES+936BGB	VG1245ES+936BGB
VG1245FR	2	29.2[3]	200	VG1245FR+92JAGC	VG1245FR+92JGGC	VG1245FR+92JBGC	VG1245FR+92JBAC
VG1245FS		46.8[3]		VG1245FS+92JAGC	VG1245FS+92JGGC	VG1245FS+92JBGC	VG1245FS+92JBAC
VG1245FT		73.7		VG1245FT+92JAGC	VG1245FT+92JGGC	VG1245FT+92JBGC	VG1245FT+92JBAC

1. VA2202-xxB and M9206-BxB have a single end switch. M9206-xGC and M9210-xGC have two end switches.
2. The VA2202 Series Actuator has a 212°F (100°C) fluid temperature limit. For fluid temperatures greater than 212°F, use an M9206 Series Actuator. To specify an M9206 Actuator, change the 22T (or 24T) in the code number to 936 (or 956). Example: VG1245AD+**22T**BGB becomes VG1245AD+**936**BGB. For Floating and Proportional, change the last **B** to **C**.
3. Cv has a characterizing disk.

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

Two-Way – Spring Return Valve Closed – Normally Closed[1]

Valve	Size, in.	Cv	Closeoff psig	AC 24 V			AC 120 V
				Floating with Two Switches	DC 0 to 10 V Proportional with Two Switches	On/Off with End Switch	On/Off with End Switch
				VA2202-AGB-2[2] M9206-AGC-2 M9210-AGC-3	VA2202-GGB-2[2] M9206-GGC-2 M9210-GGB-3	VA2202-BGB-2[2] M9206-BGB-2S M9210-BGC-3	VA2202-BAB-2[2] M9206-BAB-2S, M9210-BAC-3
VG1245AD	1/2	1.2[3]	200	VG1245AD+24TAGB	VG1245AD+24TGGB	VG1245AD+24TBGB	VG1245AD+24TBAB
VG1245AE		1.9[3]		VG1245AE+24TAGB	VG1245AE+24TGGB	VG1245AE+24TBGB	VG1245AE+24TBAB
VG1245AF		2.9[3]		VG1245AF+24TAGB	VG1245AF+24TGGB	VG1245AF+24TBGB	VG1245AF+24TBAB
VG1245AG		4.7[3]		VG1245AG+24TAGB	VG1245AG+24TGGB	VG1245AG+24TBGB	VG1245AG+24TBAB
VG1245AL		7.4[3]		VG1245AL+24TAGB	VG1245AL+24TGGB	VG1245AL+24TBGB	VG1245AL+24TBAB
VG1245AN		11.7		VG1245AN+24TAGB	VG1245AN+24TGGB	VG1245AN+24TBGB	VG1245AN+24TBAB
VG1245BG	3/4	4.7[3]	200	VG1245BG+24TAGB	VG1245BG+24TGGB	VG1245BG+24TBGB	VG1245BG+24TBAB
VG1245BL		7.4[3]		VG1245BL+24TAGB	VG1245BL+24TGGB	VG1245BL+24TBGB	VG1245BL+24TBAB
VG1245BN		11.7		VG1245BN+24TAGB	VG1245BN+24TGGB	VG1245BN+24TBGB	VG1245BN+24TBAB
VG1245CL	1	7.4[3]	200	VG1245CL+956AGC	VG1245CL+956GGC	VG1245CL+956BGB	VG1245CL+956BAB
VG1245CN		11.7[3]		VG1245CN+956AGC	VG1245CN+956GGC	VG1245CN+956BGB	VG1245CN+956BAB
VG1245CP		18.7		VG1245CP+956AGC	VG1245CP+956GGC	VG1245CP+956BGB	VG1245CP+956BAB
VG1245DN	1-1/4	11.7[3]	200	VG1245DN+956AGC	VG1245DN+956GGC	VG1245DN+956BGB	VG1245DN+956BAB
VG1245DP		18.7[3]		VG1245DP+956AGC	VG1245DP+956GGC	VG1245DP+956BGB	VG1245DP+956BAB
VG1245DR		29.2		VG1245DR+956AGC	VG1245DR+956GGC	VG1245DR+956BGB	VG1245DR+956BAB
VG1245EP	1-1/2	18.7[3]	200	VG1245EP+956AGC	VG1245EP+956GGC	VG1245EP+956BGB	VG1245EP+956BAB
VG1245ER		29.2[3]		VG1245ER+956AGC	VG1245ER+956GGC	VG1245ER+956BGB	VG1245ER+956BAB
VG1245ES		46.8		VG1245ES+956AGC	VG1245ES+956GGC	VG1245ES+956BGB	VG1245ES+956BAB
VG1245FR	2	29.2[3]	200	VG1245FR+94JAGC	VG1245FR+94JGGC	VG1245FR+94JBGC	VG1245FR+94JBAC
VG1245FS		46.8[3]		VG1245FS+94JAGC	VG1245FS+94JGGC	VG1245FS+94JBGC	VG1245FS+94JBAC
VG1245FT		73.7		VG1245FT+94JAGC	VG1245FT+94JGGC	VG1245FT+94JBGC	VG1245FT+94JBAC

1. VA2202-xxB and M9206-BxB have a single end switch. M9206-xGC and M9210-xGC have two end switches.
2. The VA2202 Series Actuator has a 212°F (100°C) fluid temperature limit. For fluid temperatures greater than 212°F, use an M9206 Series Actuator. To specify an M9206 Actuator, change the 22T (or 24T) in the code number to 936 (or 956). Example VG1245AD+**22T**BGB becomes VG1245AD+**936**BGB. For Floating and Proportional, change the last **B** to **C**.
3. Cv has a characterizing disk.

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

Technical Specifications

VG1000 Series Two-Way, Stainless Steel Trim Ball Valves with Spring Return Electric Actuators with Switches		
Service[1]		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)**	VA2202 and M2202 with M9000-550 Linkage
	284°F (140°C)	M9206 with M9000-550 Linkage M9210 with M9000-517 Linkage
Valve Body Pressure Rating	**Water**	580 psig (3,996 kPa) (PN40)
	Steam	15 psig (103 kPa) Saturated Steam
Maximum Closeoff Pressure		200 psig (1,378 kPa)
Maximum Recommended Operating Pressure Drop		Maximum Differential Pressure 50 psi: Valves with Characterized Flow Control Disk 30 psi: Quiet Service Ball Valves
Flow Characteristics	**Two-Way**	Equal Percentage
Rangeability[2]		Greater than 500:1
Minimum Ambient Operating Temperature	**-25°F (-32°C)**	M9206 Series Spring Return Actuators
	-22°F (-30°C)	VA2202 and M2202 Series Spring Return Actuators
	-40°F (-40°C)	M9210 Series Spring Return Actuators
Maximum Ambient Operating Temperature[3] **(Limited by the Actuator and Linkage)**	**Direct Mount**	122°F (50°C): VA2202 Series Spring Return Actuators
	M2000-500 Linkage	122°F (50°C): M2202 Series Spring Return Actuators
	M9000-520 Linkage	140°F (60°C): M9206 Series Spring Return Actuators
	M9000-51x Series Linkage	For Fluid Temperature below 212°F (100°C) 131°F (55°C): M9210 Series Spring Return Actuators
		For Fluid Temperature between 212°F (100°C) and 284°F (140°C) 100°F (38°C): All Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
		1% of Max Flow for Three-Way Bypass Port
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 PTFE with Ethylene Propylene Diene Monomer (EPDM) O-Ring Backing
	Stem Seals	EPDM Double O-Rings
	Characterizing Disk	Amodel® AS-1145HS Polyphthalamide Resin

1. Refer to VDI 2035 Standard for recommended proper water treatment.
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.