

VG1000 Series Three-Way, Spring Return, Plated Brass Ball and Stem Ball Valve Assemblies with End 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 M9216 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
- chrome-plated brass ball and stem assembly — handles chilled water and hot water applications with a fluid temperature range of 23 to 203°F (-5 to 95°C)
- 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



Three-Way, Spring Return, Plated Brass Ball and Stem Ball Valve Assemblies with End Switches

Selection Charts

Three-Way – Spring Return Counterclockwise – Port A (Coil) Open – with End Switches¹

Valve	Size, in.	Cv	Closeoff psig	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA2202-AGB-2 M9206-AGC-2S M9216-AGC-2	VA2202-GGB-2 M9206-GGB-2S M9216-GGB-2	VA2202-BGB-2 M9206-BGB-2S M9216-BGC-2	VA2202-BAB-2 M9206-BAB-2S M9216-BAC-2
VG1841AD	1/2	1.2 ²	200	VG1841AD+22TAGB	VG1841AD+22TGGB	VG1841AD+22TBGB	VG1841AD+22TBAB
VG1841AE		1.9 ²		VG1841AE+22TAGB	VG1841AE+22TGGB	VG1841AE+22TBGB	VG1841AE+22TBAB
VG1841AF		2.9 ²		VG1841AF+22TAGB	VG1841AF+22TGGB	VG1841AF+22TBGB	VG1841AF+22TBAB
VG1841AG		4.7 ²		VG1841AG+22TAGB	VG1841AG+22TGGB	VG1841AG+22TBGB	VG1841AG+22TBAB
VG1841AL		7.4 ²		VG1841AL+22TAGB	VG1841AL+22TGGB	VG1841AL+22TBGB	VG1841AL+22TBAB
VG1841AN		11.7		VG1841AN+22TAGB	VG1841AN+22TGGB	VG1841AN+22TBGB	VG1841AN+22TBAB
VG1841BG	3/4	4.7 ²	200	VG1841BG+22TAGB	VG1841BG+22TGGB	VG1841BG+22TBGB	VG1841BG+22TBAB
VG1841BL		7.4 ²		VG1841BL+22TAGB	VG1841BL+22TGGB	VG1841BL+22TBGB	VG1841BL+22TBAB
VG1841BN		11.7		VG1841BN+22TAGB	VG1841BN+22TGGB	VG1841BN+22TBGB	VG1841BN+22TBAB
VG1841CL	1	7.4 ²	200	VG1841CL+936AGC	VG1841CL+936GGC	VG1841CL+936BGB	VG1841CL+936BAB
VG1841CN		11.7 ²		VG1841CN+936AGC	VG1841CN+936GGC	VG1841CN+936BGB	VG1841CN+936BAB
VG1841CP		18.7		VG1841CP+936AGC	VG1841CP+936GGC	VG1841CP+936BGB	VG1841CP+936BAB
VG1841DN	1-1/4	11.7 ²	200	VG1841DN+936AGC	VG1841DN+936GGC	VG1841DN+936BGB	VG1841DN+936BAB
VG1841DP		18.7 ²		VG1841DP+936AGC	VG1841DP+936GGC	VG1841DP+936BGB	VG1841DP+936BAB
VG1841DR		29.2		VG1841DR+936AGC	VG1841DR+936GGC	VG1841DR+936BGB	VG1841DR+936BAB
VG1841EP	1-1/2	18.7 ²	200	VG1841EP+936AGC	VG1841EP+936GGC	VG1841EP+936BGB	VG1841EP+936BAB
VG1841ER		29.2 ²		VG1841ER+936AGC	VG1841ER+936GGC	VG1841ER+936BGB	VG1841ER+936BAB
VG1841ES		46.8		VG1841ES+936AGC	VG1841ES+936GGC	VG1841ES+936BGB	VG1841ES+936BAB
VG1841FR	2	29.2 ²	200	VG1841FR+926AGC	VG1841FR+926GGC	VG1841FR+926BGC	VG1841FR+926BAC
VG1841FS		46.8 ²		VG1841FS+926AGC	VG1841FS+926GGC	VG1841FS+926BGC	VG1841FS+926BAC
VG1841FT		73.7		VG1841FT+926AGC	VG1841FT+926GGC	VG1841FT+926BGC	VG1841FT+926BAC

1. VA2202-xxB and M9206-BxB have a single end switch. M9206-xGC and M9216-xGC have two end switches.

2. Cv has a characterizing disk.

VG1000 Series Three-Way, Spring Return, Plated Brass Ball and Stem Ball Valve Assemblies with End Switches (Continued)

Three-Way – Spring Return Clockwise – Port B (Bypass) Open – with End Switches¹

Valve	Size, in.	Cv	Closeoff psig	24 VAC			120 VAC
				Floating	0 to 10 VDC Proportional	On/Off	On/Off
				VA2202-AGB-2 M9206-AGC-2S M9216-AGC-2	VA2202-GGB-2 M9206-GGB-2S M9216-GGB-2	VA2202-BGB-2 M9206-BGB-2S M9216-BGC-2	VA2202-BAB-2 M9206-BAB-2S M9216-BAC-2
VG1841AD	1/2	1.2 ²	200	VG1841AD+24TAGB	VG1841AD+24TGGB	VG1841AD+24TBGB	VG1841AD+24TBAB
VG1841AE		1.9 ²		VG1841AE+24TAGB	VG1841AE+24TGGB	VG1841AE+24TBGB	VG1841AE+24TBAB
VG1841AF		2.9 ²		VG1841AF+24TAGB	VG1841AF+24TGGB	VG1841AF+24TBGB	VG1841AF+24TBAB
VG1841AG		4.7 ²		VG1841AG+24TAGB	VG1841AG+24TGGB	VG1841AG+24TBGB	VG1841AG+24TBAB
VG1841AL		7.4 ²		VG1841AL+24TAGB	VG1841AL+24TGGB	VG1841AL+24TBGB	VG1841AL+24TBAB
VG1841AN		11.7		VG1841AN+24TAGB	VG1841AN+24TGGB	VG1841AN+24TBGB	VG1841AN+24TBAB
VG1841BG	3/4	4.7 ²	200	VG1841BG+24TAGB	VG1841BG+24TGGB	VG1841BG+24TBGB	VG1841BG+24TBAB
VG1841BL		7.4 ²		VG1841BL+24TAGB	VG1841BL+24TGGB	VG1841BL+24TBGB	VG1841BL+24TBAB
VG1841BN		11.7		VG1841BN+24TAGB	VG1841BN+24TGGB	VG1841BN+24TBGB	VG1841BN+24TBAB
VG1841CL	1	7.4 ²	200	VG1841CL+956AGC	VG1841CL+956GGC	VG1841CL+956BGB	VG1841CL+956BAB
VG1841CN		11.7 ²		VG1841CN+956AGC	VG1841CN+956GGC	VG1841CN+956BGB	VG1841CN+956BAB
VG1841CP		18.7		VG1841CP+956AGC	VG1841CP+956GGC	VG1841CP+956BGB	VG1841CP+956BAB
VG1841DN	1-1/4	11.7 ²	200	VG1841DN+956AGC	VG1841DN+956GGC	VG1841DN+956BGB	VG1841DN+956BAB
VG1841DP		18.7 ²		VG1841DP+956AGC	VG1841DP+956GGC	VG1841DP+956BGB	VG1841DP+956BAB
VG1841DR		29.2		VG1841DR+956AGC	VG1841DR+956GGC	VG1841DR+956BGB	VG1841DR+956BAB
VG1841EP	1-1/2	18.7 ²	200	VG1841EP+956AGC	VG1841EP+956GGC	VG1841EP+956BGB	VG1841EP+956BAB
VG1841ER		29.2 ²		VG1841ER+956AGC	VG1841ER+956GGC	VG1841ER+956BGB	VG1841ER+956BAB
VG1841ES		46.8		VG1841ES+956AGC	VG1841ES+956GGC	VG1841ES+956BGB	VG1841ES+956BAB
VG1841FR	2	29.2 ²	200	VG1841FR+946AGC	VG1841FR+946GGC	VG1841FR+946BGC	VG1841FR+946BAC
VG1841FS		46.8 ²		VG1841FS+946AGC	VG1841FS+946GGC	VG1841FS+946BGC	VG1841FS+946BAC
VG1841FT		73.7		VG1841FT+946AGC	VG1841FT+946GGC	VG1841FT+946BGC	VG1841FT+946BAC

1. VA2202-xxB and M9206-BxB have a single end switch. M9206-xGC and M9216-xGC have two end switches.

2. Cv has a characterizing disk.

VG1000 Series Three-Way, Spring Return, Plated Brass Ball and Stem Ball Valve Assemblies with End Switches (Continued)

Technical Specifications

VG1000 Series Three-Way, Spring Return, Plated Brass Ball and Stem Ball Valve Assemblies with End 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	23 to 203°F (-5 to 95°C)
	Steam	Not Rated for Steam Service
Valve Body Pressure/ Temperature 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		50 psi Maximum Differential Pressure for Valves with Characterized Flow Control Disk and 30 psi Maximum for Quiet Service Ball Valves
Flow Characteristics	Three-Way	Equal Percentage Flow Characteristics of In-line Port A (Coil) and Linear Flow Characteristics of Angle Port B (Bypass)
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 M9216-GGx-2 Series Spring Return Actuators
	-4°F (-20°C)	M9216-AGx-2 and M9216-Bxx-2 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) 122°F (50°C) M9216 Series Spring Return Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
End Connections		NPT
Materials	Body	Forged Brass
	Ball	Chrome-Plated Brass
	Blowout-Proof Stem	Nickel-Plated Brass
	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. 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.