

VG1000 Series

LIT-1900231

## Three-Way, Plated Brass Trim, NPT End Connection Ball Valves with Spring Return Electric Actuators without 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
- chrome-plated brass ball and stem assembly handles both chilled water and hot water applications with a fluid temperature range of 23 to 203°F (-5 to 95°C)
- 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



**Three-Way, Spring Return, Plated Brass Ball and Stem Ball Valve Assemblies without End Switches**

### 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.

### Selection Charts

#### Three-Way – Spring Return Counterclockwise – Port A (Coil) Open

Valve	Size, in.	Cv	Closeoff psig	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA2202-AGA-2 M9206-AGA-2S M9210-AGA-3	VA2202-GGA-2 M9206-GGA-2S M9210-GGA-3	VA2202-BGA-2 M9206-BGA-2S M9210-BGA-3	VA2202-BAA-2 M9206-BAA-2S M9210-BAA-3
VG1841AD	1/2	1.2/0.7 <sup>1</sup>	200	VG1841AD+22TAGA	VG1841AD+22TGGA	VG1841AD+22TBGA	VG1841AD+22TBAA
VG1841AE		1.9/1.2 <sup>1</sup>		VG1841AE+22TAGA	VG1841AE+22TGGA	VG1841AE+22TBGA	VG1841AE+22TBAA
VG1841AF		2.9/1.9		VG1841AF+22TAGA	VG1841AF+22TGGA	VG1841AF+22TBGA	VG1841AF+22TBAA
VG1841AG		4.7/2.9		VG1841AG+22TAGA	VG1841AG+22TGGA	VG1841AG+22TBGA	VG1841AG+22TBAA
VG1841AL		7.4/1.7 <sup>1</sup>		VG1841AL+22TAGA	VG1841AL+22TGGA	VG1841AL+22TBGA	VG1841AL+22TBAA
VG1841AN	11.7/5.8	VG1841AN+22TAGA	VG1841AN+22TGGA	VG1841AN+22TBGA	VG1841AN+22TBAA		
VG1841BG	3/4	4.7/2.9	200	VG1841BG+22TAGA	VG1841BG+22TGGA	VG1841BG+22TBGA	VG1841BG+22TBAA
VG1841BL		7.4/4.7		VG1841BL+22TAGA	VG1841BL+22TGGA	VG1841BL+22TBGA	VG1841BL+22TBAA
VG1841BN		11.7/5.8		VG1841BN+22TAGA	VG1841BN+22TGGA	VG1841BN+22TBGA	VG1841BN+22TBAA
VG1841CL	1	7.4/4.7 <sup>1</sup>	200	VG1841CL+936AGA	VG1841CL+936GGA	VG1841CL+936BGA	VG1841CL+936BAA
VG1841CN		11.7/7.4		VG1841CN+936AGA	VG1841CN+936GGA	VG1841CN+936BGA	VG1841CN+936BAA
VG1841CP		18.7/9.4		VG1841CP+936AGA	VG1841CP+936GGA	VG1841CP+936BGA	VG1841CP+936BAA
VG1841DN	1-1/4	11.7/7.4 <sup>1</sup>	200	VG1841DN+936AGA	VG1841DN+936GGA	VG1841DN+936BGA	VG1841DN+936BAA
VG1841DP		18.7/11.7 <sup>1</sup>		VG1841DP+936AGA	VG1841DP+936GGA	VG1841DP+936BGA	VG1841DP+936BAA
VG1841DR		29.2/14.6		VG1841DR+936AGA	VG1841DR+936GGA	VG1841DR+936BGA	VG1841DR+936BAA
VG1841EP	1-1/2	18.7/11.7	200	VG1841EP+936AGA	VG1841EP+936GGA	VG1841EP+936BGA	VG1841EP+936BAA
VG1841ER		29./18.72 <sup>1</sup>		VG1841ER+936AGA	VG1841ER+936GGA	VG1841ER+936BGA	VG1841ER+936BAA
VG1841ES		46.8/23.4		VG1841ES+936AGA	VG1841ES+936GGA	VG1841ES+936BGA	VG1841ES+936BAA
VG1841FR	2	29.2/18.7 <sup>1</sup>	200	VG1841FR+92JAGA	VG1841FR+92JGGA	VG1841FR+92JBGA	VG1841FR+92JBAA
VG1841FS		46.8/29.2 <sup>1</sup>		VG1841FS+92JAGA	VG1841FS+92JGGA	VG1841FS+92JBGA	VG1841FS+92JBAA
VG1841AD		73.7/36.8		VG1841FT+92JAGA	VG1841FT+92JGGA	VG1841FT+92JBGA	VG1841FT+92JBAA

1. Cv has a characterizing disk

**VG1000 Series Three-Way, Plated Brass Trim, NPT End Connection Ball Valves with Spring Return Electric Actuators without Switches (Continued)**
**Three-Way – Spring Return Clockwise – Port B (Bypass) Open**

Valve	Size, in.	Cv	Closeoff psig	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA2202-AGA-2 M9206-AGA-2S M9210-AGA-3	VA2202-GGA-2 M9206-GGA-2S M9210-GGA-3	VA2202-BGA-2 M9206-BGA-2S M9210-BGA-3	VA2202-BAA-2 M9206-BAA-2S M9210-BAA-0
VG1841AD	1/2	1.2/0.7 <sup>1</sup>	200	VG1841AD+24TAGA	VG1841AD+24TGGA	VG1841AD+24TBGA	VG1841AD+24TBAA
VG1841AE		1.9/1.2 <sup>1</sup>		VG1841AE+24TAGA	VG1841AE+24TGGA	VG1841AE+24TBGA	VG1841AE+24TBAA
VG1841AF		2.9/1.9 <sup>1</sup>		VG1841AF+24TAGA	VG1841AF+24TGGA	VG1841AF+24TBGA	VG1841AF+24TBAA
VG1841AG		4.7/2.9 <sup>1</sup>		VG1841AG+24TAGA	VG1841AG+24TGGA	VG1841AG+24TBGA	VG1841AG+24TBAA
VG1841AL		7.4/4.7 <sup>1</sup>		VG1841AL+24TAGA	VG1841AL+24TGGA	VG1841AL+24TBGA	VG1841AL+24TBAA
VG1841AN		11.7/5.8		VG1841AN+24TAGA	VG1841AN+24TGGA	VG1841AN+24TBGA	VG1841AN+24TBAA
VG1841BG	3/4	4.7/2.9 <sup>1</sup>	200	VG1841BG+24TAGA	VG1841BG+24TGGA	VG1841BG+24TBGA	VG1841BG+24TBAA
VG1841BL		7.4/4.7 <sup>1</sup>		VG1841BL+24TAGA	VG1841BL+24TGGA	VG1841BL+24TBGA	VG1841BL+24TBAA
VG1841BN		11.7/5.8		VG1841BN+24TAGA	VG1841BN+24TGGA	VG1841BN+24TBGA	VG1841BN+24TBAA
VG1841CL	1	7.4/4.7 <sup>1</sup>	200	VG1841CL+956AGA	VG1841CL+956GGA	VG1841CL+956BGA	VG1841CL+956BAA
VG1841CN		11.7/7.4 <sup>1</sup>		VG1841CN+956AGA	VG1841CN+956GGA	VG1841CN+956BGA	VG1841CN+956BAA
VG1841CP		18.7/9.4		VG1841CP+956AGA	VG1841CP+956GGA	VG1841CP+956BGA	VG1841CP+956BAA
VG1841DN	1-1/4	11.7/7.4 <sup>1</sup>	200	VG1841DN+956AGA	VG1841DN+956GGA	VG1841DN+956BGA	VG1841DN+956BAA
VG1841DP		18.7/11.7 <sup>1</sup>		VG1841DP+956AGA	VG1841DP+956GGA	VG1841DP+956BGA	VG1841DP+956BAA
VG1841DR		29.2/14.6		VG1841DR+956AGA	VG1841DR+956GGA	VG1841DR+956BGA	VG1841DR+956BAA
VG1841EP	1-1/2	18.7/11.7 <sup>1</sup>	200	VG1841EP+956AGA	VG1841EP+956GGA	VG1841EP+956BGA	VG1841EP+956BAA
VG1841ER		29.2/18.7 <sup>1</sup>		VG1841ER+956AGA	VG1841ER+956GGA	VG1841ER+956BGA	VG1841ER+956BAA
VG1841ES		46.8/23.4		VG1841ES+956AGA	VG1841ES+956GGA	VG1841ES+956BGA	VG1841ES+956BAA
VG1841FR	2	29.2/18.7 <sup>1</sup>	200	VG1841FR+94JAGA	VG1841FR+94JGGA	VG1841FR+94JBGA	VG1841FR+94JBAA
VG1841FS		46.8/29.2 <sup>1</sup>		VG1841FS+94JAGA	VG1841FS+94JGGA	VG1841FS+94JBGA	VG1841FS+94JBAA
VG1841FT		73.7/36.8		VG1841FT+94JAGA	VG1841FT+94JGGA	VG1841FT+94JBGA	VG1841FT+94JBAA

1. Cv has a characterizing disk.

## VG1000 Series Three-Way, Plated Brass Trim, NPT End Connection Ball Valves with Spring Return Electric Actuators without Switches (Continued)

### Technical Specifications

VG1000 Three-Way, Plated Brass Trim Ball Valves with Spring Return Electric Actuators without Switches		
Service <sup>1</sup>		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 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	Three-Way	Equal Percentage Flow Characteristics of In-line Port A (Coil) and Linear Flow Characteristics of Angle Port B (Bypass)
Rangeability <sup>2</sup>		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 <sup>3</sup> (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	131°F (55°C): M9210 Series Spring Return Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4, for Characterized Port
		1% of Maximum Flow for Three-Way Bypass Port
End Connections		National Pipe Thread (NPT)
Materials	Body	Forged Brass
	Ball	Chrome-Plated Brass
	Blowout-Proof Stem	Nickel-Plated Brass
	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.