

VG1000 Series Three-Way, Plated Brass 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 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
- 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
- chrome-plated brass ball and stem assembly standard — handles both chilled and hot water applications with a fluid temperature range of 23 to 203°F (-5 to 95°C)



VG1000 Series 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 Plated Brass Trim Ball Valves – Non-Spring Return – VA9104 Electric Actuators without Switches

Fluid Temperatures: 23 to 203°F (-5 to 95°C) Not Rated for Steam Service				AC 24 V		
				On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
Valve	Size, in.	Cv	Closeoff psig	Actuators with M3 Screw Terminals		
				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1841AD	1/2	1.2/0.7 ²	200	VG1841AD+9T4AGA	VG1841AD+9T4IGA	VG1841AD+9T4GGA
VG1841AE		1.9/1.2 ²		VG1841AE+9T4AGA	VG1841AE+9T4IGA	VG1841AE+9T4GGA
VG1841AF		2.9/1.9 ²		VG1841AF+9T4AGA	VG1841AF+9T4IGA	VG1841AF+9T4GGA
VG1841AG		4.7/2.9 ²		VG1841AG+9T4AGA	VG1841AG+9T4IGA	VG1841AG+9T4GGA
VG1841AL		7.4/4.7 ²		VG1841AL+9T4AGA	VG1841AL+9T4IGA	VG1841AL+9T4GGA
VG1841AN		11.7/5.8		VG1841AN+9T4AGA	VG1841AN+9T4IGA	VG1841AN+9T4GGA
VG1841BG	3/4	4.7/2.9 ²	200	VG1841BG+9T4AGA	VG1841BG+9T4IGA	VG1841BG+9T4GGA
VG1841BL		7.4/4.7 ²		VG1841BL+9T4AGA	VG1841BL+9T4IGA	VG1841BL+9T4GGA
VG1841BN		11.7/5.8		VG1841BN+9T4AGA	VG1841BN+9T4IGA	VG1841BN+9T4GGA
VG1841CL	1	7.4/4.7 ²	200	VG1841CL+9T4AGA	VG1841CL+9T4IGA	VG1841CL+9T4GGA
VG1841CN		11.7/7.4 ²		VG1841CN+9T4AGA	VG1841CN+9T4IGA	VG1841CN+9T4GGA
VG1841CP		18.7/9.4		VG1841CP+9T4AGA	VG1841CP+9T4IGA	VG1841CP+9T4GGA
Valve	Size, in.	Cv	Closeoff psig	Actuators with 48 in. (1.2 m) 18 AWG Plenum Cable		
				VA9104-AGA-2S	VA9104-IGA-2S	VA9104-GGA-2S
VG1841AD	1/2	1.2/0.7 ²	200	VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AE		1.9/1.2 ²		VG1841AE+9A4AGA	VG1841AE+9A4IGA	VG1841AE+9A4GGA
VG1841AF		2.9/1.9 ²		VG1841AF+9A4AGA	VG1841AF+9A4IGA	VG1841AF+9A4GGA
VG1841AG		4.7/2.9 ²		VG1841AG+9A4AGA	VG1841AG+9A4IGA	VG1841AG+9A4GGA
VG1841AL		7.4/4.7 ²		VG1841AL+9A4AGA	VG1841AL+9A4IGA	VG1841AL+9A4GGA
VG1841AN		11.7/5.8		VG1841AN+9A4AGA	VG1841AN+9A4IGA	VG1841AN+9A4GGA
VG1841BG	3/4	4.7/2.9 ²	200	VG1841BG+9A4AGA	VG1841BG+9A4IGA	VG1841BG+9A4GGA
VG1841BL		7.4/4.7 ²		VG1841BL+9A4AGA	VG1841BL+9A4IGA	VG1841BL+9A4GGA
VG1841BN		11.7/5.8		VG1841BN+9A4AGA	VG1841BN+9A4IGA	VG1841BN+9A4GGA
VG1841CL	1	7.4/4.7 ²	200	VG1841CL+9A4AGA	VG1841CL+9A4IGA	VG1841CL+9A4GGA
VG1841CN		11.7/7.4 ²		VG1841CN+9A4AGA	VG1841CN+9A4IGA	VG1841CN+9A4GGA
VG1841CP		18.7/9.4		VG1841CP+9A4AGA	VG1841CP+9A4IGA	VG1841CP+9A4GGA

1. To avoid excessive wear or drive time on the motor for the AGA 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 Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators (Continued)

Three-Way Plated Brass Trim Ball Valves – Non-Spring Return – M9106 and M9109 Electric Actuators without Switches

Fluid Temperatures: 23 to 203°F (-5 to 95°C) Not Rated for Steam Service				AC 24 V		
				On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
Valve	Size, in.	Cv	Closeoff psig	M9106-AGA-2 M9109-AGA-2	M9106-IGA-2	M9106-GGA-2 M9109-GGA-2
VG1841AD	1/2	1.2/0.7 ²	200	VG1841AD+906AGA	VG1841AD+906IGA	VG1841AD+906GGA
VG1841AE		1.9/1.2 ²		VG1841AE+906AGA	VG1841AE+906IGA	VG1841AE+906GGA
VG1841AF		2.9/1.9 ²		VG1841AF+906AGA	VG1841AF+906IGA	VG1841AF+906GGA
VG1841AG		4.7/2.9 ²		VG1841AG+906AGA	VG1841AG+906IGA	VG1841AG+906GGA
VG1841AL		7.4/4.7 ²		VG1841AL+906AGA	VG1841AL+906IGA	VG1841AL+906GGA
VG1841AN		11.7/5.8		VG1841AN+906AGA	VG1841AN+906IGA	VG1841AN+906GGA
VG1841BG	3/4	4.7/2.9 ²	200	VG1841BG+906AGA	VG1841BG+906IGA	VG1841BG+906GGA
VG1841BL		7.4/4.7 ²		VG1841BL+906AGA	VG1841BL+906IGA	VG1841BL+906GGA
VG1841BN		11.7/5.8		VG1841BN+906AGA	VG1841BN+906IGA	VG1841BN+906GGA
VG1841CL	1	7.4/4.7 ²	200	VG1841CL+906AGA	VG1841CL+906IGA	VG1841CL+906GGA
VG1841CN		11.7/7.4 ²		VG1841CN+906AGA	VG1841CN+906IGA	VG1841CN+906GGA
VG1841CP		18.7/9.4		VG1841CP+906AGA	VG1841CP+906IGA	VG1841CP+906GGA
VG1841DN	1-1/4	11.7/7.4 ²	200	VG1841DN+906AGA	VG1841DN+906IGA	VG1841DN+906GGA
VG1841DP		18.7/11.7 ²		VG1841DP+906AGA	VG1841DP+906IGA	VG1841DP+906GGA
VG1841DR		29.2/14.6		VG1841DR+906AGA	VG1841DR+906IGA	VG1841DR+906GGA
VG1841EP	1-1/2	18.7/11.7 ²	200	VG1841EP+906AGA	VG1841EP+906IGA	VG1841EP+906GGA
VG1841ER		29.2/18.7 ²		VG1841ER+906AGA	VG1841ER+906IGA	VG1841ER+906GGA
VG1841ES		46.8/23.4		VG1841ES+906AGA	VG1841ES+906IGA	VG1841ES+906GGA
VG1841FR	2	29.2/18.7 ²	200	VG1841FR+909AGA	—	VG1841FR+909GGA
VG1841FS		46.8/29.2 ²		VG1841FS+909AGA	—	VG1841FS+909GGA
VG1841FT		73.7/36.8		VG1841FT+909AGA	—	VG1841FT+909GGA

1. To avoid excessive wear or drive time on the motor for the AGA 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.

Three-Way Plated Brass Trim Ball Valves – Non-Spring Return – M9106 and M9109 Electric Actuators with Switches

Fluid Temperatures: 23 to 203°F (-5 to 95°C) Not Rated for Steam Service				AC 24 V		
				On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
Valve	Size, in.	Cv	Closeoff psig	M9106-AGC-2 M9109-AGC-2	M9106-IGC-2	M9106-GGC-2 M9109-GGC-2
VG1841AD	1/2	1.2/0.7 ²	200	VG1841AD+906AGC	VG1841AD+906IGC	VG1841AD+906GGC
VG1841AE		1.9/1.2 ²		VG1841AE+906AGC	VG1841AE+906IGC	VG1841AE+906GGC
VG1841AF		2.9/1.9 ²		VG1841AF+906AGC	VG1841AF+906IGC	VG1841AF+906GGC
VG1841AG		4.7/2.9 ²		VG1841AG+906AGC	VG1841AG+906IGC	VG1841AG+906GGC
VG1841AL		7.4/4.7 ²		VG1841AL+906AGC	VG1841AL+906IGC	VG1841AL+906GGC
VG1841AN		11.7/5.8		VG1841AN+906AGC	VG1841AN+906IGC	VG1841AN+906GGC
VG1841BG	3/4	4.7/2.9 ²	200	VG1841BG+906AGC	VG1841BG+906IGC	VG1841BG+906GGC
VG1841BL		7.4/4.7 ²		VG1841BL+906AGC	VG1841BL+906IGC	VG1841BL+906GGC
VG1841BN		11.7/5.8		VG1841BN+906AGC	VG1841BN+906IGC	VG1841BN+906GGC
VG1841CL	1	7.4/4.7 ²	200	VG1841CL+906AGC	VG1841CL+906IGC	VG1841CL+906GGC
VG1841CN		11.7/7.4 ²		VG1841CN+906AGC	VG1841CN+906IGC	VG1841CN+906GGC
VG1841CP		18.7/9.4		VG1841CP+906AGC	VG1841CP+906IGC	VG1841CP+906GGC
VG1841DN	1-1/4	11.7/7.4 ²	200	VG1841DN+906AGC	VG1841DN+906IGC	VG1841DN+906GGC
VG1841DP		18.7/11.7 ²		VG1841DP+906AGC	VG1841DP+906IGC	VG1841DP+906GGC
VG1841DR		29.2/14.6		VG1841DR+906AGC	VG1841DR+906IGC	VG1841DR+906GGC
VG1841EP	1-1/2	18.7/11.7 ²	200	VG1841EP+906AGC	VG1841EP+906IGC	VG1841EP+906GGC
VG1841ER		29.2/18.7 ²		VG1841ER+906AGC	VG1841ER+906IGC	VG1841ER+906GGC
VG1841ES		46.8/23.4		VG1841ES+906AGC	VG1841ES+906IGC	VG1841ES+906GGC
VG1841FR	2	29.2/18.7 ²	200	VG1841FR+909AGC	—	VG1841FR+909GGC
VG1841FS		46.8/29.2 ²		VG1841FS+909AGC	—	VG1841FS+909GGC
VG1841FT		73.7/36.8		VG1841FT+909AGC	—	VG1841FT+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 Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators (Continued)

Technical Specifications

VG1000 Three-Way, Plated Brass Trim Ball Valves with Non-Spring Return Electric Actuators		
Service ¹		Hot Water, Chilled Water, and 50/50 Glycol Solutions for HVAC Systems
Valve Fluid Temperature Limits	Water	23 to 203°F (-5 to 95°C)
	Steam	Not Rated for Steam Service
Maximum Actuator Fluid Temperature Limit	203°F (95°C)	VA9104
		M9104 with M9000-551 Linkage
		M9106 or M9109 with M9000-520 Linkage
Valve Body Pressure Rating	Water	580 psig (3,996 kPa) (PN40)
	Steam	Not Rated for Steam Service
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		-4°F (-20°C)
Maximum Ambient Operating Temperature (Limited by the Actuator and Linkage)	140° (60°C)	VA9104 Series Non-Spring Return Actuators
		M9104 Series Non-Spring Return Actuators with M9000-551 Linkage
	125° (52°C)	M9106 and M9109 Series Non-Spring Return Actuators with M9000-520 Linkage
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
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. 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.