

VG1000 Three-Way, Plated Brass Trim 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-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
- 200 psi closeoff pressure rating — provides tight shutoff
- Graphite Reinforced Polytetrafluoroethylene (PTFE) Seats — includes 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 — handles chilled water and hot water with fluid temperature ratings from 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

Selection Charts

Three-Way Non-Spring Return without Switches

Valve	Size, in.	Cv	Closeoff psig	AC 24 V		
				On/Off Floating without Timeout ¹	On/Off (Floating) with Timeout	DC 0 to 10 V Proportional
				VA9104-AGA-xS M9106-AGA-2 M9109-AGA-2	VA9104-IGA-xS M9106-IGA-2	VA9104-GGA-xS M9106-GGA-2 M9109-GGA-2
VG1841AD	1/2	1.2 / 0.7 ²	200	VG1841AD+9T4AGA ³	VG1841AD+9T4IGA ³	VG1841AD+9T4GGA ³
VG1841AE		1.9 / 1.2 ²		VG1841AE+9T4AGA ³	VG1841AE+9T4IGA ³	VG1841AE+9T4GGA ³
VG1841AF		2.9 / 1.9 ²		VG1841AF+9T4AGA ³	VG1841AF+9T4IGA ³	VG1841AF+9T4GGA ³
VG1841AG		4.7 / 2.9 ²		VG1841AG+9T4AGA ³	VG1841AG+9T4IGA ³	VG1841AG+9T4GGA ³
VG1841AL		7.4 / 4.7 ²		VG1841AL+9T4AGA ³	VG1841AL+9T4IGA ³	VG1841AL+9T4GGA ³
VG1841AN		11.7 / 5.8		VG1841AN+9T4AGA ³	VG1841AN+9T4IGA ³	VG1841AN+9T4GGA ³
VG1841BG	3/4	4.7 / 2.9 ²	200	VG1841BG+9T4AGA ³	VG1841BG+9T4IGA ³	VG1841BG+9T4GGA ³
VG1841BL		7.4 / 4.7 ²		VG1841BL+9T4AGA ³	VG1841BL+9T4IGA ³	VG1841BL+9T4GGA ³
VG1841BN		11.7 / 5.8		VG1841BN+9T4AGA ³	VG1841BN+9T4IGA ³	VG1841BN+9T4GGA ³
VG1841CL	1	7.4 / 4.7 ²	200	VG1841CL+9T4AGA ³	VG1841CL+9T4IGA ³	VG1841CL+9T4GGA ³
VG1841CN		11.7 / 7.4 ²		VG1841CN+9T4AGA ³	VG1841CN+9T4IGA ³	VG1841CN+9T4GGA ³
VG1841CP		18.7 / 9.4		VG1841CP+9T4AGA ³	VG1841CP+9T4IGA ³	VG1841CP+9T4GGA ³
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.
3. Code numbers shown are for a VA9104-AGA-3S actuator with M3 screw terminals. To specify a 48 inch plenum rated cable, change the 9T4 to 9A4 in the code number for a VA9104-AGA-2S actuator. Example: VG1841AD+9T4AGA becomes VG1841AD+9A4AGA. To specify a conduit connection, change the 9T4 to 906 in the code number for a M9106-AGA-2 actuator. Example: VG1841AD+9T4AGA becomes VG1841AD+906AGA.

VG1000 Three-Way, Plated Brass Trim Ball Valves with Non-Spring Return Electric Actuators (Continued)

Three-Way Non-Spring Return with Two Switches

Valve	Size, in.	Cv	Closeoff psig	AC 24 V		
				On/Off Floating without Timeout ¹	On/Off (Floating) with Timeout	DC 0 to 10 V Proportional
				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 AGC 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 Three-Way, Plated Brass Trim 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		
Service¹		Hot Water, Chilled Water, and 50/50 Glycol Solutions 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		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)
Rangeability²		Greater than 500:1
Minimum Ambient Operating Temperature		-4°F (-20°C)
Maximum Ambient Operating Temperature³ (Limited by the Actuator and Linkage)	VA9104 and M9104 with M9000-550 linkage only	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
		1% of Maximum Flow for Three-Way Bypass Port
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.