

VG1000 Series Three-Way, Stainless Steel 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 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.
- 300 Series Stainless Steel Ball and Stem Assembly — tolerates high-temperature water or 15 psi saturated steam with fluid temperatures of -22 to 284°F (-30 to 140°C) or where a higher degree of corrosion protection is desired.
- 500:1 Rangeability — provides accurate control under all load conditions.



VG1000 Series Three-Way, Non-Spring-Return, Stainless Steel Ball and Stem Ball Valve Assemblies

Repair Information

If the VG1000 Series Ball Valve fails to operate within its specifications, replace the valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls representative.

Selection Charts

Three-Way Stainless Steel Trim Ball Valves, Non-Spring Return, VA9104 Electric Actuators without Switches

Fluid Temperatures: -4 to 212°F (-22 to 100°C) Not Rated for Steam Service				24 VAC		
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
Actuators with M3 Screw Terminals				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1845AD	1/2	1.2/0.7 ²	200	VG1845AD+9T4AGA	VG1845AD+9T4IGA	VG1845AD+9T4GGA
VG1845AE		1.9/1.2 ²		VG1845AE+9T4AGA	VG1845AE+9T4IGA	VG1845AE+9T4GGA
VG1845AF		2.9/1.9 ²		VG1845AF+9T4AGA	VG1845AF+9T4IGA	VG1845AF+9T4GGA
VG1845AG		4.7/2.9 ²		VG1845AG+9T4AGA	VG1845AG+9T4IGA	VG1845AG+9T4GGA
VG1845AL		7.4/4.7 ²		VG1845AL+9T4AGA	VG1845AL+9T4IGA	VG1845AL+9T4GGA
VG1845AN		11.7/5.8		VG1845AN+9T4AGA	VG1845AN+9T4IGA	VG1845AN+9T4GGA
VG1845BG	3/4	4.7/2.9 ²	200	VG1845BG+9T4AGA	VG1845BG+9T4IGA	VG1845BG+9T4GGA
VG1845BL		7.4/4.7 ²		VG1845BL+9T4AGA	VG1845BL+9T4IGA	VG1845BL+9T4GGA
VG1845BN		11.7/5.8		VG1845BN+9T4AGA	VG1845BN+9T4IGA	VG1845BN+9T4GGA
VG1845CL	1	7.4/4.7 ²	200	VG1845CL+9T4AGA	VG1845CL+9T4IGA	VG1845CL+9T4GGA
VG1845CN		11.7/7.4 ²		VG1845CN+9T4AGA	VG1845CN+9T4IGA	VG1845CN+9T4GGA
VG1845CP		18.7/9.4		VG1845CP+9T4AGA	VG1845CP+9T4IGA	VG1845CP+9T4GGA
Actuators with 48 in. (1.2 m) 18 AWG Plenum Cable				VA9104-AGA-2S	VA9104-IGA-2S	VA9104-GGA-2S
VG1845AD	1/2	1.2/0.7 ²	200	VG1845AD+9A4AGA	VG1845AD+9A4IGA	VG1845AD+9A4GGA
VG1845AE		1.9/1.2 ²		VG1845AE+9A4AGA	VG1845AE+9A4IGA	VG1845AE+9A4GGA
VG1845AF		2.9/1.9 ²		VG1845AF+9A4AGA	VG1845AF+9A4IGA	VG1845AF+9A4GGA
VG1845AG		4.7/2.9 ²		VG1845AG+9A4AGA	VG1845AG+9A4IGA	VG1845AG+9A4GGA
VG1845AL		7.4/4.7 ²		VG1845AL+9A4AGA	VG1845AL+9A4IGA	VG1845AL+9A4GGA
VG1845AN		11.7/5.8		VG1845AN+9A4AGA	VG1845AN+9A4IGA	VG1845AN+9A4GGA
VG1845BG	3/4	4.7/2.9 ²	200	VG1845BG+9A4AGA	VG1845BG+9A4IGA	VG1845BG+9A4GGA
VG1845BL		7.4/4.7 ²		VG1845BL+9A4AGA	VG1845BL+9A4IGA	VG1845BL+9A4GGA
VG1845BN		11.7/5.8		VG1845BN+9A4AGA	VG1845BN+9A4IGA	VG1845BN+9A4GGA
VG1845CL	1	7.4/4.7 ²	200	VG1845CL+9A4AGA	VG1845CL+9A4IGA	VG1845CL+9A4GGA
VG1845CN		11.7/7.4 ²		VG1845CN+9A4AGA	VG1845CN+9A4IGA	VG1845CN+9A4GGA
VG1845CP		18.7/9.4		VG1845CP+9A4AGA	VG1845CP+9A4IGA	VG1845CP+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. Valve has a characterizing disk.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products. © 2014 Johnson Controls, Inc.

VG1000 Series Three-Way, Stainless Steel Trim, NPT EndConnections Ball Valves with Non-Spring-Return Electric Actuators (Continued)

Three-Way Stainless Steel Trim Ball Valves, Non-Spring Return, VA9104 Electric Actuators without Switches with M9000-561 Thermal Barrier Installed

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 psi Saturated Steam				24 VAC		
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
Actuators with M3 Screw Terminals with M9000-561 Thermal Barrier Installed				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1845AD	1/2	1.2/0.7 ²	200	VG1845ADH9T4AGA	VG1845ADH9T4IGA	VG1845ADH9T4GGA
VG1845AE		1.9/1.2 ²		VG1845AEH9T4AGA	VG1845AEH9T4IGA	VG1845AEH9T4GGA
VG1845AF		2.9/1.9 ²		VG1845AFH9T4AGA	VG1845AFH9T4IGA	VG1845AFH9T4GGA
VG1845AG		4.7/2.9 ²		VG1845AGH9T4AGA	VG1845AGH9T4IGA	VG1845AGH9T4GGA
VG1845AL		7.4/4.7 ²		VG1845ALH9T4AGA	VG1845ALH9T4IGA	VG1845ALH9T4GGA
VG1845AN		11.7/5.8		VG1845ANH9T4AGA	VG1845ANH9T4IGA	VG1845ANH9T4GGA
VG1845BG	3/4	4.7/2.9 ²	200	VG1845BGH9T4AGA	VG1845BGH9T4IGA	VG1845BGH9T4GGA
VG1845BL		7.4/4.7 ²		VG1845BLH9T4AGA	VG1845BLH9T4IGA	VG1845BLH9T4GGA
VG1845BN		11.7/5.8		VG1845BNH9T4AGA	VG1845BNH9T4IGA	VG1845BNH9T4GGA
VG1845CL	1	7.4/4.7 ²	200	VG1845CLH9T4AGA	VG1845CLH9T4IGA	VG1845CLH9T4GGA
VG1845CN		11.7/7.4 ²		VG1845CNH9T4AGA	VG1845CNH9T4IGA	VG1845CNH9T4GGA
VG1845CP		18.7/9.4		VG1845CPH9T4AGA	VG1845CPH9T4IGA	VG1845CPH9T4GGA
Actuators with 48 in. (1.2 m) 18 AWG Plenum Cable with M9000-561 Thermal Barrier Installed				VA9104-AGA-2S	VA9104-IGA-2S	VA9104-GGA-2S
VG1845AD	1/2	1.2/0.7 ²	200	VG1845ADH9A4AGA	VG1845ADH9A4IGA	VG1845ADH9A4GGA
VG1845AE		1.9/1.2 ²		VG1845AEH9A4AGA	VG1845AEH9A4IGA	VG1845AEH9A4GGA
VG1845AF		2.9/1.9 ²		VG1845AFH9A4AGA	VG1845AFH9A4IGA	VG1845AFH9A4GGA
VG1845AG		4.7/2.9 ²		VG1845AGH9A4AGA	VG1845AGH9A4IGA	VG1845AGH9A4GGA
VG1845AL		7.4/4.7 ²		VG1845ALH9A4AGA	VG1845ALH9A4IGA	VG1845ALH9A4GGA
VG1845AN		11.7/5.8		VG1845ANH9A4AGA	VG1845ANH9A4IGA	VG1845ANH9A4GGA
VG1845BG	3/4	4.7/2.9 ²	200	VG1845BGH9A4AGA	VG1845BGH9A4IGA	VG1845BGH9A4GGA
VG1845BL		7.4/4.7 ²		VG1845BLH9A4AGA	VG1845BLH9A4IGA	VG1845BLH9A4GGA
VG1845BN		11.7/5.8		VG1845BNH9A4AGA	VG1845BNH9A4IGA	VG1845BNH9A4GGA
VG1845CL	1	7.4/4.7 ²	200	VG1845CLH9A4AGA	VG1845CLH9A4IGA	VG1845CLH9A4GGA
VG1845CN		11.7/7.4 ²		VG1845CNH9A4AGA	VG1845CNH9A4IGA	VG1845CNH9A4GGA
VG1845CP		18.7/9.4		VG1845CPH9A4AGA	VG1845CPH9A4IGA	VG1845CPH9A4GGA

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. Valve has a characterizing disk.

VG1000 Series Three-Way, Stainless Steel Trim, NPT EndConnections Ball Valves with Non-Spring-Return Electric Actuators (Continued)

Three-Way Stainless Steel Trim Ball Valves, Non-Spring Return, M9106/M9109 Electric Actuators without Switches

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 psi Saturated Steam				AC 24 V		
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
				M9106-AGA-2 M9109-AGA-2	M9106-IGA-2	M9106-GGA-2 M9109-GGA-2
VG1845DN	1-1/4	11.7/7.4 ²	200	VG1845DN+906AGA	VG1845DN+906IGA	VG1845DN+906GGA
VG1845DP		18.7/11.7 ²		VG1845DP+906AGA	VG1845DP+906IGA	VG1845DP+906GGA
VG1845DR		29.2/14.6		VG1845DR+906AGA	VG1845DR+906IGA	VG1845DR+906GGA
VG1845EP	1-1/2	18.7/11.7 ²	200	VG1845EP+906AGA	VG1845EP+906IGA	VG1845EP+906GGA
VG1845ER		29.2/18.7 ²		VG1845ER+906AGA	VG1845ER+906IGA	VG1845ER+906GGA
VG1845ES		46.8/23.4		VG1845ES+906AGA	VG1845ES+906IGA	VG1845ES+906GGA
VG1845FR	2	29.2/18.7 ²	200	VG1845FR+909AGA		VG1845FR+909GGA
VG1845FS		46.8/29.2 ²		VG1845FS+909AGA		VG1845FS+909GGA
VG1845FT		73.7/36.8		VG1845FT+909AGA		VG1845FT+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. Valve has a characterizing disk.

Three-Way Stainless Steel Trim Ball Valves, Non-Spring Return, M9106/M9109 Electric Actuators with Switches

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 psi Saturated Steam				AC 24 V		
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
				M9106-AGC-2 M9109-AGC-2	M9106-IGC-2	M9106-GGC-2 M9109-GGC-2
VG1845AD	1/2	1.2/0.7 ²	200	VG1845AD+906AGC	VG1845AD+906IGC	VG1845AD+906GGC
VG1845AE		1.9/1.2 ²		VG1845AE+906AGC	VG1845AE+906IGC	VG1845AE+906GGC
VG1845AF		2.9/1.9 ²		VG1845AF+906AGC	VG1845AF+906IGC	VG1845AF+906GGC
VG1845AG		4.7/2.9 ²		VG1845AG+906AGC	VG1845AG+906IGC	VG1845AG+906GGC
VG1845AL		7.4/4.7 ²		VG1845AL+906AGC	VG1845AL+906IGC	VG1845AL+906GGC
VG1845AN		11.7/5.8		VG1845AN+906AGC	VG1845AN+906IGC	VG1845AN+906GGC
VG1845BG	3/4	4.7/2.9 ²	200	VG1845BG+906AGC	VG1845BG+906IGC	VG1845BG+906GGC
VG1845BL		7.4/4.7 ²		VG1845BL+906AGC	VG1845BL+906IGC	VG1845BL+906GGC
VG1845BN		11.7/5.8		VG1845BN+906AGC	VG1845BN+906IGC	VG1845BN+906GGC
VG1845CL	1	7.4/4.7 ²	200	VG1845CL+906AGC	VG1845CL+906IGC	VG1845CL+906GGC
VG1845CN		11.7/7.4 ²		VG1845CN+906AGC	VG1845CN+906IGC	VG1845CN+906GGC
VG1845CP		18.7/9.4		VG1845CP+906AGC	VG1845CP+906IGC	VG1845CP+906GGC
VG1845DN	1-1/4	11.7/7.4 ²	200	VG1845DN+906AGC	VG1845DN+906IGC	VG1845DN+906GGC
VG1845DP		18.7/11.7 ²		VG1845DP+906AGC	VG1845DP+906IGC	VG1845DP+906GGC
VG1845DR		29.2/14.6		VG1845DR+906AGC	VG1845DR+906IGC	VG1845DR+906GGC
VG1845EP	1-1/2	18.7/11.7 ²	200	VG1845EP+906AGC	VG1845EP+906IGC	VG1845EP+906GGC
VG1845ER		29.2/18.7 ²		VG1845ER+906AGC	VG1845ER+906IGC	VG1845ER+906GGC
VG1845ES		46.8/23.4		VG1845ES+906AGC	VG1845ES+906IGC	VG1845ES+906GGC
VG1845FR	2	29.2/18.7 ²	200	VG1845FR+909AGC		VG1845FR+909GGC
VG1845FS		46.8/29.2 ²		VG1845FS+909AGC		VG1845FS+909GGC
VG1845FT		73.7/36.8		VG1845FT+909AGC		VG1845FT+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. Valve has a characterizing disk.

VG1000 Series Three-Way, Stainless Steel Trim, NPT EndConnections Ball Valves with Non-Spring-Return Electric Actuators (Continued)

Technical Specifications

VG1000 Series Three-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring-Return Electric Actuators		
Service¹		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)	VA9104 Series M9104 with M9000-550 Linkage
	284°F (140°C)	VA9104 Series Non-Spring-Return Actuators M9106 or M9109 Series Non-Spring-Return Actuators with M9000-520 Linkage
Valve Body Pressure/Temperature Rating	Water	580 psig (4,000 kPa) (PN40)
	Steam	15 psig (103 kPa) Saturated Steam
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (340 kPa)
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)	140°F (60°C)	VA9104 Series Non-Spring-Return Actuators M9104 Series Non-Spring-Return Actuators with M9000-550 Linkage
	125°F (52°C)	M9106 or 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	300 Series Stainless Steel
	Blowout-Proof Stem	300 Series Stainless Steel
	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. Proper water treatment is recommended; refer to the VDI 2035 Guideline.
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.