VG1000 Series

LIT-1900224

Three-Way, Stainless Steel Trim, NPT End Connection Ball Valves with Spring Return Electric Actuators with 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
- 300 Series stainless steel ball and stem assembly available 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
- ethylene propylene diene monomer (EPDM) double o-ring stem seal provides a leak-free seal; the packing has been tested and is leak-free after 200,000 cycles in iron-oxide contaminated water
- blowout-proof stem protects the user from the risk of injury

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.

Three-Way, Spring Return, Stainless Steel and Stem Ball Valve with End Switches

Selection Charts

Three-Way – Spring Return Counterclockwise – Port A (Coil) Open[1]

Valve	Size, in.	Cv	Closeoff psig	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA-2202-AGB-2[2] M9206-AGC-2 M9210-AGC-3	VA-2202-GGB-2[2] M9206-GGC-2 M9210-GGC-3	VA-2202-BGB[2] M9206-BGB-2S M9210-BGC-3	VA-2202-BAB-2[2] M9206-BAB-2S M9210-BAC-3
VG1845AD	1/2	1.2/0.7[3]	200	VG1845AD+22TAGB	VG1845AD+22TGGB	VG1845AD+22TBGB	VG1845AD+22TBAB
VG1845AE		1.9/1.2[3]		VG1845AE+22TAGB	VG1845AE+22TGGB	VG1845AE+22TBGB	VG1845AE+22TBAB
VG1845AF		2.9/1.9[3]		VG1845AF+22TAGB	VG1845AF+22TGGB	VG1845AF+22TBGB	VG1845AF+22TBAB
VG1845AG		4.7/2.9[3]		VG1845AG+22TAGB	VG1845AG+22TGGB	VG1845AG+22TBGB	VG1845AG+22TBAB
VG1845AL		7.4/4.7[3]		VG1845AL+22TAGB	VG1845AL+22TGGB	VG1845AL+22TBGB	VG1845AL+22TBAB
VG1845AN		11.7/5.8		VG1845AN+22TAGB	VG1845AN+22TGGB	VG1845AN+22TBGB	VG1845AN+22TBAB
VG1845BG	3/4	4.7/2.9[3]	200	VG1845BG+22TAGB	VG1845BG+22TGGB	VG1845BG+22TBGB	VG1845BG+22TBAB
VG1845BL		7.4/4.7[3]		VG1845BL+22TAGB	VG1845BL+22TGGB	VG1845BL+22TBGB	VG1845BL+22TBAB
VG1845BN		11.7/5.8		VG1845BN+22TAGB	VG1845BN+22TGGB	VG1845BN+22TBGB	VG1845BN+22TBAB
VG1845CL	1	7.4/4.7[3]	200	VG1845CL+936AGC	VG1845CL+936GGC	VG1845CL+936BGB	VG1845CL+936BAB
VG1845CN		11.7/7.4[3]		VG1845CN+936AGC	VG1845CN+936GGC	VG1845CN+936BGB	VG1845CN+936BAB
VG1845CP		18.7/9.4		VG1845CP+936AGC	VG1845CP+936GGC	VG1845CP+936BGB	VG1845CP+936BAB
VG1845DN	1-1/4	11.7/7.4[3]	200	VG1845DN+936AGC	VG1845DN+936GGC	VG1845DN+936BGB	VG1845DN+936BAB
VG1845DP		18.7/11.7[3]		VG1845DP+936AGC	VG1845DP+936GGC	VG1845DP+936BGB	VG1845DP+936BAB
VG1845DR		29.2/14.6		VG1845DR+936AGC	VG1845DR+936GGC	VG1845DR+936BGB	VG1845DR+936BAB
VG1845EP	1-1/2	18.7/11.7[3]	200	VG1845EP+936AGC	VG1845EP+936GGC	VG1845EP+936BGB	VG1845EP+936BAB
VG1845ER		29.2/18.7[3]		VG1845ER+936AGC	VG1845ER+936GGC	VG1845ER+936BGB	VG1845ER+936BAB
VG1845ES		46.8/23.4		VG1845ES+936AGC	VG1845ES+936GGC	VG1845ES+936BGB	VG1845ES+936BAB
VG1845FR	2	29.2/18.7[3]	200	VG1845FR+92JAGC	VG1845FR+92JGGC	VG1845FR+92JBGC	VG1845FR+92JBAC
VG1845FS		46.8/29.2[3]		VG1845FS+92JAGC	VG1845FS+92JGGC	VG1845FS+92JBGC	VG1845FS+92JBAC
VG1845FT		73.7/36.8		VG1845FT+92JAGC	VG1845FT+92JGGC	VG1845FT+92JBGC	VG1845FT+92JBAC

1. VA2202-xxB and M9206-BxB have a single end switch. M9206-xGC and M9210-xGC have two end switches
2. The VA2202 Series Actuator has a 212°F (100°C) fluid temperature limit. For fluid temperatures greater than 212°F, use an M9206 Series Actuator. To specify an M9206 Actuator, change the 22T (or 24T) in the code number to 936 (or 956). Example: VG1845AD+**22T**BGB becomes VG1845AD+**936**BGB. For Floating and Proportional, change the last **B** to a **C**.
3. Cv has a characterizing disk.

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

Three-Way – Spring Return Clockwise – Port B (Bypass) Open[1]

Valve	Size, in.	Cv	Closeoff psig	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA-2202-AGB-2[2] M9206-AGC-2 M9210-AGC-3	VA-2202-GGB-2 M9206-GGC-2 M9210-GGC-3	VA-2202-BGB M9206-BGB-2S M9210-BGC-3	VA-2202-BAB-2 M9206-BAB-2S M9210-BAC-3
VG1845AD	1/2	1.2/0.7[3]	200	VG1845AD+24TAGB	VG1845AD+24TGGB	VG1845AD+24TBGB	VG1845AD+24TBAB
VG1845AE		1.9/1.2[3]		VG1845AE+24TAGB	VG1845AE+24TGGB	VG1845AE+24TBGB	VG1845AE+24TBAB
VG1845AF		2.9/1.9[3]		VG1845AF+24TAGB	VG1845AF+24TGGB	VG1845AF+24TBGB	VG1845AF+24TBAB
VG1845AG		4.7/2.9[3]		VG1845AG+24TAGB	VG1845AG+24TGGB	VG1845AG+24TBGB	VG1845AG+24TBAB
VG1845AL		7.4/4.7[3]		VG1845AL+24TAGB	VG1845AL+24TGGB	VG1845AL+24TBGB	VG1845AL+24TBAB
VG1845AN		11.7/5.8		VG1845AN+24TAGB	VG1845AN+24TGGB	VG1845AN+24TBGB	VG1845AN+24TBAB
VG1845BG	3/4	4.7/2.9[3]	200	VG1845BG+24TAGB	VG1845BG+24TGGB	VG1845BG+24TBGB	VG1845BG+24TBAB
VG1845BL		7.4/4.7[3]		VG1845BL+24TAGB	VG1845BL+24TGGB	VG1845BL+24TBGB	VG1845BL+24TBAB
VG1845BN		11.7/5.8		VG1845BN+24TAGB	VG1845BN+24TGGB	VG1845BN+24TBGB	VG1845BN+24TBAB
VG1845CL	1	7.4/4.7[3]	200	VG1845CL+956AGC	VG1845CL+956GGC	VG1845CL+956BGB	VG1845CL+956BAB
VG1845CN		11.7/7.4[3]		VG1845CN+956AGC	VG1845CN+956GGC	VG1845CN+956BGB	VG1845CN+956BAB
VG1845CP		18.7/9.4		VG1845CP+956AGC	VG1845CP+956GGC	VG1845CP+956BGB	VG1845CP+956BAB
VG1845DN	1-1/4	11.7/7.4[3]	200	VG1845DN+956AGC	VG1845DN+956GGC	VG1845DN+956BGB	VG1845DN+956BAB
VG1845DP		18.7/11.7[3]		VG1845DP+956AGC	VG1845DP+956GGC	VG1845DP+956BGB	VG1845DP+956BAB
VG1845DR		29.2/14.6		VG1845DR+956AGC	VG1845DR+956GGC	VG1845DR+956BGB	VG1845DR+956BAB
VG1845EP	1-1/2	18.7/11.7[3]	200	VG1845EP+956AGC	VG1845EP+956GGC	VG1845EP+956BGB	VG1845EP+956BAB
VG1845ER		29.2/18.7[3]		VG1845ER+956AGC	VG1845ER+956GGC	VG1845ER+956BGB	VG1845ER+956BAB
VG1845ES		46.8/23.4		VG1845ES+956AGC	VG1845ES+956GGC	VG1845ES+956BGB	VG1845ES+956BAB
VG1845FR	2	29.2/18.7[3]	200	VG1845FR+94JAGC	VG1845FR+94JGGC	VG1845FR+94JBGC	VG1845FR+94JBAC
VG1845FS		46.8/29.2[3]		VG1845FS+94JAGC	VG1845FS+94JGGC	VG1845FS+94JBGC	VG1845FS+94JBAC
VG1845FT		73.7/36.8		VG1845FT+94JAGC	VG1845FT+94JGGC	VG1845FT+94JBGC	VG1845FT+94JBAC

1. VA2202-xxB and M9206-BxB have a single end switch. M9206-xGC and M9210-xGC have two end switches.
2. The VA2202 Series Actuator has a 212°F (100°C) fluid temperature limit. For fluid temperatures greater than 212°F, use an M9206 Series Actuator. To specify an M9206 Actuator, change the 22T (or 24T) in the code number to 936 (or 956). Example: VG1845AD+**22T**BGB becomes VG1845AD+**936**BGB. For Floating and Proportional, change the last **B** to a **C**.
3. Cv has a characterizing disk.

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

Technical Specifications

VG1000 Three-Way, Stainless Steel Trim Ball Valves with Spring Return Electric Actuators with Switches		
Service[1]		Hot Water, Chilled Water, 50/50 Glycol Solutions, and for some models, 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)**	VA2202 and M2202 with M9000-550 Linkage
	284°F (140°C)	M9206 with M9000-550 Linkage M9210 with M9000-517 Linkage
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 (Coil) and Linear Flow Characteristics of Angle Port (Bypass)
Rangeability[2]		Greater than 500:1
Minimum Ambient Operating Temperature	**-22°F (-30°C)**	VA2202 and M2202 Series Spring Return Actuators
	-25°F (-32°C)	M9206 Series Spring Return Actuators
	-40°F (-40°C)	M9210 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 131°F (55°C): M9210 Series Spring Return Actuators
		For Fluid Temperature between 212°F (100°C) and 284°F (140°C) 100°F (38°C): All Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4, for Characterized Port
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 PTFE with 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.