VG1000 Series

LIT-1900225

Three-Way, Stainless Steel 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
- 300 Series stainless steel ball and stem assembly availabe 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
- maintenance-free design performs without failure in excess of 200,000 full stroke cycles in iron-oxide contaminated water

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 Ball and Stem Ball Valve Assemblies without End Switches

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[1] M9206-AGA-2S M9210-AGA-3	VA2202-GGA-2[1] M9206-GGA-2S M9210-GGA-3	VA2202-BGA-2[1] M9206-BGA-2S M9210-BGA-3	VA2202-BAA-2[1] M9206-BAA-2S M9210-BAA-3
VG1845AD	1/2	1.2/0.7[2]	200	VG1845AD+22TAGA	VG1845AD+22TGGA	VG1845AD+22TBGA	VG1845AD+22TBAA
VG1845AE		1.9/1.2[2]		VG1845AE+22TAGA	VG1845AE+22TGGA	VG1845AE+22TBGA	VG1845AE+22TBAA
VG1845AF		2.9/1.9[2]		VG1845AF+22TAGA	VG1845AF+22TGGA	VG1845AF+22TBGA	VG1845AF+22TBAA
VG1845AG		4.7/2.9[2]		VG1845AG+22TAGA	VG1845AG+22TGGA	VG1845AG+22TBGA	VG1845AG+22TBAA
VG1845AL		7.4/4.7[2]		VG1845AL+22TAGA	VG1845AL+22TGGA	VG1845AL+22TBGA	VG1845AL+22TBAA
VG1845AN		11.7/5.8		VG1845AN+22TAGA	VG1845AN+22TGGA	VG1845AN+22TBGA	VG1845AN+22TBAA
VG1845BG	3/4	4.7/2.9[2]	200	VG1845BG+22TAGA	VG1845BG+22TGGA	VG1845BG+22TBGA	VG1845BG+22TBAA
VG1845BL		7.4/4.7[2]		VG1845BL+22TAGA	VG1845BL+22TGGA	VG1845BL+22TBGA	VG1845BL+22TBAA
VG1845BN		11.7/5.8		VG1845BN+22TAGA	VG1845BN+22TGGA	VG1845BN+22TBGA	VG1845BN+22TBAA
VG1845CL	1	7.4/4.7[2]	200	VG1845CL+936AGA	VG1845CL+936GGA	VG1845CL+936BGA	VG1845CL+936BAA
VG1845CN		11.7/7.4[2]		VG1845CN+936AGA	VG1845CN+936GGA	VG1845CN+936BGA	VG1845CN+936BAA
VG1845CP		18.7/9.4		VG1845CP+936AGA	VG1845CP+936GGA	VG1845CP+936BGA	VG1845CP+936BAA
VG1845DN	1-1/4	11.7/7.4[2]	200	VG1845DN+936AGA	VG1845DN+936GGA	VG1845DN+936BGA	VG1845DN+936BAA
VG1845DP		18.7/9.4[2]		VG1845DP+936AGA	VG1845DP+936GGA	VG1845DP+936BGA	VG1845DP+936BAA
VG1845DR		29.2/14.6		VG1845DR+936AGA	VG1845DR+936GGA	VG1845DR+936BGA	VG1845DR+936BAA
VG1845EP	1-1/2	18.7/11.7[2]	200	VG1845EP+936AGA	VG1845EP+936GGA	VG1845EP+936BGA	VG1845EP+936BAA
VG1845ER		29.2/18.7[2]		VG1845ER+936AGA	VG1845ER+936GGA	VG1845ER+936BGA	VG1845ER+936BAA
VG1845ES		46.8/23.4		VG1845ES+936AGA	VG1845ES+936GGA	VG1845ES+936BGA	VG1845ES+936BAA
VG1845FR	2	29.2/18.7[2]	200	VG1845FR+92JAGA	VG1845FR+92JGGA	VG1845FR+92JBGA	VG1845FR+92JBAA
VG1845FS		46.8/29.2[2]		VG1845FS+92JAGA	VG1845FS+92JGGA	VG1845FS+92JBGA	VG1845FS+92JBAA
VG1845FT		73.7/36.8		VG1845FT+92JAGA	VG1845FT+92JGGA	VG1845FT+92JBGA	VG1845FT+92JBAA

1. 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**AGA becomes VG1845AD+**936**AGA.
2. Cv has a characterizing disk.

VG1000 Series Three-Way, Stainless Steel 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
				VA-2202-AGA-2[1] M9206-AGA-2 M9210-AGA-3	**VA-2202-GGA-2[1] M9206-GGA-2 M9210-GGA-3**	**VA-2202-BGA[1] M9206-BGA-2S M9210-BGA-3**	**VA-2202-BAA-2[1] M9206-BAA-2S M9210-BAA-3**
VG1845AD	1/2	1.2/0.7[2]	200	VG1845AD+24TAGA	VG1845AD+24TGGA	VG1845AD+24TBGA	VG1845AD+24TBAA
VG1845AE		1.9/1.2[2]		VG1845AE+24TAGA	VG1845AE+24TGGA	VG1845AE+24TBGA	VG1845AE+24TBAA
VG1845AF		2.9/1.9[2]		VG1845AF+24TAGA	VG1845AF+24TGGA	VG1845AF+24TBGA	VG1845AF+24TBAA
VG1845AG		4.7/2.9[2]		VG1845AG+24TAGA	VG1845AG+24TGGA	VG1845AG+24TBGA	VG1845AG+24TBAA
VG1845AL		7.4/4.7[2]		VG1845AL+24TAGA	VG1845AL+24TGGA	VG1845AL+24TBGA	VG1845AL+24TBAA
VG1845AN		11.7/5.8		VG1845AN+24TAGA	VG1845AN+24TGGA	VG1845AN+24TBGA	VG1845AN+24TBAA
VG1845BG	3/4	4.7/2.9[2]	200	VG1845BG+24TAGA	VG1845BG+24TGGA	VG1845BG+24TBGA	VG1845BG+24TBAA
VG1845BL		7.4/4.7[2]		VG1845BL+24TAGA	VG1845BL+24TGGA	VG1845BL+24TBGA	VG1845BL+24TBAA
VG1845BN		11.7/5.8		VG1845BN+24TAGA	VG1845BN+24TGGA	VG1845BN+24TBGA	VG1845BN+24TBAA
VG1845CL	1	7.4/4.7[2]	200	VG1845CL+956AGA	VG1845CL+956GGA	VG1845CL+956BGA	VG1845CL+956BAA
VG1845CN		11.7/7.4[2]		VG1845CN+956AGA	VG1845CN+956GGA	VG1845CN+956BGA	VG1845CN+956BAA
VG1845CP		18.7/9.4		VG1845CP+956AGA	VG1845CP+956GGA	VG1845CP+956BGA	VG1845CP+956BAA
VG1845DN	1-1/4	11.7/7.4[2]	200	VG1845DN+956AGA	VG1845DN+956GGA	VG1845DN+956BGA	VG1845DN+956BAA
VG1845DP		18.7/9.4[2]		VG1845DP+956AGA	VG1845DP+956GGA	VG1845DP+956BGA	VG1845DP+956BAA
VG1845DR		29.2/14.6		VG1845DR+956AGA	VG1845DR+956GGA	VG1845DR+956BGA	VG1845DR+956BAA
VG1845EP	1-1/2	18.7/11.7[2]	200	VG1845EP+956AGA	VG1845EP+956GGA	VG1845EP+956BGA	VG1845EP+956BAA
VG1845ER		29.2/18.7[2]		VG1845ER+956AGA	VG1845ER+956GGA	VG1845ER+956BGA	VG1845ER+956BAA
VG1845ES		46.8/23.4		VG1845ES+956AGA	VG1845ES+956GGA	VG1845ES+956BGA	VG1845ES+956BAA
VG1845FR	2	29.2/18.7[2]	200	VG1845FR+94JAGA	VG1845FR+94JGGA	VG1845FR+94JBGA	VG1845FR+94JBAA
VG1845FS		46.8/29.2[2]		VG1845FS+94JAGA	VG1845FS+94JGGA	VG1845FS+94JBGA	VG1845FS+94JBAA
VG1845FT		73.7/36.8		VG1845FT+94JAGA	VG1845FT+94JGGA	VG1845FT+94JBGA	VG1845FT+94JBAA

1. 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**AGA becomes VG18245AD+**936**AGA.
2. Cv has a characterizing disk.

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

Technical Specifications

VG1000 Three-Way, Stainless Steel Trim Ball Valves with Spring Return Electric Actuators without Switches		
Service[1]		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)**	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 A (Coil) and Linear Flow Characteristics of Angle Port B (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
		1% of Maximum Flow
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 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.