

VG1000 Series Three-Way, Stainless Steel Trim, NPT End Connections 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- 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 — 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



VG1000 Series Three-Way, Spring Return, Stainless Steel 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 – Spring Return Counterclockwise – Port A (Coil) Open

| Valve | Size, in. | Cv | Closeoff psig | AC 24 V | | | AC 120 V |
|----------|-----------|-------------------|---------------|--|--|--|--|
| | | | | Floating | 0 to 10 VDC Proportional | On/Off | On/Off |
| | | | | VA2202-AGA-2 ¹ M9206-AGC-2S M9210-AGC-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 ² | 200 | VG1845AD+22TAGA | VG1845AD+22TGGA | VG1845AD+22TBGA | VG1845AD+22TBAA |
| VG1845AE | | 1.9 ² | | VG1845AE+22TAGA | VG1845AE+22TGGA | VG1845AE+22TBGA | VG1845AE+22TBAA |
| VG1845AF | | 2.9 ² | | VG1845AF+22TAGA | VG1845AF+22TGGA | VG1845AF+22TBGA | VG1845AF+22TBAA |
| VG1845AG | | 4.7 ² | | VG1845AG+22TAGA | VG1845AG+22TGGA | VG1845AG+22TBGA | VG1845AG+22TBAA |
| VG1845AL | | 7.4 ² | | VG1845AL+22TAGA | VG1845AL+22TGGA | VG1845AL+22TBGA | VG1845AL+22TBAA |
| VG1845AN | | 11.7 | | VG1845AN+22TAGA | VG1845AN+22TGGA | VG1845AN+22TBGA | VG1845AN+22TBAA |
| VG1845BG | 3/4 | 4.7 ² | 200 | VG1845BG+22TAGA | VG1845BG+22TGGA | VG1845BG+22TBGA | VG1845BG+22TBAA |
| VG1845BL | | 7.4 ² | | VG1845BL+22TAGA | VG1845BL+22TGGA | VG1845BL+22TBGA | VG1845BL+22TBAA |
| VG1845BN | | 11.7 | | VG1845BN+22TAGA | VG1845BN+22TGGA | VG1845BN+22TBGA | VG1845BN+22TBAA |
| VG1845CL | 1 | 7.4 ² | 200 | VG1845CL+22TAGA | VG1845CL+22TGGA | VG1845CL+22TBGA | VG1845CL+22TBAA |
| VG1845CN | | 11.7 ² | | VG1845CN+22TAGA | VG1845CN+22TGGA | VG1845CN+22TBGA | VG1845CN+22TBAA |
| VG1845CP | | 18.7 | | VG1845CP+22TAGA | VG1845CP+22TGGA | VG1845CP+22TBGA | VG1845CP+22TBAA |
| VG1845DN | 1-1/4 | 11.7 ² | 200 | VG1845DN+936AGA | VG1845DN+936GGA | VG1845DN+936BGA | VG1845DN+936BAA |
| VG1845DP | | 18.7 ² | | VG1845DP+936AGA | VG1845DP+936GGA | VG1845DP+936BGA | VG1845DP+936BAA |
| VG1845DR | | 29.2 | | VG1845DR+936AGA | VG1845DR+936GGA | VG1845DR+936BGA | VG1845DR+936BAA |
| VG1845EP | 1-1/2 | 18.7 ² | 200 | VG1845EP+936AGA | VG1845EP+936GGA | VG1845EP+936BGA | VG1845EP+936BAA |
| VG1845ER | | 29.2 ² | | VG1845ER+936AGA | VG1845ER+936GGA | VG1845ER+936BGA | VG1845ER+936BAA |
| VG1845ES | | 46.8 | | VG1845ES+936AGA | VG1845ES+936GGA | VG1845ES+936BGA | VG1845ES+936BAA |
| VG1845FR | 2 | 29.2 ² | 200 | VG1845FR+92JAGA | VG1845FR+92JGGA | VG1845FR+92JBGA | VG1845FR+92JBAA |
| VG1845FS | | 46.8 ² | | VG1845FS+92JAGA | VG1845FS+92JGGA | VG1845FS+92JBGA | VG1845FS+92JBAA |
| VG1845FT | | 73.7 | | 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 higher than 212°F, use an M9206 Series Actuator. For NPT end connection valves, you can specify a factory mount M9206 actuator by changing 22T or 24T in the code number to 936 or 956. For example, VG1845AD+22TBGA becomes VG1845AD+936BGA.

2. Cv has a characterizing disk.

VG1000 Series Three-Way, Stainless Steel Trim, NPT End Connections 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 | 0 to 10 VDC Proportional | On/Off | On/Off |
| | | | | VA-2202-AGA-2 ¹ M9206-AGC-2 M9210-AGC-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 ² | 200 | VG1845AD+24TAGA | VG1845AD+24TGGA | VG1845AD+24TBGA | VG1845AD+24TBAA |
| VG1845AE | | 1.9 ² | | VG1845AE+24TAGA | VG1845AE+24TGGA | VG1845AE+24TBGA | VG1845AE+24TBAA |
| VG1845AF | | 2.9 ² | | VG1845AF+24TAGA | VG1845AF+24TGGA | VG1845AF+24TBGA | VG1845AF+24TBAA |
| VG1845AG | | 4.7 ² | | VG1845AG+24TAGA | VG1845AG+24TGGA | VG1845AG+24TBGA | VG1845AG+24TBAA |
| VG1845AL | | 7.4 ² | | VG1845AL+24TAGA | VG1845AL+24TGGA | VG1845AL+24TBGA | VG1845AL+24TBAA |
| VG1845AN | | 11.7 | | VG1845AN+24TAGA | VG1845AN+24TGGA | VG1845AN+24TBGA | VG1845AN+24TBAA |
| VG1845BG | 3/4 | 4.7 ² | 200 | VG1845BG+24TAGA | VG1845BG+24TGGA | VG1845BG+24TBGA | VG1845BG+24TBAA |
| VG1845BL | | 7.4 ² | | VG1845BL+24TAGA | VG1845BL+24TGGA | VG1845BL+24TBGA | VG1845BL+24TBAA |
| VG1845BN | | 11.7 | | VG1845BN+24TAGA | VG1845BN+24TGGA | VG1845BN+24TBGA | VG1845BN+24TBAA |
| VG1845CL | 1 | 7.4 ² | 200 | VG1845CL+24TAGA | VG1845CL+24TGGA | VG1845CL+24TBGA | VG1845CL+24TBAA |
| VG1845CN | | 11.7 ² | | VG1845CN+24TAGA | VG1845CN+24TGGA | VG1845CN+24TBGA | VG1845CN+24TBAA |
| VG1845CP | | 18.7 | | VG1845CP+24TAGA | VG1845CP+24TGGA | VG1845CP+24TBGA | VG1845CP+24TBAA |
| VG1845DN | 1-1/4 | 11.7 ² | 200 | VG1845DN+956AGA | VG1845DN+956GGA | VG1845DN+956BGA | VG1845DN+956BAA |
| VG1845DP | | 18.7 ² | | VG1845DP+956AGA | VG1845DP+956GGA | VG1845DP+956BGA | VG1845DP+956BAA |
| VG1845DR | | 29.2 | | VG1845DR+956AGA | VG1845DR+956GGA | VG1845DR+956BGA | VG1845DR+956BAA |
| VG1845EP | 1-1/2 | 18.7 ² | 200 | VG1845EP+956AGA | VG1845EP+956GGA | VG1845EP+956BGA | VG1845EP+956BAA |
| VG1845ER | | 29.2 ² | | VG1845ER+956AGA | VG1845ER+956GGA | VG1845ER+956BGA | VG1845ER+956BAA |
| VG1845ES | | 46.8 | | VG1845ES+956AGA | VG1845ES+956GGA | VG1845ES+956BGA | VG1845ES+956BAA |
| VG1845FR | 2 | 29.2 ² | 200 | VG1845FR+94JAGA | VG1845FR+94JGGA | VG1845FR+94JBGA | VG1845FR+94JBAA |
| VG1845FS | | 46.8 ² | | VG1845FS+94JAGA | VG1845FS+94JGGA | VG1845FS+94JBGA | VG1845FS+94JBAA |
| VG1845FT | | 73.7 | | 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 higher than 212°F, use an M9206 Series Actuator. For NPT end connection valves, you can specify a factory mount M9206 actuator by changing 22T or 24T in the code number to 936 or 956. For example, VG1845AD+22TBGA becomes VG1845AD+936BGA.

2. Cv has a characterizing disk.

VG1000 Series Three-Way, Stainless Steel Trim, NPT End Connections 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 | | |
|---|---------------------------------|---|
| 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) | VA2202 M2202 with M9000-550 Linkage |
| | 284°F (140°C) | M9206 with M9000-520 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 | | 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) |
| Rangeability² | | 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 Temperature³ (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 | 131°F (55°C): M9210 Series Spring Return Actuators |
| Leakage | | 0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4 |
| | | 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. 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.

3. In steam applications, install the valve with the stem horizontal to the piping and wrap the valve and piping with insulation.