VG1205 / VG1805

2- and 3-way Control Valves with Stainless Steel Ball

Product Bulletin

VG1000 Series Ball Valves are designed to regulate the flow of hot or chilled water and low pressure steam in response to the demand of a controller in HVAC systems.

Available in sizes DN15 through DN50, this family of two- and three-way forged brass valves is factory or field mounted to Johnson Controls® VA9104 and VA9310 Series Non-Spring Return and VA9203 and VA9208 Series Spring Return Electric Actuators for on/ off, floating, or proportional control.



Forged brass body

Provides 40 bar static pressure rating

Amodel® Flow Characterizing Disk

Maintains equal percentage flow characteristics for best temperature control, available in a wide variety of Kvs to cover a broad range of applications.

1380 kPa Closeoff Pressure Rating

Provides tight shutoff.

500:1 Rangeability

Provides accurate control under all load conditions.

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.

Maintenance-Free Design

Performs without failure in excess of 200,000 full stroke cycles in iron-oxide contaminated water.



VALVES & ACTUATORS COMBINATIONS ACTUATOR TYPE Non-Spring Return Spring Return VA9104 VA9310 VA9203 VA9208 VG1000 Series Ball Valves are designed for factory or field mounting to a variety Floating and Proportional Point of M9000 and VA9000 Series Actuators. VA9000 Series Actuators include all Proportional 0 (2) to 10 VDC Proportional 0 (2) to 10 VDC Proportional 0 (2) to 10 VDC On / Off and Floating Point On / Off and Floating Point Off and Floating Point Off and Floating Point Off and Floating Point hardware necessary for attachment to the valve. Off, 9 8 5 8 o o 9 9 ر ا 9 o o 6 .230 V AC 00-230 V AC 00-230 V AC 2 ဗ 8 2 24 V AC / DC 2 24 V AC / DC V AC **POWER SUPPLY** 24 V AC / ACTUATOR OPTIONS 8 **Auxiliary Switches:** 1 SPDT, 5.0(2.9) A @ 240 V 2 SPDT, 5.0(2.9) A @ 240 V Position Feedback: 0(2) to 10VDC Position Feedback • . VA9104-GGA-1S /A9203-AGA-1Z /A9203-AGB-1Z /A9203-GGA-1Z /A9203-GGB-1Z /A9104-IGA-1S VA9104-IUA-1S /A9310-HGA-1 /A9310-AUA-1 /A9208-AGA-1 VA9208-GGA-1 /A9203-BGA-1 /A9203-BUA-1 /A9208-AGC-1 /A9208-BGA-1 /A9208-BDA-1 /A9208-BDC-1 /A9208-GGC-1 /A9203-BGB-1 /A9208-BGC-1 **ACTUATOR CODE** VALVE BODY Pressure Drop - kPa (bar) CONFIGURATION FACTORY ASSEMBLED VALVE + ACTUATOR COMBINATIONS MATRIX 5 10 25 50 100 200 300 400 500 DN Control Por 3-WAY 2-WAY (0.05)(0.25)(0.5)(1) (2) (3) (4) (5) Inch 1,00 0,71 1,41 1,73 2,00 2,24 VG1205AD VG1805AD 0,22 0,32 0,50 1,0 (0,63) 0,23 1,13 1,60 2,26 2,77 3,20 3,58 1,6 (1,0) VG1805AE 0,36 0,51 0,80 VG1205AE 0,35 0,79 1,77 2,50 3,54 4,33 5,00 VG1205AF VG1805AF 0,56 1,25 5,59 2,5 (1,6) 1/2 0.57 1.26 2.00 2.83 4.00 5.66 6.93 8.00 8.94 4.0 (2.5) VG1205AG VG1805AG 0.89 10.91 12.60 14.09 VG1805AL 0.89 1.41 1.99 3.15 4.45 6.30 8.91 6.3 (4.0) VG1205AL 1.41 3.16 5.00 7.07 10.00 14.14 17.32 20.00 22.36 10 (5.0) VG1205AN VG1805AN 0.89 1 41 1 99 3 15 4 45 6 30 | 8 91 | 10 91 | 12 60 | 14 09 6.3 (4.0) VG1205BI VG1805BI . 20 3/4 1.41 2.24 3.16 5.00 7.07 10.00 | 14.14 | 17.32 | 20.00 | 22.36 10 (5.0) VG1205BN VG1805BN 1,41 2.24 3.16 5.00 7.07 10,00 14,14 17,32 20,00 22,36 10 (6.3) VG1205CN VG1805CN 2.26 3.58 5,06 8,00 11,31 16.00 22.63 27.71 32.00 35.78 16 (8,0) VG1205CP VG1805CP 2,26 3,58 5,06 8,00 11,31 16,00 22,63 27,71 32,00 35,78 16 (10,0) VG1205DP VG1805DP 5,59 7,91 12,50 17,68 25,00 35,36 43,30 50,00 55.90 25 (12,5) VG1205DR VG1805DR 3,54 7,91 12,50 17,68 25,00 35,36 43,30 50,00 55,90 25 (16) VG1205ER VG1805FR 5,66 12,65 20,00 28,28 40,00 56,57 69,28 80,00 89,44 40 (20) VG1205ES VG1805FS 8,94 | 12,65 | 20,00 | 28,28 | 40,00 | 56,57 | 69,28 | 80,00 | 89,44 40 (25,0) VG1205FS VG1805FS 50 14,09 | 19,92 | 31,50 | 44,55 | 63,00 | 89,10 | 109,12 | 126,00 | 140,87 63 (31,5) VG1205FT VG1805FT FACTORY **FLUID ASSEMBLY CODE TEMPERATURE LIMITS MOTORIZED VALVE** ASSEMBLY CODE Water **5A4GGA 510AUA** 5x3AGA 5x3AGB 5x3BGB 5x3BUA 5x3BUB 5x3GGA 5x8AGA 5x8AGC 5x8BGC 5x8BDC 5x8GGA 5x3BGA -30° to 100 °C (-22 to 212 °F) Water **VALVE CODE** -30° to 140 °C 6A4GGA 610AUA 6x3AGB 6x3BGB 6x3BUA 6x3BUB 6x8AGA 6x8AGC 6x8BGC 6x8BDA 6x8BDC 6x8GGA (-22 to 284 °F) Steam Example: VG1805CP + 533GGB Max 103 kPa

Application Overview

Available in sizes DN15 through DN50, VG1000 Series Ball Valves are designed specifically for automated commercial HVAC service. These valves feature a forged brass body with a 300 Series stainless steel ball for high temperature water to 140°C and saturated steam to 103 kPa. The Amodel Flow Characterizing Disk maintains equal percentage flow characteristics for optimum temperature control.

The blowout-proof stem and mounting flange, combined with an innovative double O-ring stem seal and self-centering stem bushing design provide quick and easy electric actuator field mounting while ensuring long life and leak-free valve performance. The specially engineered, graphite-reinforced PTFE seat with flexible PTFE seat design (backed with EPDM O-rings) significantly reduces the operating torque, allowing the smallest possible electric actuator available to provide the force required for the specific application. All valve and actuator assemblies provide 1.380 kPa closeoff pressure while ensuring operation after long idle periods. Because of their reliable design, VG1000 Series Ball Valves are maintenance free.

VA9000 Series Electric Actuators include mounting hardware for direct coupling to VG1000 Series Ball Valves. VG1000 Series Ball Valves are designed for factory or field mounting to a wide variety of Johnson Controls® VA9000 Series Electric Actuators.

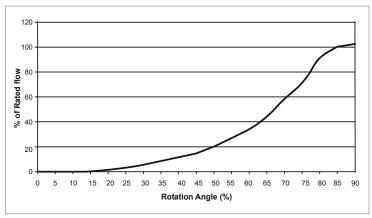


Figure 1: Typical curve characteristic of VG1000 Valves

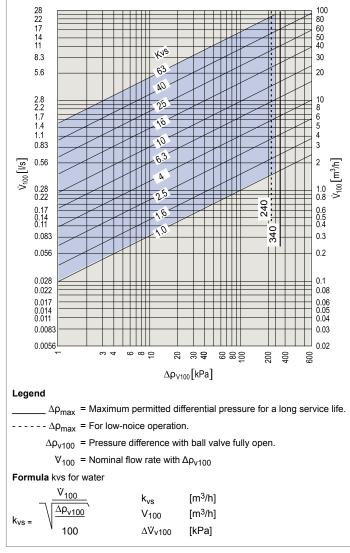


Figure 2: Pressure drop-flow chart



Electric Actuator Control Signal Action

Two-way VG1000 Series Ball Valves are fully open when the electric actuator is fully Counterclockwise (CCW) and fully closed when the electric actuator is fully Clockwise (CW).

For three-way valves, the Port A and common port are fully open when the electric actuator is fully CCW, as shown in Figure 3.

Port B and common port are fully open when the actuator is fully CW, as shown in Figure 4.

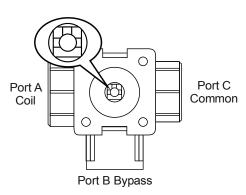


Figure 3: VG1805 Series Three-Way Ball Valve (Port A connected to Port C)

For non-spring return and spring-to-open proportional control models in the direct-acting mode, a minimum control signal drives the electric actuator to the fully CCW position, whereas a maximum control signal drives the electric actuator to the fully CW position.

For spring-to-close proportional control models in the direct-acting mode, a minimum control signal drives the electric actuator to the fully CW position, whereas a maximum control signal drives the electric actuator to the fully CCW position.

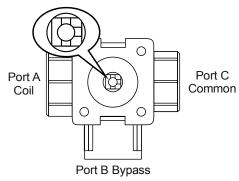


Figure 4: VG1805 Series Three-Way Ball Valve (Port B connected to Port C)

For non-spring return floating or on/off (floating) control models, a control signal to Terminal 2 (or wire 2) of a VA9104 or VA931x Series Actuator drives the electric actuator to the fully CW position. Likewise, a control signal to Terminal 3 (or wire 3) of a VA9104 or VA931x Series Actuator drives the electric actuator to the fully CCW position.

A control signal to Wire 3 of side A mounted (away from the valve) VA9203 or VA9208 Series actuated spring-to-open floating control valve assembly drives the electric actuator to the fully CW position. Likewise, a control signal to Wire 4 of a floating CCW-face VA9203 Series or VA9208 Series Actuator, or removal of the control signal from Wire 3 of an on/off CCW-face VA9203 Series or VA9208 Series actuated spring-toopen valve assembly, drives the electric actuator to the fully CCW position.

A control signal to Wire 3 of a CW-face (mounted away from the valve) VA9203 Series or VA9208 Series actuated spring-to-close floating control valve assembly drives the electric actuator to the fully CCW position. Likewise, a control signal to Wire 4 of a floating CW-face VA9203 Series or VA9208 Series Actuator, or removal of the control signal from Wire 3 of an on/off CW-face VA9203 Series or VA9208 Series actuated spring-to-close valve assembly, drives the electric actuator to the fully CW position.



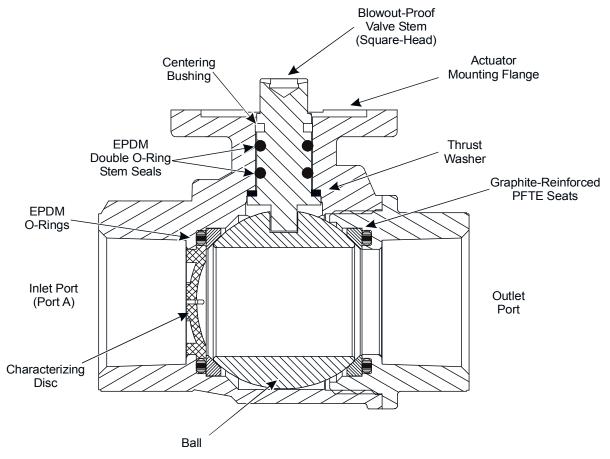
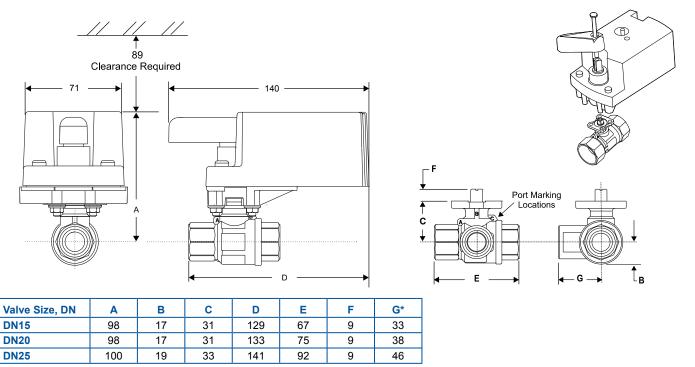


Figure 5: Internal View of a Typical VG1000 Series Ball Valve

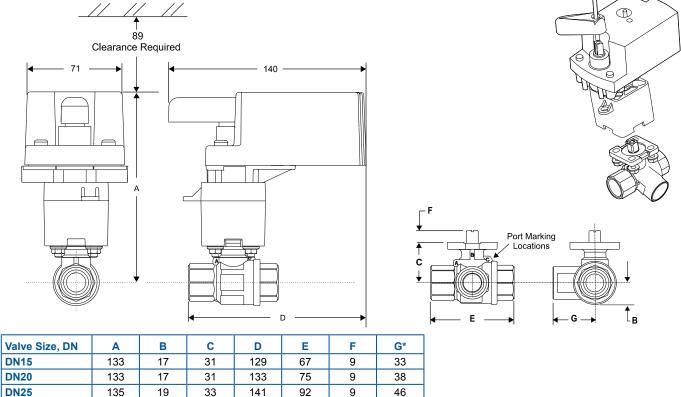


Non-Spring Return VA9104 Actuated VG1000 Series Ball Valve Linkage, Dimensions in mm



^{*} for 3-way valves only

Non-Spring Return VA9104 Actuated VG1000 Series Ball Valve with M9000-561Thermal Barrier, Dimensions in mm

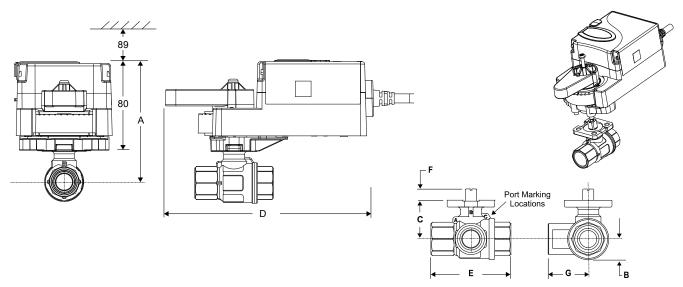


	33	17	JI	133	75	Ĺ
DN25 1	35	19	33	141	92	Ĺ

^{*} for 3-way valves only

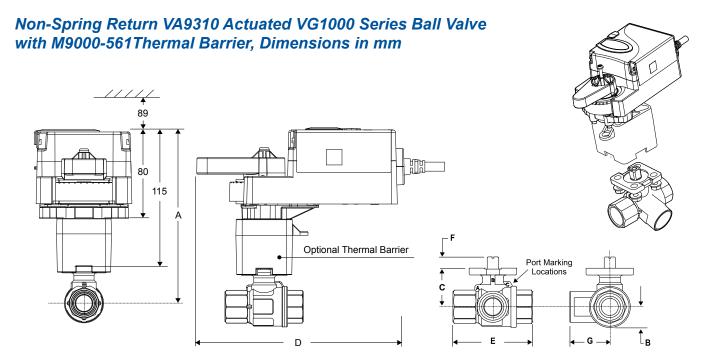


Non-Spring Return VA9310 Actuated VG1000 Series Ball Valve Linkage, Dimensions in mm



Valve Size, DN	Α	В	С	D	E	F	G*
DN15	111	17	31	163	67	9	33
DN20	111	17	31	163	75	9	38
DN25	113	19	33	163	92	9	46
DN32	124	26	44	163	109	9	54
DN40	128	29	48	163	119	9	59
DN50	133	37	53	163	139	9	74

^{*} for 3-way valves only

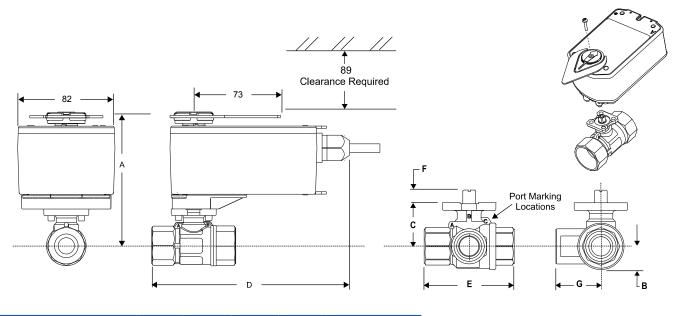


Valve Size, DN	Α	В	С	D	E	F	G*
DN15	146	17	31	163	67	9	33
DN20	146	17	31	163	75	9	38
DN25	148	19	33	163	92	9	46
DN32	159	26	44	163	109	9	54
DN40	163	29	48	163	119	9	59
DN50	168	37	53	163	139	9	74

^{*} for 3-way valves only



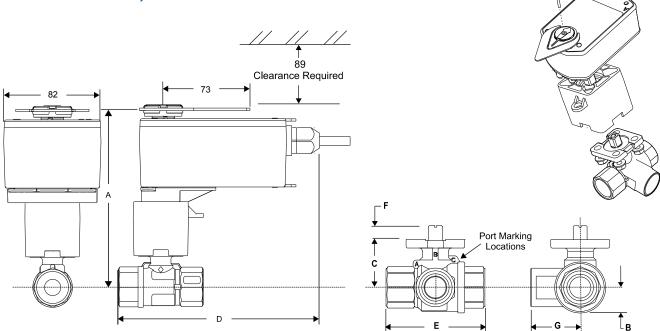
Spring Return VA9203 Actuated VG1000 Series Ball Valve, Dimensions in mm



Valve Size, DN	Α	В	С	D	Е	F	G
DN15	117	17	31	167	67	9	33
DN20	117	17	31	171	75	9	38
DN25	119	19	33	180	92	9	46

^{*} for 3-way valves only



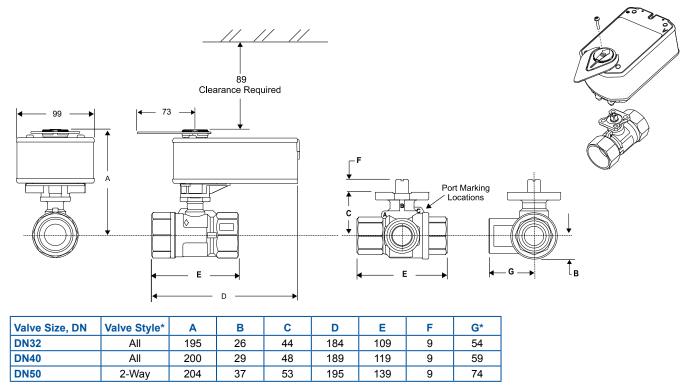


Valve Size, DN	Α	В	С	D	Е	F	G
DN15	152	17	31	167	67	9	33
DN20	152	17	31	171	75	9	38
DN25	154	19	33	180	92	9	46

^{*} for 3-way valves only

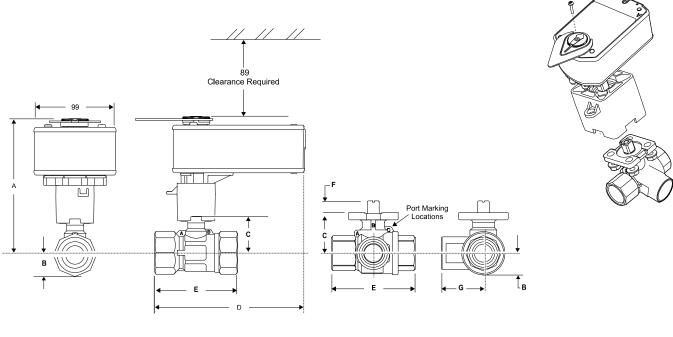


Spring Return VA9208 Actuated VG1000 Series Ball Valve, Dimensions in mm



^{*} for 3-way valves only

Spring Return VA9208 Actuated VG1000 Series Ball Valve with Thermal Barrier, Dimensions in mm



Valve Size, DN	Valve Style*	Α	В	С	D	Е	F	G*
DN32	All	235	26	44	184	109	9	54
DN40	All	240	29	48	189	119	9	59
DN50	2-Way	244	37	53	195	139	9	74

^{*} for 3-way valves only



Technical Specifications

Product	VG1205	VG1805			
Valve Type	2-way	3-way mixing*			
Service	Hot and cold water: -3095 °C with 4Nm Non Spring Return (140 °C with M9000-561 Thermal Barrier) -30100 °C with 10Nm Non Spring Return, 3Nm and 8Nm Spring Return (140 °C with M9000-561 Thermal Barrier).				
	Water with glycol to max 50% volume.				
	Steam to max 103kPa at 121 °C with 4Nm and 10Nm with Thermal Barrier.	n Non spring Return, 3Nm and 8Nm Spring Return			
Body pressure rating	PN40				
Close-off pressure ∆ρs	1380 kPa				
Differenzial pressure ∆pmax	600 kPa at 2-way valves without flow disk				
	340 kPa for all the others				
	240 kPa for low noise operation				
Flow characteristics	Equal percentage in 2-way valve				
	Equal percentage in 3-way valve (control port)				
	Linear in 3-way valve in bypass				
Leakage rate	< 0.01% from the Kvs, < 1% for bypass port				
Rangeability	> 500 : 1 (EN60534-2-4)				
Material					
- Body device	Forged brass body				
- Ball	Stainless Steel				
- Stem	Stainless Steel				
- Valve seat	PTFE with graphite part and EPDM O-ring				
- Spindle gasket	2 x EPDM O-ring				
- Flow characterisation disk	AMODEL® AS 1145HS				
End Connections	British Standard Pipe Parallel (BSPP) - (Rp, ISO 7/1)				
C € Compliance	Johnson Controls, Inc., declares that these products and other relevant provisions of the PED (Pressure E				

^{*} The valve without flow disc can also be used as diverting.

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



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