

# VG1000 Series Two-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 and VA9300 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 and single point of contact information.

## Features

- Forged Brass Body — provides 580 psig static pressure rating.
- 200 psi Closeoff Pressure Rating — provides tight shutoff.
- 300 Series Stainless Steel Ball and Stem Assembly — tolerates high-temperature water or 15 psi saturated steam with fluid temperatures of -22°F to 284°F (-30°C 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 Two-Way, Non-Spring Return, Stainless Steel Ball and Stem Ball Valve Assemblies**

## Repair Information

If the VG1000 Series Ball Valve Assembly 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

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

Fluid Temperatures: -4°F to 212°F (-20°C to 100°C) Not Rated for Steam Service				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/Off and/or Floating without Timeout <sup>1</sup>	On/Off and/or Floating with Timeout	DC 0 to 10 V Proportional
<b>Actuators with M3 Screw Terminals</b>				<b>VA9104-AGA-3S</b>	<b>VA9104-IGA-3S</b>	<b>VA9104-GGA-3S</b>
VG1245AD	1/2	1.2 <sup>2</sup>	200	VG1245AD+9T4AGA	VG1245AD+9T4IGA	VG1245AD+9T4GGA
VG1245AE		1.9 <sup>2</sup>		VG1245AE+9T4AGA	VG1245AE+9T4IGA	VG1245AE+9T4GGA
VG1245AF		2.9 <sup>2</sup>		VG1245AF+9T4AGA	VG1245AF+9T4IGA	VG1245AF+9T4GGA
VG1245AG		4.7 <sup>2</sup>		VG1245AG+9T4AGA	VG1245AG+9T4IGA	VG1245AG+9T4GGA
VG1245AL		7.4 <sup>2</sup>		VG1245AL+9T4AGA	VG1245AL+9T4IGA	VG1245AL+9T4GGA
VG1245AN		11.7		VG1245AN+9T4AGA	VG1245AN+9T4IGA	VG1245AN+9T4GGA
VG1245BG	3/4	4.7 <sup>2</sup>	200	VG1245BG+9T4AGA	VG1245BG+9T4IGA	VG1245BG+9T4GGA
VG1245BL		7.4 <sup>2</sup>		VG1245BL+9T4AGA	VG1245BL+9T4IGA	VG1245BL+9T4GGA
VG1245BN		11.7		VG1245BN+9T4AGA	VG1245BN+9T4IGA	VG1245BN+9T4GGA
VG1245CL	1	7.4 <sup>2</sup>	200	VG1245CL+9T4AGA	VG1245CL+9T4IGA	VG1245CL+9T4GGA
VG1245CN		11.7 <sup>2</sup>		VG1245CN+9T4AGA	VG1245CN+9T4IGA	VG1245CN+9T4GGA
VG1245CP		18.7		VG1245CP+9T4AGA	VG1245CP+9T4IGA	VG1245CP+9T4GGA
<b>Actuators with 120 in. (3.05 m) 18 AWG Plenum Cable</b>				<b>VA9104-AGA-2S</b>	<b>VA9104-IGA-2S</b>	<b>VA9104-GGA-2S</b>
VG1245AD	1/2	1.2 <sup>2</sup>	200	VG1245AD+9A4AGA	VG1245AD+9A4IGA	VG1245AD+9A4GGA
VG1245AE		1.9 <sup>2</sup>		VG1245AE+9A4AGA	VG1245AE+9A4IGA	VG1245AE+9A4GGA
VG1245AF		2.9 <sup>2</sup>		VG1245AF+9A4AGA	VG1245AF+9A4IGA	VG1245AF+9A4GGA
VG1245AG		4.7 <sup>2</sup>		VG1245AG+9A4AGA	VG1245AG+9A4IGA	VG1245AG+9A4GGA
VG1245AL		7.4 <sup>2</sup>		VG1245AL+9A4AGA	VG1245AL+9A4IGA	VG1245AL+9A4GGA
VG1245AN		11.7		VG1245AN+9A4AGA	VG1245AN+9A4IGA	VG1245AN+9A4GGA
VG1245BG	3/4	4.7 <sup>2</sup>	200	VG1245BG+9A4AGA	VG1245BG+9A4IGA	VG1245BG+9A4GGA
VG1245BL		7.4 <sup>2</sup>		VG1245BL+9A4AGA	VG1245BL+9A4IGA	VG1245BL+9A4GGA
VG1245BN		11.7		VG1245BN+9A4AGA	VG1245BN+9A4IGA	VG1245BN+9A4GGA
VG1245CL	1	7.4 <sup>2</sup>	200	VG1245CL+9A4AGA	VG1245CL+9A4IGA	VG1245CL+9A4GGA
VG1245CN		11.7 <sup>2</sup>		VG1245CN+9A4AGA	VG1245CN+9A4IGA	VG1245CN+9A4GGA
VG1245CP		18.7		VG1245CP+9A4AGA	VG1245CP+9A4IGA	VG1245CP+9A4GGA

1. To avoid excessive wear or drive time on the motor for the AGx 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 Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators (Continued)

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

Fluid Temperatures: -22°F to 284°F (-30°C to 140°C) Water and 15 psi Saturated Steam				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/Off and/or Floating without Timeout <sup>1</sup>	On/Off and/or Floating with Timeout	DC 0 to 10 V Proportional
Actuators with M3 Screw Terminals with M9000-561 Thermal Barrier Installed				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1245AD	1/2	1.2 <sup>2</sup>	200	VG1245ADH9T4AGA	VG1245ADH9T4IGA	VG1245ADH9T4GGA
VG1245AE		1.9 <sup>2</sup>		VG1245AEH9T4AGA	VG1245AEH9T4IGA	VG1245AEH9T4GGA
VG1245AF		2.9 <sup>2</sup>		VG1245AFH9T4AGA	VG1245AFH9T4IGA	VG1245AFH9T4GGA
VG1245AG		4.7 <sup>2</sup>		VG1245AGH9T4AGA	VG1245AGH9T4IGA	VG1245AGH9T4GGA
VG1245AL		7.4 <sup>2</sup>		VG1245ALH9T4AGA	VG1245ALH9T4IGA	VG1245ALH9T4GGA
VG1245AN		11.7		VG1245ANH9T4AGA	VG1245ANH9T4IGA	VG1245ANH9T4GGA
VG1245BG	3/4	4.7 <sup>2</sup>	200	VG1245BGH9T4AGA	VG1245BGH9T4IGA	VG1245BGH9T4GGA
VG1245BL		7.4 <sup>2</sup>		VG1245BLH9T4AGA	VG1245BLH9T4IGA	VG1245BLH9T4GGA
VG1245BN		11.7		VG1245BNH9T4AGA	VG1245BNH9T4IGA	VG1245BNH9T4GGA
VG1245CL	1	7.4 <sup>2</sup>	200	VG1245CLH9T4AGA	VG1245CLH9T4IGA	VG1245CLH9T4GGA
VG1245CN		11.7 <sup>2</sup>		VG1245CNH9T4AGA	VG1245CNH9T4IGA	VG1245CNH9T4GGA
VG1245CP		18.7		VG1245CPH9T4AGA	VG1245CPH9T4IGA	VG1245CPH9T4GGA
Actuators with 120 in. (3.05 m) 18 AWG Plenum Cable with M9000-561 Thermal Barrier Installed				VA9104-AGA-2S	VA9104-IGA-2S	VA9104-GGA-2S
VG1245AD	1/2	1.2 <sup>2</sup>	200	VG1245ADH9A4AGA	VG1245ADH9A4IGA	VG1245ADH9A4GGA
VG1245AE		1.9 <sup>2</sup>		VG1245AEH9A4AGA	VG1245AEH9A4IGA	VG1245AEH9A4GGA
VG1245AF		2.9 <sup>2</sup>		VG1245AFH9A4AGA	VG1245AFH9A4IGA	VG1245AFH9A4GGA
VG1245AG		4.7 <sup>2</sup>		VG1245AGH9A4AGA	VG1245AGH9A4IGA	VG1245AGH9A4GGA
VG1245AL		7.4 <sup>2</sup>		VG1245ALH9A4AGA	VG1245ALH9A4IGA	VG1245ALH9A4GGA
VG1245AN		11.7		VG1245ANH9A4AGA	VG1245ANH9A4IGA	VG1245ANH9A4GGA
VG1245BG	3/4	4.7 <sup>2</sup>	200	VG1245BGH9A4AGA	VG1245BGH9A4IGA	VG1245BGH9A4GGA
VG1245BL		7.4 <sup>2</sup>		VG1245BLH9A4AGA	VG1245BLH9A4IGA	VG1245BLH9A4GGA
VG1245BN		11.7		VG1245BNH9A4AGA	VG1245BNH9A4IGA	VG1245BNH9A4GGA
VG1245CL	1	7.4 <sup>2</sup>	200	VG1245CLH9A4AGA	VG1245CLH9A4IGA	VG1245CLH9A4GGA
VG1245CN		11.7 <sup>2</sup>		VG1245CNH9A4AGA	VG1245CNH9A4IGA	VG1245CNH9A4GGA
VG1245CP		18.7		VG1245CPH9A4AGA	VG1245CPH9A4IGA	VG1245CPH9A4GGA

1. To avoid excessive wear or drive time on the motor for the AGx 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 Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators (Continued)

### Two-Way Stainless Steel Trim Ball Valves, Non-Spring Return, VA9300 Series Electric Actuators without Switches

Fluid Temperatures: -4°F to 212°F (-20°C to 100°C) Not Rated for Steam Service				AC/DC 24 V		
				On/Off	Floating	DC 0(2) to 10 V Proportional
Valve	Size, in.	Cv	Closeoff psi	VA9310-HGA-2		
VG1245DN	1-1/4	11.7 <sup>1</sup>	200	VG1245DN+910HGA		
VG1245DP		18.7 <sup>1</sup>		VG1245DP+910HGA		
VG1245DR		29.2		VG1245DR+910HGA		
VG1245EP	1-1/2	18.7 <sup>1</sup>	200	VG1245EP+910HGA		
VG1245ER		29.2 <sup>1</sup>		VG1245ER+910HGA		
VG1245ES		46.8		VG1245ES+910HGA		
VG1245FR	2	29.2 <sup>1</sup>	200	VG1245FR+910HGA		
VG1245FS		48.8 <sup>1</sup>		VG1245FS+910HGA		
VG1245FT		73.7		VG1245FT+910HGA		

### Two-Way Stainless Steel Trim Ball Valves, Non-Spring Return, VA9300 Series Electric Actuators with Switches

Fluid Temperatures: -4°F to 212°F (-20°C to 100°C) Not Rated for Steam Service				AC/DC 24 V		
				On/Off	Floating	DC 0(2) to 10 V Proportional
Valve	Size, in.	Cv	Closeoff psi	VA9310-HGA-2 Actuator with M9300-2 Switch Kit <sup>1</sup>		
VG1245AD	1/2	1.2 <sup>1</sup>	200	VG1245AD+910HGC		
VG1245AE		1.9 <sup>1</sup>		VG1245AE+910HGC		
VG1245AF		2.9 <sup>1</sup>		VG1245AF+910HGC		
VG1245AG		4.7 <sup>1</sup>		VG1245AG+910HGC		
VG1245AL		7.4 <sup>1</sup>		VG1245AL+910HGC		
VG1245AN		11.7		VG1245AN+910HGC		
VG1245BG	3/4	4.7 <sup>1</sup>	200	VG1245BG+910HGC		
VG1245BL		7.4 <sup>1</sup>		VG1245BL+910HGC		
VG1245BN		11.7		VG1245BN+910HGC		
VG1245CL	1	7.4 <sup>1</sup>	200	VG1245CL+910HGC		
VG1245CN		11.7 <sup>1</sup>		VG1245CN+910HGC		
VG1245CP		18.7		VG1245CP+910HGC		
VG1245DN	1-1/4	11.7 <sup>1</sup>	200	VG1245DN+910HGC		
VG1245DP		18.7 <sup>1</sup>		VG1245DP+910HGC		
VG1245DR		29.2		VG1245DR+910HGC		
VG1245EP	1-1/2	18.7 <sup>1</sup>	200	VG1245EP+910HGC		
VG1245ER		29.2 <sup>1</sup>		VG1245ER+910HGC		
VG1245ES		46.8		VG1245ES+910HGC		
VG1245FR	2	29.2 <sup>1</sup>	200	VG1245FR+910HGC		
VG1245FS		46.8 <sup>1</sup>		VG1245FS+910HGC		
VG1245FT		73.7		VG1245FT+910HGC		

1. For field mounting order VA9310-HGA-2 and the M9300-2 Switch Kit separately.

## VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators (Continued)

Two-Way Stainless Steel Trim Ball Valves, Non-Spring Return, VA9300 Series Electric Actuators without Switches with Optional M9000-561 Thermal Barrier

Fluid Temperatures: -22°F to 284°F (-30°C to 140°C) Water and 15 psi Saturated Steam				AC/DC 24 V		
				On/Off with Timeout	Floating with Timeout	DC 0(2) to 10 V Proportional
Valve	Size, in.	Cv	Closeoff psi	VA9310-HGA-2 with M9000-561 Thermal Barrier		
VG1245DN	1-1/4	11.7 <sup>1</sup>	200	VG1245DNH910HGA		
VG1245DP		18.7 <sup>1</sup>		VG1245DPH910HGA		
VG1245DR		29.2		VG1245DRH910HGA		
VG1245EP	1-1/2	18.7 <sup>1</sup>	200	VG1245EPH910HGA		
VG1245ER		29.2 <sup>1</sup>		VG1245ERH910HGA		
VG1245ES		46.8		VG1245ESH910HGA		
VG1245FR	2	29.2 <sup>1</sup>	200	VG1245FRH910HGA		
VG1245FS		48.8 <sup>1</sup>		VG1245FSH910HGA		
VG1245FT		73.7		VG1245FTH910HGA		

1. Valve has a characterizing disk.

Two-Way Stainless Steel Trim Ball Valves, Non-Spring Return, VA9300 Electric Actuators with Switches with Optional M9000-561 Thermal Barrier

Fluid Temperatures: -22°F to 284°F (-30°C to 140°C) Water and 15 psi Saturated Steam				AC/DC 24 V		
				On/Off	Floating	DC 0(2) to 10 V Proportional
Valve	Size, in.	Cv	Closeoff psi	VA9310-HGA-2 Actuator with M9300-2 Switch Kit with M9000-561 Thermal Barrier <sup>1</sup>		
VG1245AD	1/2	1.2 <sup>2</sup>	200	VG1245ADH910HGC		
VG1245AE		1.9 <sup>2</sup>		VG1245AEH910HGC		
VG1245AF		2.9 <sup>2</sup>		VG1245AFH910HGC		
VG1245AG		4.7 <sup>2</sup>		VG1245AGH910HGC		
VG1245AL		7.4 <sup>2</sup>		VG1245ALH910HGC		
VG1245AN		11.7		VG1245ANH910HGC		
VG1245BG	3/4	4.7 <sup>2</sup>	200	VG1245BGH910HGC		
VG1245BL		7.4 <sup>2</sup>		VG1245BLH910HGC		
VG1245BN		11.7		VG1245BNH910HGC		
VG1245CL	1	7.4 <sup>2</sup>	200	VG1245CLH910HGC		
VG1245CN		11.7 <sup>2</sup>		VG1245CNH910HGC		
VG1245CP		18.7		VG1245CPH910HGC		
VG1245DN	1-1/4	11.7 <sup>2</sup>	200	VG1245DNH910HGC		
VG1245DP		18.7 <sup>2</sup>		VG1245DPH910HGC		
VG1245DR		29.2		VG1245DRH910HGC		
VG1245EP	1-1/2	18.7 <sup>2</sup>	200	VG1245EPH910HGC		
VG1245ER		29.2 <sup>2</sup>		VG1245ERH910HGC		
VG1245ES		46.8		VG1245ESH910HGC		
VG1245FR	2	29.2 <sup>2</sup>	200	VG1245FRH910HGC		
VG1245FS		46.8 <sup>2</sup>		VG1245FSH910HGC		
VG1245FT		73.7		VG1245FTH910HGC		

1. For field mounting order VA9310-HGA-2, M9300-2 Switch Kit, and M9000-561 Thermal Barrier separately.

2. Valve has a characterizing disk.

## VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators (Continued)

### Technical Specifications

VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators		
Service <sup>1</sup>		Hot Water, Chilled Water, 50/50 Glycol Solutions, and 15 psig (103 kPa) Saturated Steam for HVAC Systems
Fluid Temperature Limits	Water	-22°F to 284°F (-30°C to 140°C)
	Steam	15 psig (103 kPa) at 250°F (121°C)
Maximum Fluid Temperature Limits	212°F (100°C)	VA9104 Series Non-Spring Return Actuators VA9300 Series Non-Spring Return Actuators
	284°F (140°C)	VA9104 Series Non-Spring Return Actuators with M9000-561 Thermal Barrier VA9300 Series Non-Spring Return Actuators with M9000-561 Thermal Barrier
Valve Body Pressure/ Temperature Rating	Water	580 psig (4,000 kPa) at 203°F (95°C) (PN40) 464 psig (3,199 kPa) at 284°F (140°C) (PN40)
	Steam	15 psig (103 kPa) Saturated Steam
Maximum Closeoff Pressure		200 psig (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psi (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
Rangeability <sup>2</sup>		Greater than 500:1
Minimum Ambient Operating Temperature	-4°F (-20°C)	VA9104 Series Non-Spring Return Actuators
	-22°F (-30°C)	VA9300 Series Non-Spring Return Actuators
Maximum Ambient Operating Temperature <sup>3</sup>	140°F (60°C)	VA9104 Series Non-Spring Return Actuators VA9300 Series Non-Spring Return Actuators
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
Compliance CRN		0C16910.5C

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.



This product is made of copper alloy, which contains lead. The product is therefore not to be used on drinking water.



This product can expose you to chemicals including lead, which is known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

#### WARNING: BRASS MAY CONTAIN LEAD

To fulfill our obligations towards Article 33, in accordance to the European REACH Regulation No 1907/2006 EC, we hereby inform you that this article contains the following Substances of Very High Concern mentioned on the Candidate list:

- Lead