

# VG1000 Series Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators

LIT-1900229

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## 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 information.

## Features

- Forged brass body — provides 580 psig static pressure rating.
- 200 psi closeoff pressure rating — provides tight shutoff.
- Graphite-reinforced Polytetrafluoroethylene (PTFE) seats — include 15 per cent graphite-reinforced ball seals, providing better wear resistance.
- 500:1 rangeability — provides accurate control under all load conditions.
- Chrome-plated brass ball and stem assembly standard — handles both chilled and hot water applications with a fluid temperature range of 23°F to 203°F (-5°C to 95°C).



## Repair information

If the VG1000 Series Ball Valve 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

**Table 1: Three-way plated brass trim ball valves, non-spring return, VA9104 Series electric actuators without switches**

Fluid temperatures: 23°F to 203°F (-5°C to 95°C) not rated for steam service				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/off (floating) without timeout <sup>1</sup>	On/off (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>
VG1841AA	1/2	0.3 / 0.2 <sup>2</sup>	200	VG1841AA+9T4AGA	-	VG1841AA+9T4GGA
VG1841AB		0.5 / 0.3 <sup>2</sup>		VG1841AB+9T4AGA	-	VG1841AB+9T4GGA
VG1841AC		0.8 / 0.4 <sup>2</sup>		VG1841AC+9T4AGA	-	VG1841AC+9T4GGA
VG1841AD		1.2 / 0.7		VG1841AD+9T4AGA	VG1841AD+9T4IGA	VG1841AD+9T4GGA
VG1841AE		1.9 / 1.2 <sup>2</sup>		VG1841AE+9T4AGA	VG1841AE+9T4IGA	VG1841AE+9T4GGA
VG1841AF		2.9 / 1.9 <sup>2</sup>		VG1841AF+9T4AGA	VG1841AF+9T4IGA	VG1841AF+9T4GGA
VG1841AG		4.7 / 2.9 <sup>2</sup>		VG1841AG+9T4AGA	VG1841AG+9T4IGA	VG1841AG+9T4GGA
VG1841AL		7.4 / 4.7 <sup>2</sup>		VG1841AL+9T4AGA	VG1841AL+9T4IGA	VG1841AL+9T4GGA
VG1841AN		11.7 / 5.8		VG1841AN+9T4AGA	VG1841AN+9T4IGA	VG1841AN+9T4GGA
VG1841BG	3/4	4.7 / 2.9 <sup>2</sup>	200	VG1841BG+9T4AGA	VG1841BG+9T4IGA	VG1841BG+9T4GGA
VG1841BL		7.4 / 4.7 <sup>2</sup>		VG1841BL+9T4AGA	VG1841BL+9T4IGA	VG1841BL+9T4GGA
VG1841BN		11.7 / 5.8		VG1841BN+9T4AGA	VG1841BN+9T4IGA	VG1841BN+9T4GGA
VG1841CL	1	7.4 / 4.7 <sup>2</sup>	200	VG1841CL+9T4AGA	VG1841CL+9T4IGA	VG1841CL+9T4GGA
VG1841CN		11.7 / 7.4 <sup>2</sup>		VG1841CN+9T4AGA	VG1841CN+9T4IGA	VG1841CN+9T4GGA
VG1841CP		18.7 / 9.4		VG1841CP+9T4AGA	VG1841CP+9T4IGA	VG1841CP+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>
VG1841AA	1/2	0.3 / 0.2 <sup>2</sup>	200	VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AB		0.5 / 0.3 <sup>2</sup>		VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AC		0.8 / 0.4 <sup>2</sup>		VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AD		1.2 / 0.7 <sup>2</sup>		VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AE		1.9 / 1.2 <sup>2</sup>		VG1841AE+9A4AGA	VG1841AE+9A4IGA	VG1841AE+9A4GGA
VG1841AF		2.9 / 1.9 <sup>2</sup>		VG1841AF+9A4AGA	VG1841AF+9A4IGA	VG1841AF+9A4GGA
VG1841AG		4.7 / 2.9 <sup>2</sup>		VG1841AG+9A4AGA	VG1841AG+9A4IGA	VG1841AG+9A4GGA
VG1841AL		7.4 / 4.7 <sup>2</sup>		VG1841AL+9A4AGA	VG1841AL+9A4IGA	VG1841AL+9A4GGA
VG1841AN		11.7 / 5.8		VG1841AN+9A4AGA	VG1841AN+9A4IGA	VG1841AN+9A4GGA
VG1841BG	3/4	4.7 / 2.9 <sup>2</sup>	200	VG1841BG+9A4AGA	VG1841BG+9A4IGA	VG1841BG+9A4GGA
VG1841BL		7.4 / 4.7 <sup>2</sup>		VG1841BL+9A4AGA	VG1841BL+9A4IGA	VG1841BL+9A4GGA
VG1841BN		11.7 / 5.8		VG1841BN+9A4AGA	VG1841BN+9A4IGA	VG1841BN+9A4GGA

<sup>2</sup> VG1000 Series Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators

**Table 1: Three-way plated brass trim ball valves, non-spring return, VA9104 Series electric actuators without switches**

Fluid temperatures: 23°F to 203°F (-5°C to 95°C) not rated for steam service				AC 24 V		
Valve	Size, in.	Cv	Closeoff psig	On/off (floating) without timeout <sup>1</sup>	On/off (floating) with timeout	DC 0 to 10 V proportional
VG1841CL	1	7.4 / 4.7 <sup>2</sup>	200	VG1841CL+9A4AGA	VG1841CL+9A4IGA	VG1841CL+9A4GGA
VG1841CN		11.7 / 7.4 <sup>2</sup>		VG1841CN+9A4AGA	VG1841CN+9A4IGA	VG1841CN+9A4GGA
VG1841CP		18.7 / 9.4		VG1841CP+9A4AGA	VG1841CP+9A4IGA	VG1841CP+9A4GGA

- 1 To avoid excessive wear or drive time on the motor for the AGA 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.

**Table 2: Three-way plated brass trim ball valves, non-spring return, VA9300 Series electric actuators without switches**

Fluid temperature: 23°F to 203°F (-5°C to 95°C) Not rated for steam service				AC/DC 24 V		
Valve	Size, in.	Cv	Closeoff psi	On/off	Floating	DC 0(2) to 10 V proportional
				VA9310-HGA-2		
VG1841DN	1-1/4	11.7 <sup>1</sup>	200	VG1841DN+910HGA		
VG1841DP		18.7 <sup>1</sup>		VG1841DP+910HGA		
VG1841DR		29.2		VG1841DR+910HGA		
VG1841EP	1-1/2	18.7 <sup>1</sup>	200	VG1841EP+910HGA		
VG1841ER		29.2 <sup>1</sup>		VG1841ER+910HGA		
VG1841ES		46.8		VG1841ES+910HGA		
VG1841FR	2	29.2 <sup>1</sup>	200	VG1841FR+910HGA		
VG1841FS		46.8 <sup>1</sup>		VG1841FS+910HGA		
VG1841FT		73.7		VG1841FT+910HGA		

- 1 Valve has a characterizing disk.

**Table 3: Three-way plated brass trim ball valves, non-spring return, VA9300 Series electric actuators with switches**

Fluid temperature: 23°F to 203°F (-5°C to 95°C) not rated for steam service				AC/DC 24 V		
Valve	Size, in.	Cv	Closeoff psi	On/Off	Floating	DC 0(2) to 10 V Proportional
				VA9310 actuator with M9000-2 Switch Kit <sup>1</sup>		
VG1841AD	1/2	1.2 <sup>2</sup>	200	VG1841AD+910HGC		
VG1841AE		1.9 <sup>2</sup>		VG1841AE+910HGC		
VG1841AF		2.9 <sup>2</sup>		VG1841AF+910HGC		
VG1841AG		4.7 <sup>2</sup>		VG1841AG+910HGC		
VG1841AL		7.4 <sup>2</sup>		VG1841AL+910HGC		
VG1841AN		11.7		VG1841AN+910HGC		

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**Table 3: Three-way plated brass trim ball valves, non-spring return, VA9300 Series electric actuators with switches**

Fluid temperature: 23°F to 203°F (-5°C to 95°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 actuator with M9000-2 Switch Kit <sup>1</sup>		
VG1841BG	3/4	4.7 <sup>2</sup>	200	VG1841BG+910HGC		
VG1841BL		7.4 <sup>2</sup>		VG1841BL+910HGC		
VG1841BN		11.7		VG1841BN+910HGC		
VG1841CL	1	7.4 <sup>2</sup>	200	VG1841CL+910HGC		
VG1841CN		11.7 <sup>2</sup>		VG1841CN+910HGC		
VG1841CP		18.7		VG1841CP+910HGC		
VG1841DN	1-1/4	11.7 <sup>2</sup>	200	VG1841DN+910HGC		
VG1841DP		18.7 <sup>2</sup>		VG1841DP+910HGC		
VG1841DR		29.2		VG1841DR+910HGC		
VG1841EP	1-1/2	18.7 <sup>2</sup>	200	VG1841EP+910HGC		
VG1841ER		29.2 <sup>2</sup>		VG1841ER+910HGC		
VG1841ES		46.8		VG1841ES+910HGC		
VG1841FR	2	29.2 <sup>2</sup>	200	VG1841FR+910HGC		
VG1841FS		46.8 <sup>2</sup>		VG1841FS+910HGC		
VG1841FT		73.7		VG1841FT+910HGC		

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

2 Valve has a characterizing disk.

## Technical specifications

VG1000 Series three-way, plated brass trim, NPT end connections ball valves with non-spring return electric actuators		
Service <sup>1</sup>	Hot water, chilled water, and 50/50 glycol solutions for HVAC systems	
Valve fluid temperature limits	Water	23°F to 203 ° F (-5°C to 95 ° C)
	Steam	Not Rated for Steam Service
Maximum fluid temperature limit	203°F (95°C)	VA9104 Series Actuators VA9300 Series Actuator
Valve body pressure rating	Water	580 psig (4,000 kPa) at 203°F (95°C) (PN40)
	Steam	Not rated for steam service
Maximum closeoff pressure	200 psig (1,378 kPa)	
Maximum recommended operating pressure drop	50 psig (340 kPa)	
Flow characteristics	Three-way	Equal percentage flow characteristics of in-line port A (coil) and linear flow characteristics of angle port B (bypass)
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	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)	

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## VG1000 Series three-way, plated brass trim, NPT end connections ball valves with non-spring return electric actuators

<b>Materials</b>	<b>Body</b>	Forged brass
	<b>Ball</b>	Chrome plated brass
	<b>Blowout-proof stem</b>	Nickel plated brass
	<b>Seats</b>	Graphite-reinforced PTFE with Ethylene Propylene Diene Monomer (EPDM) O-ring backing
	<b>Stem seals</b>	EPDM double O-rings
	<b>Characterizing disk</b>	Amodel® AS-1145HS polyphthalamide resin

- 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.

### WARNING

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

### WARNING

#### **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

### WARNING

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).

## Patents

Patents: <http://jciapat.com>

## Product warranty

This product is covered by a limited warranty, details of which can be found at [www.johnsoncontrols.com/buildingswarranty](http://www.johnsoncontrols.com/buildingswarranty).

## Single point of contact

APAC	Europe	NA/SA
JOHNSON CONTROLS C/O CONTROLS PRODUCT MANAGEMENT NO. 32 CHANGJIJANG RD NEW DISTRICT WUXI JIANGSU PROVINCE 214028 CHINA	JOHNSON CONTROLS WESTENDHOF 3 45143 ESSEN GERMANY	JOHNSON CONTROLS 507 E MICHIGAN ST MILWAUKEE WI 53202 USA

