

PP1 Series Piping Packages for VG1000 Series Ball Valves

Description

PP1 Series Piping Packages are designed to provide an easier way to deploy control valve solutions to a job site. Built around Johnson Controls® field-proven VG1000 Series Ball Valves using standard components, each piping package is tested under 100 psig (689 kPa) for 24 hours and then reduced to 40 psig (276 kPa) before shipping to ensure leak-free control valve solutions.

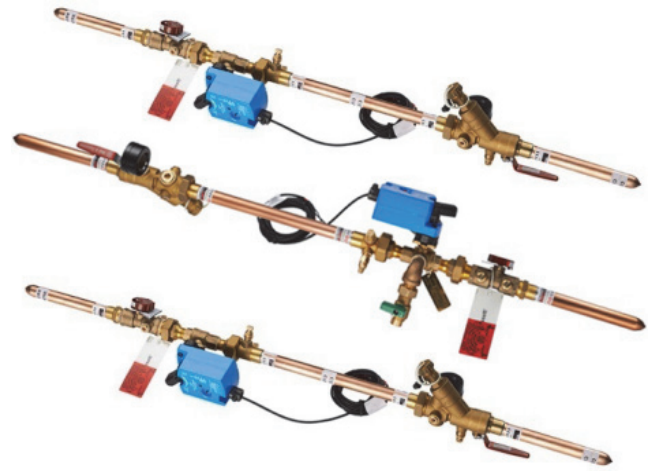
Johnson Controls piping packages are manufactured by United Association of Journeymen & Apprentices of the Plumbing and Pipe Fitting Industry of USA and Canada pipe fitters and provide defect-free solutions for 3/4 to 1-1/4 in. pipe sizes for both two-way and three-way applications.

Johnson Controls piping packages significantly reduce site labor. A piping package can be secured using the ProPress® fitting system or by soldering to fasten it to the piping infrastructure.

Refer to the *PP1 Series Piping Packages for VG1000 Series Ball Valves Product Bulletin (LIT-12011974)* for important product application information.

Features

- Assembly in a Factory Environment Following the Recommended Component Manufacturer Procedure
- 100% Tested under 100 psig (689 kPa) for 24 hours
- VG1000 Series Ball Valves
- Manufactured by United Association of Journeymen & Apprentices of the Plumbing and Pipe Fitting Industry of USA and Canada Pipe Fitters



PP1 Series Piping Packages

Repair Information

If the PP1 Series Piping Package fails to operate within its specifications, replace the unit. For a replacement piping package, contact the nearest Johnson Controls representative.



WARNING

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



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.

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

PP1 Series Piping Packages for VG1000 Series Ball Valves (Continued)

Selection Charts

Two-Way Automatic Flow Control Valve Models

Code Number	GPM	Pip Size, in.	Supply Pipe Y-Strainer with a Union End Ball Valve	Return Pipe			
				Automatic Flow Control Valve	Union Connection	VG1000 Series Ball Valve	
						Size, in. (DN)	Cv
PP12BA005-1	0.5	3/4	UBY 3/4"S x 3/4"S	AC 3/4"S x 1/2"M	UA 3/4"S x 1/2"M	1/2 (DN15)	1.2
PP12BA010-1	1						
PP12BA015-1	1.5						
PP12BA020-1	2						1.2, 1.9, 2.9
PP12BA025-1	2.5						
PP12BA030-1	3						
PP12BA035-1	3.5						1.2, 1.9, 2.9, 4.7
PP12BA040-1	4						
PP12BA045-1	4.5						2.9, 4.7, 7.4
PP12BA050-1	5						
PP12BA055-1	5.5						
PP12CA060-1	6	1	UBY 1"S x 1"S	AC 1"S x 3/4"M	UA 1"S x 3/4"M	3/4 (DN20)	4.7, 7.4
PP12CA070-1	7						
PP12CA080-1	8						
PP12CA090-1	9						4.7, 7.4, 11.8
PP12CA100-1	10						
PP12DA110-1	11	1-1/4	UBY 1-1/4"S x 1 1/4"	AC 1-1/4"S x 1"M	UA 1-1/4"S x 1"M	1 (DN25)	7.4, 11.8, 18.7
PP12DA120-1	12						
PP12DA130-1	13						
PP12DA140-1	14						
PP12DA150-1	15						
PP12DA160-1	16						11.8, 18.7
PP12DA170-1	17						
PP12DA180-1	18						
PP12DA190-1	19						
PP12DA200-1	20						
PP12DA210-1	21						
PP12DA220-1	22						

Two-Way Manual Flow Control Valve Models

Code Number	GPM	Pipe Size, in.	Supply Pipe Y-Strainer with a Union End Ball Valve	Return Pipe			
				Manual Balancing Valve	Union Connection	VG1000 Series Ball Valve	
						Size, in. (DN)	Cv
PP12BM001-1	0.5–7	3/4	UBY 3/4"S x 3/4"S	MC 3/4"S x 1/2"M	UA 3/4"S x 1/2"M	1/2 (DN15)	1.2, 1.9, 2.9, 4.7
PP12CM001-1	1.5–14	1	UBY 1"S x 1"S	MC 1"S x 1/2"M	UA 1"S x 1/2"M		4.7, 7.4
PP12CM002-1				MC 1"S x 3/4"M	UA 1"S x 3/4"M	3/4 (DN20)	4.7, 7.4, 11.7
PP12DM001-1	4.5–31	1-1/4	UBY 1 1/4"S x 1 1/4"S	MC 1-1/4"S x 1"M	UA 1 1/4"S x 1"M	1 (DN25)	7.4, 11.7, 18.7

PP1 Series Piping Packages for VG1000 Series Ball Valves (Continued)

Three-Way Manual Flow Control Valve Models

Code Number	GPM	Pipe Size, in.	Supply Pipe	Return Pipe				Bypass Pipe
			Y-Strainer with a Union End Ball Valve	Manual Balancing Valve	Union Connection	VG1000 Series Ball Valve		Ball Valve
						Size, in. (DN)	Cv	
PP18BM001-1	0.5–7	3/4	UBY 3/4"S x 3/4"S	MC 3/4"S x 1/2"M	UA 3/4"S x 1/2"M	1/2 (DN15)	1.2, 1.9, 2.9, 4.7	UBV 1/2"S x 1/2"M
PP18CM001-1	1.5–14	1	UBY 1"S x 1"S	MC 1"S x 1/2"M	UA 1"S x 1/2"M	3/4 (DN20)	4.7, 7.4	UBV 3/4"S x 3/4"M
PP18CM002-1				MC 1"S x 3/4"M	UA 1"S x 3/4"M		4.7, 7.4, 11.7	
PP18DM001-1	4.5–31	1-1/4	UBY 1 1/4"S x 1 1/4"S	MC 1-1/4"S x 1"M	UA 1 1/4"S x 1"M	1 (DN25)	7.4, 11.7, 18.7	UBV 1"S x 1"M

Technical Specifications

Y-Strainer with a Union End Ball Valve	
Product Code	UBY
Body	Forged brass C37000
Ball	Full port chrome plated
Ball Seal	Teflon®
Stem	Explosion-proof
O-Rings	Ethylene propylene diene monomer (EPDM)
Filter Screen	20 mesh, stainless steel
Maximum Seat Pressure Rating	400 psig (2,758 kPa)
Operating Temperature	-4°F to 250°F (20°C to 121°C)

Union Connection	
Product Code	UA
Body	Forged brass C37000
O-Ring	EPDM
Maximum Pressure	400 psig
Maximum Operating Temperature	-4°F to 250°F (20°C to 121°C)

Combination Commissioning Valve and Automatic Flow Limiting Valve	
Product Code	AC
Body	Brass C37710
Ball	Chrome plated brass C37710
Ball Seat	Teflon
O-Ring	EPDM
Diaphragm	Reinforced EPDM
Spring	Stainless steel
Tail Piece, Nut	Brass
Stem	Blowout-proof
Maximum Seat Pressure Rating	400 psig (2,758 kPa)
Operating Temperature	-4°F to 250°F (20°C to 121°C)
Flow Rate Accuracy	±5%

PP1 Series Piping Packages for VG1000 Series Ball Valves (Continued)

Cartridge (Included in Combination Commissioning Valve and Automatic Flow Limiting Valve)	
Body	Brass C36000 or equivalent
Spring	304 stainless steel
Diaphragm and O-Ring	EPDM
Orifice	Brass C36000 or equivalent

Calibrated Manual Balancing Valve with Shut-Off Ball Valve	
Product Code	MC
Body	Brass ASTM B584-844
Ball	Brass ASTM B16 C36000
Ball Seal	Glass and carbon-filled Teflon
Stem O-Ring	EPDM
Maximum Working Pressure	300 psig (2,069 kPa)
Operating Temperature	-4°F to 250°F (20°C to 121°C)

Pressure Gauge	
Case	Black painted steel
Dial	Black figures on white background
Tube and Sprocket	Bronze
Accuracy	ASME B40.100, Grade B, $\pm 3.75\%$ (0 to 25 psig [0 to 172 kPa]: 3%, 25 to 75 psig [172 to 517 kPa]: 2%, 75 to 100 psig [517 to 689 kPa]: 3%)
Operating Temperature	-40°F to 150°F (-40°C to 65°C)

Ball Valve (Three-Way Valve Models)	
Product Code	UBV
Body	Brass C37000
Handle	Chrome plated steel with plastic cover
Ball	Chrome plated
Ball Seal	Teflon
O-Ring	EPDM
Union Seal	Viton O-ring
Stem	Explosion-proof
Maximum Seat Pressure Rating	400 psig (2,758 kPa)
Operating Temperature	-4°F to 250°F (20°C to 121°C)

Pipe	
Copper Pipe	Type L

VG1000 Series Two-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 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 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% graphite-reinforced ball seals, providing better wear resistance.
- 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, Spring-Return, Stainless Steel Ball and Stem Ball Valve Assemblies without End Switches



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

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.



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.

Selection Charts

Two-Way — Spring Return Valves — Without Switches (Not Rated for Steam Service) (Part 1 of 2)

Fluid Temperatures: -22 to 212°F (-30 to 100°C) Not Rated for Steam Service				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Open — Valve Normally Open			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1245AD	1/2	1.2 ¹	200	VG1245AD+923AGA	VG1245AD+923GGA	VG1245AD+923BGA	VG1245AD+923BUA
VG1245AE		1.9 ¹		VG1245AE+923AGA	VG1245AE+923GGA	VG1245AE+923BGA	VG1245AE+923BUA
VG1245AF		2.9 ¹		VG1245AF+923AGA	VG1245AF+923GGA	VG1245AF+923BGA	VG1245AF+923BUA
VG1245AG		4.7 ¹		VG1245AG+923AGA	VG1245AG+923GGA	VG1245AG+923BGA	VG1245AG+923BUA
VG1245AL		7.4 ¹		VG1245AL+923AGA	VG1245AL+923GGA	VG1245AL+923BGA	VG1245AL+923BUA
VG1245AN		11.7		VG1245AN+923AGA	VG1245AN+923GGA	VG1245AN+923BGA	VG1245AN+923BUA
VG1245BG	3/4	4.7 ¹	200	VG1245BG+923AGA	VG1245BG+923GGA	VG1245BG+923BGA	VG1245BG+923BUA
VG1245BL		7.4 ¹		VG1245BL+923AGA	VG1245BL+923GGA	VG1245BL+923BGA	VG1245BL+923BUA
VG1245BN		11.7		VG1245BN+923AGA	VG1245BN+923GGA	VG1245BN+923BGA	VG1245BN+923BUA
VG1245CL	1	7.4 ¹	200	VG1245CL+923AGA	VG1245CL+923GGA	VG1245CL+923BGA	VG1245CL+923BUA
VG1245CN		11.7 ¹		VG1245CN+923AGA	VG1245CN+923GGA	VG1245CN+923BGA	VG1245CN+923BUA
VG1245CP		18.7		VG1245CP+923AGA	VG1245CP+923GGA	VG1245CP+923BGA	VG1245CP+923BUA
				Spring Return Open — Valve Normally Open			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1245DN	1-1/4	11.7 ¹	200	VG1245DN+928AGA	VG1245DN+928GGA	VG1245DN+938BGA	VG1245DN+938BAA
VG1245DP		18.7 ¹		VG1245DP+928AGA	VG1245DP+928GGA	VG1245DP+938BGA	VG1245DP+938BAA
VG1245DR		29.2		VG1245DR+928AGA	VG1245DR+928GGA	VG1245DR+938BGA	VG1245DR+938BAA
VG1245EP	1-1/2	18.7 ¹	200	VG1245EP+928AGA	VG1245EP+928GGA	VG1245EP+938BGA	VG1245EP+938BAA
VG1245ER		29.2 ¹		VG1245ER+928AGA	VG1245ER+928GGA	VG1245ER+938BGA	VG1245ER+938BAA
VG1245ES		46.8		VG1245ES+928AGA	VG1245ES+928GGA	VG1245ES+938BGA	VG1245ES+938BAA
VG1245FR	2	29.2 ¹	200	VG1245FR+928AGA	VG1245FR+928GGA	VG1245FR+938BGA	VG1245FR+938BAA
VG1245FS		46.8 ¹		VG1245FS+928AGA	VG1245FS+928GGA	VG1245FS+938BGA	VG1245FS+938BAA
VG1245FT		73.7		VG1245FT+928AGA	VG1245FT+928GGA	VG1245FT+938BGA	VG1245FT+938BAA

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

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

Two-Way — Spring Return Valves — Without Switches (Not Rated for Steam Service) (Part 2 of 2)

Fluid Temperatures: -22 to 212°F (-30 to 100°C) Not Rated for Steam Service				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Closed — Valve Normally Closed			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1245AD	1/2	1.2	200	VG1245AD+943AGA	VG1245AD+943GGA	VG1245AD+943BGA	VG1245AD+943BUA
VG1245AE		1.9 ¹		VG1245AE+943AGA	VG1245AE+943GGA	VG1245AE+943BGA	VG1245AE+943BUA
VG1245AF		2.9 ¹		VG1245AF+943AGA	VG1245AF+943GGA	VG1245AF+943BGA	VG1245AF+943BUA
VG1245AG		4.7 ¹		VG1245AG+943AGA	VG1245AG+943GGA	VG1245AG+943BGA	VG1245AG+943BUA
VG1245AL		7.4 ¹		VG1245AL+943AGA	VG1245AL+943GGA	VG1245AL+943BGA	VG1245AL+943BUA
VG1245AN		11.7		VG1245AN+943AGA	VG1245AN+943GGA	VG1245AN+943BGA	VG1245AN+943BUA
VG1245BG	3/4	4.7 ¹	200	VG1245BG+943AGA	VG1245BG+943GGA	VG1245BG+943BGA	VG1245BG+943BUA
VG1245BL		7.4 ¹		VG1245BL+943AGA	VG1245BL+943GGA	VG1245BL+943BGA	VG1245BL+943BUA
VG1245BN		11.7		VG1245BN+943AGA	VG1245BN+943GGA	VG1245BN+943BGA	VG1245BN+943BUA
VG1245CL	1	7.4 ¹	200	VG1245CL+943AGA	VG1245CL+943GGA	VG1245CL+943BGA	VG1245CL+943BUA
VG1245CN		11.7 ¹		VG1245CN+943AGA	VG1245CN+943GGA	VG1245CN+943BGA	VG1245CN+943BUA
VG1245CP		18.7		VG1245CP+943AGA	VG1245CP+943GGA	VG1245CP+943BGA	VG1245CP+943BUA
				Spring Return Closed — Valve Normally Closed			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1245DN	1-1/4	11.7 ¹	200	VG1245DN+948AGA	VG1245DN+948GGA	VG1245DN+958BGA	VG1245DN+958BAA
VG1245DP		18.7 ¹		VG1245DP+948AGA	VG1245DP+948GGA	VG1245DP+958BGA	VG1245DP+958BAA
VG1245DR		29.2		VG1245DR+948AGA	VG1245DR+948GGA	VG1245DR+958BGA	VG1245DR+958BAA
VG1245EP	1-1/2	18.7 ¹	200	VG1245EP+948AGA	VG1245EP+948GGA	VG1245EP+958BGA	VG1245EP+958BAA
VG1245ER		29.2 ¹		VG1245ER+948AGA	VG1245ER+948GGA	VG1245ER+958BGA	VG1245ER+958BAA
VG1245ES		46.8		VG1245ES+948AGA	VG1245ES+948GGA	VG1245ES+958BGA	VG1245ES+958BAA
VG1245FR	2	29.2 ¹	200	VG1245FR+948AGA	VG1245FR+948GGA	VG1245FR+958BGA	VG1245FR+958BAA
VG1245FS		46.8 ¹		VG1245FS+948AGA	VG1245FS+948GGA	VG1245FS+958BGA	VG1245FS+958BAA
VG1245FT		73.7		VG1245FT+948AGA	VG1245FT+948GGA	VG1245FT+958BGA	VG1245FT+958BAA

1. Valve has a characterizing disk.

Valve Assemblies with M9000-561 Thermal Barrier Installed — Rated for High-Temperature Fluid Service Two-Way — Spring Return Valve Open — Normally Open — Without End Switches (Part 1 of 2)

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 psi Steam				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Open — Valve Normally Open			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1245AD	1/2	1.2 ¹	200	VG1245ADH923AGA	VG1245ADH923GGA	VG1245ADH923BGA	VG1245ADH923BUA
VG1245AE		1.9 ¹		VG1245AEH923AGA	VG1245AEH923GGA	VG1245AEH923BGA	VG1245AEH923BUA
VG1245AF		2.9 ¹		VG1245AFH923AGA	VG1245AFH923GGA	VG1245AFH923BGA	VG1245AFH923BUA
VG1245AG		4.7 ¹		VG1245AGH923AGA	VG1245AGH923GGA	VG1245AGH923BGA	VG1245AGH923BUA
VG1245AL		7.4 ¹		VG1245ALH923AGA	VG1245ALH923GGA	VG1245ALH923BGA	VG1245ALH923BUA
VG1245AN		11.7		VG1245ANH923AGA	VG1245ANH923GGA	VG1245ANH923BGA	VG1245ANH923BUA
VG1245BG	3/4	4.7 ¹	200	VG1245BGH923AGA	VG1245BGH923GGA	VG1245BGH923BGA	VG1245BGH923BUA
VG1245BL		7.4 ¹		VG1245BLH923AGA	VG1245BLH923GGA	VG1245BLH923BGA	VG1245BLH923BUA
VG1245BN		11.7		VG1245BNH923AGA	VG1245BNH923GGA	VG1245BNH923BGA	VG1245BNH923BUA
VG1245CL	1	7.4 ¹	200	VG1245CLH923AGA	VG1245CLH923GGA	VG1245CLH923BGA	VG1245CLH923BUA
VG1245CN		11.7 ¹		VG1245CNH923AGA	VG1245CNH923GGA	VG1245CNH923BGA	VG1245CNH923BUA
VG1245CP		18.7		VG1245CPH923AGA	VG1245CPH923GGA	VG1245CPH923BGA	VG1245CPH923BUA

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

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

Valve Assemblies with M9000-561 Thermal Barrier Installed — Rated for High-Temperature Fluid Service Two-Way — Spring Return Valve Open — Normally Open — Without End Switches (Part 2 of 2)

Fluid Temperatures: -22 to 284°F (-30 to 140°C) Water and 15 psi Steam				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Open — Valve Normally Open			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1245DN	1-1/4	11.7 ¹	200	VG1245DNH928AGA	VG1245DNH928GGA	VG1245DNH938BGA	VG1245DNH938BAA
VG1245DP		18.7 ¹		VG1245DPH928AGA	VG1245DPH928GGA	VG1245DPH938BGA	VG1245DPH938BAA
VG1245DR		29.2		VG1245DRH928AGA	VG1245DRH928GGA	VG1245DRH938BGA	VG1245DRH938BAA
VG1245EP	1-1/2	18.7 ¹	200	VG1245EPH928AGA	VG1245EPH928GGA	VG1245EPH938BGA	VG1245EPH938BAA
VG1245ER		29.2 ¹		VG1245ERH928AGA	VG1245ERH928GGA	VG1245ERH938BGA	VG1245ERH938BAA
VG1245ES		46.8		VG1245ESH928AGA	VG1245ESH928GGA	VG1245ESH938BGA	VG1245ESH938BAA
VG1245FR	2	29.2 ¹	200	VG1245FRH928AGA	VG1245FRH928GGA	VG1245FRH938BGA	VG1245FRH938BAA
VG1245FS		46.8 ¹		VG1245FSH928AGA	VG1245FSH928GGA	VG1245FSH938BGA	VG1245FSH938BAA
VG1245FT		73.7		VG1245FTH928AGA	VG1245FTH928GGA	VG1245FTH938BGA	VG1245FTH938BAA
				Spring Return Closed — Valve Normally Closed			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1245AD	1/2	1.2	200	VG1245ADH943AGA	VG1245ADH943GGA	VG1245ADH943BGA	VG1245ADH943BUA
VG1245AE		1.9 ¹		VG1245AEH943AGA	VG1245AEH943GGA	VG1245AEH943BGA	VG1245AEH943BUA
VG1245AF		2.9 ¹		VG1245AFH943AGA	VG1245AFH943GGA	VG1245AFH943BGA	VG1245AFH943BUA
VG1245AG		4.7 ¹		VG1245AGH943AGA	VG1245AGH943GGA	VG1245AGH943BGA	VG1245AGH943BUA
VG1245AL		7.4 ¹		VG1245ALH943AGA	VG1245ALH943GGA	VG1245ALH943BGA	VG1245ALH943BUA
VG1245AN		11.7		VG1245ANH943AGA	VG1245ANH943GGA	VG1245ANH943BGA	VG1245ANH943BUA
VG1245BG	3/4	4.7 ¹	200	VG1245BGH943AGA	VG1245BGH943GGA	VG1245BGH943BGA	VG1245BGH943BUA
VG1245BL		7.4 ¹		VG1245BLH943AGA	VG1245BLH943GGA	VG1245BLH943BGA	VG1245BLH943BUA
VG1245BN		11.7		VG1245BNH943AGA	VG1245BNH943GGA	VG1245BNH943BGA	VG1245BNH943BUA
VG1245CL	1	7.4 ¹	200	VG1245CLH943AGA	VG1245CLH943GGA	VG1245CLH943BGA	VG1245CLH943BUA
VG1245CN		11.7 ¹		VG1245CNH943AGA	VG1245CNH943GGA	VG1245CNH943BGA	VG1245CNH943BUA
VG1245CP		18.7		VG1245CPH943AGA	VG1245CPH943GGA	VG1245CPH943BGA	VG1245CPH943BUA
				Spring Return Closed — Valve Normally Closed			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1245DN	1-1/4	11.7 ¹	200	VG1245DNH948AGA	VG1245DNH948GGA	VG1245DNH958BGA	VG1245DNH958BAA
VG1245DP		18.7 ¹		VG1245DPH948AGA	VG1245DPH948GGA	VG1245DPH958BGA	VG1245DPH958BAA
VG1245DR		29.2		VG1245DRH948AGA	VG1245DRH948GGA	VG1245DRH958BGA	VG1245DRH958BAA
VG1245EP	1-1/2	18.7 ¹	200	VG1245EPH948AGA	VG1245EPH948GGA	VG1245EPH958BGA	VG1245EPH958BAA
VG1245ER		29.2 ¹		VG1245ERH948AGA	VG1245ERH948GGA	VG1245ERH958BGA	VG1245ERH958BAA
VG1245ES		46.8		VG1245ESH948AGA	VG1245ESH948GGA	VG1245ESH958BGA	VG1245ESH958BAA
VG1245FR	2	29.2 ¹	200	VG1245FRH948AGA	VG1245FRH948GGA	VG1245FRH958BGA	VG1245FRH958BAA
VG1245FS		46.8 ¹		VG1245FSH948AGA	VG1245FSH948GGA	VG1245FSH958BGA	VG1245FSH958BAA
VG1245FT		73.7		VG1245FTH948AGA	VG1245FTH948GGA	VG1245FTH958BGA	VG1245FTH958BAA

1. Valve has a characterizing disk.

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

Technical Specifications

VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections 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°F to 284°F (-30°C to 140°C)
	Steam	15 psig (103 kPa) at 250°F (121°C)
Maximum Actuator Fluid Temperature Limit	212°F (100°C)	VA9203 Series VA9208 Series
	284°F (140°C)	VA9203 Series with M9000-561 Thermal Barrier VA9208 Series with M9000-561 Thermal Barrier
Valve Body Pressure Rating	Water	580 psig (4,000 kPa) at 203°F (95°C) (PN40) 464 psig (3,196 kPa) at 284°F (140°C) (PN40)
	Steam	15 psig (103 kPa) Saturated Steam (Applies to VA9203 Series or VA9208 Series Actuators with M9000-561 Thermal Barrier Installed)
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
Rangeability ²		Greater than 500:1
Minimum Ambient Operating Temperature	-22°F (-30°C)	VA9203 Series Spring-Return Actuators
	-40°F (-40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature ³ (Limited by the Actuator and Linkage)	Direct Mount	140°F (60°C): VA9203 or VA9208 Series Spring-Return Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
		1% of Maximum Flow for Three-Way Bypass Port
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
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.

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

VG1000 Series Two-Way, Plated Brass 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 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% graphite-reinforced ball seals, providing better wear resistance.
- 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).
- 500:1 Rangeability — provides accurate control under all load conditions.

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.



VG1000 Series Two-Way Non-Spring Return Plated Brass Ball and Stem Ball Valve Assemblies



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.

Selection Charts

Two-Way Plated Brass Trim 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 and/or Floating without Timeout ¹	On/Off and/or Floating with Timeout	DC 0 to 10 V Proportional
Actuators with M3 Screw Terminals				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1241AD	1/2	1.2 ²	200	VG1241AD+9T4AGA	VG1241AD+9T4IGA	VG1241AD+9T4GGA
VG1241AE		1.9 ²		VG1241AE+9T4AGA	VG1241AE+9T4IGA	VG1241AE+9T4GGA
VG1241AF		2.9 ²		VG1241AF+9T4AGA	VG1241AF+9T4IGA	VG1241AF+9T4GGA
VG1241AG		4.7 ²		VG1241AG+9T4AGA	VG1241AG+9T4IGA	VG1241AG+9T4GGA
VG1241AL		7.4 ²		VG1241AL+9T4AGA	VG1241AL+9T4IGA	VG1241AL+9T4GGA
VG1241AN		11.7		VG1241AN+9T4AGA	VG1241AN+9T4IGA	VG1241AN+9T4GGA
VG1241BG	3/4	4.7 ²	200	VG1241BG+9T4AGA	VG1241BG+9T4IGA	VG1241BG+9T4GGA
VG1241BL		7.4 ²		VG1241BL+9T4AGA	VG1241BL+9T4IGA	VG1241BL+9T4GGA
VG1241BN		11.7		VG1241BN+9T4AGA	VG1241BN+9T4IGA	VG1241BN+9T4GGA
VG1241CL	1	7.4 ²	200	VG1241CL+9T4AGA	VG1241CL+9T4IGA	VG1241CL+9T4GGA
VG1241CN		11.7 ²		VG1241CN+9T4AGA	VG1241CN+9T4IGA	VG1241CN+9T4GGA
VG1241CP		18.7		VG1241CP+9T4AGA	VG1241CP+9T4IGA	VG1241CP+9T4GGA
Actuators with 120 in. (3.05 m) 18 AWG Plenum Cable				VA9104-AGA-2S	VA9104-IGA-2S	VA9104-GGA-2S
VG1241AD	1/2	1.2 ²	200	VG1241AD+9A4AGA	VG1241AD+9A4IGA	VG1241AD+9A4GGA
VG1241AE		1.9 ²		VG1241AE+9A4AGA	VG1241AE+9A4IGA	VG1241AE+9A4GGA
VG1241AF		2.9 ²		VG1241AF+9A4AGA	VG1241AF+9A4IGA	VG1241AF+9A4GGA
VG1241AG		4.7 ²		VG1241AG+9A4AGA	VG1241AG+9A4IGA	VG1241AG+9A4GGA
VG1241AL		7.4 ²		VG1241AL+9A4AGA	VG1241AL+9A4IGA	VG1241AL+9A4GGA
VG1241AN		11.7		VG1241AN+9A4AGA	VG1241AN+9A4IGA	VG1241AN+9A4GGA
VG1241BG	3/4	4.7 ²	200	VG1241BG+9A4AGA	VG1241BG+9A4IGA	VG1241BG+9A4GGA
VG1241BL		7.4 ²		VG1241BL+9A4AGA	VG1241BL+9A4IGA	VG1241BL+9A4GGA
VG1241BN		11.7		VG1241BN+9A4AGA	VG1241BN+9A4IGA	VG1241BN+9A4GGA
VG1241CL	1	7.4 ²	200	VG1241CL+9A4AGA	VG1241CL+9A4IGA	VG1241CL+9A4GGA
VG1241CN		11.7 ²		VG1241CN+9A4AGA	VG1241CN+9A4IGA	VG1241CN+9A4GGA
VG1241CP		18.7		VG1241CP+9A4AGA	VG1241CP+9A4IGA	VG1241CP+9A4GGA

- 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).
- Valve has a characterizing disk.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

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

Two-Way Plated Brass Trim Ball Valves, Non-Spring Return, VA9300 Series Electric Actuators For Fluid Temperatures to 203°F

Fluid Temperature: 23°F to 203°F (-5°C to 95°C) Not Rated for Steam Service				AC/DC 24 V		
				On/Off with Timeout	Floating with Timeout	DC 0(2) to 10 V Proportional
Valve	Size, in.	Cv	Closeoff psi	Actuators without Switches		
				VA9310-HGA-2		
VG1241DN	1-1/4	11.7 ¹	200	VG1241DN+910HGA		
VG1241DP		18.7 ¹		VG1241DP+910HGA		
VG1241DR		29.2		VG1241DR+910HGA		
VG1241EP	1-1/2	18.7 ¹	200	VG1241EP+910HGA		
VG1241ER		29.2 ¹		VG1241ER+910HGA		
VG1241ES		46.8		VG1241ES+910HGA		
VG1241FR	2	29.2 ¹	200	VG1241FR+910HGA		
VG1241FS		46.8 ¹		VG1241FS+910HGA		
VG1241FT		73.7		VG1241FT+910HGA		
Valve	Size, in.	Cv	Closeoff psi	Actuators With Two Switches		
				VA9300 actuator with M9300-2 Switch Kit ²		
VG1241AD	1/2	1.2 ¹	200	VG1241AD+910HGC		
VG1241AE		1.9 ¹		VG1241AE+910HGC		
VG1241AF		2.9 ¹		VG1241AF+910HGC		
VG1241AG		4.7 ¹		VG1241AG+910HGC		
VG1241AL		7.4 ¹		VG1241AL+910HGC		
VG1241AN		11.7		VG1241AN+910HGC		
VG1241BG	3/4	4.7 ¹	200	VG1241BG+910HGC		
VG1241BL		7.4 ¹		VG1241BL+910HGC		
VG1241BN		11.7		VG1241BN+910HGC		
VG1241CL	1	7.4 ¹	200	VG1241CL+910HGC		
VG1241CN		11.7 ¹		VG1241CN+910HGC		
VG1241CP		18.7		VG1241CP+910HGC		
VG1241DN	1-1/4	11.7 ¹	200	VG1241DN+910HGC		
VG1241DP		18.7 ¹		VG1241DP+910HGC		
VG1241DR		29.2		VG1241DR+910HGC		
VG1241EP	1-1/2	18.7 ¹	200	VG1241EP+910HGC		
VG1241ER		29.2 ¹		VG1241ER+910HGC		
VG1241ES		46.8		VG1241ES+910HGC		
VG1241FR	2	29.2 ¹	200	VG1241FR+910HGC		
VG1241FS		46.8 ¹		VG1241FS+910HGC		
VG1241FT		73.7		VG1241FT+910HGC		

1. Valve has a characterizing disk.

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

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

Technical Specifications

VG1000 Series Two-Way, Plated Brass Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators		
Service ¹		Hot Water, Chilled Water, or 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 Non-Spring Return Actuators VA9300 Series Non-Spring Return Actuators
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 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
Rangeability ²		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)
Materials	Body	Forged Brass
	Ball	Chrome Plated Brass
	Blowout-Proof Stem	Nickel Plated Brass
	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 Guideline.

2. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.

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

VG1000 Series Three-Way, Plated Brass 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 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% 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.



VG1000 Series Three-Way, Non-Spring Return, Plated Brass Ball and Stem Ball Valve Assemblies without End Switches

Selection Charts

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 ¹	On/Off (Floating) with Timeout	DC 0 to 10 V Proportional
Actuators with M3 Screw Terminals				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1841AD	1/2	1.2/0.7 ²	200	VG1841AD+9T4AGA	VG1841AD+9T4IGA	VG1841AD+9T4GGA
VG1841AE		1.9/1.2 ²		VG1841AE+9T4AGA	VG1841AE+9T4IGA	VG1841AE+9T4GGA
VG1841AF		2.9/1.9 ²		VG1841AF+9T4AGA	VG1841AF+9T4IGA	VG1841AF+9T4GGA
VG1841AG		4.7/2.9 ²		VG1841AG+9T4AGA	VG1841AG+9T4IGA	VG1841AG+9T4GGA
VG1841AL		7.4/4.7 ²		VG1841AL+9T4AGA	VG1841AL+9T4IGA	VG1841AL+9T4GGA
VG1841AN		11.7/5.8		VG1841AN+9T4AGA	VG1841AN+9T4IGA	VG1841AN+9T4GGA
VG1841BG	3/4	4.7/2.9 ²	200	VG1841BG+9T4AGA	VG1841BG+9T4IGA	VG1841BG+9T4GGA
VG1841BL		7.4/4.7 ²		VG1841BL+9T4AGA	VG1841BL+9T4IGA	VG1841BL+9T4GGA
VG1841BN		11.7/5.8		VG1841BN+9T4AGA	VG1841BN+9T4IGA	VG1841BN+9T4GGA
VG1841CL	1	7.4/4.7 ²	200	VG1841CL+9T4AGA	VG1841CL+9T4IGA	VG1841CL+9T4GGA
VG1841CN		11.7/7.4 ²		VG1841CN+9T4AGA	VG1841CN+9T4IGA	VG1841CN+9T4GGA
VG1841CP		18.7/9.4		VG1841CP+9T4AGA	VG1841CP+9T4IGA	VG1841CP+9T4GGA
Actuators with 120 in. (3.05 m) 18 AWG Plenum Cable				VA9104-AGA-2S	VA9104-IGA-2S	VA9104-GGA-2S
VG1841AD	1/2	1.2/0.7 ²	200	VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AE		1.9/1.2 ²		VG1841AE+9A4AGA	VG1841AE+9A4IGA	VG1841AE+9A4GGA
VG1841AF		2.9/1.9 ²		VG1841AF+9A4AGA	VG1841AF+9A4IGA	VG1841AF+9A4GGA
VG1841AG		4.7/2.9 ²		VG1841AG+9A4AGA	VG1841AG+9A4IGA	VG1841AG+9A4GGA
VG1841AL		7.4/4.7 ²		VG1841AL+9A4AGA	VG1841AL+9A4IGA	VG1841AL+9A4GGA
VG1841AN		11.7/5.8		VG1841AN+9A4AGA	VG1841AN+9A4IGA	VG1841AN+9A4GGA
VG1841BG	3/4	4.7/2.9 ²	200	VG1841BG+9A4AGA	VG1841BG+9A4IGA	VG1841BG+9A4GGA
VG1841BL		7.4/4.7 ²		VG1841BL+9A4AGA	VG1841BL+9A4IGA	VG1841BL+9A4GGA
VG1841BN		11.7/5.8		VG1841BN+9A4AGA	VG1841BN+9A4IGA	VG1841BN+9A4GGA
VG1841CL	1	7.4/4.7 ²	200	VG1841CL+9A4AGA	VG1841CL+9A4IGA	VG1841CL+9A4GGA
VG1841CN		11.7/7.4 ²		VG1841CN+9A4AGA	VG1841CN+9A4IGA	VG1841CN+9A4GGA
VG1841CP		18.7/9.4		VG1841CP+9A4AGA	VG1841CP+9A4IGA	VG1841CP+9A4GGA

- 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).
- Valve has a characterizing disk.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

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

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		
				On/Off	Floating	DC 0(2) to 10 V Proportional
Valve	Size, in.	Cv	Closeoff psi	VA9310-HGA-2		
VG1841DN	1-1/4	11.7 ¹	200	VG1841DN+910HGA		
VG1841DP		18.7 ¹		VG1841DP+910HGA		
VG1841DR		29.2		VG1841DR+910HGA		
VG1841EP	1-1/2	18.7 ¹	200	VG1841EP+910HGA		
VG1841ER		29.2 ¹		VG1841ER+910HGA		
VG1841ES		46.8		VG1841ES+910HGA		
VG1841FR	2	29.2 ¹	200	VG1841FR+910HGA		
VG1841FS		46.8 ¹		VG1841FS+910HGA		
VG1841FT		73.7		VG1841FT+910HGA		

1. Valve has a characterizing disk.

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 ¹		
VG1841AD	1/2	1.2 ²	200	VG1841AD+910HGC		
VG1841AE		1.9 ²		VG1841AE+910HGC		
VG1841AF		2.9 ²		VG1841AF+910HGC		
VG1841AG		4.7 ²		VG1841AG+910HGC		
VG1841AL		7.4 ²		VG1841AL+910HGC		
VG1841AN		11.7		VG1841AN+910HGC		
VG1841BG	3/4	4.7 ²	200	VG1841BG+910HGC		
VG1841BL		7.4 ²		VG1841BL+910HGC		
VG1841BN		11.7		VG1841BN+910HGC		
VG1841CL	1	7.4 ²	200	VG1841CL+910HGC		
VG1841CN		11.7 ²		VG1841CN+910HGC		
VG1841CP		18.7		VG1841CP+910HGC		
VG1841DN	1-1/4	11.7 ²	200	VG1841DN+910HGC		
VG1841DP		18.7 ²		VG1841DP+910HGC		
VG1841DR		29.2		VG1841DR+910HGC		
VG1841EP	1-1/2	18.7 ²	200	VG1841EP+910HGC		
VG1841ER		29.2 ²		VG1841ER+910HGC		
VG1841ES		46.8		VG1841ES+910HGC		
VG1841FR	2	29.2 ²	200	VG1841FR+910HGC		
VG1841FS		46.8 ²		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.

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

Technical Specifications

VG1000 Series Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators		
Service ¹		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 ²		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)
Materials	Body	Forged Brass
	Ball	Chrome Plated Brass
	Blowout-Proof Stem	Nickel Plated Brass
	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 Guideline.
2. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.



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.

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

VG1000 Series Two-Way, Plated Brass 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 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 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.
- Chrome-Plated Brass Ball and Stem Assembly Standard — handles both chilled water and hot water applications with a fluid temperature range of 23°F to 203°F (-5°C to 95°C).
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals, providing better wear resistance.
- 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 valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls representative.

VG1000 Series Two-Way, Spring-Return, Plated Brass Ball and Stem Ball Valve Assemblies without End Switches

Selection Chart

Two-Way — Spring Return without Switches (Part 1 of 2)

Fluid Temperatures: 23°F to 203°F (-5°C to 95°C)				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Open — Valve Normally Open			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1241AD	1/2	1.2 ¹	200	VG1241AD+923AGA	VG1241AD+923GGA	VG1241AD+923BGA	VG1241AD+923BUA
VG1241AE		1.9 ¹		VG1241AE+923AGA	VG1241AE+923GGA	VG1241AE+923BGA	VG1241AE+923BUA
VG1241AF		2.9 ¹		VG1241AF+923AGA	VG1241AF+923GGA	VG1241AF+923BGA	VG1241AF+923BUA
VG1241AG		4.7 ¹		VG1241AG+923AGA	VG1241AG+923GGA	VG1241AG+923BGA	VG1241AG+923BUA
VG1241AL		7.4 ¹		VG1241AL+923AGA	VG1241AL+923GGA	VG1241AL+923BGA	VG1241AL+923BUA
VG1241AN		11.7		VG1241AN+923AGA	VG1241AN+923GGA	VG1241AN+923BGA	VG1241AN+923BUA
VG1241BG	3/4	4.7 ¹	200	VG1241BG+923AGA	VG1241BG+923GGA	VG1241BG+923BGA	VG1241BG+923BUA
VG1241BL		7.4 ¹		VG1241BL+923AGA	VG1241BL+923GGA	VG1241BL+923BGA	VG1241BL+923BUA
VG1241BN		11.7		VG1241BN+923AGA	VG1241BN+923GGA	VG1241BN+923BGA	VG1241BN+923BUA
VG1241CL	1	7.4 ¹	200	VG1241CL+923AGA	VG1241CL+923GGA	VG1241CL+923BGA	VG1241CL+923BUA
VG1241CN		11.7 ¹		VG1241CN+923AGA	VG1241CN+923GGA	VG1241CN+923BGA	VG1241CN+923BUA
VG1241CP		18.7		VG1241CP+923AGA	VG1241CP+923GGA	VG1241CP+923BGA	VG1241CP+923BUA
				Spring Return Open — Valve Normally Open			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1241DN	1-1/4	11.7 ¹	200	VG1241DN+928AGA	VG1241DN+928GGA	VG1241DN+938BGA	VG1241DN+938BAA
VG1241DP		18.7 ¹		VG1241DP+928AGA	VG1241DP+928GGA	VG1241DP+938BGA	VG1241DP+938BAA
VG1241DR		29.2		VG1241DR+928AGA	VG1241DR+928GGA	VG1241DR+938BGA	VG1241DR+938BAA
VG1241EP	1-1/2	18.7 ¹	200	VG1241EP+928AGA	VG1241EP+928GGA	VG1241EP+938BGA	VG1241EP+938BAA
VG1241ER		29.2 ¹		VG1241ER+928AGA	VG1241ER+928GGA	VG1241ER+938BGA	VG1241ER+938BAA
VG1241ES		46.8		VG1241ES+928AGA	VG1241ES+928GGA	VG1241ES+938BGA	VG1241ES+938BAA
VG1241FR	2	29.2 ¹	200	VG1241FR+928AGA	VG1241FR+928GGA	VG1241FR+938BGA	VG1241FR+938BAA
VG1241FS		46.8 ¹		VG1241FS+928AGA	VG1241FS+928GGA	VG1241FS+938BGA	VG1241FS+938BAA
VG1241FT		73.7		VG1241FT+928AGA	VG1241FT+928GGA	VG1241FT+938BGA	VG1241FT+938BAA

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VG1000 Series Two-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators without Switches (Continued)

Two-Way — Spring Return without Switches (Part 2 of 2)

Fluid Temperatures: 23°F to 203°F (-5°C to 95°C)				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Closed — Valve Normally Closed			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1241AD	1/2	1.2 ¹	200	VG1241AD+943AGA	VG1241AD+943GGA	VG1241AD+943BGA	VG1241AD+943BUA
VG1241AE		1.9 ¹		VG1241AE+943AGA	VG1241AE+943GGA	VG1241AE+943BGA	VG1241AE+943BUA
VG1241AF		2.9 ¹		VG1241AF+943AGA	VG1241AF+943GGA	VG1241AF+943BGA	VG1241AF+943BUA
VG1241AG		4.7 ¹		VG1241AG+943AGA	VG1241AG+943GGA	VG1241AG+943BGA	VG1241AG+943BUA
VG1241AL		7.4 ¹		VG1241AL+943AGA	VG1241AL+943GGA	VG1241AL+943BGA	VG1241AL+943BUA
VG1241AN		11.7		VG1241AN+943AGA	VG1241AN+943GGA	VG1241AN+943BGA	VG1241AN+943BUA
VG1241BG	3/4	4.7 ¹	200	VG1241BG+943AGA	VG1241BG+943GGA	VG1241BG+943BGA	VG1241BG+943BUA
VG1241BL		7.4 ¹		VG1241BL+943AGA	VG1241BL+943GGA	VG1241BL+943BGA	VG1241BL+943BUA
VG1241BN		11.7		VG1241BN+943AGA	VG1241BN+943GGA	VG1241BN+943BGA	VG1241BN+943BUA
VG1241CL	1	7.4 ¹	200	VG1241CL+943AGA	VG1241CL+943GGA	VG1241CL+943BGA	VG1241CL+943BUA
VG1241CN		11.7 ¹		VG1241CN+943AGA	VG1241CN+943GGA	VG1241CN+943BGA	VG1241CN+943BUA
VG1241CP		18.7		VG1241CP+943AGA	VG1241CP+943GGA	VG1241CP+943BGA	VG1241CP+943BUA
				Spring Return Closed — Valve Normally Closed			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1241DN	1-1/4	11.7 ¹	200	VG1241DN+948AGA	VG1241DN+948GGA	VG1241DN+958BGA	VG1241DN+958BAA
VG1241DP		18.7 ¹		VG1241DP+948AGA	VG1241DP+948GGA	VG1241DP+958BGA	VG1241DP+958BAA
VG1241DR		29.2		VG1241DR+948AGA	VG1241DR+948GGA	VG1241DR+958BGA	VG1241DR+958BAA
VG1241EP	1-1/2	18.7 ¹	200	VG1241EP+948AGA	VG1241EP+948GGA	VG1241EP+958BGA	VG1241EP+958BAA
VG1241ER		29.2 ¹		VG1241ER+948AGA	VG1241ER+948GGA	VG1241ER+958BGA	VG1241ER+958BAA
VG1241ES		46.8		VG1241ES+948AGA	VG1241ES+948GGA	VG1241ES+958BGA	VG1241ES+958BAA
VG1241FR	2	29.2 ¹	200	VG1241FR+948AGA	VG1241FR+948GGA	VG1241FR+958BGA	VG1241FR+958BAA
VG1241FS		46.8 ¹		VG1241FS+948AGA	VG1241FS+948GGA	VG1241FS+958BGA	VG1241FS+958BAA
VG1241FT		73.7		VG1241FT+948AGA	VG1241FT+948GGA	VG1241FT+958BGA	VG1241FT+958BAA

1. Valve has a characterizing disk.

VG1000 Series Two-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators without Switches (Continued)

Technical Specifications

VG1000 Series Two-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators without Switches		
Service ¹		Hot Water, Chilled Water, 50/50 Glycol Solutions
Fluid Temperature Limits	Water	23°F to 203°F (-5°C to 95°C)
	Steam	Not Rated for Steam Service
Valve Body Pressure Rating	Water	580 psig (4,000 kPa) (PN40)
	Steam	Not Rated for Steam Service
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
Rangeability ²		Greater than 500:1
Minimum Ambient Operating Temperature	-22°F (-30°C)	VA9203 Series Spring-Return Actuators
	-40°F (-40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature ³ (Limited by the Actuator)	140°F (60°C)	VA9203 or VA9208 Series 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	Chrome Plated Brass
	Blowout-Proof Stem	Nickel Plated Brass
	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 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.



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



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.

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

VG1000 Series Two-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with 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 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 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 and single point of contact information.

Features

- Forged Brass Body — provides 580 psig static pressure rating.
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals, providing better wear resistance.
- 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 valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls representative.

VG1000 Series Two-Way, Spring-Return, Plated Brass Ball and Stem Ball Valve Assemblies with End Switches



Selection Charts

Two-Way — Spring Return Valve Open — Normally Open with Switches

Fluid Temperatures: 23°F to 203°F (-5°C to 95°C)				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Open — Valve Normally Open — Actuators with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1241AD	1/2	1.2 ¹	200	VG1241AD+923AGB	VG1241AD+923GGB	VG1241AD+923BGB	VG1241AD+923BUB
VG1241AE		1.9 ¹		VG1241AE+923AGB	VG1241AE+923GGB	VG1241AE+923BGB	VG1241AE+923BUB
VG1241AF		2.9 ¹		VG1241AF+923AGB	VG1241AF+923GGB	VG1241AF+923BGB	VG1241AF+923BUB
VG1241AG		4.7 ¹		VG1241AG+923AGB	VG1241AG+923GGB	VG1241AG+923BGB	VG1241AG+923BUB
VG1241AL		7.4 ¹		VG1241AL+923AGB	VG1241AL+923GGB	VG1241AL+923BGB	VG1241AL+923BUB
VG1241AN		11.7		VG1241AN+923AGB	VG1241AN+923GGB	VG1241AN+923BGB	VG1241AN+923BUB
VG1241BG	3/4	4.7 ¹	200	VG1241BG+923AGB	VG1241BG+923GGB	VG1241BG+923BGB	VG1241BG+923BUB
VG1241BL		7.4 ¹		VG1241BL+923AGB	VG1241BL+923GGB	VG1241BL+923BGB	VG1241BL+923BUB
VG1241BN		11.7		VG1241BN+923AGB	VG1241BN+923GGB	VG1241BN+923BGB	VG1241BN+923BUB
VG1241CL	1	7.4 ¹	200	VG1241CL+923AGB	VG1241CL+923GGB	VG1241CL+923BGB	VG1241CL+923BUB
VG1241CN		11.7 ¹		VG1241CN+923AGB	VG1241CN+923GGB	VG1241CN+923BGB	VG1241CN+923BUB
VG1241CP		18.7		VG1241CP+923AGB	VG1241CP+923GGB	VG1241CP+923BGB	VG1241CP+923BUB
				Spring Return Open — Valve Normally Open — Actuators with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1241DN	1-1/4	11.7 ¹	200	VG1241DN+938AGC	VG1241DN+938GGC	VG1241DN+938BGC	VG1241DN+938BAC
VG1241DP		18.7 ¹		VG1241DP+938AGC	VG1241DP+938GGC	VG1241DP+938BGC	VG1241DP+938BAC
VG1241DR		29.2		VG1241DR+938AGC	VG1241DR+938GGC	VG1241DR+938BGC	VG1241DR+938BAC
VG1241EP	1-1/2	18.7 ¹	200	VG1241EP+938AGC	VG1241EP+938GGC	VG1241EP+938BGC	VG1241EP+938BAC
VG1241ER		29.2 ¹		VG1241ER+938AGC	VG1241ER+938GGC	VG1241ER+938BGC	VG1241ER+938BAC
VG1241ES		46.8		VG1241ES+938AGC	VG1241ES+938GGC	VG1241ES+938BGC	VG1241ES+938BAC
VG1241FR	2	29.2 ¹	200	VG1241FR+938AGC	VG1241FR+938GGC	VG1241FR+938BGC	VG1241FR+938BAC
VG1241FS		46.8 ¹		VG1241FS+938AGC	VG1241FS+938GGC	VG1241FS+938BGC	VG1241FS+938BAC
VG1241FT		73.7		VG1241FT+938AGC	VG1241FT+938GGC	VG1241FT+938BGC	VG1241FT+938BAC

1. Valve has a characterizing disk.

VG1000 Series Two-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with Switches (Continued)

Two-Way — Spring Return Valve Closed — Normally Closed with End Switches

Fluid Temperatures: 23°F to 203°F (-5°C to 95°C)				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Closed — Valve Normally Closed — Actuators with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1241AD	1/2	1.2 ¹	200	VG1241AD+943AGB	VG1241AD+943GGB	VG1241AD+943BGB	VG1241AD+943BUB
VG1241AE		1.9 ¹		VG1241AE+943AGB	VG1241AE+943GGB	VG1241AE+943BGB	VG1241AE+943BUB
VG1241AF		2.9 ¹		VG1241AF+943AGB	VG1241AF+943GGB	VG1241AF+943BGB	VG1241AF+943BUB
VG1241AG		4.7 ¹		VG1241AG+943AGB	VG1241AG+943GGB	VG1241AG+943BGB	VG1241AG+943BUB
VG1241AL		7.4 ¹		VG1241AL+943AGB	VG1241AL+943GGB	VG1241AL+943BGB	VG1241AL+943BUB
VG1241AN		11.7		VG1241AN+943AGB	VG1241AN+943GGB	VG1241AN+943BGB	VG1241AN+943BUB
VG1241BG	3/4	4.7 ¹	200	VG1241BG+943AGB	VG1241BG+943GGB	VG1241BG+943BGB	VG1241BG+943BUB
VG1241BL		7.4 ¹		VG1241BL+943AGB	VG1241BL+943GGB	VG1241BL+943BGB	VG1241BL+943BUB
VG1241BN		11.7		VG1241BN+943AGB	VG1241BN+943GGB	VG1241BN+943BGB	VG1241BN+943BUB
VG1241CL	1	7.4 ¹	200	VG1241CL+943AGB	VG1241CL+943GGB	VG1241CL+943BGB	VG1241CL+943BUB
VG1241CN		11.7 ¹		VG1241CN+943AGB	VG1241CN+943GGB	VG1241CN+943BGB	VG1241CN+943BUB
VG1241CP		18.7		VG1241CP+943AGB	VG1241CP+943GGB	VG1241CP+943BGB	VG1241CP+943BUB
				Spring Return Closed — Valve Normally Closed — Actuators with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1241DN	1-1/4	11.7 ¹	200	VG1241DN+958AGC	VG1241DN+958GGC	VG1241DN+958BGC	VG1241DN+958BAC
VG1241DP		18.7 ¹		VG1241DP+958AGC	VG1241DP+958GGC	VG1241DP+958BGC	VG1241DP+958BAC
VG1241DR		29.2		VG1241DR+958AGC	VG1241DR+958GGC	VG1241DR+958BGC	VG1241DR+958BAC
VG1241EP	1-1/2	18.7 ¹	200	VG1241EP+958AGC	VG1241EP+958GGC	VG1241EP+958BGC	VG1241EP+958BAC
VG1241ER		29.2 ¹		VG1241ER+958AGC	VG1241ER+958GGC	VG1241ER+958BGC	VG1241ER+958BAC
VG1241ES		46.8		VG1241ES+958AGC	VG1241ES+958GGC	VG1241ES+958BGC	VG1241ES+958BAC
VG1241FR	2	29.2 ¹	200	VG1241FR+958AGC	VG1241FR+958GGC	VG1241FR+958BGC	VG1241FR+958BAC
VG1241FS		46.8 ¹		VG1241FS+958AGC	VG1241FS+958GGC	VG1241FS+958BGC	VG1241FS+958BAC
VG1241FT		73.7		VG1241FT+958AGC	VG1241FT+958GGC	VG1241FT+958BGC	VG1241FT+958BAC

1. Valve has a characterizing disk.

VG1000 Series Two-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with Switches (Continued)

Technical Specifications

VG1000 Series Two-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with 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	23°F to 203°F (-5°C to 95°C)
	Steam	Not Rated for Steam Service
Valve Body Pressure Rating	Water	580 psig (4,000 kPa) (PN40)
	Steam	Not Rated for Steam Service
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
Rangeability ²		Greater than 500:1
Minimum Ambient Operating Temperature	-22°F (-30°C)	VA9203 Series Spring-Return Actuators
	-40°F (-40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature ³ (Limited by the Actuator and Linkage)	Direct Mount	140°F (60°C): VA9208 Series 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	Chrome Plated Brass
	Blowout-Proof Stem	Nickel Plated Brass
	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 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.



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



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.

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

VG1000 Series Three-Way, Plated Brass Ball and Stem, NPT End Connections Ball Valve Assemblies with End 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 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 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.
- 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).
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals, providing better wear resistance.
- 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, Plated Brass Ball and Stem Ball Valve Assemblies with End Switches

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

Three-Way — Spring Return Valve Counterclockwise — Port A (Coil) Open with Switches

Fluid Temperatures: 23°F to 203°F (-5°C to 95°C)				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv Port A/B	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Port A Open — Valve Spring Return Counterclockwise — Actuator with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1841AD	1/2	1.2/0.7 ¹	200	VG1841AD+923AGB	VG1841AD+923GGB	VG1841AD+923BGB	VG1841AD+923BUB
VG1841AE		1.9/1.2 ¹		VG1841AE+923AGB	VG1841AE+923GGB	VG1841AE+923BGB	VG1841AE+923BUB
VG1841AF		2.9/1.9 ¹		VG1841AF+923AGB	VG1841AF+923GGB	VG1841AF+923BGB	VG1841AF+923BUB
VG1841AG		4.7/2.9 ¹		VG1841AG+923AGB	VG1841AG+923GGB	VG1841AG+923BGB	VG1841AG+923BUB
VG1841AL		7.4/4.7 ¹		VG1841AL+923AGB	VG1841AL+923GGB	VG1841AL+923BGB	VG1841AL+923BUB
VG1841AN		11.7/5.8		VG1841AN+923AGB	VG1841AN+923GGB	VG1841AN+923BGB	VG1841AN+923BUB
VG1841BG	3/4	4.7/2.9 ¹	200	VG1841BG+923AGB	VG1841BG+923GGB	VG1841BG+923BGB	VG1841BG+923BUB
VG1841BL		7.4/4.7 ¹		VG1841BL+923AGB	VG1841BL+923GGB	VG1841BL+923BGB	VG1841BL+923BUB
VG1841BN		11.7/5.8		VG1841BN+923AGB	VG1841BN+923GGB	VG1841BN+923BGB	VG1841BN+923BUB
VG1841CL	1	7.4/4.7 ¹	200	VG1841CL+923AGB	VG1841CL+923GGB	VG1841CL+923BGB	VG1841CL+923BUB
VG1841CN		11.7/7.4 ¹		VG1841CN+923AGB	VG1841CN+923GGB	VG1841CN+923BGB	VG1841CN+923BUB
VG1841CP		18.7/9.4		VG1841CP+923AGB	VG1841CP+923GGB	VG1841CP+923BGB	VG1841CP+923BUB
				Spring Return Port A Open — Valve Spring Return Counterclockwise — Actuator with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1841DN	1-1/4	11.7/7.4 ¹	200	VG1841DN+938AGC	VG1841DN+938GGC	VG1841DN+938BGC	VG1841DN+938BAC
VG1841DP		18.7/9.4 ¹		VG1841DP+938AGC	VG1841DP+938GGC	VG1841DP+938BGC	VG1841DP+938BAC
VG1841DR		29.2/14.6		VG1841DR+938AGC	VG1841DR+938GGC	VG1841DR+938BGC	VG1841DR+938BAC
VG1841EP	1-1/2	18.7/11.7 ¹	200	VG1841EP+938AGC	VG1841EP+938GGC	VG1841EP+938BGC	VG1841EP+938BAC
VG1841ER		29.2/14.6 ¹		VG1841ER+938AGC	VG1841ER+938GGC	VG1841ER+938BGC	VG1841ER+938BAC
VG1841ES		46.8/23.4		VG1841ES+938AGC	VG1841ES+938GGC	VG1841ES+938BGC	VG1841ES+938BAC
VG1841FR	2	29.2/18.7 ¹	200	VG1841FR+938AGC	VG1841FR+938GGC	VG1841FR+938BGC	VG1841FR+938BAC
VG1841FS		46.8/29.2 ¹		VG1841FS+938AGC	VG1841FS+938GGC	VG1841FS+938BGC	VG1841FS+938BAC
VG1841FT		73.7/36.8		VG1841FT+938AGC	VG1841FT+938GGC	VG1841FT+938BGC	VG1841FT+938BAC

1. Valve has a characterizing disk.

VG1000 Series Three-Way, Plated Brass Ball and Stem, NPT End Connections Ball Valve Assemblies with End Switches (Continued)

Three-Way — Spring Return Valve Clockwise — Port A (Coil) Closed with End Switches

Fluid Temperatures: 23°F to 203°F (-5°C to 95°C)				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv Port A/B	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Port A Closed — Valve Spring Return Clockwise — Actuator with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1841AD	1/2	1.2/0.7 ¹	200	VG1841AD+943AGB	VG1841AD+943GGB	VG1841AD+943BGB	VG1841AD+943BUB
VG1841AE		1.9/1.2 ¹		VG1841AE+943AGB	VG1841AE+943GGB	VG1841AE+943BGB	VG1841AE+943BUB
VG1841AF		2.9/1.9 ¹		VG1841AF+943AGB	VG1841AF+943GGB	VG1841AF+943BGB	VG1841AF+943BUB
VG1841AG		4.7/2.9 ¹		VG1841AG+943AGB	VG1841AG+943GGB	VG1841AG+943BGB	VG1841AG+943BUB
VG1841AL		7.4/4.7 ¹		VG1841AL+943AGB	VG1841AL+943GGB	VG1841AL+943BGB	VG1841AL+943BUB
VG1841AN		11.7/5.8		VG1841AN+943AGB	VG1841AN+943GGB	VG1841AN+943BGB	VG1841AN+943BUB
VG1841BG	3/4	4.7/2.9 ¹	200	VG1841BG+943AGB	VG1841BG+943GGB	VG1841BG+943BGB	VG1841BG+943BUB
VG1841BL		7.4/4.7 ¹		VG1841BL+943AGB	VG1841BL+943GGB	VG1841BL+943BGB	VG1841BL+943BUB
VG1841BN		11.7/5.8		VG1841BN+943AGB	VG1841BN+943GGB	VG1841BN+943BGB	VG1841BN+943BUB
VG1841CL	1	7.4/4.7 ¹	200	VG1841CL+943AGB	VG1841CL+943GGB	VG1841CL+943BGB	VG1841CL+943BUB
VG1841CN		11.7/7.4 ¹		VG1841CN+943AGB	VG1841CN+943GGB	VG1841CN+943BGB	VG1841CN+943BUB
VG1841CP		18.7/9.4		VG1841CP+943AGB	VG1841CP+943GGB	VG1841CP+943BGB	VG1841CP+943BUB
				Spring Return Port A Closed — Valve Spring Return Clockwise — Actuator with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1841DN	1-1/4	11.7/7.4 ¹	200	VG1841DN+958AGC	VG1841DN+958GGC	VG1841DN+958BGC	VG1841DN+958BAC
VG1841DP		18.7/9.4 ¹		VG1841DP+958AGC	VG1841DP+958GGC	VG1841DP+958BGC	VG1841DP+958BAC
VG1841DR		29.2/14.6		VG1841DR+958AGC	VG1841DR+958GGC	VG1841DR+958BGC	VG1841DR+958BAC
VG1841EP	1-1/2	18.7/11.7 ¹	200	VG1841EP+958AGC	VG1841EP+958GGC	VG1841EP+958BGC	VG1841EP+958BAC
VG1841ER		29.2/14.6 ¹		VG1841ER+958AGC	VG1841ER+958GGC	VG1841ER+958BGC	VG1841ER+958BAC
VG1841ES		46.8/23.4		VG1841ES+958AGC	VG1841ES+958GGC	VG1841ES+958BGC	VG1841ES+958BAC
VG1841FR	2	29.2/18.7 ¹	200	VG1841FR+958AGC	VG1841FR+958GGC	VG1841FR+958BGC	VG1841FR+958BAC
VG1841FS		46.8/29.2 ¹		VG1841FS+958AGC	VG1841FS+958GGC	VG1841FS+958BGC	VG1841FS+958BAC
VG1841FT		73.7/36.8		VG1841FT+958AGC	VG1841FT+958GGC	VG1841FT+958BGC	VG1841FT+958BAC

1. Valve has a characterizing disk.

VG1000 Series Three-Way, Plated Brass Ball and Stem, NPT End Connections Ball Valve Assemblies with End Switches (Continued)

Technical Specifications

VG1000 Series Three-Way, Plated Brass Ball and Stem, NPT End Connections Ball Valve Assemblies with End Switches		
Service ¹		Hot Water, Chilled Water, 50/50 Glycol Solutions
Fluid Temperature Limits	Water	23°F to 203°F (-5°C to 95°C)
	Steam	Not Rated for Steam Service
Valve Body Pressure Rating	Water	580 psig (4,000 kPa) (PN40)
	Steam	Not Rated for Steam Service
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (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 ²		Greater than 500:1
Minimum Ambient Operating Temperature	-22°F (-30°C)	VA9203 Series Spring-Return Actuators
	-40°F (-40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature	140°F (60°C)	VA9203 or VA9208 Series Spring-Return Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
		1% of Maximum Flow for Three-Way Bypass Port
End Connections		National Pipe Thread (NPT)
Materials	Body	Forged Brass
	Ball	Chrome Plated Brass
	Blowout-Proof Stem	Nickel Plated Brass
	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

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 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.

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

VG1000 Series Three-Way, Plated Brass 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 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 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.
- 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).
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals, providing better wear resistance.
- 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.



Three-Way, Spring-Return, Plated Brass Ball and Stem Valve Assemblies with End Switches

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 Chart

Three-Way — Spring Return — without Switches (Part 1 of 2)

Fluid Temperatures: 23°F to 203°F (-5°C to 95°C)				AC 24 V			AC-85-264V (VA9203) AC 120 V (VA9208)
Valve	Size, in. (mm)	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Port A Open — Valve Spring Return Counterclockwise			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1841AD	1/2	1.2/0.7 ¹	200	VG1841AD+923AGA	VG1841AD+923GGA	VG1841AD+923BGA	VG1841AD+923BUA
VG1841AE		1.9/1.2 ¹		VG1841AE+923AGA	VG1841AE+923GGA	VG1841AE+923BGA	VG1841AE+923BUA
VG1841AF		2.9/1.9 ¹		VG1841AF+923AGA	VG1841AF+923GGA	VG1841AF+923BGA	VG1841AF+923BUA
VG1841AG		4.7/2.9 ¹		VG1841AG+923AGA	VG1841AG+923GGA	VG1841AG+923BGA	VG1841AG+923BUA
VG1841AL		7.4/4.7 ¹		VG1841AL+923AGA	VG1841AL+923GGA	VG1841AL+923BGA	VG1841AL+923BUA
VG1841AN		11.7/7.4		VG1841AN+923AGA	VG1841AN+923GGA	VG1841AN+923BGA	VG1841AN+923BUA
VG1841BG	3/4	4.7/2.9 ¹	200	VG1841BG+923AGA	VG1841BG+923GGA	VG1841BG+923BGA	VG1841BG+923BUA
VG1841BL		7.4/4.7 ¹		VG1841BL+923AGA	VG1841BL+923GGA	VG1841BL+923BGA	VG1841BL+923BUA
VG1841BN		11.7/11.7		VG1841BN+923AGA	VG1841BN+923GGA	VG1841BN+923BGA	VG1841BN+923BUA
VG1841CL	1	7.4/4.7 ¹	200	VG1841CL+923AGA	VG1841CL+923GGA	VG1841CL+923BGA	VG1841CL+923BUA
VG1841CN		11.7/7.4 ¹		VG1841CN+923AGA	VG1841CN+923GGA	VG1841CN+923BGA	VG1841CN+923BUA
VG1841CP		18.7/11.7		VG1841CP+923AGA	VG1841CP+923GGA	VG1841CP+923BGA	VG1841CP+923BUA
				Spring Return Port A Open — Valve Spring Return Counterclockwise			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1841DN	1-1/4	11.7/7.4 ¹	200	VG1841DN+928AGA	VG1841DN+928GGA	VG1841DN+938BGA	VG1841DN+938BAA
VG1841DP		18.7/11.7 ¹		VG1841DP+928AGA	VG1841DP+928GGA	VG1841DP+938BGA	VG1841DP+938BAA
VG1841DR		29.2/18.7		VG1841DR+928AGA	VG1841DR+928GGA	VG1841DR+938BGA	VG1841DR+938BAA
VG1841EP	1-1/2	18.7/11.7 ¹	200	VG1841EP+928AGA	VG1841EP+928GGA	VG1841EP+938BGA	VG1841EP+938BAA
VG1841ER		29.2/18.7 ¹		VG1841ER+928AGA	VG1841ER+928GGA	VG1841ER+938BGA	VG1841ER+938BAA
VG1841ES		46.8/29.2		VG1841ES+928AGA	VG1841ES+928GGA	VG1841ES+938BGA	VG1841ES+938BAA
VG1841FR	2	29.2/18.7 ¹	200	VG1841FR+928AGA	VG1841FR+928GGA	VG1841FR+938BGA	VG1841FR+938BAA
VG1841FS		46.8/29.2 ¹		VG1841FS+928AGA	VG1841FS+928GGA	VG1841FS+938BGA	VG1841FS+938BAA
VG1841FT		73.7/36.8		VG1841FT+928AGA	VG1841FT+928GGA	VG1841FT+938BGA	VG1841FT+938BAA

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

VG1000 Series Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators without Switches (Continued)

Three-Way — Spring Return — without Switches (Part 2 of 2)

Fluid Temperatures: 23°F to 203°F (-5°C to 95°C)				AC 24 V			AC-85-264V (VA9203) AC 120 V (VA9208)
Valve	Size, in. (mm)	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Port A Closed — Valve Spring Return Clockwise			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1841AD	1/2	1.2/0.7 ¹	200	VG1841AD+943AGA	VG1841AD+943GGA	VG1841AD+943BGA	VG1841AD+943BUA
VG1841AE		1.9/1.2 ¹		VG1841AE+943AGA	VG1841AE+943GGA	VG1841AE+943BGA	VG1841AE+943BUA
VG1841AF		2.9/1.9 ¹		VG1841AF+943AGA	VG1841AF+943GGA	VG1841AF+943BGA	VG1841AF+943BUA
VG1841AG		4.7/2.9 ¹		VG1841AG+943AGA	VG1841AG+943GGA	VG1841AG+943BGA	VG1841AG+943BUA
VG1841AL		7.4/4.7 ¹		VG1841AL+943AGA	VG1841AL+943GGA	VG1841AL+943BGA	VG1841AL+943BUA
VG1841AN		11.7/7.4 ¹		VG1841AN+943AGA	VG1841AN+943GGA	VG1841AN+943BGA	VG1841AN+943BUA
VG1841BG	3/4	4.7/2.9 ¹	200	VG1841BG+943AGA	VG1841BG+943GGA	VG1841BG+943BGA	VG1841BG+943BUA
VG1841BL		7.4/4.7 ¹		VG1841BL+943AGA	VG1841BL+943GGA	VG1841BL+943BGA	VG1841BL+943BUA
VG1841BN		11.7/7.4 ¹		VG1841BN+943AGA	VG1841BN+943GGA	VG1841BN+943BGA	VG1841BN+943BUA
VG1841CL	1	7.4/4.7 ¹	200	VG1841CL+943AGA	VG1841CL+943GGA	VG1841CL+943BGA	VG1841CL+943BUA
VG1841CN		11.7/7.4 ¹		VG1841CN+943AGA	VG1841CN+943GGA	VG1841CN+943BGA	VG1841CN+943BUA
VG1841CP		18.7/11.7 ¹		VG1841CP+943AGA	VG1841CP+943GGA	VG1841CP+943BGA	VG1841CP+943BUA
				Spring Return Port A Closed — Valve Spring Return Clockwise			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1841DN	1-1/4	11.7/7.4 ¹	200	VG1841DN+948AGA	VG1841DN+948GGA	VG1841DN+958BGA	VG1841DN+958BAA
VG1841DP		18.7/11.7 ¹		VG1841DP+948AGA	VG1841DP+948GGA	VG1841DP+958BGA	VG1841DP+958BAA
VG1841DR		29.2/18.7 ¹		VG1841DR+948AGA	VG1841DR+948GGA	VG1841DR+958BGA	VG1841DR+958BAA
VG1841EP	1-1/2	18.7/11.7 ¹	200	VG1841EP+948AGA	VG1841EP+948GGA	VG1841EP+958BGA	VG1841EP+958BAA
VG1841ER		29.2/18.7 ¹		VG1841ER+948AGA	VG1841ER+948GGA	VG1841ER+958BGA	VG1841ER+958BAA
VG1841ES		46.8/29.2 ¹		VG1841ES+948AGA	VG1841ES+948GGA	VG1841ES+958BGA	VG1841ES+958BAA
VG1841FR	2	29.2/18.7 ¹	200	VG1841FR+948AGA	VG1841FR+948GGA	VG1841FR+958BGA	VG1841FR+958BAA
VG1841FS		46.8/29.2 ¹		VG1841FS+948AGA	VG1841FS+948GGA	VG1841FS+958BGA	VG1841FS+958BAA
VG1841FT		73.7/36.8 ¹		VG1841FT+948AGA	VG1841FT+948GGA	VG1841FT+958BGA	VG1841FT+958BAA

1. Valve has a characterizing disk.

VG1000 Series Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators without Switches (Continued)

Technical Specifications

VG1000 Series Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators without Switches		
Service ¹		Hot Water, Chilled Water, 50/50 Glycol Solutions
Fluid Temperature Limits	Water	23°F to 203°F (-5°C to 95°C)
	Steam	Not Rated for Steam Service
Valve Body Pressure Rating	Water	580 psig (4,000 kPa) (PN40)
	Steam	Not Rated for Steam Service
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (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 ²		Greater than 500:1
Minimum Ambient Operating Temperature	-22°F (-30°C)	VA9203 Series Spring-Return Actuators
	-40°F (40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature ³ (Limited by the Actuator and Linkage)	140°F (60°C)	Direct Mount: VA9203 or VA9208 Series Spring-Return Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
		1% of Maximum Flow for Three-Way Bypass Port
End Connections		National Pipe Thread (NPT)
Materials	Body	Forged Brass
	Ball	Chrome Plated Brass
	Blowout-Proof Stem	Nickel Plated Brass
	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 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.

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

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.

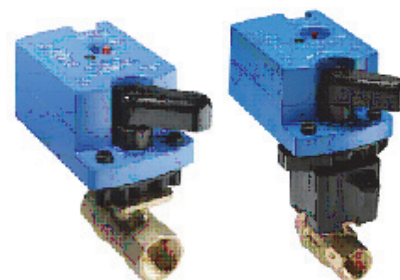
Refer to the *VG1000 Series Forged Brass Ball Valves Product Bulletin (LIT-977132)* for important product application and single point of contact information.

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.

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.



VG1000 Series Two-Way, Non-Spring Return, Stainless Steel Ball and Stem Ball Valve Assemblies

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 ¹	On/Off and/or Floating with Timeout	DC 0 to 10 V Proportional
Actuators with M3 Screw Terminals				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1245AD	1/2	1.2 ²	200	VG1245AD+9T4AGA	VG1245AD+9T4IGA	VG1245AD+9T4GGA
VG1245AE		1.9 ²		VG1245AE+9T4AGA	VG1245AE+9T4IGA	VG1245AE+9T4GGA
VG1245AF		2.9 ²		VG1245AF+9T4AGA	VG1245AF+9T4IGA	VG1245AF+9T4GGA
VG1245AG		4.7 ²		VG1245AG+9T4AGA	VG1245AG+9T4IGA	VG1245AG+9T4GGA
VG1245AL		7.4 ²		VG1245AL+9T4AGA	VG1245AL+9T4IGA	VG1245AL+9T4GGA
VG1245AN		11.7		VG1245AN+9T4AGA	VG1245AN+9T4IGA	VG1245AN+9T4GGA
VG1245BG	3/4	4.7 ²	200	VG1245BG+9T4AGA	VG1245BG+9T4IGA	VG1245BG+9T4GGA
VG1245BL		7.4 ²		VG1245BL+9T4AGA	VG1245BL+9T4IGA	VG1245BL+9T4GGA
VG1245BN		11.7		VG1245BN+9T4AGA	VG1245BN+9T4IGA	VG1245BN+9T4GGA
VG1245CL	1	7.4 ²	200	VG1245CL+9T4AGA	VG1245CL+9T4IGA	VG1245CL+9T4GGA
VG1245CN		11.7 ²		VG1245CN+9T4AGA	VG1245CN+9T4IGA	VG1245CN+9T4GGA
VG1245CP		18.7		VG1245CP+9T4AGA	VG1245CP+9T4IGA	VG1245CP+9T4GGA
Actuators with 120 in. (3.05 m) 18 AWG Plenum Cable				VA9104-AGA-2S	VA9104-IGA-2S	VA9104-GGA-2S
VG1245AD	1/2	1.2 ²	200	VG1245AD+9A4AGA	VG1245AD+9A4IGA	VG1245AD+9A4GGA
VG1245AE		1.9 ²		VG1245AE+9A4AGA	VG1245AE+9A4IGA	VG1245AE+9A4GGA
VG1245AF		2.9 ²		VG1245AF+9A4AGA	VG1245AF+9A4IGA	VG1245AF+9A4GGA
VG1245AG		4.7 ²		VG1245AG+9A4AGA	VG1245AG+9A4IGA	VG1245AG+9A4GGA
VG1245AL		7.4 ²		VG1245AL+9A4AGA	VG1245AL+9A4IGA	VG1245AL+9A4GGA
VG1245AN		11.7		VG1245AN+9A4AGA	VG1245AN+9A4IGA	VG1245AN+9A4GGA
VG1245BG	3/4	4.7 ²	200	VG1245BG+9A4AGA	VG1245BG+9A4IGA	VG1245BG+9A4GGA
VG1245BL		7.4 ²		VG1245BL+9A4AGA	VG1245BL+9A4IGA	VG1245BL+9A4GGA
VG1245BN		11.7		VG1245BN+9A4AGA	VG1245BN+9A4IGA	VG1245BN+9A4GGA
VG1245CL	1	7.4 ²	200	VG1245CL+9A4AGA	VG1245CL+9A4IGA	VG1245CL+9A4GGA
VG1245CN		11.7 ²		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 ¹	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 ²	200	VG1245ADH9T4AGA	VG1245ADH9T4IGA	VG1245ADH9T4GGA
VG1245AE		1.9 ²		VG1245AEH9T4AGA	VG1245AEH9T4IGA	VG1245AEH9T4GGA
VG1245AF		2.9 ²		VG1245AFH9T4AGA	VG1245AFH9T4IGA	VG1245AFH9T4GGA
VG1245AG		4.7 ²		VG1245AGH9T4AGA	VG1245AGH9T4IGA	VG1245AGH9T4GGA
VG1245AL		7.4 ²		VG1245ALH9T4AGA	VG1245ALH9T4IGA	VG1245ALH9T4GGA
VG1245AN		11.7		VG1245ANH9T4AGA	VG1245ANH9T4IGA	VG1245ANH9T4GGA
VG1245BG	3/4	4.7 ²	200	VG1245BGH9T4AGA	VG1245BGH9T4IGA	VG1245BGH9T4GGA
VG1245BL		7.4 ²		VG1245BLH9T4AGA	VG1245BLH9T4IGA	VG1245BLH9T4GGA
VG1245BN		11.7		VG1245BNH9T4AGA	VG1245BNH9T4IGA	VG1245BNH9T4GGA
VG1245CL	1	7.4 ²	200	VG1245CLH9T4AGA	VG1245CLH9T4IGA	VG1245CLH9T4GGA
VG1245CN		11.7 ²		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 ²	200	VG1245ADH9A4AGA	VG1245ADH9A4IGA	VG1245ADH9A4GGA
VG1245AE		1.9 ²		VG1245AEH9A4AGA	VG1245AEH9A4IGA	VG1245AEH9A4GGA
VG1245AF		2.9 ²		VG1245AFH9A4AGA	VG1245AFH9A4IGA	VG1245AFH9A4GGA
VG1245AG		4.7 ²		VG1245AGH9A4AGA	VG1245AGH9A4IGA	VG1245AGH9A4GGA
VG1245AL		7.4 ²		VG1245ALH9A4AGA	VG1245ALH9A4IGA	VG1245ALH9A4GGA
VG1245AN		11.7		VG1245ANH9A4AGA	VG1245ANH9A4IGA	VG1245ANH9A4GGA
VG1245BG	3/4	4.7 ²	200	VG1245BGH9A4AGA	VG1245BGH9A4IGA	VG1245BGH9A4GGA
VG1245BL		7.4 ²		VG1245BLH9A4AGA	VG1245BLH9A4IGA	VG1245BLH9A4GGA
VG1245BN		11.7		VG1245BNH9A4AGA	VG1245BNH9A4IGA	VG1245BNH9A4GGA
VG1245CL	1	7.4 ²	200	VG1245CLH9A4AGA	VG1245CLH9A4IGA	VG1245CLH9A4GGA
VG1245CN		11.7 ²		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 ¹	200	VG1245DN+910HGA		
VG1245DP		18.7 ¹		VG1245DP+910HGA		
VG1245DR		29.2		VG1245DR+910HGA		
VG1245EP	1-1/2	18.7 ¹	200	VG1245EP+910HGA		
VG1245ER		29.2 ¹		VG1245ER+910HGA		
VG1245ES		46.8		VG1245ES+910HGA		
VG1245FR	2	29.2 ¹	200	VG1245FR+910HGA		
VG1245FS		48.8 ¹		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 ¹		
VG1245AD	1/2	1.2 ¹	200	VG1245AD+910HGC		
VG1245AE		1.9 ¹		VG1245AE+910HGC		
VG1245AF		2.9 ¹		VG1245AF+910HGC		
VG1245AG		4.7 ¹		VG1245AG+910HGC		
VG1245AL		7.4 ¹		VG1245AL+910HGC		
VG1245AN		11.7		VG1245AN+910HGC		
VG1245BG	3/4	4.7 ¹	200	VG1245BG+910HGC		
VG1245BL		7.4 ¹		VG1245BL+910HGC		
VG1245BN		11.7		VG1245BN+910HGC		
VG1245CL	1	7.4 ¹	200	VG1245CL+910HGC		
VG1245CN		11.7 ¹		VG1245CN+910HGC		
VG1245CP		18.7		VG1245CP+910HGC		
VG1245DN	1-1/4	11.7 ¹	200	VG1245DN+910HGC		
VG1245DP		18.7 ¹		VG1245DP+910HGC		
VG1245DR		29.2		VG1245DR+910HGC		
VG1245EP	1-1/2	18.7 ¹	200	VG1245EP+910HGC		
VG1245ER		29.2 ¹		VG1245ER+910HGC		
VG1245ES		46.8		VG1245ES+910HGC		
VG1245FR	2	29.2 ¹	200	VG1245FR+910HGC		
VG1245FS		46.8 ¹		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 ¹	200	VG1245DNH910HGA		
VG1245DP		18.7 ¹		VG1245DPH910HGA		
VG1245DR		29.2		VG1245DRH910HGA		
VG1245EP	1-1/2	18.7 ¹	200	VG1245EPH910HGA		
VG1245ER		29.2 ¹		VG1245ERH910HGA		
VG1245ES		46.8		VG1245ESH910HGA		
VG1245FR	2	29.2 ¹	200	VG1245FRH910HGA		
VG1245FS		48.8 ¹		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 ¹		
VG1245AD	1/2	1.2 ²	200	VG1245ADH910HGC		
VG1245AE		1.9 ²		VG1245AEH910HGC		
VG1245AF		2.9 ²		VG1245AFH910HGC		
VG1245AG		4.7 ²		VG1245AGH910HGC		
VG1245AL		7.4 ²		VG1245ALH910HGC		
VG1245AN		11.7		VG1245ANH910HGC		
VG1245BG	3/4	4.7 ²	200	VG1245BGH910HGC		
VG1245BL		7.4 ²		VG1245BLH910HGC		
VG1245BN		11.7		VG1245BNH910HGC		
VG1245CL	1	7.4 ²	200	VG1245CLH910HGC		
VG1245CN		11.7 ²		VG1245CNH910HGC		
VG1245CP		18.7		VG1245CPH910HGC		
VG1245DN	1-1/4	11.7 ²	200	VG1245DNH910HGC		
VG1245DP		18.7 ²		VG1245DPH910HGC		
VG1245DR		29.2		VG1245DRH910HGC		
VG1245EP	1-1/2	18.7 ²	200	VG1245EPH910HGC		
VG1245ER		29.2 ²		VG1245ERH910HGC		
VG1245ES		46.8		VG1245ESH910HGC		
VG1245FR	2	29.2 ²	200	VG1245FRH910HGC		
VG1245FS		46.8 ²		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 ¹		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 ²		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 ³	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.

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

VG1000 Series Three-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 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% graphite-reinforced ball seals, providing better wear resistance.
- 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.

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.



VG1000 Series Three-Way, Non-Spring Return, Stainless Steel Ball and Stem Ball Valve Assemblies

Selection Charts

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

Fluid Temperatures: -4°F to 212°F (-22°C to 100°C) Not Rated for Steam Service				AC 24 V		
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	On/Off and/or Floating without Timeout	On/Off and/or Floating with Timeout	DC 0 to 10 V Proportional
Actuators with M3 Screw Terminals				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1845AD	1/2	1.2/0.7 ¹	200	VG1845AD+9T4AGA	VG1845AD+9T4IGA	VG1845AD+9T4GGA
VG1845AE		1.9/1.2 ¹		VG1845AE+9T4AGA	VG1845AE+9T4IGA	VG1845AE+9T4GGA
VG1845AF		2.9/1.9 ¹		VG1845AF+9T4AGA	VG1845AF+9T4IGA	VG1845AF+9T4GGA
VG1845AG		4.7/2.9 ¹		VG1845AG+9T4AGA	VG1845AG+9T4IGA	VG1845AG+9T4GGA
VG1845AL		7.4/4.7 ¹		VG1845AL+9T4AGA	VG1845AL+9T4IGA	VG1845AL+9T4GGA
VG1845AN		11.7/5.8		VG1845AN+9T4AGA	VG1845AN+9T4IGA	VG1845AN+9T4GGA
VG1845BG	3/4	4.7/2.9 ¹	200	VG1845BG+9T4AGA	VG1845BG+9T4IGA	VG1845BG+9T4GGA
VG1845BL		7.4/4.7 ¹		VG1845BL+9T4AGA	VG1845BL+9T4IGA	VG1845BL+9T4GGA
VG1845BN		11.7/5.8		VG1845BN+9T4AGA	VG1845BN+9T4IGA	VG1845BN+9T4GGA
VG1845CL	1	7.4/4.7 ¹	200	VG1845CL+9T4AGA	VG1845CL+9T4IGA	VG1845CL+9T4GGA
VG1845CN		11.7/7.4 ¹		VG1845CN+9T4AGA	VG1845CN+9T4IGA	VG1845CN+9T4GGA
VG1845CP		18.7/9.4		VG1845CP+9T4AGA	VG1845CP+9T4IGA	VG1845CP+9T4GGA
Actuators with 120 in. (3.05 m) 18 AWG Plenum Cable				VA9104-AGA-2S	VA9104-IGA-2S	VA9104-GGA-2S
VG1845AD	1/2	1.2/0.7 ¹	200	VG1845AD+9A4AGA	VG1845AD+9A4IGA	VG1845AD+9A4GGA
VG1845AE		1.9/1.2 ¹		VG1845AE+9A4AGA	VG1845AE+9A4IGA	VG1845AE+9A4GGA
VG1845AF		2.9/1.9 ¹		VG1845AF+9A4AGA	VG1845AF+9A4IGA	VG1845AF+9A4GGA
VG1845AG		4.7/2.9 ¹		VG1845AG+9A4AGA	VG1845AG+9A4IGA	VG1845AG+9A4GGA
VG1845AL		7.4/4.7 ¹		VG1845AL+9A4AGA	VG1845AL+9A4IGA	VG1845AL+9A4GGA
VG1845AN		11.7/5.8		VG1845AN+9A4AGA	VG1845AN+9A4IGA	VG1845AN+9A4GGA
VG1845BG	3/4	4.7/2.9 ¹	200	VG1845BG+9A4AGA	VG1845BG+9A4IGA	VG1845BG+9A4GGA
VG1845BL		7.4/4.7 ¹		VG1845BL+9A4AGA	VG1845BL+9A4IGA	VG1845BL+9A4GGA
VG1845BN		11.7/5.8		VG1845BN+9A4AGA	VG1845BN+9A4IGA	VG1845BN+9A4GGA
VG1845CL	1	7.4/4.7 ¹	200	VG1845CL+9A4AGA	VG1845CL+9A4IGA	VG1845CL+9A4GGA
VG1845CN		11.7/7.4 ¹		VG1845CN+9A4AGA	VG1845CN+9A4IGA	VG1845CN+9A4GGA
VG1845CP		18.7/9.4		VG1845CP+9A4AGA	VG1845CP+9A4IGA	VG1845CP+9A4GGA

1. The for CV listed is for Port.

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

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

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 (Port A/B)	Closeoff psig	On/Off and/or Floating without Timeout ¹	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
VG1845AD	1/2	1.2/0.7 ²	200	VG1845ADH9T4AGA	VG1845ADH9T4IGA	VG1845ADH9T4GGA
VG1845AE		1.9/1.2 ²		VG1845AEH9T4AGA	VG1845AEH9T4IGA	VG1845AEH9T4GGA
VG1845AF		2.9/1.9 ²		VG1845AFH9T4AGA	VG1845AFH9T4IGA	VG1845AFH9T4GGA
VG1845AG		4.7/2.9 ²		VG1845AGH9T4AGA	VG1845AGH9T4IGA	VG1845AGH9T4GGA
VG1845AL		7.4/4.7 ²		VG1845ALH9T4AGA	VG1845ALH9T4IGA	VG1845ALH9T4GGA
VG1845AN		11.7/5.8		VG1845ANH9T4AGA	VG1845ANH9T4IGA	VG1845ANH9T4GGA
VG1845BG	3/4	4.7/2.9 ²	200	VG1845BGH9T4AGA	VG1845BGH9T4IGA	VG1845BGH9T4GGA
VG1845BL		7.4/4.7 ²		VG1845BLH9T4AGA	VG1845BLH9T4IGA	VG1845BLH9T4GGA
VG1845BN		11.7/5.8		VG1845BNH9T4AGA	VG1845BNH9T4IGA	VG1845BNH9T4GGA
VG1845CL	1	7.4/4.7 ²	200	VG1845CLH9T4AGA	VG1845CLH9T4IGA	VG1845CLH9T4GGA
VG1845CN		11.7/7.4 ²		VG1845CNH9T4AGA	VG1845CNH9T4IGA	VG1845CNH9T4GGA
VG1845CP		18.7/9.4		VG1845CPH9T4AGA	VG1845CPH9T4IGA	VG1845CPH9T4GGA
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
VG1845AD	1/2	1.2/0.7 ²	200	VG1845ADH9A4AGA	VG1845ADH9A4IGA	VG1845ADH9A4GGA
VG1845AE		1.9/1.2 ²		VG1845AEH9A4AGA	VG1845AEH9A4IGA	VG1845AEH9A4GGA
VG1845AF		2.9/1.9 ²		VG1845AFH9A4AGA	VG1845AFH9A4IGA	VG1845AFH9A4GGA
VG1845AG		4.7/2.9 ²		VG1845AGH9A4AGA	VG1845AGH9A4IGA	VG1845AGH9A4GGA
VG1845AL		7.4/4.7 ²		VG1845ALH9A4AGA	VG1845ALH9A4IGA	VG1845ALH9A4GGA
VG1845AN		11.7/5.8		VG1845ANH9A4AGA	VG1845ANH9A4IGA	VG1845ANH9A4GGA
VG1845BG	3/4	4.7/2.9 ²	200	VG1845BGH9A4AGA	VG1845BGH9A4IGA	VG1845BGH9A4GGA
VG1845BL		7.4/4.7 ²		VG1845BLH9A4AGA	VG1845BLH9A4IGA	VG1845BLH9A4GGA
VG1845BN		11.7/5.8		VG1845BNH9A4AGA	VG1845BNH9A4IGA	VG1845BNH9A4GGA
VG1845CL	1	7.4/4.7 ²	200	VG1845CLH9A4AGA	VG1845CLH9A4IGA	VG1845CLH9A4GGA
VG1845CN		11.7/7.4 ²		VG1845CNH9A4AGA	VG1845CNH9A4IGA	VG1845CNH9A4GGA
VG1845CP		18.7/9.4		VG1845CPH9A4AGA	VG1845CPH9A4IGA	VG1845CPH9A4GGA

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.

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

Three-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		
VG1845DN	1-1/4	11.7 ¹	200	VG1845DN+910HGA		
VG1845DP		18.7 ¹		VG1845DP+910HGA		
VG1845DR		29.2		VG1845DR+910HGA		
VG1845EP	1-1/2	18.7 ¹	200	VG1845EP+910HGA		
VG1845ER		29.2 ¹		VG1845ER+910HGA		
VG1845ES		46.8		VG1845ES+910HGA		
VG1845FR	2	29.2 ¹	200	VG1845FR+910HGA		
VG1845FS		48.8 ¹		VG1845FS+910HGA		
VG1845FT		73.7		VG1845FT+910HGA		

1. Valve has a characterizing disk.

Three-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 ¹		
VG1845AD	1/2	1.2 ²	200	VG1845AD+910HGC		
VG1845AE		1.9 ²		VG1845AE+910HGC		
VG1845AF		2.9 ²		VG1845AF+910HGC		
VG1845AG		4.7 ²		VG1845AG+910HGC		
VG1845AL		7.4 ²		VG1845AL+910HGC		
VG1845AN		11.7		VG1845AN+910HGC		
VG1845BG	3/4	4.7 ²	200	VG1845BG+910HGC		
VG1845BL		7.4 ²		VG1845BL+910HGC		
VG1845BN		11.7		VG1845BN+910HGC		
VG1845CL	1	7.4 ²	200	VG1845CL+910HGC		
VG1845CN		11.7 ²		VG1845CN+910HGC		
VG1845CP		18.7		VG1845CP+910HGC		
VG1845DN	1-1/4	11.7 ²	200	VG1845DN+910HGC		
VG1845DP		18.7 ²		VG1845DP+910HGC		
VG1845DR		29.2		VG1845DR+910HGC		
VG1845EP	1-1/2	18.7 ²	200	VG1845EP+910HGC		
VG1845ER		29.2 ²		VG1845ER+910HGC		
VG1845ES		46.8		VG1845ES+910HGC		
VG1845FR	2	29.2 ²	200	VG1845FR+910HGC		
VG1845FS		46.8 ²		VG1845FS+910HGC		
VG1845FT		73.7		VG1845FT+910HGC		

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

2. Valve has a characterizing disk.

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

Three-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	Floating	DC 0(2) to 10 V Proportional
Valve	Size, in.	Cv	Closeoff psi	VA9310-HGA-2 with M9000-561 Thermal Barrier		
VG1845DN	1-1/4	11.7 ¹	200	VG1845DNH910HGA		
VG1845DP		18.7 ¹		VG1845DPH910HGA		
VG1845DR		29.2		VG1845DRH910HGA		
VG1845EP	1-1/2	18.7 ¹	200	VG1845EPH910HGA		
VG1845ER		29.2 ¹		VG1845ERH910HGA		
VG1845ES		46.8		VG1845ESH910HGA		
VG1845FR	2	29.2 ¹	200	VG1845FRH910HGA		
VG1845FS		48.8 ¹		VG1845FSH910HGA		
VG1845FT		73.7		VG1845FTH910HGA		

1. Valve has a characterizing disk.

Three-Way Stainless Steel Trim Ball Valves, Non-Spring Return, VA9300 Series 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 ¹		
VG1845AD	1/2	1.2 ²	200	VG1845ADH910HGC		
VG1845AE		1.9 ²		VG1845AEH910HGC		
VG1845AF		2.9 ²		VG1845AFH910HGC		
VG1845AG		4.7 ²		VG1845AGH910HGC		
VG1845AL		7.4 ²		VG1845ALH910HGC		
VG1845AN		11.7		VG1845ANH910HGC		
VG1845BG	3/4	4.7 ²	200	VG1845BGH910HGC		
VG1845BL		7.4 ²		VG1845BLH910HGC		
VG1845BN		11.7		VG1845BNH910HGC		
VG1845CL	1	7.4 ²	200	VG1845CLH910HGC		
VG1845CN		11.7 ²		VG1845CNH910HGC		
VG1845CP		18.7		VG1845CPH910HGC		
VG1845DN	1-1/4	11.7 ²	200	VG1845DNH910HGC		
VG1845DP		18.7 ²		VG1845DPH910HGC		
VG1845DR		29.2		VG1845DRH910HGC		
VG1845EP	1-1/2	18.7 ²	200	VG1845EPH910HGC		
VG1845ER		29.2 ²		VG1845ERH910HGC		
VG1845ES		46.8		VG1845ESH910HGC		
VG1845FR	2	29.2 ²	200	VG1845FRH910HGC		
VG1845FS		46.8 ²		VG1845FSH910HGC		
VG1845FT		73.7		VG1845FTH910HGC		

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

Technical Specifications

VG1000 Series Three-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators		
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°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 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (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 ²		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 ³	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.

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

VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with 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 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, VA9109, and M9100 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.
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals, providing better wear resistance.
- 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 valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls representative.



VG1000 Series Two-Way, Spring-Return, Stainless Steel Ball and Stem Ball Valve Assemblies with End Switches

Selection Charts

Two-Way — Spring Return Valve Open — Normally Open with Switches (Not Rated for Steam Service)

Fluid Temperatures: -22°F to 212°F (-30°C to 100°C) Not Rated for Steam Service				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Open — Valve Normally Open — Actuators with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1245AD	1/2	1.2 ¹	200	VG1245AD+923AGB	VG1245AD+923GGB	VG1245AD+923BGB	VG1245AD+923BUB
VG1245AE		1.9 ¹		VG1245AE+923AGB	VG1245AE+923GGB	VG1245AE+923BGB	VG1245AE+923BUB
VG1245AF		2.9 ¹		VG1245AF+923AGB	VG1245AF+923GGB	VG1245AF+923BGB	VG1245AF+923BUB
VG1245AG		4.7 ¹		VG1245AG+923AGB	VG1245AG+923GGB	VG1245AG+923BGB	VG1245AG+923BUB
VG1245AL		7.4 ¹		VG1245AL+923AGB	VG1245AL+923GGB	VG1245AL+923BGB	VG1245AL+923BUB
VG1245AN		11.7		VG1245AN+923AGB	VG1245AN+923GGB	VG1245AN+923BGB	VG1245AN+923BUB
VG1245BG	3/4	4.7 ¹	200	VG1245BG+923AGB	VG1245BG+923GGB	VG1245BG+923BGB	VG1245BG+923BUB
VG1245BL		7.4 ¹		VG1245BL+923AGB	VG1245BL+923GGB	VG1245BL+923BGB	VG1245BL+923BUB
VG1245BN		11.7		VG1245BN+923AGB	VG1245BN+923GGB	VG1245BN+923BGB	VG1245BN+923BUB
VG1245CL	1	7.4 ¹	200	VG1245CL+923AGB	VG1245CL+923GGB	VG1245CL+923BGB	VG1245CL+923BUB
VG1245CN		11.7 ¹		VG1245CN+923AGB	VG1245CN+923GGB	VG1245CN+923BGB	VG1245CN+923BUB
VG1245CP		18.7		VG1245CP+923AGB	VG1245CP+923GGB	VG1245CP+923BGB	VG1245CP+923BUB
				Spring Return Open — Valve Normally Open — Actuators with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1245DN	1-1/4	11.7 ¹	200	VG1245DN+938AGC	VG1245DN+938GGC	VG1245DN+938BGC	VG1245DN+938BAC
VG1245DP		18.7 ¹		VG1245DP+938AGC	VG1245DP+938GGC	VG1245DP+938BGC	VG1245DP+938BAC
VG1245DR		29.2		VG1245DR+938AGC	VG1245DR+938GGC	VG1245DR+938BGC	VG1245DR+938BAC
VG1245EP	1-1/2	18.7 ¹	200	VG1245EP+938AGC	VG1245EP+938GGC	VG1245EP+938BGC	VG1245EP+938BAC
VG1245ER		29.2 ¹		VG1245ER+938AGC	VG1245ER+938GGC	VG1245ER+938BGC	VG1245ER+938BAC
VG1245ES		46.8		VG1245ES+938AGC	VG1245ES+938GGC	VG1245ES+938BGC	VG1245ES+938BAC
VG1245FR	2	29.2 ¹	200	VG1245FR+938AGC	VG1245FR+938GGC	VG1245FR+938BGC	VG1245FR+938BAC
VG1245FS		46.8 ¹		VG1245FS+938AGC	VG1245FS+938GGC	VG1245FS+938BGC	VG1245FS+938BAC
VG1245FT		73.7		VG1245FT+938AGC	VG1245FT+938GGC	VG1245FT+938BGC	VG1245FT+938BAC

1. Valve has a characterizing disk.

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

Two-Way — Spring Return Closed — Valve Normally Closed

Fluid Temperatures: -22°F to 212°F (-30°C to 100°C) Not Rated for Steam Service				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Closed — Valve Normally Closed — Actuators with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1245AD	1/2	1.2 ¹	200	VG1245AD+943AGB	VG1245AD+943GGB	VG1245AD+943BGB	VG1245AD+943BUB
VG1245AE		1.9 ¹		VG1245AE+943AGB	VG1245AE+943GGB	VG1245AE+943BGB	VG1245AE+943BUB
VG1245AF		2.9 ¹		VG1245AF+943AGB	VG1245AF+943GGB	VG1245AF+943BGB	VG1245AF+943BUB
VG1245AG		4.7 ¹		VG1245AG+943AGB	VG1245AG+943GGB	VG1245AG+943BGB	VG1245AG+943BUB
VG1245AL		7.4 ¹		VG1245AL+943AGB	VG1245AL+943GGB	VG1245AL+943BGB	VG1245AL+943BUB
VG1245AN		11.7		VG1245AN+943AGB	VG1245AN+943GGB	VG1245AN+943BGB	VG1245AN+943BUB
VG1245BG	3/4	4.7 ¹	200	VG1245BG+943AGB	VG1245BG+943GGB	VG1245BG+943BGB	VG1245BG+943BUB
VG1245BL		7.4 ¹		VG1245BL+943AGB	VG1245BL+943GGB	VG1245BL+943BGB	VG1245BL+943BUB
VG1245BN		11.7		VG1245BN+943AGB	VG1245BN+943GGB	VG1245BN+943BGB	VG1245BN+943BUB
VG1245CL	1	7.4 ¹	200	VG1245CL+943AGB	VG1245CL+943GGB	VG1245CL+943BGB	VG1245CL+943BUB
VG1245CN		11.7 ¹		VG1245CN+943AGB	VG1245CN+943GGB	VG1245CN+943BGB	VG1245CN+943BUB
VG1245CP		18.7		VG1245CP+943AGB	VG1245CP+943GGB	VG1245CP+943BGB	VG1245CP+943BUB
				Spring Return Closed — Valve Normally Closed — Actuators with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1245DN	1-1/4	11.7 ¹	200	VG1245DN+958AGC	VG1245DN+958GGC	VG1245DN+958BGC	VG1245DN+958BAC
VG1245DP		18.7 ¹		VG1245DP+958AGC	VG1245DP+958GGC	VG1245DP+958BGC	VG1245DP+958BAC
VG1245DR		29.2		VG1245DR+958AGC	VG1245DR+958GGC	VG1245DR+958BGC	VG1245DR+958BAC
VG1245EP	1-1/2	18.7 ¹	200	VG1245EP+958AGC	VG1245EP+958GGC	VG1245EP+958BGC	VG1245EP+958BAC
VG1245ER		29.2 ¹		VG1245ER+958AGC	VG1245ER+958GGC	VG1245ER+958BGC	VG1245ER+958BAC
VG1245ES		46.8		VG1245ES+958AGC	VG1245ES+958GGC	VG1245ES+958BGC	VG1245ES+958BAC
VG1245FR	2	29.2 ¹	200	VG1245FR+958AGC	VG1245FR+958GGC	VG1245FR+958BGC	VG1245FR+958BAC
VG1245FS		46.8 ¹		VG1245FS+958AGC	VG1245FS+958GGC	VG1245FS+958BGC	VG1245FS+958BAC
VG1245FT		73.7		VG1245FT+958AGC	VG1245FT+958GGC	VG1245FT+958BGC	VG1245FT+958BAC

1. Valve has a characterizing disk.

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

Valve Assemblies with M9000-561 Thermal Barrier Installed — Rated for High-Temperature Fluid Service, Two-Way — Spring Return — With End Switches

Fluid Temperatures: -22°F to 284°F (-30°C to 140°C), 15 psi Steam				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv	Closeoff psig	Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				Spring Return Open — Valve Normally Open — Actuators with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1245AD	1/2	1.2 ¹	200	VG1245ADH923AGB	VG1245ADH923GGB	VG1245ADH923BGB	VG1245ADH923BUB
VG1245AE		1.9 ¹		VG1245AEH923AGB	VG1245AEH923GGB	VG1245AEH923BGB	VG1245AEH923BUB
VG1245AF		2.9 ¹		VG1245AFH923AGB	VG1245AFH923GGB	VG1245AFH923BGB	VG1245AFH923BUB
VG1245AG		4.7 ¹		VG1245AGH923AGB	VG1245AGH923GGB	VG1245AGH923BGB	VG1245AGH923BUB
VG1245AL		7.4 ¹		VG1245ALH923AGB	VG1245ALH923GGB	VG1245ALH923BGB	VG1245ALH923BUB
VG1245AN		11.7		VG1245ANH923AGB	VG1245ANH923GGB	VG1245ANH923BGB	VG1245ANH923BUB
VG1245BG	3/4	4.7 ¹	200	VG1245BGH923AGB	VG1245BGH923GGB	VG1245BGH923BGB	VG1245BGH923BUB
VG1245BL		7.4 ¹		VG1245BLH923AGB	VG1245BLH923GGB	VG1245BLH923BGB	VG1245BLH923BUB
VG1245BN		11.7		VG1245BNH923AGB	VG1245BNH923GGB	VG1245BNH923BGB	VG1245BNH923BUB
VG1245CL	1	7.4 ¹	200	VG1245CLH923AGB	VG1245CLH923GGB	VG1245CLH923BGB	VG1245CLH923BUB
VG1245CN		11.7 ¹		VG1245CNH923AGB	VG1245CNH923GGB	VG1245CNH923BGB	VG1245CNH923BUB
VG1245CP		18.7		VG1245CPH923AGB	VG1245CPH923GGB	VG1245CPH923BGB	VG1245CPH923BUB
				Spring Return Open — Valve Normally Open — Actuators with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1245DN	1-1/4	11.7 ¹	200	VG1245DNH938AGC	VG1245DNH938GGC	VG1245DNH938BGC	VG1245DNH938BAC
VG1245DP		18.7 ¹		VG1245DPH938AGC	VG1245DPH938GGC	VG1245DPH938BGC	VG1245DPH938BAC
VG1245DR		29.2		VG1245DRH938AGC	VG1245DRH938GGC	VG1245DRH938BGC	VG1245DRH938BAC
VG1245EP	1-1/2	18.7 ¹	200	VG1245EPH938AGC	VG1245EPH938GGC	VG1245EPH938BGC	VG1245EPH938BAC
VG1245ER		29.2 ¹		VG1245ERH938AGC	VG1245ERH938GGC	VG1245ERH938BGC	VG1245ERH938BAC
VG1245ES		46.8		VG1245ESH938AGC	VG1245ESH938GGC	VG1245ESH938BGC	VG1245ESH938BAC
VG1245FR	2	29.2 ¹	200	VG1245FRH938AGC	VG1245FRH938GGC	VG1245FRH938BGC	VG1245FRH938BAC
VG1245FS		46.8 ¹		VG1245FSH938AGC	VG1245FSH938GGC	VG1245FSH938BGC	VG1245FSH938BAC
VG1245FT		73.7		VG1245FTH938AGC	VG1245FTH938GGC	VG1245FTH938BGC	VG1245FTH938BAC
				Spring Return Closed — Valve Normally Closed — Actuators with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1245AD	1/2	1.2 ¹	200	VG1245ADH943AGB	VG1245ADH943GGB	VG1245ADH943BGB	VG1245ADH943BUB
VG1245AE		1.9 ¹		VG1245AEH943AGB	VG1245AEH943GGB	VG1245AEH943BGB	VG1245AEH943BUB
VG1245AF		2.9 ¹		VG1245AFH943AGB	VG1245AFH943GGB	VG1245AFH943BGB	VG1245AFH943BUB
VG1245AG		4.7 ¹		VG1245AGH943AGB	VG1245AGH943GGB	VG1245AGH943BGB	VG1245AGH943BUB
VG1245AL		7.4 ¹		VG1245ALH943AGB	VG1245ALH943GGB	VG1245ALH943BGB	VG1245ALH943BUB
VG1245AN		11.7		VG1245ANH943AGB	VG1245ANH943GGB	VG1245ANH943BGB	VG1245ANH943BUB
VG1245BG	3/4	4.7 ¹	200	VG1245BGH943AGB	VG1245BGH943GGB	VG1245BGH943BGB	VG1245BGH943BUB
VG1245BL		7.4 ¹		VG1245BLH943AGB	VG1245BLH943GGB	VG1245BLH943BGB	VG1245BLH943BUB
VG1245BN		11.7		VG1245BNH943AGB	VG1245BNH943GGB	VG1245BNH943BGB	VG1245BNH943BUB
VG1245CL	1	7.4 ¹	200	VG1245CLH943AGB	VG1245CLH943GGB	VG1245CLH943BGB	VG1245CLH943BUB
VG1245CN		11.7 ¹		VG1245CNH943AGB	VG1245CNH943GGB	VG1245CNH943BGB	VG1245CNH943BUB
VG1245CP		18.7		VG1245CPH943AGB	VG1245CPH943GGB	VG1245CPH943BGB	VG1245CPH943BUB
				Spring Return Closed — Valve Normally Closed — Actuators with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1245DN	1-1/4	11.7 ¹	200	VG1245DNH958AGC	VG1245DNH958GGC	VG1245DNH958BGC	VG1245DNH958BAC
VG1245DP		18.7 ¹		VG1245DPH958AGC	VG1245DPH958GGC	VG1245DPH958BGC	VG1245DPH958BAC
VG1245DR		29.2		VG1245DRH958AGC	VG1245DRH958GGC	VG1245DRH958BGC	VG1245DRH958BAC
VG1245EP	1-1/2	18.7 ¹	200	VG1245EPH958AGC	VG1245EPH958GGC	VG1245EPH958BGC	VG1245EPH958BAC
VG1245ER		29.2 ¹		VG1245ERH958AGC	VG1245ERH958GGC	VG1245ERH958BGC	VG1245ERH958BAC
VG1245ES		46.8		VG1245ESH958AGC	VG1245ESH958GGC	VG1245ESH958BGC	VG1245ESH958BAC
VG1245FR	2	29.2 ¹	200	VG1245FRH958AGC	VG1245FRH958GGC	VG1245FRH958BGC	VG1245FRH958BAC
VG1245FS		46.8 ¹		VG1245FSH958AGC	VG1245FSH958GGC	VG1245FSH958BGC	VG1245FSH958BAC
VG1245FT		73.7		VG1245FTH958AGC	VG1245FTH958GGC	VG1245FTH958BGC	VG1245FTH958BAC

1. Valve has a characterizing disk.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

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

Technical Specifications

VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with Switches		
Service¹		Hot Water, Chilled Water, 50/50 Glycol Solutions, and 15 psig (103 kPa) Saturated Steam for HVAC Systems (Select Models)
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 Actuator Fluid Temperature Limit	212°F (100°C)	VA9203 VA9208
	284°F (140°C)	VA9203 with M9000-561 Thermal Barrier VA9208 with M9000-561 Thermal Barrier
Valve Body Pressure Rating	Water	580 psig (4,000 kPa) at 203°F (95°C) 464 psig (3,199 kPa) at 284°F (140°C) (PN40)
	Steam	15 psig (103 kPa) Saturated Steam (Only with VA9203 or VA9208 Series Actuator with M900-561 Thermal Barrier)
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
Rangeability²		Greater than 500:1
Minimum Ambient Operating Temperature	-22°F (-30°C)	VA9203 Series Spring-Return Actuators
	-40°F (-40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature³ (Limited by the Actuator)	Direct Mount	140°F (60°C): VA9203 or VA9208 Series Spring-Return Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
		1% of Maximum Flow for Three-Way Bypass Port
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
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.



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



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.

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

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 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 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.
- 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.
- 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 valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls representative.



VG1000 Series Three-Way, Spring-Return, Stainless Steel Ball and Stem Ball Valve Assemblies without End Switches

Selection Charts

Three-Way — Spring Return without Switches (Not Rated for Steam Service) (Part 1 of 2)

Fluid Temperatures: -22°F to 212°F (-30°C to 100°C) Not Rated for Steam Service				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	Floating	0 to 10 VDC Proportional	On/Off	On/Off
				Spring Return Port A Open — Valve Spring Return Counterclockwise			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1845AD	1/2	1.2 ¹	200	VG1845AD+923AGA	VG1845AD+923GGA	VG1845AD+923BGA	VG1845AD+923BUA
VG1845AE		1.9 ¹		VG1845AE+923AGA	VG1845AE+923GGA	VG1845AE+923BGA	VG1845AE+923BUA
VG1845AF		2.9 ¹		VG1845AF+923AGA	VG1845AF+923GGA	VG1845AF+923BGA	VG1845AF+923BUA
VG1845AG		4.7 ¹		VG1845AG+923AGA	VG1845AG+923GGA	VG1845AG+923BGA	VG1845AG+923BUA
VG1845AL		7.4 ¹		VG1845AL+923AGA	VG1845AL+923GGA	VG1845AL+923BGA	VG1845AL+923BUA
VG1845AN		11.7		VG1845AN+923AGA	VG1845AN+923GGA	VG1845AN+923BGA	VG1845AN+923BUA
VG1845BG	3/4	4.7 ¹	200	VG1845BG+923AGA	VG1845BG+923GGA	VG1845BG+923BGA	VG1845BG+923BUA
VG1845BL		7.4 ¹		VG1845BL+923AGA	VG1845BL+923GGA	VG1845BL+923BGA	VG1845BL+923BUA
VG1845BN		11.7		VG1845BN+923AGA	VG1845BN+923GGA	VG1845BN+923BGA	VG1845BN+923BUA
VG1845CL	1	7.4 ¹	200	VG1845CL+923AGA	VG1845CL+923GGA	VG1845CL+923BGA	VG1845CL+923BUA
VG1845CN		11.7 ¹		VG1845CN+923AGA	VG1845CN+923GGA	VG1845CN+923BGA	VG1845CN+923BUA
VG1845CP		18.7		VG1845CP+923AGA	VG1845CP+923GGA	VG1845CP+923BGA	VG1845CP+923BUA
				Spring Return Port A Open — Valve Spring Return Counterclockwise			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1845DN	1-1/4	11.7 ¹	200	VG1845DN+928AGA	VG1845DN+928GGA	VG1845DN+938BGA	VG1845DN+938BAA
VG1845DP		18.7 ¹		VG1845DP+928AGA	VG1845DP+928GGA	VG1845DP+938BGA	VG1845DP+938BAA
VG1845DR		29.2		VG1845DR+928AGA	VG1845DR+928GGA	VG1845DR+938BGA	VG1845DR+938BAA
VG1845EP	1-1/2	18.7 ¹	200	VG1845EP+928AGA	VG1845EP+928GGA	VG1845EP+938BGA	VG1845EP+938BAA
VG1845ER		29.2 ¹		VG1845ER+928AGA	VG1845ER+928GGA	VG1845ER+938BGA	VG1845ER+938BAA
VG1845ES		46.8		VG1845ES+928AGA	VG1845ES+928GGA	VG1845ES+938BGA	VG1845ES+938BAA

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

Three-Way — Spring Return without Switches (Not Rated for Steam Service) (Part 2 of 2)

Fluid Temperatures: -22°F to 212°F (-30°C to 100°C) Not Rated for Steam Service				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	Floating	0 to 10 VDC Proportional	On/Off	On/Off
VG1845FR	2	29.2 ¹	200	VG1845FR+928AGA	VG1845FR+928GGA	VG1845FR+938BGA	VG1845FR+938BAA
VG1845FS		46.8 ¹		VG1845FS+928AGA	VG1845FS+928GGA	VG1845FS+938BGA	VG1845FS+938BAA
VG1845FT		73.7		VG1845FT+928AGA	VG1845FT+928GGA	VG1845FT+938BGA	VG1845FT+938BAA
				Spring Return Port A Closed — Valve Spring Return Clockwise			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1845AD	1/2	1.2 ¹	200	VG1845AD+943AGA	VG1845AD+943GGA	VG1845AD+943BGA	VG1845AD+943BUA
VG1845AE		1.9 ¹		VG1845AE+943AGA	VG1845AE+943GGA	VG1845AE+943BGA	VG1845AE+943BUA
VG1845AF		2.9 ¹		VG1845AF+943AGA	VG1845AF+943GGA	VG1845AF+943BGA	VG1845AF+943BUA
VG1845AG		4.7 ¹		VG1845AG+943AGA	VG1845AG+943GGA	VG1845AG+943BGA	VG1845AG+943BUA
VG1845AL		7.4 ¹		VG1845AL+943AGA	VG1845AL+943GGA	VG1845AL+943BGA	VG1845AL+943BUA
VG1845AN		11.7		VG1845AN+943AGA	VG1845AN+943GGA	VG1845AN+943BGA	VG1845AN+943BUA
VG1845BG	3/4	4.7 ¹	200	VG1845BG+943AGA	VG1845BG+943GGA	VG1845BG+943BGA	VG1845BG+943BUA
VG1845BL		7.4 ¹		VG1845BL+943AGA	VG1845BL+943GGA	VG1845BL+943BGA	VG1845BL+943BUA
VG1845BN		11.7		VG1845BN+943AGA	VG1845BN+943GGA	VG1845BN+943BGA	VG1845BN+943BUA
VG1845CL	1	7.4 ¹	200	VG1845CL+943AGA	VG1845CL+943GGA	VG1845CL+943BGA	VG1845CL+943BUA
VG1845CN		11.7 ¹		VG1845CN+943AGA	VG1845CN+943GGA	VG1845CN+943BGA	VG1845CN+943BUA
VG1845CP		18.7		VG1845CP+943AGA	VG1845CP+943GGA	VG1845CP+943BGA	VG1845CP+943BUA
				Spring Return Port A Closed — Valve Spring Return Clockwise			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1845DN	1-1/4	11.7 ¹	200	VG1845DN+948AGA	VG1845DN+948GGA	VG1845DN+958BGA	VG1845DN+958BAA
VG1845DP		18.7 ¹		VG1845DP+948AGA	VG1845DP+948GGA	VG1845DP+958BGA	VG1845DP+958BAA
VG1845DR		29.2		VG1845DR+948AGA	VG1845DR+948GGA	VG1845DR+958BGA	VG1845DR+958BAA
VG1845EP	1-1/2	18.7 ¹	200	VG1845EP+948AGA	VG1845EP+948GGA	VG1845EP+958BGA	VG1845EP+958BAA
VG1845ER		29.2 ¹		VG1845ER+948AGA	VG1845ER+948GGA	VG1845ER+958BGA	VG1845ER+958BAA
VG1845ES		46.8		VG1845ES+948AGA	VG1845ES+948GGA	VG1845ES+958BGA	VG1845ES+958BAA
VG1845FR	2	29.2 ¹	200	VG1845FR+948AGA	VG1845FR+948GGA	VG1845FR+958BGA	VG1845FR+958BAA
VG1845FS		46.8 ¹		VG1845FS+948AGA	VG1845FS+948GGA	VG1845FS+958BGA	VG1845FS+958BAA
VG1845FT		73.7		VG1845FT+948AGA	VG1845FT+948GGA	VG1845FT+958BGA	VG1845FT+958BAA

1. Valve has a characterizing disk.

Valve Assemblies with M9000-561 Thermal Barrier Installed — Rated for High-Temperature Fluid Service, Three-Way — Spring Return without Switches (Part 1 of 2)

Fluid Temperatures: -22°F to 284°F (-30°C to 140°C) Water and 15 psi Steam				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	Floating	0 to 10 VDC Proportional	On/Off	On/Off
				Spring Return Port A Open — Valve Spring Return Counterclockwise			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1845AD	1/2	1.2 ¹	200	VG1845ADH923AGA	VG1845ADH923GGA	VG1845ADH923BGA	VG1845ADH923BUA
VG1845AE		1.9 ¹		VG1845AEH923AGA	VG1845AEH923GGA	VG1845AEH923BGA	VG1845AEH923BUA
VG1845AF		2.9 ¹		VG1845AFH923AGA	VG1845AFH923GGA	VG1845AFH923BGA	VG1845AFH923BUA
VG1845AG		4.7 ¹		VG1845AGH923AGA	VG1845AGH923GGA	VG1845AGH923BGA	VG1845AGH923BUA
VG1845AL		7.4 ¹		VG1845ALH923AGA	VG1845ALH923GGA	VG1845ALH923BGA	VG1845ALH923BUA
VG1845AN		11.7		VG1845ANH923AGA	VG1845ANH923GGA	VG1845ANH923BGA	VG1845ANH923BUA

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

Valve Assemblies with M9000-561 Thermal Barrier Installed — Rated for High-Temperature Fluid Service, Three-Way — Spring Return without Switches (Part 2 of 2)

Fluid Temperatures: -22°F to 284°F (-30°C to 140°C) Water and 15 psi Steam				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv (Port A/B)	Closeoff psig	Floating	0 to 10 VDC Proportional	On/Off	On/Off
VG1845BG	3/4	4.7 ¹	200	VG1845BGH923AGA	VG1845BGH923GGA	VG1845BGH923BGA	VG1845BGH923BUA
VG1845BL		7.4 ¹		VG1845BLH923AGA	VG1845BLH923GGA	VG1845BLH923BGA	VG1845BLH923BUA
VG1845BN		11.7		VG1845BNH923AGA	VG1845BNH923GGA	VG1845BNH923BGA	VG1845BNH923BUA
VG1845CL	1	7.4 ¹	200	VG1845CLH923AGA	VG1845CLH923GGA	VG1845CLH923BGA	VG1845CLH923BUA
VG1845CN		11.7 ¹		VG1845CNH923AGA	VG1845CNH923GGA	VG1845CNH923BGA	VG1845CNH923BUA
VG1845CP		18.7		VG1845CPH923AGA	VG1845CPH923GGA	VG1845CPH923BGA	VG1845CPH923BUA
				Spring Return Port A Open — Valve Spring Return Counterclockwise			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1845DN	1-1/4	11.7 ¹	200	VG1845DNH928AGA	VG1845DNH928GGA	VG1845DNH938BGA	VG1845DNH938BAA
VG1845DP		18.7 ¹		VG1845DPH928AGA	VG1845DPH928GGA	VG1845DPH938BGA	VG1845DPH938BAA
VG1845DR		29.2		VG1845DRH928AGA	VG1845DRH928GGA	VG1845DRH938BGA	VG1845DRH938BAA
VG1845EP	1-1/2	18.7 ¹	200	VG1845EPH928AGA	VG1845EPH928GGA	VG1845EPH938BGA	VG1845EPH938BAA
VG1845ER		29.2 ¹		VG1845ERH928AGA	VG1845ERH928GGA	VG1845ERH938BGA	VG1845ERH938BAA
VG1845ES		46.8		VG1845ESH928AGA	VG1845ESH928GGA	VG1845ESH938BGA	VG1845ESH938BAA
VG1845FR	2	29.2 ¹	200	VG1845FRH928AGA	VG1845FRH928GGA	VG1845FRH938BGA	VG1845FRH938BAA
VG1845FS		46.8 ¹		VG1845FSH928AGA	VG1845FSH928GGA	VG1845FSH938BGA	VG1845FSH938BAA
VG1845FT		73.7		VG1845FTH928AGA	VG1845FTH928GGA	VG1845FTH938BGA	VG1845FTH938BAA
				Spring Return Port A Closed — Valve Spring Return Clockwise			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1845AD	1/2	1.2 ¹	200	VG1845ADH943AGA	VG1845ADH943GGA	VG1845ADH943BGA	VG1845ADH943BUA
VG1845AE		1.9 ¹		VG1845AEH943AGA	VG1845AEH943GGA	VG1845AEH943BGA	VG1845AEH943BUA
VG1845AF		2.9 ¹		VG1845AFH943AGA	VG1845AFH943GGA	VG1845AFH943BGA	VG1845AFH943BUA
VG1845AG		4.7 ¹		VG1845AGH943AGA	VG1845AGH943GGA	VG1845AGH943BGA	VG1845AGH943BUA
VG1845AL		7.4 ¹		VG1845ALH943AGA	VG1845ALH943GGA	VG1845ALH943BGA	VG1845ALH943BUA
VG1845AN		11.7		VG1845ANH943AGA	VG1845ANH943GGA	VG1845ANH943BGA	VG1845ANH943BUA
VG1845BG	3/4	4.7 ¹	200	VG1845BGH943AGA	VG1845BGH943GGA	VG1845BGH943BGA	VG1845BGH943BUA
VG1845BL		7.4 ¹		VG1845BLH943AGA	VG1845BLH943GGA	VG1845BLH943BGA	VG1845BLH943BUA
VG1845BN		11.7		VG1845BNH943AGA	VG1845BNH943GGA	VG1845BNH943BGA	VG1845BNH943BUA
VG1845CL	1	7.4 ¹	200	VG1845CLH943AGA	VG1845CLH943GGA	VG1845CLH943BGA	VG1845CLH943BUA
VG1845CN		11.7 ¹		VG1845CNH943AGA	VG1845CNH943GGA	VG1845CNH943BGA	VG1845CNH943BUA
VG1845CP		18.7		VG1845CPH943AGA	VG1845CPH943GGA	VG1845CPH943BGA	VG1845CPH943BUA
				Spring Return Port A Closed — Valve Spring Return Clockwise			
				VA9208-AGA-2	VA9208-GGA-2	VA9208-BGA-3	VA9208-BAA-3
VG1845DN	1-1/4	11.7 ¹	200	VG1845DNH948AGA	VG1845DNH948GGA	VG1845DNH958BGA	VG1845DNH958BAA
VG1845DP		18.7 ¹		VG1845DPH948AGA	VG1845DPH948GGA	VG1845DPH958BGA	VG1845DPH958BAA
VG1845DR		29.2		VG1845DRH948AGA	VG1845DRH948GGA	VG1845DRH958BGA	VG1845DRH958BAA
VG1845EP	1-1/2	18.7 ¹	200	VG1845EPH948AGA	VG1845EPH948GGA	VG1845EPH958BGA	VG1845EPH958BAA
VG1845ER		29.2 ¹		VG1845ERH948AGA	VG1845ERH948GGA	VG1845ERH958BGA	VG1845ERH958BAA
VG1845ES		46.8		VG1845ESH948AGA	VG1845ESH948GGA	VG1845ESH958BGA	VG1845ESH958BAA
VG1845FR	2	29.2 ¹	200	VG1845FRH948AGA	VG1845FRH948GGA	VG1845FRH958BGA	VG1845FRH958BAA
VG1845FS		46.8 ¹		VG1845FSH948AGA	VG1845FSH948GGA	VG1845FSH958BGA	VG1845FSH958BAA
VG1845FT		73.7		VG1845FTH948AGA	VG1845FTH948GGA	VG1845FTH958BGA	VG1845FTH958BAA

1. Valve 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 Series Three-Way, Stainless Steel Trim, NPT End Connections 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°F to 284°F (-30°C to 140°C)
	Steam	15 psig (103 kPa) at 250°F (121°C)
Maximum Actuator Fluid Temperature Limits	212°F (100°C)	VA9203 Series Spring-Return Actuators VA9208 Series Spring-Return Actuators
	284°F (140°C)	VA9203 Series Spring-Return Actuators with M9000-561 Thermal Barrier Installed VA9208 Series Spring-Return Actuators with M9000-561 Thermal Barrier Installed
Valve Body Pressure Rating	Water	580 psig (4,000 kPa) at 203°F (95°C) (PN40) 464 psig (3,196 kPa) at 284°F (140°C) (PN40)
	Steam	15 psig (103 kPa) Saturated Steam (Applies to VA9208 Series Spring Return Actuator with M9000-561 Thermal Barrier Installed)
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (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 ²		Greater than 500:1
Minimum Ambient Operating Temperature	-22°F (-30°C)	VA9203 Series Spring-Return Actuators
	-40°F (-40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature ³ (Limited by the Actuator and Linkage)	Direct Mount	140°F (60°C): VA9208 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
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.

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

VG1000 Series Three-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with 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 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 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.
- 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.
- 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.
- Blowout-Proof Stem — protects the user from the risk of injury.



VG1000 Series Three-Way, Spring-Return, Stainless Steel Ball and Stem Ball Valve with End Switches

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

Three-Way — Spring Return Valve Counterclockwise — Port A (Coil) Open with Switches (Not Rated for Steam Service)

Fluid Temperatures: -22°F to 212°F (-30°C to 100°C) Not Rated for Steam Service				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv Port A/B	Closeoff psig	Floating	0 to 10 VDC Proportional	On/Off	On/Off
				Spring Return Port A Open — Valve Spring Return Counterclockwise — Actuator with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1845AD	1/2	1.2/0.7 ¹	200	VG1845AD+923AGB	VG1845AD+923GGB	VG1845AD+923BGB	VG1845AD+923BUB
VG1845AE		1.9/1.2 ¹		VG1845AE+923AGB	VG1845AE+923GGB	VG1845AE+923BGB	VG1845AE+923BUB
VG1845AF		2.9/1.9 ¹		VG1845AF+923AGB	VG1845AF+923GGB	VG1845AF+923BGB	VG1845AF+923BUB
VG1845AG		4.7/2.9 ¹		VG1845AG+923AGB	VG1845AG+923GGB	VG1845AG+923BGB	VG1845AG+923BUB
VG1845AL		7.4/4.7 ¹		VG1845AL+923AGB	VG1845AL+923GGB	VG1845AL+923BGB	VG1845AL+923BUB
VG1845AN		11.7/5.8		VG1845AN+923AGB	VG1845AN+923GGB	VG1845AN+923BGB	VG1845AN+923BUB
VG1845BG	3/4	4.7/2.9 ¹	200	VG1845BG+923AGB	VG1845BG+923GGB	VG1845BG+923BGB	VG1845BG+923BUB
VG1845BL		7.4/4.7 ¹		VG1845BL+923AGB	VG1845BL+923GGB	VG1845BL+923BGB	VG1845BL+923BUB
VG1845BN		11.7/5.8		VG1845BN+923AGB	VG1845BN+923GGB	VG1845BN+923BGB	VG1845BN+923BUB
VG1845CL	1	7.4/4.7 ¹	200	VG1845CL+923AGB	VG1845CL+923GGB	VG1845CL+923BGB	VG1845CL+923BUB
VG1845CN		11.7/7.4 ¹		VG1845CN+923AGB	VG1845CN+923GGB	VG1845CN+923BGB	VG1845CN+923BUB
VG1845CP		18.7/9.4		VG1845CP+923AGB	VG1845CP+923GGB	VG1845CP+923BGB	VG1845CP+923BUB
				Spring Return Port A Open — Valve Spring Return Counterclockwise — Actuator with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1845DN	1-1/4	11.7/7.4 ¹	200	VG1845DN+938AGC	VG1845DN+938GGC	VG1845DN+938BGC	VG1845DN+938BAC
VG1845DP		18.7/11.7 ¹		VG1845DP+938AGC	VG1845DP+938GGC	VG1845DP+938BGC	VG1845DP+938BAC
VG1845DR		29.2/14.6		VG1845DR+938AGC	VG1845DR+938GGC	VG1845DR+938BGC	VG1845DR+938BAC
VG1845EP	1-1/2	18.7/11.7 ¹	200	VG1845EP+938AGC	VG1845EP+938GGC	VG1845EP+938BGC	VG1845EP+938BAC
VG1845ER		29.2/18.7 ¹		VG1845ER+938AGC	VG1845ER+938GGC	VG1845ER+938BGC	VG1845ER+938BAC
VG1845ES		46.8/23.4		VG1845ES+938AGC	VG1845ES+938GGC	VG1845ES+938BGC	VG1845ES+938BAC
VG1845FR	2	29.2/18.7 ¹	200	VG1845FR+938AGC	VG1845FR+938GGC	VG1845FR+938BGC	VG1845FR+938BAC
VG1845FS		46.8/29.2 ¹		VG1845FS+938AGC	VG1845FS+938GGC	VG1845FS+938BGC	VG1845FS+938BAC
VG1845FT		73.7/36.8		VG1845FT+938AGC	VG1845FT+938GGC	VG1845FT+938BGC	VG1845FT+938BAC

1. Valve has a characterizing disk.

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

Three-Way — Spring Return Valve Clockwise — Port A (Coil) Closed with End Switches (Not Rated for Steam Service)

Fluid Temperatures: -22°F to 212°F (-30°C to 100°C) Not Rated for Steam Service				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv Port A/B	Closeoff psig	Floating	0 to 10 VDC Proportional	On/Off	On/Off
				Spring Return Port A Closed — Valve Spring Return Clockwise — Actuator with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1845AD	1/2	1.2/0.7 ¹	200	VG1845AD+943AGB	VG1845AD+943GGB	VG1845AD+943BGB	VG1845AD+943BUB
VG1845AE		1.9/1.2 ¹		VG1845AE+943AGB	VG1845AE+943GGB	VG1845AE+943BGB	VG1845AE+943BUB
VG1845AF		2.9/1.9 ¹		VG1845AF+943AGB	VG1845AF+943GGB	VG1845AF+943BGB	VG1845AF+943BUB
VG1845AG		4.7/2.9 ¹		VG1845AG+943AGB	VG1845AG+943GGB	VG1845AG+943BGB	VG1845AG+943BUB
VG1845AL		7.4/4.7 ¹		VG1845AL+943AGB	VG1845AL+943GGB	VG1845AL+943BGB	VG1845AL+943BUB
VG1845AN		11.7/5.8		VG1845AN+943AGB	VG1845AN+943GGB	VG1845AN+943BGB	VG1845AN+943BUB
VG1845BG	3/4	4.7/2.9 ¹	200	VG1845BG+943AGB	VG1845BG+943GGB	VG1845BG+943BGB	VG1845BG+943BUB
VG1845BL		7.4/4.7 ¹		VG1845BL+943AGB	VG1845BL+943GGB	VG1845BL+943BGB	VG1845BL+943BUB
VG1845BN		11.7/5.8		VG1845BN+943AGB	VG1845BN+943GGB	VG1845BN+943BGB	VG1845BN+943BUB
VG1845CL	1	7.4/4.7 ¹	200	VG1845CL+943AGB	VG1845CL+943GGB	VG1845CL+943BGB	VG1845CL+943BUB
VG1845CN		11.7/7.4 ¹		VG1845CN+943AGB	VG1845CN+943GGB	VG1845CN+943BGB	VG1845CN+943BUB
VG1845CP		18.7/9.4		VG1845CP+943AGB	VG1845CP+943GGB	VG1845CP+943BGB	VG1845CP+943BUB
				Spring Return Port A Closed — Valve Spring Return Clockwise — Actuator with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1845DN	1-1/4	11.7/7.4 ¹	200	VG1845DN+958AGC	VG1845DN+958GGC	VG1845DN+958BGC	VG1845DN+958BAC
VG1845DP		18.7/11.7 ¹		VG1845DP+958AGC	VG1845DP+958GGC	VG1845DP+958BGC	VG1845DP+958BAC
VG1845DR		29.2/14.6		VG1845DR+958AGC	VG1845DR+958GGC	VG1845DR+958BGC	VG1845DR+958BAC
VG1845EP	1-1/2	18.7/11.7 ¹	200	VG1845EP+958AGC	VG1845EP+958GGC	VG1845EP+958BGC	VG1845EP+958BAC
VG1845ER		29.2/18.7 ¹		VG1845ER+958AGC	VG1845ER+958GGC	VG1845ER+958BGC	VG1845ER+958BAC
VG1845ES		46.8/23.4		VG1845ES+958AGC	VG1845ES+958GGC	VG1845ES+958BGC	VG1845ES+958BAC
VG1845FR	2	29.2/18.7 ¹	200	VG1845FR+958AGC	VG1845FR+958GGC	VG1845FR+958BGC	VG1845FR+958BAC
VG1845FS		46.8/29.2 ¹		VG1845FS+958AGC	VG1845FS+958GGC	VG1845FS+958BGC	VG1845FS+958BAC
VG1845FT		73.7/36.8		VG1845FT+958AGC	VG1845FT+958GGC	VG1845FT+958BGC	VG1845FT+958BAC

1. Valve has a characterizing disk.



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.

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

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

Valve Assemblies with M9000-561 Thermal Barrier Installed — Rated for High-Temperature Fluid Service, Three-Way — Spring Return — with End Switches (Part 1 of 2)

Fluid Temperatures: -22°F to 284°F (-30°C to 140°C) Water and 15 psi Steam				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv Port A/B	Closeoff psig	Floating	0 to 10 VDC Proportional	On/Off	On/Off
				Spring Return Port A Open — Valve Spring Return Counterclockwise — Actuator with One Switch and 48 in. (18 AWG) Appliance Cables			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1845AD	1/2	1.2/0.7 ¹	200	VG1845ADH923AGB	VG1845ADH923GGB	VG1845ADH923BGB	VG1845ADH923BUB
VG1845AE		1.9/1.2 ¹		VG1845AEH923AGB	VG1845AEH923GGB	VG1845AEH923BGB	VG1845AEH923BUB
VG1845AF		2.9/1.9 ¹		VG1845AFH923AGB	VG1845AFH923GGB	VG1845AFH923BGB	VG1845AFH923BUB
VG1845AG		4.7/2.9 ¹		VG1845AGH923AGB	VG1845AGH923GGB	VG1845AGH923BGB	VG1845AGH923BUB
VG1845AL		7.4/4.7 ¹		VG1845ALH923AGB	VG1845ALH923GGB	VG1845ALH923BGB	VG1845ALH923BUB
VG1845AN		11.7/5.8		VG1845ANH923AGB	VG1845ANH923GGB	VG1845ANH923BGB	VG1845ANH923BUB
VG1845BG	3/4	4.7/2.9 ¹	200	VG1845BGH923AGB	VG1845BGH923GGB	VG1845BGH923BGB	VG1845BGH923BUB
VG1845BL		7.4/4.7 ¹		VG1845BLH923AGB	VG1845BLH923GGB	VG1845BLH923BGB	VG1845BLH923BUB
VG1845BN		11.7/5.8		VG1845BNH923AGB	VG1845BNH923GGB	VG1845BNH923BGB	VG1845BNH923BUB
VG1845CL	1	7.4/4.7 ¹	200	VG1845CLH923AGB	VG1845CLH923GGB	VG1845CLH923BGB	VG1845CLH923BUB
VG1845CN		11.7/7.4 ¹		VG1845CNH923AGB	VG1845CNH923GGB	VG1845CNH923BGB	VG1845CNH923BUB
VG1845CP		18.7/9.4		VG1845CPH923AGB	VG1845CPH923GGB	VG1845CPH923BGB	VG1845CPH923BUB
				Spring Return Port A Open — Valve Spring Return Counterclockwise — Actuator with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1845DN	1-1/4	11.7/7.4 ¹	200	VG1845DNH938AGC	VG1845DNH938GGC	VG1845DNH938BGC	VG1845DNH938BAC
VG1845DP		18.7/11.7 ¹		VG1845DPH938AGC	VG1845DPH938GGC	VG1845DPH938BGC	VG1845DPH938BAC
VG1845DR		29.2/14.6		VG1845DRH938AGC	VG1845DRH938GGC	VG1845DRH938BGC	VG1845DRH938BAC
VG1845EP	1-1/2	18.7/11.7 ¹	200	VG1845EPH938AGC	VG1845EPH938GGC	VG1845EPH938BGC	VG1845EPH938BAC
VG1845ER		29.2/18.7 ¹		VG1845ERH938AGC	VG1845ERH938GGC	VG1845ERH938BGC	VG1845ERH938BAC
VG1845ES		46.8/23.4		VG1845ESH938AGC	VG1845ESH938GGC	VG1845ESH938BGC	VG1845ESH938BAC
VG1845FR	2	29.2/18.7 ¹	200	VG1845FRH938AGC	VG1845FRH938GGC	VG1845FRH938BGC	VG1845FRH938BAC
VG1845FS		46.8/29.2 ¹		VG1845FSH938AGC	VG1845FSH938GGC	VG1845FSH938BGC	VG1845FSH938BAC
VG1845FT		73.7/36.8		VG1845FTH938AGC	VG1845FTH938GGC	VG1845FTH938BGC	VG1845FTH938BAC
				Spring Return Port A Closed — Valve Spring Return Clockwise — Actuator with One Switch			
				VA9203-AGB-2Z	VA9203-GGB-2Z	VA9203-BGB-2	VA9203-BUB-2
VG1845AD	1/2	1.2/0.7	200	VG1845ADH943AGB	VG1845ADH943GGB	VG1845ADH943BGB	VG1845ADH943BUB
VG1845AE		1.9/1.2 ¹		VG1845AEH943AGB	VG1845AEH943GGB	VG1845AEH943BGB	VG1845AEH943BUB
VG1845AF		2.9/1.9 ¹		VG1845AFH943AGB	VG1845AFH943GGB	VG1845AFH943BGB	VG1845AFH943BUB
VG1845AG		4.7/2.9 ¹		VG1845AGH943AGB	VG1845AGH943GGB	VG1845AGH943BGB	VG1845AGH943BUB
VG1845AL		7.4/4.7 ¹		VG1845ALH943AGB	VG1845ALH943GGB	VG1845ALH943BGB	VG1845ALH943BUB
VG1845AN		11.7/5.8		VG1845ANH943AGB	VG1845ANH943GGB	VG1845ANH943BGB	VG1845ANH943BUB
VG1845BG	3/4	4.7/2.9 ¹	200	VG1845BGH943AGB	VG1845BGH943GGB	VG1845BGH943BGB	VG1845BGH943BUB
VG1845BL		7.4/4.7 ¹		VG1845BLH943AGB	VG1845BLH943GGB	VG1845BLH943BGB	VG1845BLH943BUB
VG1845BN		11.7/5.8		VG1845BNH943AGB	VG1845BNH943GGB	VG1845BNH943BGB	VG1845BNH943BUB
VG1845CL	1	7.4/4.7 ¹	200	VG1845CLH943AGB	VG1845CLH943GGB	VG1845CLH943BGB	VG1845CLH943BUB
VG1845CN		11.7/7.4 ¹		VG1845CNH943AGB	VG1845CNH943GGB	VG1845CNH943BGB	VG1845CNH943BUB
VG1845CP		18.7/9.4		VG1845CPH943AGB	VG1845CPH943GGB	VG1845CPH943BGB	VG1845CPH943BUB

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

Valve Assemblies with M9000-561 Thermal Barrier Installed — Rated for High-Temperature Fluid Service, Three-Way — Spring Return — with End Switches (Part 2 of 2)

Fluid Temperatures: -22°F to 284°F (-30°C to 140°C) Water and 15 psig Steam				AC 24 V			AC 85–264 V (VA9203) AC 120 V (VA9208)
Valve	Size, in.	Cv Port A/B	Closeoff psig	Floating	0 to 10 VDC Proportional	On/Off	On/Off
				Spring Return Port A Closed — Valve Spring Return Clockwise — Actuator with Two Switches			
				VA9208-AGC-3	VA9208-GGC-3	VA9208-BGC-3	VA9208-BAC-3
VG1845DN	1-1/4	11.7/7.4 ¹	200	VG1845DNH958AGC	VG1845DNH958GGC	VG1845DNH958BGC	VG1845DNH958BAC
VG1845DP		18.7/11.7 ¹		VG1845DPH958AGC	VG1845DPH958GGC	VG1845DPH958BGC	VG1845DPH958BAC
VG1845DR		29.2/14.6		VG1845DRH958AGC	VG1845DRH958GGC	VG1845DRH958BGC	VG1845DRH958BAC
VG1845EP	1-1/2	18.7/11.7 ¹	200	VG1845EPH958AGC	VG1845EPH958GGC	VG1845EPH958BGC	VG1845EPH958BAC
VG1845ER		29.2/18.7 ¹		VG1845ERH958AGC	VG1845ERH958GGC	VG1845ERH958BGC	VG1845ERH958BAC
VG1845ES		46.8/23.4		VG1845ESH958AGC	VG1845ESH958GGC	VG1845ESH958BGC	VG1845ESH958BAC
VG1845FR	2	29.2/18.7 ¹	200	VG1845FRH958AGC	VG1845FRH958GGC	VG1845FRH958BGC	VG1845FRH958BAC
VG1845FS		46.8/29.2 ¹		VG1845FSH958AGC	VG1845FSH958GGC	VG1845FSH958BGC	VG1845FSH958BAC
VG1845FT		73.7/36.8		VG1845FTH958AGC	VG1845FTH958GGC	VG1845FTH958BGC	VG1845FTH958BAC

1. Valve has a characterizing disk.

Technical Specifications

VG1000 Series Three-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with 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°F to 284°F (-30°C to 140°C)
	Steam	15 psig (103 kPa) at 250°F (121°C)
Maximum Actuator Fluid Temperature Limits	212°F (100°C)	VA9203 Series Spring-Return Actuators VA9208 Series Spring-Return Actuators
	284°F (140°C)	VA9203 with M9000-561 Thermal Barrier VA9208 with M9000-561 Thermal Barrier
Valve Body Pressure 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 (Applies to VA9203 Series or VA9208 Series Actuators with M9000-561 Thermal Barrier Installed)
Maximum Closeoff Pressure	200 psid (1,378 kPa)	
Maximum Recommended Operating Pressure Drop	50 psid (340 kPa)	
Flow Characteristics	Three-Way	Equal Percentage Flow Characteristics of In-Line Port (Coil) and Linear Flow Characteristics of Angle Port B (Bypass)
Rangeability ²	Greater than 500:1	
Minimum Ambient Operating Temperature	-22°F (-30°C)	VA9203 Series Spring-Return Actuators
	-40°F (-40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature ³ (Limited by the Actuator and Linkage)	Direct Mount	140°F (60°C): VA9208 Series Spring-Return Actuators
Leakage	0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4 1% of Maximum Flow for Three-Way Bypass Port	
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 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.

VG1000 Series Forged Brass Ball Valves for Assembly in the Field

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 and single point of contact information.

Features

- National Pipe Thread (NPT), sweat, and press end connections—provide the right valve for a broad range of applications, reduce installation time while reducing the need for adapters, and increase system reliability.

- 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.
- 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.
- Graphite-reinforced Polytetrafluoroethylene (PTFE) seats—include 15% graphite-reinforced ball seats, providing better wear resistance.
- 200 psi closeoff pressure rating—provides tight shutoff.
- 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).
- Blowout-proof stem—protects the user from the risk of injury.

VG1000 Series Ball Valves



Selection Charts

Valid Ball Valve, Electric Actuator, Linkage Kit, and Weather Shield Combinations (for Assembly in the Field) (Part 1 of 3)

Valve Size, in. (DN)	Valve Code Numbers			Actuator Base Number ¹	Linkage Kit Code Number			Weather Shield
	NPT End Connection	Sweat End Connection	Press End Connection		Fluid Temperatures (<203°F [95°C])	Fluid Temperatures (<212°F [100°C])	Fluid Temperatures (≥212°F [100°C])	
1/2 (DN15)	VG1241Ax VG1841Ax		VG1291Ax VG1891Ax	VA9104 ²	None Required	Not Rated	Not Rated	M9000-342
				M9104 ²	Not Available			
				VA9300	None Required			
				M9300	M9310-500			
				VA9203	None Required			
				M9203	M9000-560			
	VG1245Ax VG1845Ax	VG1275Ax VG1875Ax	VG1295Ax VG1895Ax	VA9104 ²	None Required		M9000-561	
				M9104 ²	Not Available			
				VA9300	None Required			
				M9300	M9310-500			
				VA9203	None Required			
				M9203	M9000-560			



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.

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

VG1000 Series Forged Brass Ball Valves for Assembly in the Field (Continued)

Valid Ball Valve, Electric Actuator, Linkage Kit, and Weather Shield Combinations (for Assembly in the Field) (Part 2 of 3)

Valve Size, in. (DN)	Valve Code Numbers			Actuator Base Number ¹	Linkage Kit Code Number			Weather Shield
	NPT End Connection	Sweat End Connection	Press End Connection		Fluid Temperatures (<203°F [95°C])	Fluid Temperatures (<212°F [100°C])	Fluid Temperatures (≥212°F [100°C])	
3/4 (DN20)	VG1241Bx VG1841Bx		VG1291Bx VG1891Bx	VA9104 ²	None Required	Not Rated	Not Rated	M9000-342
				M9104 ²	Not Available			
				VA9300	None Required			
				M9300	M9310-500			
				VA9203	None Required			
				M9203	M9000-560			
	VG1245Bx VG1845Bx	VG1275Bx VG1875Bx	VG1295Bx VG1895Bx	VA9104 ²	None Required		M9000-561	
				M9104 ²	Not Available			
				VA9300	None Required			
				M9300	M9310-500			
				VA9203	None Required			
				M9203	M9000-560			
1 (DN25)	VG1241Cx VG1841Cx	VG1271Cx VG1871Cx	VG1291Cx VG1891Cx	VA9104 ²	None Required	Not Rated	Not Rated	M9000-342
				M9104 ²	Not Available			
				VA9300	None Required			
				M9300	M9310-500			
				VA9203	None Required			
				M9203	M9000-560			
	VG1245Cx VG1845Cx	VG1275Cx VG1875Cx	VG1295Cx VG1895Cx	VA9104 ²	None Required		M9000-561	
				M9104 ²	Not Available			
				VA9300	None Required			
				M9300	M9310-500			
				VA9203	None Required			
				M9203	M9000-560			
1-1/4 (DN32)	VG1241Dx VG1841Dx			VA9300	None Required	Not Rated	Not Rated	M9000-342
				M9300	M9310-500			
				VA9208	None Required			
				M9208	M9000-550			
	VG1245Dx VG1845Dx			VA9300	None Required		M9000-561	
				M9300	M9310-500			
				VA9208	None Required			
				M9208	M9000-560			
1-1/2 (DN40)	VG1241Ex VG1841Ex			VA9300	None Required	Not Rated	Not Rated	M9000-342
				M9300	M9310-500			
				VA9208	None Required			
				M9208	M9000-560			
	VG1245Ex VG1845Ex			VA9300	None Required		M9000-561	
				M9300	M9310-500			
				VA9208	None Required			
				M9208	M9000-560			

VG1000 Series Forged Brass Ball Valves for Assembly in the Field (Continued)

Valid Ball Valve, Electric Actuator, Linkage Kit, and Weather Shield Combinations (for Assembly in the Field) (Part 3 of 3)

Valve Size, in. (DN)	Valve Code Numbers			Actuator Base Number ¹	Linkage Kit Code Number			Weather Shield
	NPT End Connection	Sweat End Connection	Press End Connection		Fluid Temperatures (<203°F [95°C])	Fluid Temperatures (<212°F [100°C])	Fluid Temperatures (≥212°F [100°C])	
2 (DN50)	VG1241Fx VG1841Fx			VA9300	None Required	Not Rated	Not Rated	M9000-342
				M9300	M9310-500			
				VA9208	None Required			
				M9208	M9000-560			
	VG1245Fx VG1845Fx			VA9300	None Required		M9000-561	
				M9300	M9310-500			
				VA9208	None Required			
				M9208	M9000-560			

1. VA9104, M9104, VA9300, and M9300 Series Actuators are non-spring-return, and VA9203, M9203, VA9208, and M9208 Series Actuators are spring-return. Note: VA9104, M9104, VA9300, M9300, VA9203, M9203, VA9208, and M9208 have a maximum fluid temperature limit of 212°F (100°C) unless used with the M9000-561 Thermal Barrier.
2. To avoid excessive wear or drive time on the motor for VA9104 and M9104 use a controller and/or software that provides a timeout function to remove the signal at the end of rotation (stall). The IGx and GGx models have an automatic shutoff to avoid excessive wear or drive time on the motor.

Ball Valves (for Assembly in the Field)¹

Size, in. (mm)	Closeoff psig	Characterizing Disc	Control Port Cv (Kvs)	Bypass Port Cv (Kvs) (Three-Way Only)	Plated Brass Ball and Stem 23°F to 203°F (-5°C to 95°C) Fluid Temperature		Stainless Steel Ball and Stem -22°F to 284°F (-30°C to 140°C) Fluid Temperature, 15 psi Saturated Steam	
					Two-Way	Three-Way	Two-Way	Three-Way
					NPT Threaded End Connection Valves			
1/2 (DN15)	200	Yes	1.2 (1.0)	0.7 (0.6)	VG1241AD	VG1841AD	VG1245AD	VG1845AD
			1.9 (1.6)	1.2 (1.0)	VG1241AE	VG1841AE	VG1245AE	VG1845AE
			2.9 (2.5)	1.9 (1.6)	VG1241AF	VG1841AF	VG1245AF	VG1845AF
			4.7 (4.0)	2.9 (2.5)	VG1241AG	VG1841AG	VG1245AG	VG1845AG
			7.4 (6.3)	4.7 (4.0)	VG1241AL	VG1841AL	VG1245AL	VG1845AL
		No	11.7 (10.0)	5.8 (5.0)	VG1241AN	VG1841AN	VG1245AN	VG1845AN
3/4 (DN20)	200	Yes	4.7 (4.0)	2.9 (2.5)	VG1241BG	VG1841BG	VG1245BG	VG1845BG
		No	7.4 (6.3)	4.7 (4.0)	VG1241BL	VG1841BL	VG1245BL	VG1845BL
			11.7 (10.0)	5.8 (5.0)	VG1241BN	VG1841BN	VG1245BN	VG1845BN
1 (DN25)	200	Yes	7.4 (6.3)	4.7 (4.0)	VG1241CL	VG1841CL	VG1245CL	VG1845CL
		No	11.7 (10.0)	5.8 (5.0)	VG1241CN	VG1841CN	VG1245CN	VG1845CN
			18.7 (16.0)	9.4 (8.0)	VG1241CP	VG1841CP	VG1245CP	VG1845CP
1-1/4 (DN32)	200	Yes	11.7 (10.0)	5.8 (5.0)	VG1241DN	VG1841DN	VG1245DN	VG1845DN
		No	18.7 (16.0)	9.4 (8.0)	VG1241DP	VG1841DP	VG1245DP	VG1845DP
			29.2 (25.0)	14.6 (12.5)	VG1241DR	VG1841DR	VG1245DR	VG1845DR
1-1/2 (DN40)	200	Yes	18.7 (16.0)	9.4 (8.0)	VG1241EP	VG1841EP	VG1245EP	VG1845EP
		No	29.2 (25.0)	14.6 (12.5)	VG1241ER	VG1841ER	VG1245ER	VG1845ER
			46.8 (40.0)	23.4 (20.0)	VG1241ES	VG1841ES	VG1245ES	VG1845ES
2 (DN50)	200	Yes	29.2 (25.0)	14.6 (12.5)	VG1241FR	VG1841FR	VG1245FR	VG1845FR
		No	46.8 (40.0)	23.4 (20.0)	VG1241FS	VG1841FS	VG1245FS	VG1845FS
			73.7 (63.0)	36.8 (31.5)	VG1241FT	VG1841FT	VG1245FT	VG1845FT

1. Before retrofitting older valves with VA9104, VA9300, VA9203, or VA9208 actuators, be sure that the valves have a tapped hole in the center of the valve stem and no threads in the flange holes. These direct-mount actuators do not fit older valves designed without a tapped center stem hole or with threaded flange mounting holes unless they are used with the M9000-561 Thermal Barrier kit.

Repair Parts

Linkage	Replacement Description	Code Number
M9000-560	Linkage for VA9203/M9203 and VA9203/M9208 Series Actuators	Unit Replacement
M9000-561	Thermal Barrier for VA9104/VA9203/VA9208/VA9300Series Actuators	Unit Replacement
M9310-500	Linkage for VA9300/M9300 Actuators	Unit Replacement

VG1000 Series Forged Brass Ball Valves for Assembly in the Field (Continued)

Technical Specifications

VG1000 Series Forged Brass Ball Valves for Assembly in the Field		
Service¹		Hot water, chilled water, 50/50 Glycol solutions, and 15 psig (103 kPa) saturated steam ² for HVAC systems
Fluid Temperature Limits	Water	VG12x1 and VG18x1 Series: 23°F to 203°F (-5°C to 95°C)
		VG12x5 and VG18x5 Series: -22°F to 284°F (-30°C to 140°C)
	Steam²	VG12x1 and VG18x1 Series: Not Rated for Steam Service
		VG12x5 and VG18x5 Series: 15 psig (103 kPa) at 250°F (121°C)
Maximum Actuator Fluid Temperature Limits	212°F (100°C)	VA9104, VA9300, VA9203, VA9208
	284°F (140°C)	VA9104, VA9300, VA9203, VA9208 with M9000-561 Thermal Barrier
Valve Body Pressure Rating	Water	VG1241, VG1245, VG1841, and VG1845 Series: 580 psig (4,000 kPa) (PN40), 464 psig (3,196 kPa) at 284°F (140°C) (PN40)
		VG1275 and VG1875 Series: 300 psig (2,067 kPa)
		VG1295 and VG1895 Series: 300 psig (2,067 kPa)
	Steam²	15 psig (103 kPa) saturated steam
Maximum Closeoff Pressure	VG12x1 and VG12x5 Series:	200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (340 kPa)
Flow Characteristics	Two-Way	Equal percentage
	Three-Way	Equal percentage flow characteristics of in-line port (coil) and linear flow characteristics of angle port (bypass)
Rangeability³		Greater than 500:1
Minimum Ambient Operating Temperature	-4°F (-20°C)	VA9104 Series Non-Spring-Return Actuators
	-22°F (-30°C)	VA9203 and VA9300 Series Spring-Return Actuators
	-40°F (-40°C)	VA9208 Series Spring-Return Actuators
Maximum Ambient Operating Temperature² (Limited by the Actuator and Linkage)	140°F (60°C)	VA9104 and M9300 Series Non-Spring-Return Actuators VA9203 and VA9208 Series Spring-Return Actuators
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
		1% of maximum flow for three-way bypass port
End Connections		NPT: 1/2 through 2 in.
		Sweat: 1/2 through 1 in. (DN15 through DN25)
		Press (ProPress® Compatible): 1/2 through 1 in. (DN15 through DN25)
Materials	Body	Forged Brass
	Ball	VG12x1 and VG18x1 Series: chrome plated brass
		VG12x5 and VG18x5 Series: 300 Series stainless steel
	Blowout-Proof Stem	VG12x1 and VG18x1 Series: nickel plated brass
		VG12x5 and VG18x5 Series: 300 Series stainless steel
	Seats	Graphite-Reinforced PTFE with EPDM O-Ring backing
	Stem Seals	EPDM Double O-Rings
	Characterizing Disk	AMODEL® AS-1145HS Polyphthalamide Resin
Compliance CRN		For NPT threaded valves with stainless steel ball (VG1x45...): 0C16910.5C

1. Refer to the VDI 2035 Guideline for recommended proper water treatment.

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

3. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.

VG1000 Smart Ball Valves

Description

VG1000 Series Ball Valves are designed to control the flow of hot or chilled water in HVAC systems. Available in sizes 1/2 through 1 in. (DN15 through DN25), this family of two- and three-way forged brass valves is factory or field mounted to Johnson Controls® VMA Modular Assembly Controller Series. The controller allows for a customized response to environmental conditions and is particularly well suited for applications such as chilled beams and fan coils.

Features

- factory-mounted VMA1656 programmable VAV box controller series
- forged brass body
- Amodel® flow characterizing disk
- 200 psi closeoff pressure rating
- chrome-plated brass ball and stem assembly standard
- 500:1 rangeability



**VG1000 Series Ball Valves Shown
with Factory-Mounted VMA**

Selection Chart

Ordering Data¹

V	Valve Global														
1	Product		1 = Forged Brass Ball Valve												
3	Family														
2	Body Type and Flow Characteristic		2 = Two-Way, with Equal Percentage Flow Characteristics												
4			8 = Three-Way Mixing, with Equal Percentage Flow Characteristics of In-line Port and Linear Flow Characteristics of Angle-Port												
4	End Connection		4 = Threaded - NPT Taper												
5															
1	Trim		1 = Chrome-Plated Brass Ball and Nickel-Plated Brass Stem												
6															
A	E	Size and Maximum Cv (Kvs = Cv x 0.857)	Size	Control Disk	Control Port Cv (Kvs)	Bypass Port Cv (Kvs) (Three-Way Only)									
7	8		AD = 1/2 in. (DN15)	Yes	1.2 (1.0)	0.7 (0.6)									
			AE = 1/2 in. (DN15)	Yes	1.9 (1.6)	1.2 (1.0)									
			AF = 1/2 in. (DN15)	Yes	2.9 (2.5)	1.9 (1.6)									
			AG = 1/2 in. (DN15)	Yes	4.7 (4.0)	2.9 (2.5)									
			AL = 1/2 in. (DN15)	Yes	7.4 (6.3)	4.7 (4.0)									
			AN = 1/2 in. (DN15)	No	11.7 (10.0)	5.8 (5.0)									
			BG = 3/4 in. (DN20)	Yes	4.7 (4.0)	2.9 (2.5)									
			BL = 3/4 in. (DN20)	Yes	7.4 (6.3)	4.7 (4.0)									
			BN = 3/4 in. (DN20)	No	11.7 (10.0)	5.8 (5.0)									
			CL = 1 in. (DN25)	Yes	7.4 (6.3)	4.7 (4.0)									
		CN = 1 in. (DN25)	Yes	11.7 (10.0)	7.4 (6.3)										
		CP = 1 in. (DN25)	No	18.7 (16.0)	9.4 (8.0)										
+	Actuator		+ = Factory-Mounted Actuator												
9	Mounting		(Leave Fields 9 through 15 blank for valve without factory-mounted actuator.) H = High Temperature Linkage (VA9104, VA9203, and VA9208 actuators)												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	= Field
V	G	1	2	4	1	A	E	+							
Valve								+	Actuator						
Example: Forged brass ball valve, two-way, threaded (NPT), brass trim, equal %, 1/2 in. (DN15) 1.9 Cv.															

Example: Forged brass ball valve, two-way, threaded (NPT), brass trim, equal %, 1/2 in. (DN15) 1.9 Cv.

1. Before retrofitting older valves with VMA1656 Modular Assembly Controller Series be sure that the valves have a tapped hole in the center of the valve stem and no threads in the flange holes. These direct mount actuators do not fit older valves designed without a tapped center stem hole or with threaded flange mounting holes.

VG1000 Smart Ball Valves (Continued)

Ordering Data – Adding a Factory-Mounted Electric Actuator¹

V	G	1	2	4	1	A	E	+							Actuator	+ = Factory-Mounted Actuator H = High Temperature Linkage (VA9104, VA9203, and VA9208 actuators)		
									9							Mounting	(Leave Fields 9 through 15 blank for valve without factory-mounted actuator.)	
									9							Actuator	9 = Direct Acting M9000 or VA9000 Series Actuator	
									10							Series		
									11	12					Actuator Series ²	T4 = VMA1656, Non-Spring Return, Tab Terminals (All 1/2, 3/4, and 1 in. Valves)		
										V	M	A				Control Type	VMA = VMA1656 24 VAC	
										13	14	15						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	= Field			
V	G	1	2	4	1	A	E	+	9	T	4	V	M	A				
Valve									+	Actuator								

Example: Forged brass ball valve, two-way, threaded (NPT), brass trim, equal %, 1/2 in. (DN15) 1.9 Cv, factory-mounted VMA1656 Modular Assembly Controller Series.

- Before retrofitting older valves with VMA Actuators, be sure that the valves have a tapped hole in the center of the valve stem and no threads in the flange holes. These direct mount actuators do not fit older valves designed without a tapped center stem hole or with threaded flange mounting holes.
- Refer to *Metasys® System Field Equipment Controllers and Related Products Product Bulletin (LIT-12011042)* for detailed VMA information.

Two-Way Chrome Plated Brass Trim Ball Valves, Non-Spring Return, VMA1656 Series Actuator with built-in Controller for Fluid Temperatures to 203°F

Fluid Temperature: 23°F to 203°F (-5°C to 95°C) Not Rated for Steam Service				AC 24 V
Valve	Size, in.	Cv	Closeoff psi	VMA1656 Series
VG1241AD	1/2	1.2 ¹	200	VG1241AD+9T4VMA
VG1241AE		1.9 ¹		VG1241AE+9T4VMA
VG1241AF		2.9 ¹		VG1241AF+9T4VMA
VG1241AG		4.7 ¹		VG1241AG+9T4VMA
VG1241AL		7.4 ¹		VG1241AL+9T4VMA
VG1241AN		11.7		VG1241AN+9T4VMA
VG1241BG	3/4	4.7 ¹	200	VG1241BG+9T4VMA
VG1241BL		7.4 ¹		VG1241BL+9T4VMA
VG1241BN		11.7		VG1241BN+9T4VMA
VG1241CL	1	7.4 ¹	200	VG1241CL+9T4VMA
VG1241CN		11.7 ¹		VG1241CN+9T4VMA
VG1241CP		18.7		VG1241CP+9T4VMA

1. Valve has a characterizing disk.

Three-Way Chrome Plated Brass Trim Ball Valves, Non-Spring Return, VMA1656 Electric Actuators for Fluid Temperatures to 203°F

Fluid Temperature: 23°F to 203°F (-5°C to 95°C) Not Rated for Steam Service				AC 24 V
Valve	Size, in.	Cv	Closeoff psi	VMA1656 Series
VG1841AD	1/2	1.2 ¹	200	VG1841AD+9T4VMA
VG1841AE		1.9 ¹		VG1841AE+9T4VMA
VG1841AF		2.9 ¹		VG1841AF+9T4VMA
VG1841AG		4.7 ¹		VG1841AG+9T4VMA
VG1841AL		7.4 ¹		VG1841AL+9T4VMA
VG1841AN		11.7		VG1841AN+9T4VMA
VG1841BG	3/4	4.7 ¹	200	VG1841BG+9T4VMA
VG1841BL		7.4 ¹		VG1841BL+9T4VMA
VG1841BN		11.7		VG1841BN+9T4VMA
VG1841CL	1	7.4 ¹	200	VG1841CL+9T4VMA
VG1841CN		11.7 ¹		VG1841CN+9T4VMA
VG1841CP		18.7		VG1841CP+9T4VMA

1. Valve has a characterizing disk.

VG1000 Smart Ball Valves (Continued)

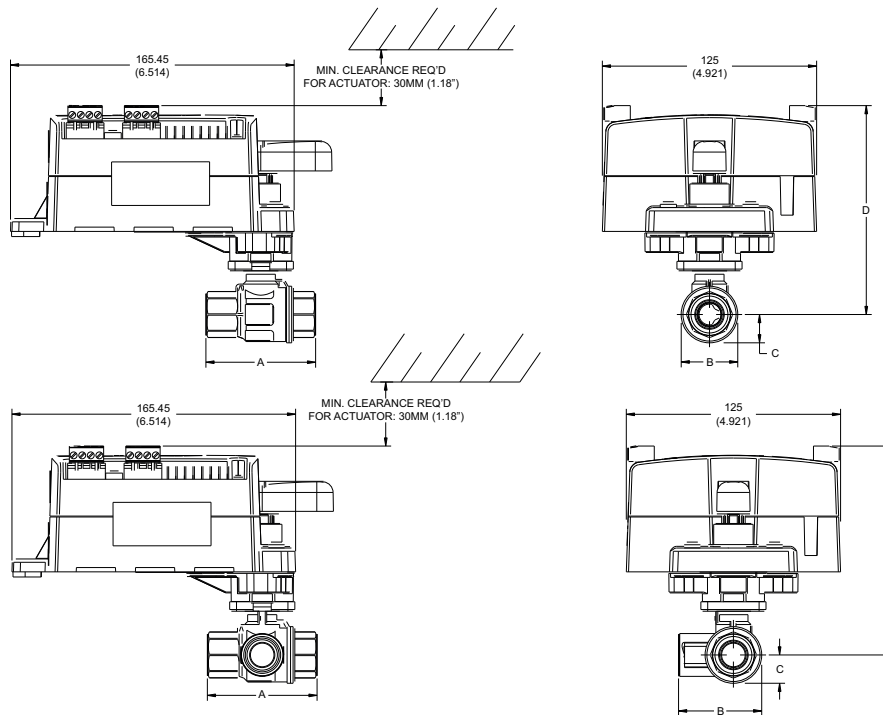
Shipping Weights, lb (kg) (Includes the VMA)

Valve Code Number	Description	Shipping Weight, lb (kg)
VG12xxAx	1/2 in. (DN15) Two-Way Forged Brass Ball Valve	1.6 (0.7)
VG12xxBx	3/4 in. (DN20) Two-Way Forged Brass Ball Valve	1.6 (0.7)
VG12xxCx	1 in. (DN25) Two-Way Forged Brass Ball Valve	1.6 (0.7)
VG18xxAx	1/2 in. (DN15) Three-Way Forged Brass Ball Valve	1.6 (0.7)
VG18xxBx	3/4 in. (DN20) Three-Way Forged Brass Ball Valve	1.6 (0.7)
VG18xxCx	1 in. (DN25) Three-Way Forged Brass Ball Valve	1.6 (0.7)

Repair Parts

Linkage	Replacement Description	Replacement Part Code Number
M9000-551	Linkage with Handle for VA9104 Series Actuators and VMA1656 Modular Assembly Controller Series	Unit Replacement
M9000-561	Thermal Barrier for VA9104/VA9203/VA9208 Series Actuators and VMA1656 Modular Assembly Controller Series	Unit Replacement

See the figure below for dimension drawings of the VMA1656, VG1241, and VG1841 Series NPT End Connection Ball Valves. See the table below for specific model linkage dimensions.



VMA1656 Actuated VG1241 and VG1841 Ball Valve with NPT End Connections Dimensions, in. (mm)

VMA1656 Actuated VG1241 and VG1841 Series Ball Valve with Optional M9000-551 Linkage Dimensions, in. (mm)

Valve Code Number	Valve Size, in. (DN) ¹	A	B	C	D
VG124XAX	1/2 (DN15)	2.52 (64)	1.34 (34)	0.67 (17)	4.80 (122)
VG124XBX	3/4 (DN20)	2.80 (71)	1.34 (34)	0.67 (17)	4.80 (122)
VG124XCX	3/4 (DN20)	3.43 (87)	1.50 (38)	0.75 (19)	4.88 (124)
VG184XAX	1/2 (DN15)	2.52 (64)	1.93 (49)	0.67 (17)	4.80 (122)
VG184XBX	3/4 (DN20)	2.80 (71)	2.09 (53)	0.67 (17)	4.80 (122)
VG184XCX	1 (DN25)	3.43 (87)	2.36 (60)	0.75 (19)	4.88 (124)

1. Port A must always be connected to the coil.

VG1000 Smart Ball Valves (Continued)

Technical Specifications

VG1000 Series Forged Brass Ball Valves

Service¹		Hot Water, Chilled Water, 50/50 Glycol Solutions
Fluid Temperature Limits	Water	VG12x1 and VG18x1 Series: 23 to 203°F (-5 to 95°C)
Maximum Actuator Fluid Temperature Limits	212°F (100°C)	VMA1656 Modular Assembly Controller Series
Valve Body Pressure/Temperature Rating	Water	580 psig (3,996 kPa) at 203°F (95°C) (PN40) 464 psig (3,196 kPa) at 284°F (140°C) (PN40)
Maximum Closeoff Pressure		200 psig (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psig (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
	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		32°F (0°C)
Maximum Ambient Operating Temperature³ (Limited by the Actuator and Linkage)		122°F (50°C): VMA1656 Series Non-Spring Return Actuators Modular Assembly Controller Series Direct Mount or With M9000-561 Thermal Barrier
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4 (Two- and Three-Way Control Port) 1% of Maximum Flow for Three-Way Bypass Port
End Connections		National Pipe Thread (NPT): 1/2 to 1 in. (DN15 to DN25)
Materials	Body	Forged Brass
	Ball	Chrome Plated Brass
	Blowout-Proof Stem	Nickel Plated Brass
	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 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.

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.



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.

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

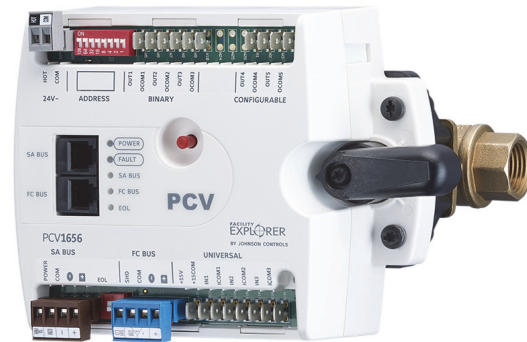
VG1000 Smart Ball Valves with FX-PCV Programmable VAV Box Controller Series

Description

VG1000 Series Ball Valves are designed to control the flow of hot or chilled water in HVAC systems. Available in sizes 1/2 through 1 in. (DN15 through DN25), this family of two- and three-way forged brass valves is factory or field mounted to Johnson Controls® FX-PCV Modular Assembly Controller Series. The controller allows for a customized response to environmental conditions and is particularly well suited for applications such as chilled beams and fan coils.

Features

- factory-mounted FX-PCV1656 programmable VAV box controller series
- forged brass body
- Amodel® flow characterizing disk
- 200 psi closeoff pressure rating
- chrome-plated brass ball and stem assembly standard
- 500:1 rangeability



**VG1000 Series Ball Valves Shown
with FX-PCV1656 Programmable VAV Box Controller**

Selection Chart

Ordering Data¹

V		Valve Global													
	1	Product		1 = Forged Brass Ball Valve											
	3	Family													
	2	Body Type and Flow Characteristic		2 = Two-Way, with Equal Percentage Flow Characteristics											
	4			8 = Three-Way Mixing, with Equal Percentage Flow Characteristics of In-line Port and Linear Flow Characteristics of Angle-Port											
	4	End Connection		4 = Threaded - NPT Taper											
	5														
	1	Trim		1 = Chrome-Plated Brass Ball and Nickel-Plated Brass Stem											
	6														
	A	E	Size and Maximum Cv	Size	Control Disk	Control Port Cv (Kvs)	Bypass Port Cv (Kvs) (Three-Way Only)								
	7	8	(Kvs = Cv x 0.857)	AD = 1/2 in. (DN15)	Yes	1.2 (1.0)	0.7 (0.6)								
				AE = 1/2 in. (DN15)	Yes	1.9 (1.6)	1.2 (1.0)								
				AF = 1/2 in. (DN15)	Yes	2.9 (2.5)	1.9 (1.6)								
				AG = 1/2 in. (DN15)	Yes	4.7 (4.0)	2.9 (2.5)								
				AL = 1/2 in. (DN15)	Yes	7.4 (6.3)	4.7 (4.0)								
				AN = 1/2 in. (DN15)	No	11.7 (10.0)	5.8 (5.0)								
				BG = 3/4 in. (DN20)	Yes	4.7 (4.0)	2.9 (2.5)								
				BL = 3/4 in. (DN20)	Yes	7.4 (6.3)	4.7 (4.0)								
				BN = 3/4 in. (DN20)	No	11.7 (10.0)	5.8 (5.0)								
				CL = 1 in. (DN25)	Yes	7.4 (6.3)	4.7 (4.0)								
				CN = 1 in. (DN25)	Yes	11.7 (10.0)	7.4 (6.3)								
				CP = 1 in. (DN25)	No	18.7 (16.0)	9.4 (8.0)								
			+	Actuator		+ = Factory-Mounted Actuator									
			9	Mounting		(Leave Fields 9 through 15 blank for valve without factory-mounted actuator.) H = High Temperature Linkage (VA9104, VA9203, and VA9208 actuators)									
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	= Field
V	G	1	2	4	1	A	E	+							
Valve								+ Actuator							
Example: Forged brass ball valve, two-way, threaded (NPT), brass trim, equal %, 1/2 in. (DN15) 1.9 Cv.															

Example: Forged brass ball valve, two-way, threaded (NPT), brass trim, equal %, 1/2 in. (DN15) 1.9 Cv.

1. Before retrofitting older valves with FX-PCV1656 Modular Assembly Controller Series be sure that the valves have a tapped hole in the center of the valve stem and no threads in the flange holes. These direct mount actuators do not fit older valves designed without a tapped center stem hole or with threaded flange mounting holes.

VG1000 Smart Ball Valves with FX-PCV Programmable VAV Box Controller Series (Continued)

Ordering Data – Adding a Factory-Mounted Electric Actuator¹

V	G	1	2	4	1	A	E	+							Actuator	+ = Factory-Mounted Actuator H = High Temperature Linkage (VA9104, VA9203, and VA9208 actuators)		
									9							Mounting	(Leave Fields 9 through 15 blank for valve without factory-mounted actuator.)	
									9							Actuator	9 = Direct Acting M9000 or VA9000 Series Actuator	
									10							Series		
									11	12							Actuator Series ² .	T4 = FX-PCV1656, Non-Spring Return, Tab Terminals (All 1/2, 3/4, and 1 in. Valves)
											P	C	V			Control Type	PCV = FX-PCV1656 24 VAC	
											13	14	15					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	= Field			
V	G	1	2	4	1	A	E	+	9	T	4	P	C	V				
Valve									+	Actuator						Example: Forged brass ball valve, two-way, threaded (NPT), brass trim, equal %, 1/2 in. (DN15) 1.9 Cv, factory-mounted FX-PCV1656 Modular Assembly Controller Series.		

- Before retrofitting older valves with FX-PCV Actuators, be sure that the valves have a tapped hole in the center of the valve stem and no threads in the flange holes. These direct mount actuators do not fit older valves designed without a tapped center stem hole or with threaded flange mounting holes.
- Refer to *FX-PCV Programmable Controllers and Related Products Product Bulletin (LIT-12011657)* for detailed FX-PCV information.

Two-Way Chrome Plated Brass Trim Ball Valves, Non-Spring Return, FX-PCV1656 Series Actuator with built-in Controller for Fluid Temperatures to 203°F

Fluid Temperature: 23 to 203°F (-5 to 95°C) Not Rated for Steam Service				AC 24 V
Valve	Size, in.	Cv	Closeoff psi	FX-PCV1656 Series
VG1241AD	1/2	1.2 ¹	200	VG1241AD+9T4PCV
VG1241AE		1.9 ¹		VG1241AE+9T4PCV
VG1241AF		2.9 ¹		VG1241AF+9T4PCV
VG1241AG		4.7 ¹		VG1241AG+9T4PCV
VG1241AL		7.4 ¹		VG1241AL+9T4PCV
VG1241AN		11.7		VG1241AN+9T4PCV
VG1241BG	3/4	4.7 ¹	200	VG1241BG+9T4PCV
VG1241BL		7.4 ¹		VG1241BL+9T4PCV
VG1241BN		11.7		VG1241BN+9T4PCV
VG1241CL	1	7.4 ¹	200	VG1241CL+9T4PCV
VG1241CN		11.7 ¹		VG1241CN+9T4PCV
VG1241CP		18.7		VG1241CP+9T4PCV

1. Valve has a characterizing disk.

Three-Way Chrome Plated Brass Trim Ball Valves, Non-Spring Return, FX-PCV1656 Electric Actuators for Fluid Temperatures to 203°F

Fluid Temperature: 23 to 203°F (-5 to 95°C) Not Rated for Steam Service				AC 24 V
Valve	Size, in.	Cv	Closeoff psi	FX-PCV1656 Series
VG1841AD	1/2	1.2 ¹	200	VG1841AD+9T4PCV
VG1841AE		1.9 ¹		VG1841AE+9T4PCV
VG1841AF		2.9 ¹		VG1841AF+9T4PCV
VG1841AG		4.7 ¹		VG1841AG+9T4PCV
VG1841AL		7.4 ¹		VG1841AL+9T4PCV
VG1841AN		11.7		VG1841AN+9T4PCV
VG1841BG	3/4	4.7 ¹	200	VG1841BG+9T4PCV
VG1841BL		7.4 ¹		VG1841BL+9T4PCV
VG1841BN		11.7		VG1841BN+9T4PCV
VG1841CL	1	7.4 ¹	200	VG1841CL+9T4PCV
VG1841CN		11.7 ¹		VG1841CN+9T4PCV
VG1841CP		18.7		VG1841CP+9T4PCV

1. Valve has a characterizing disk.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls www.johnsoncontrols.com

VG1000 Smart Ball Valves with FX-PCV Programmable VAV Box Controller Series (Continued)

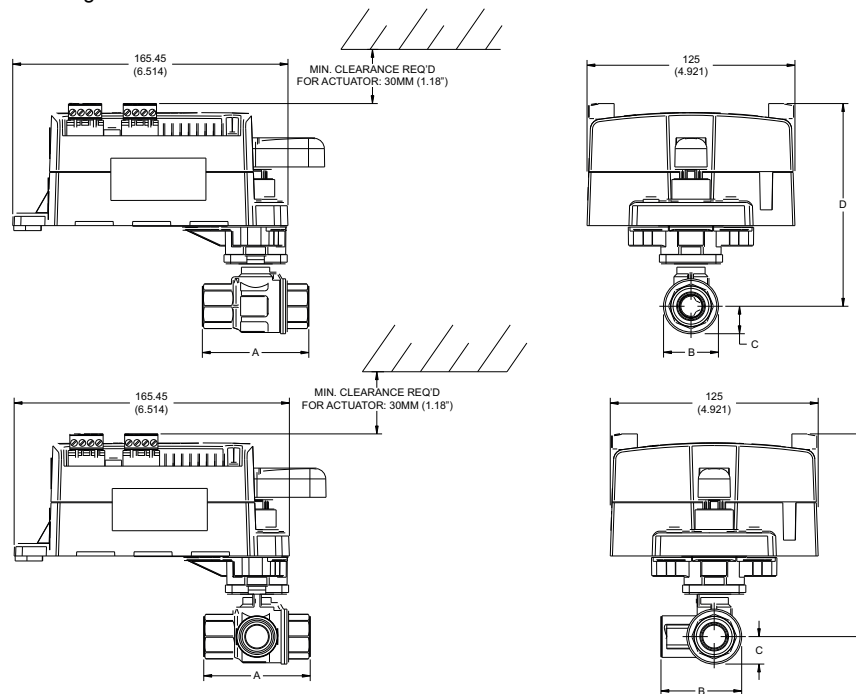
Shipping Weights, lb (kg) (Includes the FX-PCV)

Valve Code Number	Description	Shipping Weight, lb (kg)
VG12xxAx	1/2 in. (DN15) Two-Way Forged Brass Ball Valve	1.6 (0.7)
VG12xxBx	3/4 in. (DN20) Two-Way Forged Brass Ball Valve	1.6 (0.7)
VG12xxCx	1 in. (DN25) Two-Way Forged Brass Ball Valve	1.6 (0.7)
VG18xxAx	1/2 in. (DN15) Three-Way Forged Brass Ball Valve	1.6 (0.7)
VG18xxBx	3/4 in. (DN20) Three-Way Forged Brass Ball Valve	1.6 (0.7)
VG18xxCx	1 in. (DN25) Three-Way Forged Brass Ball Valve	1.6 (0.7)

Repair Parts

Linkage	Replacement Description	Replacement Part Code Number
M9000-551	Linkage with Handle for VA9104 Series Actuators and FX-PCV1656 Modular Assembly Controller Series	Unit Replacement
M9000-561	Thermal Barrier for VA9104/VA9203/VA9208 Series Actuators and FX-PCV1656 Modular Assembly Controller Series	Unit Replacement

See the figure below for dimension drawings of the FX-PCV1656, VG1241, and VG1841 Series NPT End Connection Ball Valves. See the table below for specific model linkage dimensions.



FX-PCV1656 Actuated VG1241 and VG1841 Ball Valve with
NPT End Connections Dimensions, in. (mm)

FX-PCV1656 Actuated VG1241 and VG1841 Series Ball Valve with Optional M9000-551 Linkage Dimensions, in. (mm)

Valve Code Number	Valve Size, in. (DN) ¹	A	B	C	D
VG124XAX	1/2 (DN15)	2.52 (64)	1.34 (34)	0.67 (17)	4.80 (122)
VG124XBX	3/4 (DN20)	2.80 (71)	1.34 (34)	0.67 (17)	4.80 (122)
VG124XCX	3/4 (DN20)	3.43 (87)	1.50 (38)	0.75 (19)	4.88 (124)
VG184XAX	1/2 (DN15)	2.52 (64)	1.93 (49)	0.67 (17)	4.80 (122)
VG184XBX	3/4 (DN20)	2.80 (71)	2.09 (53)	0.67 (17)	4.80 (122)
VG184XCX	1 (DN25)	3.43 (87)	2.36 (60)	0.75 (19)	4.88 (124)

1. Port A must always be connected to the coil.

VG1000 Smart Ball Valves with FX-PCV Programmable VAV Box Controller Series (Continued)

Technical Specifications

VG1000 Series Forged Brass Ball Valves

Service¹		Hot Water, Chilled Water, 50/50 Glycol Solutions
Fluid Temperature Limits	Water	VG12x1 and VG18x1 Series: 23 to 203°F (-5 to 95°C)
Maximum Actuator Fluid Temperature Limits	212°F (100°C)	FX-PCV1656 Programmable VAV Box Controller Series
Valve Body Pressure/Temperature Rating	Water	580 psig (3,996 kPa) at 203°F (95°C) (PN40) 464 psig (3,196 kPa) at 284°F (140°C) (PN40)
Maximum Closeoff Pressure		200 psig (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psig (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
	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		32°F (0°C)
Maximum Ambient Operating Temperature³ (Limited by the Actuator and Linkage)		122°F (50°C): FX-PCV1656 Series Non-Spring Return Actuators Modular Assembly Controller Series Direct Mount or With M9000-561 Thermal Barrier
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4 (Two- and Three-Way Control Port) 1% of Maximum Flow for Three-Way Bypass Port
End Connections		National Pipe Thread (NPT): 1/2 to 1 in. (DN15 to DN25)
Materials	Body	Forged Brass
	Ball	Chrome Plated Brass
	Blowout-Proof Stem	Nickel Plated Brass
	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 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.

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 shall not be liable for damages resulting from misapplication or misuse of its products.



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.

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

VG1000 Series Sweat End Connection Plated Brass Trim Ball Valves

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 1 in. (DN15 through DN25), this family of two- and three-way forged brass valves is factory or field mounted to Johnson Controls® VA9104 Series Non-Spring-Return and VA9203 Series Spring-Return Electric Actuators for on/off, floating, or proportional control. When supplied with an actuator, the actuator is not mounted to the valve to allow access to the end connections.

Refer to the *VG1000 Series Forged Brass Ball Valves Product Bulletin (LIT-977132)* for important product application information.

Features

- Forged Brass Body — provides 300 psig static pressure rating.
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals, providing better wear resistance.
- 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 Sweat End Connection Valves

Selection Charts

VG1000 Sweat End Connection Valves, Brass Trim, Non-Spring-Return Actuators with M3 Screw Terminal

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V		
				On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	DC 0 to 10 V Proportional
				VA9104-AGA-3S ²	VA9104-IGA-3S ²	VA9104-GGA-3S ²
Two-Way						
VG1271AD	1/2	1.2 ³	200	VG1271AD+9T4AGA	VG1271AD+9T4IGA	VG1271AD+9T4GGA
VG1271AE		1.9 ³		VG1271AE+9T4AGA	VG1271AE+9T4IGA	VG1271AE+9T4GGA
VG1271AF		2.9 ³		VG1271AF+9T4AGA	VG1271AF+9T4IGA	VG1271AF+9T4GGA
VG1271AG		4.7 ³		VG1271AG+9T4AGA	VG1271AG+9T4IGA	VG1271AG+9T4GGA
VG1271AL		7.4 ³		VG1271AL+9T4AGA	VG1271AL+9T4IGA	VG1271AL+9T4GGA
VG1271AN		11.7		VG1271AN+9T4AGA	VG1271AN+9T4IGA	VG1271AN+9T4GGA
VG1271BG	3/4	4.7 ³	200	VG1271BG+9T4AGA	VG1271BG+9T4IGA	VG1271BG+9T4GGA
VG1271BL		7.4 ³		VG1271BL+9T4AGA	VG1271BL+9T4IGA	VG1271BL+9T4GGA
VG1271BN		11.7		VG1271BN+9T4AGA	VG1271BN+9T4IGA	VG1271BN+9T4GGA
VG1271CL	1	7.4 ³	200	VG1271CL+9T4AGA	VG1271CL+9T4IGA	VG1271CL+9T4GGA
VG1271CN		11.7 ³		VG1271CN+9T4AGA	VG1271CN+9T4IGA	VG1271CN+9T4GGA
VG1271CP		18.7		VG1271CP+9T4AGA	VG1271CP+9T4IGA	VG1271CP+9T4GGA
Three-Way						
VG1871AD	1/2	1.2 ³	200	VG1871AD+9T4AGA	VG1871AD+9T4IGA	VG1871AD+9T4GGA
VG1871AE		1.9 ³		VG1871AE+9T4AGA	VG1871AE+9T4IGA	VG1871AE+9T4GGA
VG1871AF		2.9 ³		VG1871AF+9T4AGA	VG1871AF+9T4IGA	VG1871AF+9T4GGA
VG1871AG		4.7 ³		VG1871AG+9T4AGA	VG1871AG+9T4IGA	VG1871AG+9T4GGA
VG1871AL		7.4 ³		VG1871AL+9T4AGA	VG1871AL+9T4IGA	VG1871AL+9T4GGA
VG1871AN		11.7		VG1871AN+9T4AGA	VG1871AN+9T4IGA	VG1871AN+9T4GGA
VG1871BG	3/4	4.7 ³	200	VG1871BG+9T4AGA	VG1871BG+9T4IGA	VG1871BG+9T4GGA
VG1871BL		7.4 ³		VG1871BL+9T4AGA	VG1871BL+9T4IGA	VG1871BL+9T4GGA
VG1871BN		11.7		VG1871BN+9T4AGA	VG1871BN+9T4IGA	VG1871BN+9T4GGA
VG1871CL	1	7.4 ³	200	VG1871CL+9T4AGA	VG1871CL+9T4IGA	VG1871CL+9T4GGA
VG1871CN		11.7 ³		VG1871CN+9T4AGA	VG1871CN+9T4IGA	VG1871CN+9T4GGA
VG1871CP		18.7		VG1871CP+9T4AGA	VG1871CP+9T4IGA	VG1871CP+9T4GGA

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. Code numbers shown are for a VA9104-xGA-3S actuator with M3 screw terminals. To specify a 48-in. plenum rated cable, change the 9T4 to 9A4 in the code number for a VA9104-xGA-2S actuator. Example: VG1241AD+9T4AGA becomes VG1241AD+9A4AGA.
3. Valve has a characterizing disk.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

VG1000 Series Sweat End Connection Plated Brass Trim Ball Valves (Continued)

VG1000 Sweat End Connection Valves, Brass Trim, Spring-Return Actuators (Part 1 of 2)

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
Two-Way Spring Return Valve Open (Normally Open)							
VG1271AD	1/2	1.2 ¹	200	VG1271AD+923AGA	VG1271AD+923GGA	VG1271AD+923BGA	VG1271AD+923BUA
VG1271AE		1.9 ¹		VG1271AE+923AGA	VG1271AE+923GGA	VG1271AE+923BGA	VG1271AE+923BUA
VG1271AF		2.9 ¹		VG1271AF+923AGA	VG1271AF+923GGA	VG1271AF+923BGA	VG1271AF+923BUA
VG1271AG		4.7 ¹		VG1271AG+923AGA	VG1271AG+923GGA	VG1271AG+923BGA	VG1271AG+923BUA
VG1271AL		7.4 ¹		VG1271AL+923AGA	VG1271AL+923GGA	VG1271AL+923BGA	VG1271AL+923BUA
VG1271AN		11.7		VG1271AN+923AGA	VG1271AN+923GGA	VG1271AN+923BGA	VG1271AN+923BUA
VG1271BG	3/4	4.7 ¹	200	VG1271BG+923AGA	VG1271BG+923GGA	VG1271BG+923BGA	VG1271BG+923BUA
VG1271BL		7.4 ¹		VG1271BL+923AGA	VG1271BL+923GGA	VG1271BL+923BGA	VG1271BL+923BUA
VG1271BN		11.7		VG1271BN+923AGA	VG1271BN+923GGA	VG1271BN+923BGA	VG1271BN+923BUA
VG1271CL	1	7.4 ¹	200	VG1271CL+923AGA	VG1271CL+923GGA	VG1271CL+923BGA	VG1271CL+923BUA
VG1271CN		11.7 ¹		VG1271CN+923AGA	VG1271CN+923GGA	VG1271CN+923BGA	VG1271CN+923BUA
VG1271CP		18.7		VG1271CP+923AGA	VG1271CP+923GGA	VG1271CP+923BGA	VG1271CP+923BUA
Two-Way Spring Return Valve Closed (Normally Closed)							
VG1271AD	1/2	1.2 ¹	200	VG1271AD+943AGA	VG1271AD+943GGA	VG1271AD+943BGA	VG1271AD+943BUA
VG1271AE		1.9 ¹		VG1271AE+943AGA	VG1271AE+943GGA	VG1271AE+943BGA	VG1271AE+943BUA
VG1271AF		2.9 ¹		VG1271AF+943AGA	VG1271AF+943GGA	VG1271AF+943BGA	VG1271AF+943BUA
VG1271AG		4.7 ¹		VG1271AG+943AGA	VG1271AG+943GGA	VG1271AG+943BGA	VG1271AG+943BUA
VG1271AL		7.4 ¹		VG1271AL+943AGA	VG1271AL+943GGA	VG1271AL+943BGA	VG1271AL+943BUA
VG1271AN		11.7		VG1271AN+943AGA	VG1271AN+943GGA	VG1271AN+943BGA	VG1271AN+943BUA
VG1271BG	3/4	4.7 ¹	200	VG1271BG+943AGA	VG1271BG+943GGA	VG1271BG+943BGA	VG1271BG+943BUA
VG1271BL		7.4 ¹		VG1271BL+943AGA	VG1271BL+943GGA	VG1271BL+943BGA	VG1271BL+943BUA
VG1271BN		11.7		VG1271BN+943AGA	VG1271BN+943GGA	VG1271BN+943BGA	VG1271BN+943BUA
VG1271CL	1	7.4 ¹	200	VG1271CL+943AGA	VG1271CL+943GGA	VG1271CL+943BGA	VG1271CL+943BUA
VG1271CN		11.7 ¹		VG1271CN+943AGA	VG1271CN+943GGA	VG1271CN+943BGA	VG1271CN+943BUA
VG1271CP		18.7		VG1271CP+943AGA	VG1271CP+943GGA	VG1271CP+943BGA	VG1271CP+943BUA
Three-Way Spring Return Counterclockwise, Port A (Coil) Open							
VG1871AD	1/2	1.2 ¹	200	VG1871AD+923AGA	VG1871AD+923GGA	VG1871AD+923BGA	VG1871AD+923BUA
VG1871AE		1.9 ¹		VG1871AE+923AGA	VG1871AE+923GGA	VG1871AE+923BGA	VG1871AE+923BUA
VG1871AF		2.9 ¹		VG1871AF+923AGA	VG1871AF+923GGA	VG1871AF+923BGA	VG1871AF+923BUA
VG1871AG		4.7 ¹		VG1871AG+923AGA	VG1871AG+923GGA	VG1871AG+923BGA	VG1871AG+923BUA
VG1871AL		7.4 ¹		VG1871AL+923AGA	VG1871AL+923GGA	VG1871AL+923BGA	VG1871AL+923BUA
VG1871AN		11.7		VG1871AN+923AGA	VG1871AN+923GGA	VG1871AN+923BGA	VG1871AN+923BUA
VG1871BG	3/4	4.7 ¹	200	VG1871BG+923AGA	VG1871BG+923GGA	VG1871BG+923BGA	VG1871BG+923BUA
VG1871BL		7.4 ¹		VG1871BL+923AGA	VG1871BL+923GGA	VG1871BL+923BGA	VG1871BL+923BUA
VG1871BN		11.7		VG1871BN+923AGA	VG1871BN+923GGA	VG1871BN+923BGA	VG1871BN+923BUA
VG1871CL	1	7.4 ¹	200	VG1871CL+923AGA	VG1871CL+923GGA	VG1871CL+923BGA	VG1871CL+923BUA
VG1871CN		11.7 ¹		VG1871CN+923AGA	VG1871CN+923GGA	VG1871CN+923BGA	VG1871CN+923BUA
VG1871CP		18.7		VG1871CP+923AGA	VG1871CP+923GGA	VG1871CP+923BGA	VG1871CP+923BUA



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

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

VG1000 Series Sweat End Connection Plated Brass Trim Ball Valves (Continued)

VG1000 Sweat End Connection Valves, Brass Trim, Spring-Return Actuators (Part 2 of 2)

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
Three-Way Spring Return Clockwise, Port B (Bypass) Open							
VG1871AD	1/2	1.2 ¹	200	VG1871AD+943AGA	VG1871AD+943GGA	VG1871AD+943BGA	VG1871AD+943BUA
VG1871AE		1.9 ¹		VG1871AE+943AGA	VG1871AE+943GGA	VG1871AE+943BGA	VG1871AE+943BUA
VG1871AF		2.9 ¹		VG1871AF+943AGA	VG1871AF+943GGA	VG1871AF+943BGA	VG1871AF+943BUA
VG1871AG		4.7 ¹		VG1871AG+943AGA	VG1871AG+943GGA	VG1871AG+943BGA	VG1871AG+943BUA
VG1871AL		7.4 ¹		VG1871AL+943AGA	VG1871AL+943GGA	VG1871AL+943BGA	VG1871AL+943BUA
VG1871AN		11.7		VG1871AN+943AGA	VG1871AN+943GGA	VG1871AN+943BGA	VG1871AN+943BUA
VG1871BG	3/4	4.7 ¹	200	VG1871BG+943AGA	VG1871BG+943GGA	VG1871BG+943BGA	VG1871BG+943BUA
VG1871BL		7.4 ¹		VG1871BL+943AGA	VG1871BL+943GGA	VG1871BL+943BGA	VG1871BL+943BUA
VG1871BN		11.7		VG1871BN+943AGA	VG1871BN+943GGA	VG1871BN+943BGA	VG1871BN+943BUA
VG1871CL	1	7.4 ¹	200	VG1871CL+943AGA	VG1871CL+943GGA	VG1871CL+943BGA	VG1871CL+943BUA
VG1871CN		11.7 ¹		VG1871CN+943AGA	VG1871CN+943GGA	VG1871CN+943BGA	VG1871CN+943BUA
VG1871CP		18.7		VG1871CP+943AGA	VG1871CP+943GGA	VG1871CP+943BGA	VG1871CP+943BUA

1. Valve has a characterizing disk.

Accessories and Repair Parts

Linkage	Replacement Description
M9000-551	Ball Valve Linkage Kit with Handle for M9104 Series Actuators
M9000-560	Ball Valve Linkage Kit for M9203 Series Actuators

Technical Specifications

VG1000 Series Sweat End Connection Plated Brass Trim Ball Valves		
Service ¹		Hot Water, Chilled Water, and 50/50 Glycol Solutions for HVAC Systems
Fluid Temperature Limits		23°F to 203°F (-5°C to 95°C)
Valve Body Pressure Rating		300 psig, PN40
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psid (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
	Three-Way	Equal Percentage Flow Characteristics on the In-Line Port A (Coil) and Linear Flow Characteristics of the Angle Port B (Bypass)
Rangeability ²		Greater than 500:1
Minimum Ambient Operating Temperature	With VA9203 Series Spring-Return Actuators	-22°F (-30°C)
	With VA9104 Series Non-Spring-Return Actuators	-4°F (-20°C)
Maximum Ambient Operating Temperature	With VA9203 Series Spring-Return Actuators	122°F (50°C)
	With VA9104 Series Non-Spring-Return Actuators	140°F (60°C)
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
End Connections		Sweat Note: Use a Low Melting Point Solder.
Materials	Body	Forged Brass
	Ball	Chrome Plated Brass
	Blowout Proof Stem	Nickel Plated Brass
	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 Guideline.

2. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.

VG1000 Series Sweat End Connection Stainless Steel Trim Ball Valves

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 with Sweat End Connections in sizes 1/2 through 1 in. (DN15 through DN25), this family of two- and three-way forged brass valves is factory or field mounted to Johnson Controls® VA9104 Series Non-Spring-Return and VA9203 Series Spring-Return Electric Actuators for on/off, floating, or proportional control. When supplied with an actuator, the actuator is not mounted to the valve to allow access to the end connections for brazing.

Refer to the *VG1000 Series Forged Brass Ball Valves Product Bulletin (LIT-977132)* for important product application information.

Features

- Forged Brass Body — provides 300 psig static pressure rating.
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals, providing better wear resistance.
- 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 Sweat End Connection Valves

Selection Charts

VG1000 Sweat End Connection Valves, Stainless Steel Trim, Non-Spring-Return Actuators with M3 Screw Terminal

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V		
				On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	DC 0 to 10 V Proportional
				VA9104-AGA-3S ²	VA9104-IGA-3S ²	VA9104-GGA-3S ²
Two-Way						
VG1275AD	1/2	1.2 ³	200	VG1275AD+9T4AGA	VG1275AD+9T4IGA	VG1275AD+9T4GGA
VG1275AE		1.9 ³		VG1275AE+9T4AGA	VG1275AE+9T4IGA	VG1275AE+9T4GGA
VG1275AF		2.9 ³		VG1275AF+9T4AGA	VG1275AF+9T4IGA	VG1275AF+9T4GGA
VG1275AG		4.7 ³		VG1275AG+9T4AGA	VG1275AG+9T4IGA	VG1275AG+9T4GGA
VG1275AL		7.4 ³		VG1275AL+9T4AGA	VG1275AL+9T4IGA	VG1275AL+9T4GGA
VG1275AN		11.7		VG1275AN+9T4AGA	VG1275AN+9T4IGA	VG1275AN+9T4GGA
VG1275BG	3/4	4.7 ³	200	VG1275BG+9T4AGA	VG1275BG+9T4IGA	VG1275BG+9T4GGA
VG1275BL		7.4 ³		VG1275BL+9T4AGA	VG1275BL+9T4IGA	VG1275BL+9T4GGA
VG1275BN		11.7		VG1275BN+9T4AGA	VG1275BN+9T4IGA	VG1275BN+9T4GGA
VG1275CL	1	7.4 ³	200	VG1275CL+9T4AGA	VG1275CL+9T4IGA	VG1275CL+9T4GGA
VG1275CN		11.7 ³		VG1275CN+9T4AGA	VG1275CN+9T4IGA	VG1275CN+9T4GGA
VG1275CP		18.7		VG1275CP+9T4AGA	VG1275CP+9T4IGA	VG1275CP+9T4GGA
Three-Way						
VG1875AD	1/2	1.2/0.7 ³	200	VG1875AD+9T4AGA	VG1875AD+9T4IGA	VG1875AD+9T4GGA
VG1875AE		1.9/1.2 ³		VG1875AE+9T4AGA	VG1875AE+9T4IGA	VG1875AE+9T4GGA
VG1875AF		2.9/1.9 ³		VG1875AF+9T4AGA	VG1875AF+9T4IGA	VG1875AF+9T4GGA
VG1875AG		4.7/2.9 ³		VG1875AG+9T4AGA	VG1875AG+9T4IGA	VG1875AG+9T4GGA
VG1875AL		7.4/4.7 ³		VG1875AL+9T4AGA	VG1875AL+9T4IGA	VG1875AL+9T4GGA
VG1875AN		11.7/5.8		VG1875AN+9T4AGA	VG1875AN+9T4IGA	VG1875AN+9T4GGA
VG1875BG	3/4	4.7/2.9 ³	200	VG1875BG+9T4AGA	VG1875BG+9T4IGA	VG1875BG+9T4GGA
VG1875BL		7.4/4.7 ³		VG1875BL+9T4AGA	VG1875BL+9T4IGA	VG1875BL+9T4GGA
VG1875BN		11.7/5.8		VG1875BN+9T4AGA	VG1875BN+9T4IGA	VG1875BN+9T4GGA
VG1875CL	1	7.4/4.7 ³	200	VG1875CL+9T4AGA	VG1875CL+9T4IGA	VG1875CL+9T4GGA
VG1875CN		11.7/7.4 ³		VG1875CN+9T4AGA	VG1875CN+9T4IGA	VG1875CN+9T4GGA
VG1875CP		18.7/9.4		VG1875CP+9T4AGA	VG1875CP+9T4IGA	VG1875CP+9T4GGA

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. Code numbers shown are for a VA9104-xGA-3S actuator with M3 screw terminals. To specify a 120-in. plenum rated cable, change 9T4 to 9A4 in the code number for a VA9104-xGA-2S actuator. For example, VG1241AD+9T4AGA becomes VG1241AD+9A4AGA.
3. Valve has a characterizing disk.

VG1000 Series Sweat End Connection Stainless Steel Trim Ball Valves (Continued)

VG1000 Sweat End Connection Valves, Stainless Steel Trim, Spring-Return Actuators (Part 1 of 2)

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V			AC 85-264 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
Two-Way Spring Return Valve Open (Normally Open)							
VG1275AD	1/2	1.2 ¹	200	VG1275AD+923AGA	VG1275AD+923GGA	VG1275AD+923BGA	VG1275AD+923BUA
VG1275AE		1.9 ¹		VG1275AE+923AGA	VG1275AE+923GGA	VG1275AE+923BGA	VG1275AE+923BUA
VG1275AF		2.9 ¹		VG1275AF+923AGA	VG1275AF+923GGA	VG1275AF+923BGA	VG1275AF+923BUA
VG1275AG		4.7 ¹		VG1275AG+923AGA	VG1275AG+923GGA	VG1275AG+923BGA	VG1275AG+923BUA
VG1275AL		7.4 ¹		VG1275AL+923AGA	VG1275AL+923GGA	VG1275AL+923BGA	VG1275AL+923BUA
VG1275AN		11.7		VG1275AN+923AGA	VG1275AN+923GGA	VG1275AN+923BGA	VG1275AN+923BUA
VG1275BG	3/4	4.7 ¹	200	VG1275BG+923AGA	VG1275BG+923GGA	VG1275BG+923BGA	VG1275BG+923BUA
VG1275BL		7.4 ¹		VG1275BL+923AGA	VG1275BL+923GGA	VG1275BL+923BGA	VG1275BL+923BUA
VG1275BN		11.7		VG1275BN+923AGA	VG1275BN+923GGA	VG1275BN+923BGA	VG1275BN+923BUA
VG1275CL	1	7.4 ¹	200	VG1275CL+923AGA	VG1275CL+923GGA	VG1275CL+923BGA	VG1275CL+923BUA
VG1275CN		11.7 ¹		VG1275CN+923AGA	VG1275CN+923GGA	VG1275CN+923BGA	VG1275CN+923BUA
VG1275CP		18.7		VG1275CP+923AGA	VG1275CP+923GGA	VG1275CP+923BGA	VG1275CP+923BUA
Two-Way Spring Return Valve Closed (Normally Closed)							
VG1275AD	1/2	1.2 ¹	200	VG1275AD+943AGA	VG1275AD+943GGA	VG1275AD+943BGA	VG1275AD+943BUA
VG1275AE		1.9 ¹		VG1275AE+943AGA	VG1275AE+943GGA	VG1275AE+943BGA	VG1275AE+943BUA
VG1275AF		2.9 ¹		VG1275AF+943AGA	VG1275AF+943GGA	VG1275AF+943BGA	VG1275AF+943BUA
VG1275AG		4.7 ¹		VG1275AG+943AGA	VG1275AG+943GGA	VG1275AG+943BGA	VG1275AG+943BUA
VG1275AL		7.4 ¹		VG1275AL+943AGA	VG1275AL+943GGA	VG1275AL+943BGA	VG1275AL+943BUA
VG1275AN		11.7		VG1275AN+943AGA	VG1275AN+943GGA	VG1275AN+943BGA	VG1275AN+943BUA
VG1275BG	3/4	4.7 ¹	200	VG1275BG+943AGA	VG1275BG+943GGA	VG1275BG+943BGA	VG1275BG+943BUA
VG1275BL		7.4 ¹		VG1275BL+943AGA	VG1275BL+943GGA	VG1275BL+943BGA	VG1275BL+943BUA
VG1275BN		11.7		VG1275BN+943AGA	VG1275BN+943GGA	VG1275BN+943BGA	VG1275BN+943BUA
VG1275CL	1	7.4 ¹	200	VG1275CL+943AGA	VG1275CL+943GGA	VG1275CL+943BGA	VG1275CL+943BUA
VG1275CN		11.7 ¹		VG1275CN+943AGA	VG1275CN+943GGA	VG1275CN+943BGA	VG1275CN+943BUA
VG1275CP		18.7		VG1275CP+943AGA	VG1275CP+943GGA	VG1275CP+943BGA	VG1275CP+943BUA
Three-Way Spring Return Counterclockwise, Port A (Coil) Open							
VG1875AD	1/2	1.2/0.7 ¹	200	VG1875AD+923AGA	VG1875AD+923GGA	VG1875AD+923BGA	VG1875AD+923BUA
VG1875AE		1.9/1.2 ¹		VG1875AE+923AGA	VG1875AE+923GGA	VG1875AE+923BGA	VG1875AE+923BUA
VG1875AF		2.9/1.9 ¹		VG1875AF+923AGA	VG1875AF+923GGA	VG1875AF+923BGA	VG1875AF+923BUA
VG1875AG		4.7/2.9 ¹		VG1875AG+923AGA	VG1875AG+923GGA	VG1875AG+923BGA	VG1875AG+923BUA
VG1875AL		7.4/4.7 ¹		VG1875AL+923AGA	VG1875AL+923GGA	VG1875AL+923BGA	VG1875AL+923BUA
VG1875AN		11.7/5.8		VG1875AN+923AGA	VG1875AN+923GGA	VG1875AN+923BGA	VG1875AN+923BUA
VG1875BG	3/4	4.7/2.9 ¹	200	VG1875BG+923AGA	VG1875BG+923GGA	VG1875BG+923BGA	VG1875BG+923BUA
VG1875BL		7.4/4.7 ¹		VG1875BL+923AGA	VG1875BL+923GGA	VG1875BL+923BGA	VG1875BL+923BUA
VG1875BN		11.7/5.8		VG1875BN+923AGA	VG1875BN+923GGA	VG1875BN+923BGA	VG1875BN+923BUA
VG1875CL	1	7.4/4.7 ¹	200	VG1875CL+923AGA	VG1875CL+923GGA	VG1875CL+923BGA	VG1875CL+923BUA
VG1875CN		11.7/7.4 ¹		VG1875CN+923AGA	VG1875CN+923GGA	VG1875CN+923BGA	VG1875CN+923BUA
VG1875CP		18.7/9.4		VG1875CP+923AGA	VG1875CP+923GGA	VG1875CP+923BGA	VG1875CP+923BUA



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

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

VG1000 Series Sweat End Connection Stainless Steel Trim Ball Valves (Continued)

VG1000 Sweat End Connection Valves, Stainless Steel Trim, Spring-Return Actuators (Part 2 of 2)

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V			AC 85-264 V
				Floating	DC 0 to 10 V Proportional	On/Off	On/Off
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
Three-Way Spring Return Clockwise, Port B (Bypass) Open							
VG1875AD	1/2	1.2/0.7 ¹	200	VG1875AD+943AGA	VG1875AD+943GGA	VG1875AD+943BGA	VG1875AD+943BUA
VG1875AE		1.9/1.2 ¹		VG1875AE+943AGA	VG1875AE+943GGA	VG1875AE+943BGA	VG1875AE+943BUA
VG1875AF		2.9/1.9 ¹		VG1875AF+943AGA	VG1875AF+943GGA	VG1875AF+943BGA	VG1875AF+943BUA
VG1875AG		4.7/2.9 ¹		VG1875AG+943AGA	VG1875AG+943GGA	VG1875AG+943BGA	VG1875AG+943BUA
VG1875AL		7.4/4.7 ¹		VG1875AL+943AGA	VG1875AL+943GGA	VG1875AL+943BGA	VG1875AL+943BUA
VG1875AN		11.7/5.8		VG1875AN+943AGA	VG1875AN+943GGA	VG1875AN+943BGA	VG1875AN+943BUA
VG1875BG	3/4	4.7/2.9 ¹	200	VG1875BG+943AGA	VG1875BG+943GGA	VG1875BG+943BGA	VG1875BG+943BUA
VG1875BL		7.4/4.7 ¹		VG1875BL+943AGA	VG1875BL+943GGA	VG1875BL+943BGA	VG1875BL+943BUA
VG1875BN		11.7/5.8		VG1875BN+943AGA	VG1875BN+943GGA	VG1875BN+943BGA	VG1875BN+943BUA
VG1875CL	1	7.4/4.7 ¹	200	VG1875CL+943AGA	VG1875CL+943GGA	VG1875CL+943BGA	VG1875CL+943BUA
VG1875CN		11.7/7.4 ¹		VG1875CN+943AGA	VG1875CN+943GGA	VG1875CN+943BGA	VG1875CN+943BUA
VG1875CP		18.7/9.4		VG1875CP+943AGA	VG1875CP+943GGA	VG1875CP+943BGA	VG1875CP+943BUA

1. Valve has a characterizing disk.

Accessories and Repair Parts

Linkage	Replacement Description
M9000-551	Ball Valve Linkage Kit with Handle for M9104 Series Actuators
M9000-560	Ball Valve Linkage Kit for M9203 Series Actuators
M9000-561	Thermal Barrier for VA9104 and VA9203 Series Actuators

Technical Specifications

VG1000 Series Sweat End Connection Stainless Steel Trim Ball Valves		
Service ¹	Hot Water, Chilled Water, and 50/50 Glycol Solutions for HVAC Systems	
Fluid Temperature Limits, without M9000-561 Thermal Barrier	-22°F to 212°F (-30°C to 100°C)	
Fluid Temperature Limits, with M9000-561 Thermal Barrier	-22°F to 284°F (-30°C to 100°C)	
Valve Body Pressure Rating	300 psig, PN40	
Maximum Closeoff Pressure	200 psid (1,378 kPa)	
Maximum Recommended Operating Pressure Drop	50 psi (340 kPa)	
Flow Characteristics	Two-Way	Equal Percentage
	Three-Way	Equal Percentage Flow Characteristics on the In-Line Port A (Coil) and Linear Flow Characteristics of the Angle Port B (Bypass)
Rangeability ²	Greater than 500:1	
Minimum Ambient Operating Temperature	With VA9203 Series Spring-Return Actuators	-22°F (-30°C)
	With M9104 Series Non-Spring-Return Actuators	-4°F (-20°C)
Maximum Ambient Operating Temperature (Limited by the Actuator)	With VA9203 Series Spring-Return Actuators	140°F (60°C)
	With VA9104 Series Non-Spring-Return Actuators	140°F (60°C)
Leakage	0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4	
End Connections	Sweat Note: Use a Low Melting Point Solder.	
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 Guideline.

2. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.

VG1000 Series Press End Connection Stainless Steel Trim Ball Valves

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 1 in. (DN15 through DN25), this family of two- and three-way forged brass valves is factory or field mounted to Johnson Controls® VA9104 Series Non-Spring-Return and VA9203 Series Spring-Return Electric Actuators for on/off, floating, or proportional control. When supplied with an actuator, the actuator is not mounted to the valve to allow access to the end connections.

Refer to the *VG1000 Series Forged Brass Ball Valves Product Bulletin (LIT-977132)* for important product application information.

Features

- Forged Brass Body — provides 300 psig static pressure rating.
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats — include 15% graphite-reinforced ball seals, providing better wear resistance.
- 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.
- Press End Connections — designed to work with RIDGID® pressing tools, reducing installation costs.



VG1000 Series Press End Connection Valves



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.

Selection Charts

VG1000 Press End Connection Valves, Stainless Steel Trim, Non-Spring-Return Actuators with M3 Screw Terminal

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V		
				On/Off (Floating) without Timeout ¹	On/Off (Floating) with Timeout	0 to 10 VDC Proportional
				VA9104-AGA-3S ²	VA9104-IGA-3S ²	VA9104-GGA-3S ²
Two-Way						
VG1295AD	1/2	1.2 ³	200	VG1295AD+9T4AGA	VG1295AD+9T4IGA	VG1295AD+9T4GGA
VG1295AE		1.9 ³		VG1295AE+9T4AGA	VG1295AE+9T4IGA	VG1295AE+9T4GGA
VG1295AF		2.9 ³		VG1295AF+9T4AGA	VG1295AF+9T4IGA	VG1295AF+9T4GGA
VG1295AG		4.7 ³		VG1295AG+9T4AGA	VG1295AG+9T4IGA	VG1295AG+9T4GGA
VG1295AL		7.4 ³		VG1295AL+9T4AGA	VG1295AL+9T4IGA	VG1295AL+9T4GGA
VG1295AN		11.7		VG1295AN+9T4AGA	VG1295AN+9T4IGA	VG1295AN+9T4GGA
VG1295BG	3/4	4.7 ³	200	VG1295BG+9T4AGA	VG1295BG+9T4IGA	VG1295BG+9T4GGA
VG1295BL		7.4 ³		VG1295BL+9T4AGA	VG1295BL+9T4IGA	VG1295BL+9T4GGA
VG1295BN		11.7		VG1295BN+9T4AGA	VG1295BN+9T4IGA	VG1295BN+9T4GGA
VG1295CL	1	7.4 ³	200	VG1295CL+9T4AGA	VG1295CL+9T4IGA	VG1295CL+9T4GGA
VG1295CN		11.7 ³		VG1295CN+9T4AGA	VG1295CN+9T4IGA	VG1295CN+9T4GGA
VG1295CP		18.7		VG1295CP+9T4AGA	VG1295CP+9T4IGA	VG1295CP+9T4GGA
Three-Way						
VG1895AD	1/2	1.2 ³	200	VG1895AD+9T4AGA	VG1895AD+9T4IGA	VG1895AD+9T4GGA
VG1895AE		1.9 ³		VG1895AE+9T4AGA	VG1895AE+9T4IGA	VG1895AE+9T4GGA
VG1895AF		2.9 ³		VG1895AF+9T4AGA	VG1895AF+9T4IGA	VG1895AF+9T4GGA
VG1895AG		4.7 ³		VG1895AG+9T4AGA	VG1895AG+9T4IGA	VG1895AG+9T4GGA
VG1895AL		7.4 ³		VG1895AL+9T4AGA	VG1895AL+9T4IGA	VG1895AL+9T4GGA
VG1895AN		11.7		VG1895AN+9T4AGA	VG1895AN+9T4IGA	VG1895AN+9T4GGA
VG1895BG	3/4	4.7 ³	200	VG1895BG+9T4AGA	VG1895BG+9T4IGA	VG1895BG+9T4GGA
VG1895BL		7.4 ³		VG1895BL+9T4AGA	VG1895BL+9T4IGA	VG1895BL+9T4GGA
VG1895BN		11.7		VG1895BN+9T4AGA	VG1895BN+9T4IGA	VG1895BN+9T4GGA
VG1895CL	1	7.4 ³	200	VG1895CL+9T4AGA	VG1895CL+9T4IGA	VG1895CL+9T4GGA
VG1895CN		11.7 ³		VG1895CN+9T4AGA	VG1895CN+9T4IGA	VG1895CN+9T4GGA
VG1895CP		18.7		VG1895CP+9T4AGA	VG1895CP+9T4IGA	VG1895CP+9T4GGA

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. Code numbers shown are for a VA9104-xGA-3S actuator with M3 screw terminals. To specify a 48-in. plenum rated cable, change 9T4 to 9A4 in the code number for a VA9104-xGA-2S actuator. For example, VG1241AD+9T4AGA becomes VG1241AD+9A4AGA.
3. Valve has a characterizing disk.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

VG1000 Series Press End Connection Stainless Steel Trim Ball Valves (Continued)

VG1000 Press End Connection Valves, Stainless Steel Trim, Spring-Return Actuators

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V			AC 120 V
				Floating	0 to 10 VDC Proportional	On/Off	On/Off
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA-9203-BUA-2
Two-Way Spring Return Valve Open (Normally Open)							
VG1295AD	1/2	1.2 ¹	200	VG1295AD+923AGA	VG1295AD+923GGA	VG1295AD+923BGA	VG1295AD+923BUA
VG1295AE		1.9 ¹		VG1295AE+923AGA	VG1295AE+923GGA	VG1295AE+923BGA	VG1295AE+923BUA
VG1295AF		2.9 ¹		VG1295AF+923AGA	VG1295AF+923GGA	VG1295AF+923BGA	VG1295AF+923BUA
VG1295AG		4.7 ¹		VG1295AG+923AGA	VG1295AG+923GGA	VG1295AG+923BGA	VG1295AG+923BUA
VG1295AL		7.4 ¹		VG1295AL+923AGA	VG1295AL+923GGA	VG1295AL+923BGA	VG1295AL+923BUA
VG1295AN		11.7		VG1295AN+923AGA	VG1295AN+923GGA	VG1295AN+923BGA	VG1295AN+923BUA
VG1295BG	3/4	4.7 ¹	200	VG1295BG+22TAGA	VG1295BG+923GGA	VG1295BG+923BGA	VG1295BG+923BUA
VG1295BL		7.4 ¹		VG1295BL+923AGA	VG1295BL+923GGA	VG1295BL+923BGA	VG1295BL+923BUA
VG1295BN		11.7		VG1295BN+923AGA	VG1295BN+923GGA	VG1295BN+923BGA	VG1295BN+923BUA
VG1295CL	1	7.4 ¹	200	VG1295CL+923AGA	VG1295CL+923GGA	VG1295CL+923BGA	VG1295CL+923BUA
VG1295CN		11.7 ¹		VG1295CN+923AGA	VG1295CN+923GGA	VG1295CN+923BGA	VG1295CN+923BUA
VG1295CP		18.7		VG1295CP+923AGA	VG1295CP+923GGA	VG1295CP+923BGA	VG1295CP+923BUA
Two-Way Spring Return Valve Closed (Normally Closed)							
VG1295AD	1/2	1.2 ¹	200	VG1295AD+943AGA	VG1295AD+943GGA	VG1295AD+943BGA	VG1295AD+943BUA
VG1295AE		1.9 ¹		VG1295AE+943AGA	VG1295AE+943GGA	VG1295AE+943BGA	VG1295AE+943BUA
VG1295AF		2.9 ¹		VG1295AF+943AGA	VG1295AF+943GGA	VG1295AF+943BGA	VG1295AF+943BUA
VG1295AG		4.7 ¹		VG1295AG+943AGA	VG1295AG+943GGA	VG1295AG+943BGA	VG1295AG+943BUA
VG1295AL		7.4 ¹		VG1295AL+943AGA	VG1295AL+943GGA	VG1295AL+943BGA	VG1295AL+943BUA
VG1295AN		11.7		VG1295AN+943AGA	VG1295AN+943GGA	VG1295AN+943BGA	VG1295AN+943BUA
VG1295BG	3/4	4.7 ¹	200	VG1295BG+943AGA	VG1295BG+943GGA	VG1295BG+943BGA	VG1295BG+943BUA
VG1295BL		7.4 ¹		VG1295BL+943AGA	VG1295BL+943GGA	VG1295BL+943BGA	VG1295BL+943BUA
VG1295BN		11.7		VG1295BN+943AGA	VG1295BN+943GGA	VG1295BN+943BGA	VG1295BN+943BUA
VG1295CL	1	7.4 ¹	200	VG1295CL+943AGA	VG1295CL+943GGA	VG1295CL+943BGA	VG1295CL+943BUA
VG1295CN		11.7 ¹		VG1295CN+943AGA	VG1295CN+943GGA	VG1295CN+943BGA	VG1295CN+943BUA
VG1295CP		18.7		VG1295CP+943AGA	VG1295CP+943GGA	VG1295CP+943BGA	VG1295CP+943BUA

1. Valve has a characterizing disk.

Three-Way Spring-Return Actuators (Part 1 of 2)

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V			AC 85-264V
				Floating	0 to 10 VDC Proportional	On/Off	On/Off
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
Three-Way Spring Return Counterclockwise, Port A (Coil) Open							
VG1895AD	1/2	1.2 ¹	200	VG1895AD+923AGA	VG1895AD+923GGA	VG1895AD+923BGA	VG1895AD+923BUA
VG1895AE		1.9 ¹		VG1895AE+923AGA	VG1895AE+923GGA	VG1895AE+923BGA	VG1895AE+923BUA
VG1895AF		2.9 ¹		VG1895AF+923AGA	VG1895AF+923GGA	VG1895AF+923BGA	VG1895AF+923BUA
VG1895AG		4.7 ¹		VG1895AG+923AGA	VG1895AG+923GGA	VG1895AG+923BGA	VG1895AG+923BUA
VG1895AL		7.4 ¹		VG1895AL+923AGA	VG1895AL+923GGA	VG1895AL+923BGA	VG1895AL+923BUA
VG1895AN		11.7		VG1895AN+923AGA	VG1895AN+923GGA	VG1895AN+923BGA	VG1895AN+923BUA
VG1895BG	3/4	4.7 ¹	200	VG1895BG+923AGA	VG1895BG+923GGA	VG1895BG+923BGA	VG1895BG+923BUA
VG1895BL		7.4 ¹		VG1895BL+923AGA	VG1895BL+923GGA	VG1895BL+923BGA	VG1895BL+923BUA
VG1895BN		11.7		VG1895BN+923AGA	VG1895BN+923GGA	VG1895BN+923BGA	VG1895BN+923BUA
VG1895CL	1	7.4 ¹	200	VG1895CL+923AGA	VG1895CL+923GGA	VG1895CL+923BGA	VG1895CL+923BUA
VG1895CN		11.7 ¹		VG1895CN+923AGA	VG1895CN+923GGA	VG1895CN+923BGA	VG1895CN+923BUA
VG1895CP		18.7		VG1895CP+923AGA	VG1895CP+923GGA	VG1895CP+923BGA	VG1895CP+923BUA



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

VG1000 Series Press End Connection Stainless Steel Trim Ball Valves (Continued)

Three-Way Spring-Return Actuators (Part 2 of 2)

Valve Code Number	Size, in.	Cv (Control Port) / Cv (Bypass Port)	Closeoff psig	AC 24 V			AC 85-264V
				Floating	0 to 10 VDC Proportional	On/Off	On/Off
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
Three-Way Spring Return Clockwise, Port B (Bypass) Open							
VG1895AD	1/2	1.2 ¹	200	VG1895AD+943AGA	VG1895AD+943GGA	VG1895AD+943BGA	VG1895AD+943BUA
VG1895AE		1.9 ¹		VG1895AE+943AGA	VG1895AE+943GGA	VG1895AE+943BGA	VG1895AE+943BUA
VG1895AF		2.9 ¹		VG1895AF+943AGA	VG1895AF+943GGA	VG1895AF+943BGA	VG1895AF+943BUA
VG1895AG		4.7 ¹		VG1895AG+943AGA	VG1895AG+943GGA	VG1895AG+943BGA	VG1895AG+943BUA
VG1895AL		7.4 ¹		VG1895AL+943AGA	VG1895AL+943GGA	VG1895AL+943BGA	VG1895AL+943BUA
VG1895AN		11.7		VG1895AN+943AGA	VG1895AN+943GGA	VG1895AN+943BGA	VG1895AN+943BUA
VG1895BG	3/4	4.7 ¹	200	VG1895BG+943AGA	VG1895BG+943GGA	VG1895BG+943BGA	VG1895BG+943BUA
VG1895BL		7.4 ¹		VG1895BL+943AGA	VG1895BL+943GGA	VG1895BL+943BGA	VG1895BL+943BUA
VG1895BN		11.7		VG1895BN+943AGA	VG1895BN+943GGA	VG1895BN+943BGA	VG1895BN+943BUA
VG1895CL	1	7.4 ¹	200	VG1895CL+943AGA	VG1895CL+943GGA	VG1895CL+943BGA	VG1895CL+943BUA
VG1895CN		11.7 ¹		VG1895CN+943AGA	VG1895CN+943GGA	VG1895CN+943BGA	VG1895CN+943BUA
VG1895CP		18.7		VG1895CP+943AGA	VG1895CP+943GGA	VG1895CP+943BGA	VG1895CP+943BUA

1. Valve has a characterizing disk.

Accessories and Repair Parts

Linkage	Replacement Description
M9000-551	Ball Valve Linkage Kit with Handle for M9104 Series Actuators
M9000-560	Ball Valve Linkage Kit for M9203 Series Actuators

Technical Specifications

VG1000 Series Press End Connection Stainless Steel Trim Ball Valves		
Service ¹		Hot Water, Chilled Water, and 50/50 Glycol Solutions for HVAC Systems
Fluid Temperature Limits		-22°F to 212°F (-30°C to 100°C)
Valve Body Pressure Rating		300 psig, PN40
Maximum Closeoff Pressure		200 psid (1,378 kPa)
Maximum Recommended Operating Pressure Drop		50 psi (340 kPa)
Flow Characteristics	Two-Way	Equal Percentage
	Three-Way	Equal Percentage Flow Characteristics on the In-Line Port A (Coil) and Linear Flow Characteristics of the Angle Port B (Bypass)
Rangeability ²		Greater than 500:1
Minimum Ambient Operating Temperature	With VA9203 Series Spring-Return Actuators	-22°F (-30°C)
	With VA9104 Series Non-Spring-Return Actuators	-4°F (-20°C)
Maximum Ambient Operating Temperature	With VA9203 Series Spring-Return Actuators	140°F (60°C)
	With VA9104 Series Non-Spring-Return Actuators	140°F (60°C)
Leakage		0.01% of Maximum Flow per ANSI/FCI 70-2, Class 4
End Connections		Press (ProPress® Compatible, 1/2 through 1 in. Sizes) Press End Connections are Designed to Work with RIDGID Pressing Tools.
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 Guideline.

2. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.

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

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

VA9905 Series Actuators - VG1600 Series 270° Six-Way Ball Valves

Description

The VA9905 Series Electric Non-Spring Return Actuators are direct-mount actuators for VG1600 Series 270° Six-Way Ball Valves.

The easy-to-use mounting system of the VA9905 Series Electric Non-Spring Return Actuator and VG1600 Series 270° Six-Way Ball Valve reduces mistakes in the installation due to its intuitive assembly mechanism. The actuator is guided by plastic posts and tabs that align with the valve flange and stem notch for proper installation.

VG1600 Series 270° Six-Way Ball Valves are designed to easily and efficiently regulate the flow of both hot and chilled water in response to the demand of a controller in HVAC systems. It is a multi-input signal 24 V AC/DC actuator with Brushless DC Motor Technology. The actuator can also be configured for thermostat controlled On/Off heating and cooling applications and driven by a 24VAC thermostat or controller.

The 270° Six-Way Valve substitutes either four through valves or two through valves and one change-over valve. The true close-off feature, which is internal to the valve, isolates the Source 1 circuit from the Source 2 circuit.

The VG1600 is supplied with control flow disks providing the right flow rate for a wide range of applications. Available in 1/2 inch and 3/4 inch sizes, the valve is operated by a 270° rotary multi-input signal non-spring return actuator.

Refer to the *VA9905 and VG1600 Product Bulletin (LIT-12012553)* for important product application information.

Features

VA9905 Actuator

- Control Options:
 - 2 Analog Inputs
 - 1 Analog Input
 - 2 24VAC Inputs
- Microprocessor-Controlled Brushless DC Motor
- Mode Configuration Switches
- Simplified installation and field wiring
- Plenum-Rated Models
- Small Footprint
- NEMA5/IP54 Enclosure
- Position Indicator Handle and Manual Override
- Manufactured under ISO-9001 Quality Control Standards
- UL, CE Mark, and RCM Compliance
- 100,000 Cycles and 2.5 Million Repositions
- 5-Year Warranty

VG1600 270° Six-Way Ball Valves

- Available in NPT (internal), BSPP (external) and Sweat Union Fittings
- Forged Brass Body
- Ethylene Propylene Diene Monomer (EPDM) Double O-Ring Stem Seal
- Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats
- Maintenance – Free Design
- 100,000 full stroke cycles in iron oxide contaminated water
- Various valve configurations with just one valve size
- Available in 1/2 inch and 3/4 inch sizes
- Factory- Mounted VA9905 Series Electric Actuator



VA9905 Actuator and VG1600 6-way Valve

Repair Information

If the VA9905 Series Actuator or VG1600 Series 270° Six-Way Ball Valve fails to operate within its specifications, replace the unit. For a replacement VA9905 Actuator or VG1600 Ball Valve, contact the nearest Johnson Controls® representative.

Selection Chart

Valves and Actuators Ordering Codes

Code Number	Description
VG1641AF	Six-Way Ball Valve with 1/2" NPT internal threads
VG1671AF	Six-Way Ball Valve with 1/2" BSPP external threads + 6x Sweat Union Fitting
VG1641BL	Six-Way Ball Valve with 3/4" NPT internal threads
VG1671BL	Six-Way Ball Valve with 3/4" BSPP external threads + 6x Sweat Union Fitting
VA9905-KGA-2	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs
VG1641AF+905KGA	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs + Six-Way Ball Valve 1/2" NPT internal threads
VG1671AF+905KGA	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs + Six-Way Ball Valve 1/2" BSPP external threads + 6x Sweat Union Fitting
VG1641BL+905KGA	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs + Six-Way Ball Valve 3/4" NPT internal threads
VG1671BL+905KGA	Multi-Input Signal Actuator 5Nm furnished with 2 x 0(2)... 10V, 1 x 0(2)... 10V Analog Inputs, 2 x 24V Inputs + Six-Way Ball Valve 3/4" BSPP external threads + 6x Sweat Union Fitting

Note: Optional 0(4)...20mA control with field furnished 500 ohm 1/4" resistor for proportional control

Accessories Ordering Codes

Code Number	Description
VG1600-01	Mounting Bracket
VG1600-02	1/2" Flow Disk Kit (2 x flow disk sets + 2 x ring nut)
VG1600-03	1/2" Insulation Shell
VG1600-04	1/2" Sweat Union Fitting kits (6x sweat union fitting)
VG1600-05	3/4" Flow Disk Kit (2 x flow disk sets + 2 x ring nut)
VG1600-06	3/4" Insulation Shell
VG1600-07	3/4" Sweat Union Fitting kits (6x sweat union fitting)

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VA9905 Series Actuators - VG1600 Series 270° Six-Way Ball Valves (Continued)

Technical Specifications

VA9905 Actuator

Product description	VA9905-KGA-2 (North America): Multi-Input Signal mode actuator.
Power requirements	AC 24 V $\pm 20\%$ at 50/60 Hz, Class 2 (North America) or SELV (Europe), 4.7 VA Running; DC 24 V $\pm 10\%$ Class 2 (North America) or SELV (Europe), 1.4 W Running.
Transformer sizing requirements	≥ 6 VA
Input signal/adjustments	0 (2) to 10 VDC or 0 (4) to 20 mA with field furnished 500 ohm 1/4 W resistor for proportional control or 24VAC dual wire on/off control
Control impedance	100k ohm DC, 4.7k ohm AC
Rotation rate	1.5 ° per second
Cycles	100,000 full stroke cycles; 2,500,000 repositions
Audible noise	<35 dBA at 1 m (39-13/32 in.)
Electrical connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 0.75 mm ² (19 AWG cable) conductors and 0.25 in. (6 mm) ferrule ends
Conduit connections	1/2 in. NPSM threaded conduit
Ambient conditions	Operating: 32 to 140°F (0 to 60°C), 90% RH, noncondensing, Storage: -40 to 185°F (-40 to 85°C), 95% RH, noncondensing
Enclosure	IP54/NEMA 5
Dimensions	Width: 3-1/2 in. (89 mm), Height: 2-15/16 in. (74 mm), Length: 5-11/16 in. (170mm)
Shipping weight	1.75 lbs (0.8 Kg)
Compliance	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators, Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code. Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators. Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive. IEC 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements and IEC 60730-2-14, Automatic Electrical Controls for Household and Similar Use; Part 2—Particular Requirements for Electric Actuators Australia and New Zealand: RCM—Australia/NZ Emissions Compliant

VG1600 Six-Way Ball Valve

	VG16x1AF	VG16x1BL
Total operation angle	270°	
Sequence 1	0...>90°	
Dead band	>90...<180°	
Sequence 2	>180...270°	
Characteristic curve	Linear	
ID	10.5 mm	15mm
Fluid type	Water, glycol solutions (max 50%) for HVAC applications	
Fluid temperature	41 to 203 °F (5 to 95 °C)	
Nominal pressure	232 psi (PN16)	
Close off pressure	50 psi (350 kPa)	
Max. differential pressure	35 psi (240 kPa)	
Range ability	100:1	
Max. Cv (Kv)	3.3 (3.8) - 1/2" pipe size	6.3 (7.4) - 3/4" pipe size
Body	Brass CW 617N (UNI EN 12420)	
End Connection	Brass CW 617N (UNI EN 12420)	
Balls	Brass Chrome Plated	
Stems	Brass Chrome Plated	
Ball Seat	PTFE 15% Graphite Filled	
O-ring	EPDM PEROX	
Ring Nut	Brass CW 614N (UNI EN 12164 – UNI EN 12168)	
Connections	1/2 inch BSPP Thread (external), 1/2 inch NPT Thread (internal), or Sweat Union Fitting Kit	3/4 inch BSPP Thread (external), 3/4 inch NPT Thread (internal), or Sweat Union Fitting Kit
Flow coefficient	Flow control disk	
Leakage rate	A, 100,000 cycles in iron-oxide contaminated water and air-bubble-tight (EN 12266-1)	
Water quality	Iron-oxide contaminated water (900ppm)	
Maintenance	Maintenance Free	
Warranty	Minimum 5 years to our customer	
Shipping Weight	VG1641AF: 1.85 lbs (0.8 Kg), VG1671AF: 2.20 lbs (1 Kg)	VG1641BL: 3.69 lbs (1.7 Kg), VG1671BL: 4.13 lbs (1.9 Kg)

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

VA9905 Series Actuators - VG1600 Series 270° Six-Way Ball Valves (Continued)

⚠ WARNING

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

⚠ 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.

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

VA9104 Series Electric Non-Spring Return Valve Actuators

Description

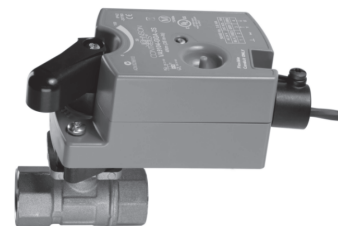
The VA9104 Series Actuators are direct-mount, non-spring return electric valve actuators that operate on AC 24 V or 100 to 240 V power. Use these synchronous motors or stepper motors (for line voltage models) driven actuators to provide accurate positioning on Johnson Controls® VG1000 Series DN15, DN20, and DN25 (1/2, 3/4, and 1 in.) ball valves in HVAC applications.

The VA9104 Series Electric Non-Spring Return Actuators provide a running torque of 35 lb-in (4 N-m). The nominal travel time is 60 seconds at 60 Hz for 90° of rotation.

Refer to the *VA9104 Series Electric Non-Spring Return Valve Actuators Product Bulletin (LIT-12011050)* for important product application information.

Features

- 35 dBA Maximum Audible Noise Rating
- Synchronous Drive
- 100,000 Cycle Rating
- Direct Mounting with Single Screw
- Manual Override
- Plenum Cable or Screw Terminal Electrical Connections
- 3/8 in. Flexible Metal Conduit Connector on VA9104-xxA-2S Models
- Available Weather Shield for Field Mounting
- Optional M9000-561 Thermal Barrier
- 5-Year Warranty



VA9104 Series Electric Non-Spring Return Valve Actuator on a VG1000 Series Ball Valve

Repair Information

If the VA9104 Series Electric Non-Spring Return Valve Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls representative.

Selection Chart

Code Number	Rotation Time For 90°	Power Requirement		Power Consumption		Input Signal			Position Feedback	Electrical Connection		
	Power On – Running (Seconds)	24 VAC + 25%/-20% at 50/60 Hz	85 to 265 V at 50/60 Hz	Amperage: Running	VA Rating, Transformer Sizing	Floating Point Without Timeout	On/Off and Floating Point With Timeout	0 (2) to 10 VDC 0 (4) to 20 mA (with 500 ohm Resistor)	0(2) to 10 VDC	48 in. (1.2 m) UL 444 Type CMP Plenum Rated Cable With 19 AWG (0.75 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends and Connector for 3/8 in. (9.5 mm) Flexible Metal Conduit	48 in. (1.2 m) with 18 AWG (1.02mm) conductors and connector for 3/8 in. (9.5 mm) flexible metal conduit	M3 Screw Terminals (Require a Slotted Screwdriver)
VA9104-AGA-2S	60 s at 60 Hz 72 s at 50 Hz	X			2.3	X				X		
VA9104-AGA-3S	60 s at 60 Hz 72 s at 50 Hz	X			2.3	X						X
VA9104-GGA-2S	60 s at 60 Hz 72 s at 50 Hz	X			2.9			X	X	X		
VA9104-GGA-3S	60 s at 60 Hz 72 s at 50 Hz	X			2.9			X				X
VA9104-IGA-2S	60 s at 60 Hz 72 s at 50 Hz	X			3.0		X			X		
VA9104-IGA-3S	60 s at 60 Hz 72 s at 50 Hz	X			3.0		X					X
VA9104-IUA-2S	60 s at 60 Hz 60 s at 50 Hz		X	0.07 A	7.5		X				X	

Accessories

Code Number	Description
M9000-342	Weather Shield Kit for VG1000 Series Ball Application of VA9104, VA9203, VA9208, and VA9308/9310 Series Electric Non-Spring Return Actuators (Quantity 1)
M9000-551	Mounting Hardware Replacement Kit (Quantity 1)
M9000-561	Thermal Barrier Kit for M9000-551 and M9000-560 Ball Valve Linkages. Extends the VA9104, VA9203, VA9208, and VA9308/9310 Series Electric Non-Spring Return Actuators Applications to Include Low-Pressure Steam (Quantity 1)
M9000-700	Universal Ball Valve Linkage (Quantity 1)

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

VA9104 Series Electric Non-Spring Return Valve Actuators (Continued)

Technical Specifications

Power Requirements	VA9104-xxx-xS	AC 24 V +25%/-20% at 50/60 Hz, 2.3 VA (-AGA), 2.9 VA (-GGA), 3.0 VA (-IGA) Supply, Class 2 or Safety Extra-Low Voltage (SELV)
	VA9104-IUA-xS	AC 100 to 240 V (-15%/+10%) at 50/60 Hz, 0.07 A Running, and 7.5 VA Supply
Control Type	VA9104-AGA-xS	Floating Control without Timeout
	VA9104-GGA-xS	Proportional Control
	VA9104-IxA-xS	Floating or On/Off Control with Timeout
Control Signal	VA9104-AGA-xS	AC 24 V +25%/-20% at 50/60 Hz, Class 2 or SELV Without Timeout
	VA9104-GGA-xS	DC 0 (2) to 10 V or 0 (4) to 20 mA With Field-Furnished 500 ohm Resistor
	VA9104-IGA-xS	AC 24 V +25%/-20% at 50/60 Hz, Class 2 or SELV With Timeout
	VA9104-IUA-xS	AC 100 to 240V -15%/+10% at 50/60 Hz, and 7.5 VA Supply
Control Input Impedance	VA9104-GGA-xS	Voltage Input: 200,000 ohm Current Input: 500 ohm With Field-Furnished 500 ohm Resistor
Running Torque		35 lb-in (4 N·m)
Travel Time	VA9104-xGA-xS	60 Seconds at 60 Hz (72 Seconds at 50 Hz) for 90° of Rotation
	VA9104-IUA-2S	60 Seconds for 90° of Rotation
Rotation Range		93° ±3°, CW or CCW
Cycles		100,000 Full Stroke Cycles; 2,500,000 Repositions at Rated Running Torque
Audible Noise Rating		35 dBA at 39-13/32 in. (1 m) maximum
Electrical Connections	VA9104-xxA-2S	48 in. (1.2 m) UL 444 Type CMP Plenum Rated cable with 18 AWG (1.02 mm ²) connector for 3/8 in. (9.5 mm) flexible metal conduit.
	VA9104-xGA-3S	M3 Screw Terminals (Requires a Slotted Screwdriver)
	VA9104-IUA-2S	48 in. (1.2 m) with 18 AWG (1.02 mm) conductors and connector for 3/8 in. (9.5 mm) flexible metal conduit.
Enclosure	VA9104-xxA-2S	NEMA 2, IP42
	VA9104-xGA-3S	NEMA 1, IP40
Ambient Conditions	Operating	-4°F to 140°F (-20°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 90% RH Maximum, Noncondensing
Fluid Temperature Limits (Actuator and Valve Assembly)	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C)
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C)
	VG12x5 and VG18x5 Series With M9000-561 Thermal Barrier Installed	-22°F to 284°F (-30°C to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
Compliance	United States	UL Listed, CCN XAPX, File 27734 Plenum rated, UL2043, suitable for use in other environmental spaces (plenums) in accordance with section 300.22.(c) of the National Electrical Code
	Canada	cUL Listed, CCN XAPX7, File 27734 Plenum Rated Per CSA 22.2 No. 236/UL 1995, Heating and Cooling Equipment
	Europe	Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping Weight		1.25 lb (0.55 kg)



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.

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

VA9203-xxx-xx Series Electric Spring-Return Actuators

Description

The VA9203-xxx-xx Series Electric Spring-Return Ball Valve Actuators are direct-mount valve actuators that operate on AC/DC 24 V power. These bidirectional actuators are used to provide accurate positioning on Johnson Controls® VG1000 Series 1/2, 3/4, and 1 in. (DN15, DN20, and DN25) ball valves in HVAC applications. A mechanical spring-return system provides rated torque with or without power applied to the actuator. The series includes the following control options:

- On/Off, 24 V, or 85 to 264 VAC power
- On/Off and Floating Point, 24 V power
- Proportional, 24 V power, for 0(2) to 10 VDC or 0(4) to 20 mA Control Signal

An accessory crankarm and remote mounting kit are available for applications where the actuator cannot be direct-coupled to the damper shaft. An optional line voltage auxiliary switch indicates an end-stop position or performs switching functions within the selected rotation range.

Refer to the *VA9203-xxx-xx Series Electric Spring-Return Actuators Product Bulletin (LIT-12011702)* for important product application information.

Features

- direct mounting with a single screw
- electronic stall detection
- double-insulated construction
- microprocessor-controlled brushless DC motor (-AGx and -GGx types)
- external mode selection switch (-AGx and -GGx types)
- integral cables with colored and numbered conductors
- integral connectors for 1/2 in. (13 mm) threaded conduit connector(s)
- optional integrated auxiliary switch
- plenum rated models
- optional thermal barrier
- available weather shield for field mounting
- override control (Proportional Models only)
- Underwriters Laboratories (UL), CE Mark, and C-Tick Compliance
- manufactured under International Standards Organization (ISO) 9001 Quality Control Standards
- 5-year warranty



VA9203 Series Electric Spring-Return Valve Actuator

Accessories and Replacement Parts

Code Number	Description
M9000-560	Ball Valve Linkage Kit for Applying M9203 and M9208 Series Actuators to VG1000 Series Valves (Quantity 1)
M9000-561	Thermal Barrier Extends M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring-Return Actuator Applications to Include Low-Pressure Steam (Quantity 1)
M9000-342	Weather Shield Kit for VG1000 Series Ball Valve Application of VA9104, VA9203, VA9208, and VA9308/9310 Series Electric Actuators (Quantity 1)
M9000-607	Position Indicator for VG1000 Series Ball Valve Applications (Quantity 5)
M9000-700	Universal Ball Valve Linkage Kit (Quantity 1)

Selection Chart

Code Number	Rotation Time (Seconds) for 90°		Power Requirement		Power Consumption			Input Signal		Position Feedback	Auxiliary Switch	Electrical Connection		
	Power On — Running	Power Off — Spring Return	24 VAC +/- 20% VDC +20%/-10%	85 to 264 VAC +/- 10%	VA Rating, Transformer Sizing	VA: Running (Holding)	Amperage: Running (Holding)	On/Off	On/Off and Floating Point			48 in. (1.2 m) 18 AWG Appliance Cable	120 in. (3.05 m) 19 AWG Plenum Cable	Integral 3/8 in. FMC Connectors
VA9203-AGA-2Z	90	< 25	■	■	6	5.1 (2.8)	—	■	■	0(2) to 10 VDC 0(4) to 20 mA (with 500 Ohm Resistor)	0(2) to 10 VDC	SPDT, 5.0 A (2.9 A Inductive) at 240 V	■	■
VA9203-AGB-2Z	90	< 25	■	■	6	5.1 (2.8)	—	■	■	■	■	■	■	■
VA9203-BGA-2	< 75	< 75	■	■	6	5.0 (2.5)	—	■	■	■	■	■	■	■
VA9203-BGB-2	< 75	< 75	■	■	6	5.0 (2.5)	—	■	■	■	■	■	■	■
VA9203-BUA-2	< 75	< 75	■	■	—	—	0.06 (0.02)	■	■	■	■	■	■	■
VA9203-BUB-2	< 75	< 75	■	■	—	—	0.06 (0.02)	■	■	■	■	■	■	■
VA9203-GGA-2Z	90	< 25	■	■	6	5.1 (2.8)	—	■	■	■	■	■	■	■
VA9203-GGB-2Z	90	< 25	■	■	6	5.1 (2.8)	—	■	■	■	■	■	■	■

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

VA9203-xxx-xx Series Electric Spring-Return Actuators (Continued)

Technical Specifications

VA9203-GGx-2Z Series Proportional Electric Spring-Return Actuator		
Power Requirements		AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 4.7 VA Running, 2.7 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe) 1.8 W Running, 1 W Holding Position Minimum Transformer Size: 6 VA per Actuator
Input Signal/Adjustments		Factory Set at DC 0 to 10 V, CW Rotation with Signal Increase Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with Field Furnished 500 Ohm, 0.25 W Minimum Resistor Switch Selectable Direct or Reverse Action with Signal Increase
Control Input Impedance		Voltage Input: 100,000 Ohms Current Input: 500 Ohms with Field Furnished 500 Ohm Resistor
Feedback Signal		DC 0 (2) to 10 V for Desired Rotation Range up to 95° Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum
Auxiliary Switch Rating	-xxB Models	One Single-Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A is away from Valve: CCW Spring Return Actuator Face Labeled B is away from Valve: CW Spring Return
Rated Torque	Power On (Running)	27 lb-in (3 N-m) All Operating Temperatures
	Power Off (Spring Returning)	27 lb-in (3 N-m) All Operating Temperatures
Rotation Range		Maximum Full Stroke: 95° Adjustable Stop: 35° to 95° Maximum Position
Rotation Time for 90 Degrees of Travel	Power On (Running)	90 Seconds Constant for 0 lb-in to 27 lb-in (3 N-m) Load, at All Operating Conditions
	Power Off (Spring Returning)	12 to 17 Seconds for 0 lb-in to 27 lb-in (3 N-m) Load, at Room Temperature 16 Seconds Nominal at Full Rated Load 22 Seconds Maximum with 27 lb-in (3 N-m) Load, at -22°F (-30°C)
Life Cycles		60,000 Full Stroke Cycles with 27 lb-in (3 N-m) Load 1,500,000 Repositions with 27 lb-in (3 N-m) Load
Audible Noise Rating	Power On (Running)	< 37 dBA at 27 lb-in (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at a Distance of 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 56 dBA at 27 lb-in (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	-GGA-2Z Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
	-GGB-2Z Models	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connector(s)
Fluid Temperature Limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22°F to 284°F (-30°C to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
Ambient Conditions	Standard Operating	-22°F to 140°F (-30°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
Compliance 	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and Low Voltage Directive 2006/95/EC
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping Weight	-GGA Models	2.0 lb (0.9 kg)
	-GGB Models	2.4 lb (1.1 kg)

VA9203-xxx-xx Series Electric Spring-Return Actuators (Continued)

VA9203-AGx-2Z Series On/Off and Floating Point Electric Spring-Return Actuators		
Power Requirements		AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 5.1 VA Running, 2.8 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe) 1.9 W Running, 1.1 W Holding Holding Position Minimum Transformer Size: 6 VA per Actuator
Input Signal/Adjustments		AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20%/-10% Class 2 (North America) or SELV (Europe) Minimum Pulse Width: 500 ms
Control Input Impedance		4,700 Ohm Control Inputs
Auxiliary Switch Rating	-xxB Models	One Single-Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A is away from Valve: CCW Spring Return Actuator Face Labeled B is away from Valve: CW Spring Return
Rated Torque	Power On (Running)	27 lb-in (3 N·m) All Operating Temperatures
	Power Off (Spring Returning)	27 lb-in (3 N·m) All Operating Temperatures
Rotation Range		Maximum Full Stroke: 95°
Rotation Time for 90 Degrees of Travel	Power On (Running)	90 Seconds Constant for 0 lb-in to 27 lb-in (3 N·m) Load, at All Operating Conditions
	Power Off (Spring Returning)	12 to 17 Seconds for 0 lb-in to 27 lb-in (3 N·m) Load, at Room Temperature 16 Seconds Nominal at Full Rated Load 22 Seconds Maximum with 27 lb-in (3 N·m) Load, at -22°F (-30°C)
Life Cycles		60,000 Full Stroke Cycles with 27 lb-in (3 N·m) Load 1,500,000 Repositions with 27 lb-in (3 N·m) Load
Audible Noise Rating	Power On (Running)	< 37 dBA at 27 lb-in (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at a Distance of 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 56 dBA at 27 lb-in (3 N·m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	-AGA-2Z Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
	-AGB-2Z Models	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connectors
Fluid Temperature Limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22°F to 284°F (-30°C to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
Ambient Conditions	Standard Operating	-22°F to 140°F (-30°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
Compliance 	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping Weight	-AGA Models	2.0 lb (0.9 kg)
	-AGB Models	2.4 lb (1.1 kg)

VA9203-xxx-xx Series Electric Spring-Return Actuators (Continued)

VA9203-Bxx-x Series On/Off Electric Spring-Return Actuator		
Power Requirements	-BGx-2 Models	AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 5 VA Running, 1.6 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe) 2.8 W Running, 0.8 W Holding Position Minimum Transformer Size: 6 VA per Actuator
	-BUx-2 Models	AC 100 V to 240 V (AC 85 V to 264 V) at 50/60 Hz: 0.06 A Running, 0.02 A Holding Position
Auxiliary Switch Rating	-xxB-2 Models	One Single-Pole, Double-Throw (SPDT), Double-Insulated Switch with Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A is away from Valve: CCW Spring Return Actuator Face Labeled B is away from Valve: CW Spring Return
Rated Torque	Power On (Running)	27 lb-in (3 N-m) All Operating Temperatures
	Power Off (Spring Returning)	27 lb-in (3 N-m) All Operating Temperatures
Rotation Range		Maximum Full Stroke: 95°
Rotation Time for 90 Degrees of Travel	Power On (Running) Bxx-2 Models	53 to 71 Seconds Constant for 0 lb-in to 27 lb-in (3 N-m) Load, at Room Temperature 60 Seconds Nominal at Full Rated Load (0.25 rpm)
	Power Off (Spring Returning)	37 to 46 Seconds for 0 lb-in to 27 lb-in (3 N-m) Load, at Room Temperature 44 Seconds Nominal at Full Rated Load 75 Seconds Maximum with 27 lb-in (3 N-m) Load at -22°F (-30°C)
Life Cycles		60,000 Full Stroke Cycles with 27 lb-in (3 N-m) Load
Audible Noise Rating	Power On (Running)	< 36 dBA at 27 lb-in (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at a Distance of 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 35 dBA at 27 lb-in (3 N-m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	Actuator (All Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
	Auxiliary Switches (-xxB-2 Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 0.25 in. (6 mm) Ferrule Ends
Conduit Connections		Integral 1/2 in. (13 mm) Threaded Conduit Connectors
Fluid Temperature Limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22°F to 284°F (-30°C to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
Ambient Conditions	Standard Operating	-22°F to 140°F (-30°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
Compliance	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant
Shipping Weight	-xxA Models	2.0 lb (0.9 kg)
	-xxB Models	2.4 lb (1.1 kg)

VA9208-xxx-xx Series Electric Spring-Return Actuators

Description

The VA9208-xxx-xx Series Electric Spring-Return Valve Actuators are direct-mount valve actuators. These bidirectional actuators are used to provide accurate positioning on Johnson Controls® VG1000 Series 1-1/4, 1-1/2, and 2 in. (DN32, DN40, and DN50) ball valves in HVAC applications. A mechanical spring-return system provides rated torque with and without power applied to the actuator. The series includes the following control responses:

- On/Off, 24 V, 120 VAC, 230 VAC power
- On/Off and Floating Point, 24 V power
- Proportional, 24 V power, for 0(2) to 10 VDC or 0(4) to 20 mA Control Signal

Optional line voltage auxiliary switches indicate an end-stop position or perform switching functions within the selected rotation range.

Refer to the *VA9208-xxx-x Series Electric Spring-Return Actuators Product Bulletin (LIT-12011622)* for important product application and single point of contact information.

Features

- direct mounting with a single screw
- electronic stall detection
- double-insulated construction
- microprocessor-controlled brushless DC motor (-AGx and -GGx Models)
- external mode selection switch (-AGx and -GGx Models)
- integral cables with colored and numbered conductors
- integral connectors for 3/8 in. (10 mm) Flexible Metal Conduit (FMC)
- optional integrated auxiliary switches
- plenum rated models
- optional thermal barrier
- override control (proportional models only)
- available weather shield for field mounting
- 5-year warranty



VA9208 Series Electric Spring-Return Valve Actuator

Accessories and Replacement Parts

Code Number	Description
M9000-560	Ball Valve Linkage Kit for Applying M9203 and M9208 Series Actuators to VG1000 Series Valves (Quantity 1)
M9000-561	Thermal Barrier Extends M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring-Return Actuator Applications to Include Low-Pressure Steam (Quantity 1)
M9000-341	Weather Shield Kit for VG1000 Series Ball Valve Application of M(VA)9104, M(VA)9203, and M(VA)9208 Series Electric Spring-Return Actuators (Quantity 1)
M9220-604	Replacement Manual Override Cranks with Long Crank Radius: 2.83 in. (72 mm) (Quantity 5)
M9208-605	Replacement Manual Override Cranks with Short Crank Radius: 1.83 in. (46.5 mm) (Quantity 5)

VA9208-xxx-xx Series Electric Spring-Return Actuators (Continued)

Selection Chart

Code Number	Rotation Time (Seconds) for 90°		Power Requirement				Power Consumption			Input Signal		Position Feedback	Auxiliary Switches	Electrical Connection			
	Power On (Running)	Power Off (Spring Return)	24 VAC +/- 25% VDC +20%/-10%	24 VAC +/- 20% VDC +20%/-10%	120 VAC +/- 10%	230 VAC +/- 10%	VA Rating, Transformer Sizing	VA: Running (Holding)	Amperage: Running (Holding)	On/Off	Floating Point	0(2) to 10 VDC 0(4) to 20 mA (with 500 Ohm Resistor)	0(2) to 10 VDC	2 SPDT, 5.0 A (2.9 A Inductive) at 240 V	48 in. (1.2 m) 18 AWG Appliance Cable	120 in. (3.05 m) 19 AWG Plenum Cable	Integral 3/8 in. FMC Connectors
VA9208-AGA-2	150	17 to 25 ¹		■			8	7.9 (5.5)		■	■					■	■
VA9208-AGA-3	150	17 to 25 ¹		■			8	7.9 (5.5)		■	■				■		■
VA9208-AGC-3	150	17 to 25 ¹		■			8	7.9 (5.5)		■	■			■	■		■
VA9208-BGA-3	55 to 71	13 to 26 ²	■				7	6.1 (1.2)		■					■		■
VA9208-BGC-3	55 to 71	13 to 26 ²	■				7	6.1 (1.2)		■				■	■		■
VA9208-BAA-3	55 to 71	13 to 26 ²			■			0.05 (0.03)		■					■		■
VA9208-BAC-3	55 to 71	13 to 26 ²			■			0.05 (0.03)		■				■	■		■
VA9208-BDA-3	55 to 71	13 to 26 ²				■		0.04 (0.03)		■					■		■
VA9208-BDC-3	55 to 71	13 to 26 ²				■		0.04 (0.03)		■				■	■		■
VA9208-GGA-2	150	17 to 25 ¹		■			8	7.9 (5.5)				■	■			■	■
VA9208-GGA-3	150	17 to 25 ¹		■			8	7.9 (5.5)				■	■		■		■
VA9208-GGC-3	150	17 to 25 ¹		■			8	7.9 (5.5)				■	■	■	■		■

1. 22 seconds nominal at room temperature and rated load, 94 seconds maximum at rated load and -40°F (-40°C).

2. 21 seconds nominal at room temperature and rated load, 39 seconds maximum at rated load and -4°F (-20°C), 108 seconds maximum at 53 lb-in (6 N·m) and -40°F (-40°C).

VA9208-xxx-xx Series Electric Spring-Return Actuators (Continued)

Technical Specifications

VA9208-GGx-xx Series On/Off and Floating Electric Spring-Return Actuators		
Power Requirements	-GGx Models	AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 7.9 VA Running, 5.5 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe) 3.5 W Running, 1.9 W Holding Position Minimum Transformer Size: 8 VA per Actuator
Input Signal/Adjustments	-GGx Models	Factory Set at DC 0 to 10 V, CW Rotation with Signal Increase Selectable DC 0 (2) to 10 V or 0 (4) to 20 mA with Field Furnished 500 Ohm, 0.25 W Minimum Resistor; Switch Selectable Direct or Reverse Action with Signal Increase
Control Input Impedance	-GGx Models	Voltage Input: 100,000 Ohms Current Input: 500 Ohms with Field Furnished 500 Ohm Resistor
Feedback Signal	-GGx Models	DC 0 (2) to 10 V for Desired Rotation Range up to 95° Corresponds to Rotation Limits, 0.5 mA at 10 V Maximum
Auxiliary Switch Rating	-xxC Models	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold over Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A is away from Valve: CCW Spring Return Actuator Face Labeled B is away from Valve: CW Spring Return
Rated Torque	Power On (Running)	70 lb-in (8 N·m) All Operating Temperatures
	Power Off (Spring Returning)	70 lb-in (8 N·m) All Operating Temperatures
Rotation Range		Maximum Full Stroke: 95° Adjustable Stop: 35° to 95° Maximum Position
Rotation Time for 90 Degrees of Travel	Power On (Running)	150 Seconds Constant for 0 lb-in to 70 lb-in (8 N·m) Load, at All Operating Conditions 90 Seconds for 0 lb-in to 70 lb-in (8 N·m) in Calibration Mode or Override Mode
	Power Off (Spring Returning)	17 to 25 Seconds for 0 lb-in to 70 lb-in (8 N·m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 94 Seconds Maximum with 70 lb-in (8 N·m) Load, at -40°F (-40°C)
Life Cycles		60,000 Full Stroke Cycles with 70 lb-in (8 N·m) Load 1,500,000 Repositions with 70 lb-in (8 N·m) Load
Audible Noise Rating	Power On (Running)	< 35 dBA at 70 lb-in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at a Distance of 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 52 dBA at 70 lb-in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	-GGx-3 Models	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
	-GGx-2 Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
	Auxiliary Switches (-xxC Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
Conduit Connections		Integral Connectors for 3/8 in. (10 mm) Flexible Metal Conduit
Fluid Temperature Limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22°F to 284°F (-30°C to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
Ambient Conditions	Standard Operating	-40°F to 140°F (-40°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
Compliance	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant
Shipping Weight	-GGA Models	3.5 lb (1.6 kg)
	-GGC Models	3.9 lb (1.8 kg)

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

VA9208-xxx-xx Series Electric Spring-Return Actuators (Continued)

VA9208-AGx-x Series On/Off and Floating Point Electric Spring-Return Actuators		
Power Requirements	-AGx Models	AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 7.9 VA Running, 5.5 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe) 3.5 W Running, 1.9 W Holding Position Minimum Transformer Size: 8 VA per Actuator
Input Signal/Adjustments	-AGx Models	AC 19.2 to 28.8 V at 50/60 Hz or DC 24 V +20%/-10% Class 2 (North America) or SELV (Europe) Minimum Pulse Width: 500 ms
Control Input Impedance	-AGx Models	3,000 Ohm Control Inputs
Auxiliary Switch Rating	-xxC Models	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold over Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A is away from Valve: CCW Spring Return Actuator Face Labeled B is away from Valve: CW Spring Return
Rated Torque	Power On (Running)	70 lb·in (8 N·m) All Operating Temperatures
	Power Off (Spring Returning)	70 lb·in (8 N·m) All Operating Temperatures
Rotation Range		Maximum Full Stroke: 95°
Rotation Time for 90 Degrees of Travel	Power On (Running)	150 Seconds for 0 lb·in to 70 lb·in (8 N·m) Load, at All Operating Conditions
	Power Off (Spring Returning)	17 to 25 Seconds for 0 lb·in to 70 lb·in (8 N·m) Load, at Room Temperature 22 Seconds Nominal at Full Rated Load 94 Seconds Maximum with 70 lb·in (8 N·m) Load, at -40°F (-40°C)
Life Cycles		60,000 Full Stroke Cycles with 70 lb·in (8 N·m) Load 1,500,000 Repositions with 70 lb·in (8 N·m) Load
Audible Noise Rating	Power On (Running)	< 35 dBA at 70 lb·in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at a Distance of 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 52 dBA at 70 lb·in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	-AGx-3 Models	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
	-AGx-2 Models	120 in. (3.05 m) UL 444 Type CMP Plenum Rated Cable with 19 AWG (0.75 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
	Auxiliary Switches (-xxC Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
Conduit Connections		Integral Connectors for 3/8 in. (10 mm) Flexible Metal Conduit
Fluid Temperature Limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22°F to 284°F (-30°C to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
Ambient Conditions	Standard Operating	-40°F to 140°F (-40°C to 60°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
Compliance	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant
Shipping Weight	-AGA Models	3.5 lb (1.6 kg)
	-AGC Models	3.9 lb (1.8 kg)

VA9208-xxx-xx Series Electric Spring-Return Actuators (Continued)

VA9208-Bxx-x Series On/Off Electric Spring-Return Actuator		
Power Requirements	-BGx Models	AC 24 V (AC 18 V to 30 V) at 50/60 Hz: Class 2 (North America) or Safety Extra-Low Voltage (SELV) (Europe), 6.1 VA Running, 1.2 VA Holding Position DC 24 V (DC 21.6 V to 28.8 V): Class 2 (North America) or SELV (Europe) 3.5 W Running, 0.5 W Holding Position Minimum Transformer Size: 7 VA per Actuator
	-BAx Models	AC 120 V (AC 102 V to 132 V) at 60 Hz: 0.05 A Running, 0.03 A Holding Position
	-BDx Models	AC 230 V (AC 198 V to 264 V) at 50/60 Hz: 0.04 A Running, 0.03 A Holding Position
Auxiliary Switch Rating	-xxC Models	Two Single-Pole, Double-Throw (SPDT), Double-Insulated Switches with Gold over Silver Contacts: AC 24 V, 50 VA Pilot Duty AC 120 V, 5.8 A Resistive, 1/4 hp, 275 VA Pilot Duty AC 240 V, 5.0 A Resistive, 1/4 hp, 275 VA Pilot Duty
Spring Return		Direction is Selectable with Mounting Position of Actuator: Actuator Face Labeled A is away from Valve: CCW Spring Return Actuator Face Labeled B is away from Valve: CW Spring Return
Rated Torque	Power On (Running)	70 lb·in (8 N·m) All Operating Temperatures
	Power Off (Spring Returning)	70 lb·in (8 N·m) at Standard Operating Temperatures 53 lb·in (6 N·m) at Extended Operating Temperatures
Rotation Range		Maximum Full Stroke: 95°
Rotation Time for 90 Degrees of Travel	Power On (Running)	55 to 71 Seconds for 0 lb·in to 70 lb·in (8 N·m) Load, at All Operating Conditions 60 Seconds Nominal at Full Rated Load (0.25 rpm)
	Power Off (Spring Returning)	13 to 26 Seconds for 0 lb·in to 70 lb·in (8 N·m) Load, at Room Temperature 21 Seconds Nominal at Full Rated Load 39 Seconds Maximum with 70 lb·in (8 N·m) Load, at -4°F (-20°C) 108 Seconds Maximum with 53 lb·in (6 N·m) Load at -40°F (-40°C)
Life Cycles		60,000 Full Stroke Cycles with 70 lb·in (8 N·m) Load
Audible Noise Rating	Power On (Running)	< 47 dBA at 70 lb·in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
	Power On (Holding)	< 20 dBA at a Distance of 39-13/32 in. (1 m)
	Power Off (Spring Returning)	< 52 dBA at 70 lb·in (8 N·m) Load, at a Distance of 39-13/32 in. (1 m)
Electrical Connections	-Bxx-3 Models	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
	Auxiliary Switches (-xxC Models)	48 in. (1.2 m) UL 758 Type AWM Halogen-Free Cable with 18 AWG (0.85 mm ²) Conductors and 1/4 in. (6 mm) Ferrule Ends
Conduit Connections		Integral Connectors for 3/8 in. (10 mm) Flexible Metal Conduit
Fluid Temperature Limits	VG12x1 and VG18x1 Series	23°F to 203°F (-5°C to 95°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series	-22°F to 212°F (-30°C to 100°C), Not Rated for Steam Service
	VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed	-22°F to 284°F (-30°C to 140°C) Water; 15 psig (103 kPa) at 250°F (121°C) Saturated Steam
Ambient Conditions	Standard Operating	-4°F to 140°F (-20°C to 60°C); 90% RH Maximum, Noncondensing
	Extended Operating	-40°F to 4°F (-40°C to -20°C); 90% RH Maximum, Noncondensing
	Storage	-40°F to 185°F (-40°C to 85°C); 95% RH Maximum, Noncondensing
Enclosure Rating		NEMA 2 (IP54) for All Mounting Directions
Compliance	United States	UL Listed, CCN XAPX, File E27734; to UL 60730-1A: 2003-08, Ed. 3.1, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2002-02, Ed. 1, Part 2 Particular Requirements for Electric Actuators
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment
	Europe	CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant
Shipping Weight	-BGC Models	3.8 lb (1.7 kg)
	-BAC and -BDC Models	4.2 lb (1.9 kg)
	-BGA Models	3.4 lb (1.5 kg)
	-BAA and -BDA Models	3.8 lb (1.7 kg)

VA9300 Series Electric Non-Spring Return Valve Actuators

Description

The VA9300 Series Electric Non-Spring Return Actuators are direct mount actuators for valves with ISO Flange mounting such as the VG1000 Series Valves.

The series provides Automatic Signal Input Detection which allows automatic recognition of input signals for on/off, floating, and proportional control.

An optional line voltage auxiliary switch kit can be field installed to indicate an end-stop position or perform switching functions within the selected rotation range. The VA9300 Actuators also feature a NEMA 4X weathershield for applications in harsh environments.

Refer to the *VA9300 Series Electric Non-Spring Return Actuators Product Bulletin (LIT-12012265)* for important product application information.

Features

- automatic signal input detection, on/off, floating, and proportional control with adjustable span and offset
- line voltage on/off and floating models
- high speed on/off and floating models
- easy conversion to valve operation—same actuator used for dampers or valves

- optional accessory kit
- backward compatible auxiliary switch kits and auxiliary potentiometer
- self-calibrating input signal to adjust stroke
- electronic stall detection
- microprocessor-controlled brushless DC motor
- mode configuration switches
- integral cables with colored and numbered conductors
- optional integral 1/2 in. (13 mm) threaded conduit connectors
- plenum-rated models
- small footprint
- M9106, M9109, and M9108 series actuators replacement
- position indicator handle
- same weathershield as M9203 and M9208 series actuators
- NEMA5/IP54 enclosure
- underwriters laboratories Inc.® (UL), CE Mark, and RCM compliance
- manufactured under international standards organization (ISO) 9001 quality control standards
- 100,000 cycles and 2.5 million repositions
- 5-year warranty

VA9310 Series Electric Non-Spring Return Actuator



Repair Information

If the VA9300 Series Electric Non-Spring Return Valve Actuator fails to operate within its specifications, replace the unit. For a replacement actuator, contact the nearest Johnson Controls® representative.

Selection Chart

Table 1: Selection Chart

Code Number	Torque lb-in. (N·m)	Rotation Time For 90° Running (Seconds)	Power Supply		Input Signal			Position Feedback					Electrical Connection		Auxiliary Switches	
			AC/DC 24 V	AC 85 to 264 V	On/Off	Floating	Proportional DC 0 (2) to 10 V (with Adjustable Span)	DC 0 (2) to 10 V	140 Ω	1 k Ω	2 k Ω	10 k Ω	120 in. (3 m) Plenum Cable	48 in. (1 m) Halogen Free Cable	1 x SPDT, AC 3 (0.5) A, 240 V	2 x SPDT, 3 (0.5) A, AC 240 V
VA9308-AGA-2Z	70 (8)	8	X		X	X			X ¹	X ¹	X ¹	X ¹	X		X ¹	X ²
VA9308-AUA-2Z	70 (8)	8		X	X	X			X ¹	X ¹	X ¹	X ¹		X	X ²	X ²
VA9310-AUA-2	90 (10)	90		X	X	X			X ¹	X ¹	X ¹	X ¹		X	X ²	X ²
VA9310-GUA-2	90 (10)	90		X	X	X	X	X ³	X ¹	X ¹	X ¹	X ¹		X	X ²	X ²
VA9310-HGA-2	90 (10)	90	X		X	X	X	X ²	X ¹	X ¹	X ¹	X ¹	X		X ²	X ²
VA9320-AUA-2	180 (20)	90		X	X	X			X ¹	X ¹	X ¹	X ¹		X	X ²	X ²
VA9320-GUA-2	180 (20)	90		X	X	X	X	X ³	X ¹	X ¹	X ¹	X ¹		X	X ²	X ²
VA9320-HGA-2	180 (20)	90	X		X	X	X	X ²	X ¹	X ¹	X ¹	X ¹	X		X ²	X ²
VA9335-AUA-2	310 (35)	150		X	X	X			X ¹	X ¹	X ¹	X ¹		X	X ²	X ²
VA9335-GUA-2	310 (35)	150		X	X	X	X	X ³	X ¹	X ¹	X ¹	X ¹		X	X ²	X ²
VA9335-HGA-2	310 (35)	150	X		X	X	X	X ³	X ¹	X ¹	X ¹	X ¹		X	X ²	X ²

1. With optional external feedback potentiometer kit (M9300-140, M9300-1K, M9300-2K, or M9000-10K).

2. With optional external auxiliary switch kit (M9300-1 or M9300-2).

3. Feedback is available when 0 (2) to 10 V proportional input is used.

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

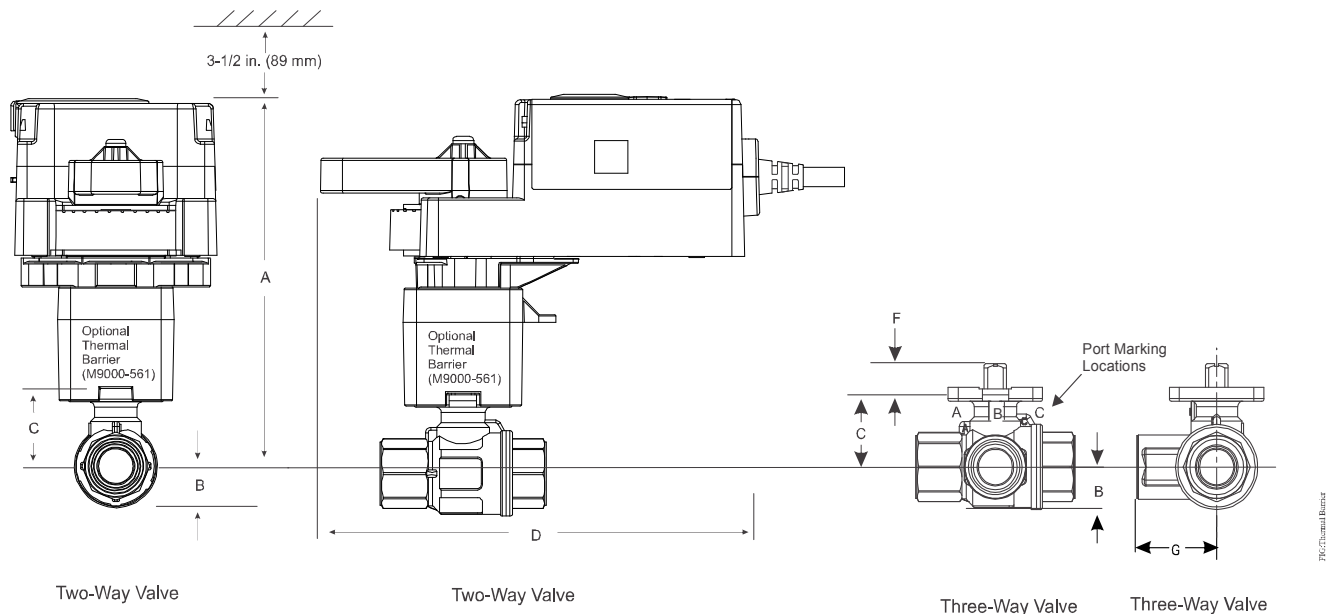
VA9300 Series Electric Non-Spring Return Valve Actuators (Continued)

Accessories

Code Number	Description
M9000-342	NEMA 4X, IP66/67 weathershield kit for VG1000 Series Ball application of VA9104, VA9300, VA9203, and VA9208 Series Electric Actuators (quantity 1)
M9000-343	NEMA 4X, IP66/67 weathershield for 2 1/2 in. to 6 in. VG1000 Series Ball Valve application of VA9320 and VA9335 Series Electric Actuators
M9000-561	Thermal barrier kit, extends the VA9104, VA9300, VA9203, and VA9208 Series Electric Actuators applications to include low pressure steam
M9000-700	Universal Ball Valve Linkage Kit
M9300-1	External auxiliary switch kit (one single-pole, double-throw)
M9300-2	External auxiliary switch kit (two single-pole, double-throw)
M9300-100	Threaded conduit adapters for 1/2 in. electrician's fittings (quantity 5)
M9300-140	External auxiliary feedback potentiometer 140k ohm
M9300-1K	External auxiliary feedback potentiometer 1k ohm
M9300-2K	External auxiliary feedback potentiometer 2k ohm
M9310-10K	External auxiliary feedback potentiometer 10k ohm
M9310-600	Coupler kit for transformation from VA9308 to M9308 and from VA9310 to M9310 Series Actuators
M9320-600	Coupler kit for transformation to 9320 Series Actuators

VA9300 Dimensions

VA9300 Series Electric Non-Spring Return Actuator and Valve Dimensions
(with Optional M9000-561 Thermal Barrier)



VA9300 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve Dimensions, in. (mm)

Valve Size, in. (DN)	A (with Thermal Barrier)	A (without Thermal Barrier)	B	C	D	E	F	G
1/2 (DN15)	5-3/4 (146)	4-3/8 (111)	21/32 (17)	1-7/32 (31)	6-13/32 (163)	2-33/64 (64)	11/32 (9)	1-1/4 (32)
3/4 (DN20)	5-3/4 (146)	4-3/8 (111)	21/32 (17)	1-7/32 (31)	6-13/32 (163)	2-51/64 (71)	11/32 (9)	1-13/32 (36)
1 (DN25)	5-13/16 (148)	4-7/16 (113)	3/4 (19)	1-5/16 (33)	6-13/32 (163)	3-13/32 (87)	11/32 (9)	1-45/64 (43)
1-1/4 (DN32)	6-1/4 (159)	4-7/8 (124)	1-1/32 (26)	1-23/32 (44)	6-13/32 (163)	3-15/16 (100)	11/32 (9)	1-31/32 (50)
1-1/2 (DN40)	6-13/32 (163)	5-1/32 (128)	1-1/8 (29)	1-7/8 (48)	6-13/32 (163)	4-21/64 (110)	11/32 (9)	2-11/64 (55)
2 (DN50)	6-5/8 (168)	5-1/4 (133)	1-15/32 (37)	2-1/16 (53)	6-13/32 (163)	4-27/32 (123)	11/32 (9)	2-27/64 (62)

VA9300 Series Electric Non-Spring Return Valve Actuators (Continued)

VA9300 Series Electric Non-Spring Return Actuator and Valve Dimensions
(with Optional M9000-561 Thermal Barrier and M9300-2 Switch Kit)

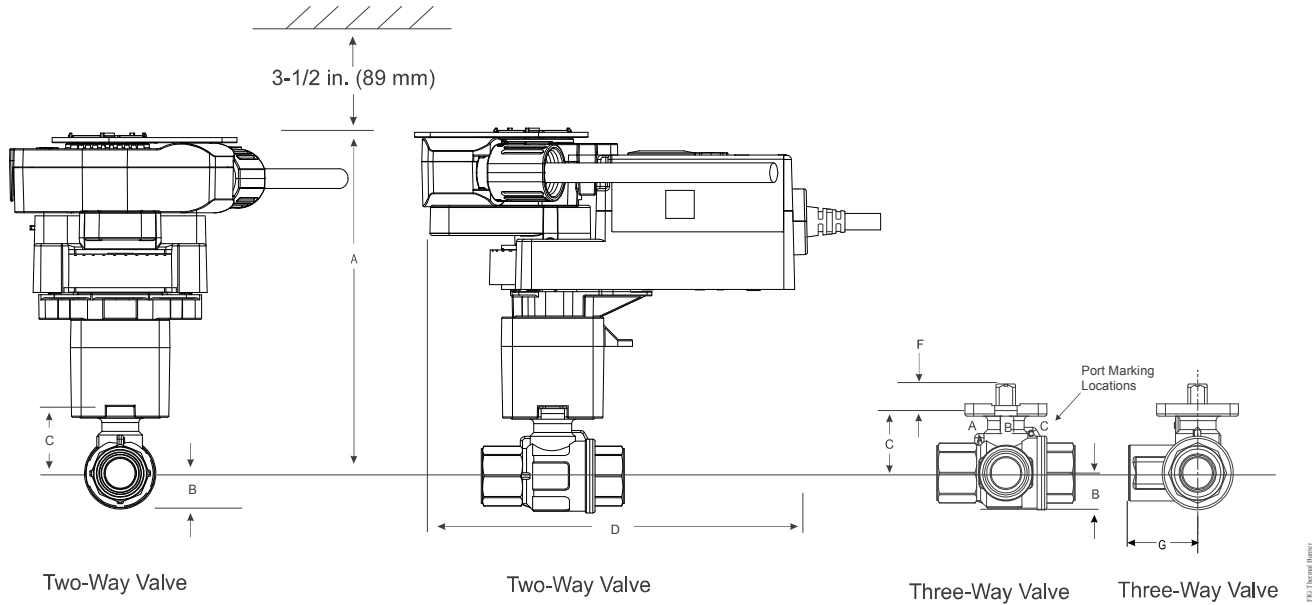


FIG. Thermal Barrier

VA9300 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve Dimensions (with Optional M9000-561 Thermal Barrier and M9300-2 Switch Kit)

Valve Size, in. (DN)	A (with Thermal Barrier)	A (without Thermal Barrier)	B	C	D	E	F	G
1/2 (DN15)	6-3/25 (155.7)	4-3/4 (120.7)	21/32 (17)	1-7/32 (31)	6-21/32 (169)	2-33/64 (64)	11/32 (9)	1-1/4 (32)
3/4 (DN20)	6-3/25 (155.7)	4-3/4 (120.7)	21/32 (17)	1-7/32 (31)	6-21/32 (169)	2-51/64 (71)	11/32 (9)	1-13/32 (36)
1 (DN25)	6-1/5 (157.7)	4-21/25 (122.7)	3/4 (19)	1-5/16 (33)	6-21/32 (169)	3-13/32 (87)	11/32 (9)	1-45/64 (43)
1-1/4 (DN32)	6-16/25 (168.7)	5-1/4 (133.7)	1-1/32 (26)	1-23/32 (44)	6-21/32 (169)	3-15/16 (100)	11/32 (9)	1-31/32 (50)
1-1/2 (DN40)	6-4/5 (172.7)	5-3/7 (137.7)	1-1/8 (29)	1-7/8 (48)	6-21/32 (169)	4-21/64 (110)	11/32 (9)	2-11/64 (55)
2 (DN50)	6 (177.2)	5-5/8 (142.7)	1-15/32 (37)	2-1/16 (53)	6-21/32 (169)	4-27/32 (123)	11/32 (9)	2-27/64 (62)

VA9300 Series Electric Non-Spring Return Valve Actuators (Continued)

Technical Specifications

VA9308-AxA-2Z and VA9310-AUA-2 Series Electric Non-Spring Return Actuators

Product Description	VA9308-AGA-2Z: Floating and on/off mode	VA9308-AUA-2Z: Floating and on/off mode	VA9310-AUA-2: Floating and on/off mode
Power Requirements	AC 24 V ±20% at 50/60 Hz, Class 2 (North America) or SELV (Europe), 12.7 VA running. DC 24 V ±10% Class 2 (North America) or SELV (Europe), 5.7 W running.	Nominal AC 120 V at 60 Hz: 0.11 A running	Nominal AC 120 V at 60 Hz: 0.04 A running
Transformer Sizing Requirements	≥13 VA	—	—
Input Signal/Adjustments	AC 19.2 V to 28.8 V at 50/60 Hz or DC 24 V ±10% Class 2 (North America) or SELV (Europe)	AC 100 V to 240 V (AC 85 V to 264 V) at 50/60 Hz	
Rotation Range	Mechanically limited to 95° ±3°		
Rotation Time for 90° of Travel	8 seconds, constant at all operating conditions		90 seconds, constant at all operating conditions
Cycles	60,000 full stroke cycles; 1,500,000 repositions		100,000 full stroke cycles; 2,500,000 repositions
Audible Noise	<45 dBA at 0 lb·in to 70 lb·in (8 N·m) load, at a distance of 39-13/32 in. (1m)		<35 dBA at 39-13/32 in. (1m)
Electrical Connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 19 AWG (0.75 mm ²) conductors and 0.25 in. (6 mm) ferrule ends	48 in. (1.2 m) halogen free cable with 18 AWG (0.82 mm ²) conductors and 0.25 in. (6mm) ferrule ends	
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 Conduit Connector (optional with the VA9308-AGA-2Z)		
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing		
Fluid Temperature Limits (Actuator and Valve Assembly)	VG12x1 and VG18x1 Series: 23°F to 203°F (-5°C to 95°C) VG12x5 and VG18x5 Series: -22°F to 212°F (-30°C to 100°C) VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed: -22°F to 284°F (-30°C to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) saturated steam		
Enclosure	IP54/NEMA 5		
Shipping Weight	2 lb (0.9 kg)		
Compliance	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code. Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.		
	Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.		
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant		

VA9300 Series Electric Non-Spring Return Valve Actuators (Continued)

VA9310-HGA-2 Electric Non-Spring Return Actuators

Product Description	VA9310-HGA-2: On/off and floating mode	VA9310-HGA-2: Proportional mode
Power Requirements	AC 24 V $\pm 20\%$ at 50/60 Hz, Class 2 (North America) or SELV (Europe), 4.7 VA running. DC 24 V $\pm 10\%$ Class 2 (North America) or SELV (Europe), 1.3 W running.	
Transformer Sizing Requirements	≥ 6.5 VA	
Input Signal/Adjustments	AC 19.2 V to 28.8 V at 50/60 Hz or DC 24 V $\pm 10\%$ Class 2 (North America) or SELV (Europe)	DC 0 (2) to 10 V or 0 (4) to 20 mA with field furnished 500 ohm 1/4 W resistor Offset: DC 0 V to 10 V SPAN: DC 2 V to 10 V
Control Impedance	4.7k ohm	100k ohm
Feedback Signal	—	DC 0 (2) to 10 V
Rotation Range	Mechanically limited to $95^\circ \pm 3^\circ$	
Rotation Time for 90° of Travel	90 seconds, constant for all operating conditions	
Rotation Time Auto-calibration	35 seconds	
Cycles	100,000 full stroke cycles; 2,500,000 repositions	
Audible Noise	<35 dBA at 0 lb·in to 90 lb·in (10 N·m) load, at a distance of 39-13/32 in. (1 m)	
Electrical Connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 19 AWG cable (0.75 mm ²) conductors and 0.25 in. (6 mm) ferrule ends	
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 Conduit Connector (optional with the M9310-HGA-2)	
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing	
Fluid Temperature Limits (Actuator and Valve Assembly)	VG12x1 and VG18x1 Series: 23°F to 203°F (-5°C to 95°C) VG12x5 and VG18x5 Series: -22°F to 212°F (-30°C to 100°C) VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed: -22°F to 284°F (-30°C to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) saturated steam	
Enclosure	IP54/NEMA 5	
Shipping Weight	2 lb (0.9 kg)	
Compliance 	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code. Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.	
	Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.	
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant	

VA9300 Series Electric Non-Spring Return Valve Actuators (Continued)

VA9310-GUA-2 and VA9320-xUA-2 Series Electric Non-Spring Return Actuators

Product Description	VA9310-GUA-2: Proportional mode	VA9320-GUA-2: Floating and on/off mode	VA9320-AUA-2: Floating and on/off mode	VA9335-GUA-2: Proportional mode
Power Requirements	Nominal AC 120 V at 60 Hz: 0.05 A running	Nominal AC 120 V at 60 Hz: 0.05 A running	Nominal AC 120 V at 60 Hz: 0.05 A running	Nominal AC 120 V at 60 Hz: 0.06 A running
Transformer Sizing Requirements	—	—	—	—
Input Signal/Adjustments	AC 100 V to 240 V (AC 85 V to 264 V) at 50/60 Hz	AC 100 V to 240 V (AC 85 V to 264 V) at 50/60 Hz		
Rotation Range	Mechanically limited to 95° ±3°			
Rotation Time for 90° of Travel	90 seconds, constant at all operating conditions		90 seconds, constant at all operating conditions	150 seconds, constant at all operating conditions
Cycles	60,000 full stroke cycles; 1,500,000 repositions		100,000 full stroke cycles; 2,500,000 repositions	
Audible Noise	<35 dBA at 0 lb·in to 70 lb·in (8 N·m) load, at a distance of 39-13/32 in. (1m)	<45 dBA at 0 lb·in to 70 lb·in (8 N·m) load, at a distance of 39-13/32 in. (1m)	<45 dBA at 39-13/32 in. (1m)	
Electrical Connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 19 AWG (0.75 mm ²) conductors and 0.25 in. (6 mm) ferrule ends	48 in. (1.2 m) halogen free cable with 18 AWG (0.82 mm ²) conductors and 0.25 in. (6mm) ferrule ends		
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 Conduit Connector (optional with the VA9308-AGA-2Z)			
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing			
Fluid Temperature Limits (Actuator and Valve Assembly)	VG12x1 and VG18x1 Series: 23°F to 203°F (-5°C to 95°C) VG12x5 and VG18x5 Series: -22°F to 212°F (-30°C to 100°C) VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed: -22°F to 284°F (-30°C to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) saturated steam			
Enclosure	IP54/NEMA 5			
Shipping Weight	2 lb (0.9 kg)			
Compliance	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code. Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA-E60730-2-14, Particular Requirements for Electric Actuators.			
	Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive.			
	Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant			

VA9300 Series Electric Non-Spring Return Valve Actuators (Continued)

VA9320-HGA-2 and VA9335-HGA-2 Electric Non-Spring Return Actuators

Product Description	VA9320-HGA-2 & VA9335-HGA-2	
	On/off and floating mode	Proportional mode
Power Requirements	AC 24 V (AC 19.2 V to 28.8 V) at 50/60 Hz, Class 2 (North America) or SELV (Europe) VA9320-HGA-2: 5.7 VA running; VA9335-HGA-2: 6.1 VA running DC 24 V (DC 21.6 V to 26.4 V) Class 2 (North America) or SELV (Europe) VA9320-HGA-2: 2.1 W running; VA9335-HGA-2: 2.1 W running	
Transformer Sizing Requirements	≥7 VA	
Input Signal/Adjustments	AC 19.2 V to 28.8 V at 50/60 Hz or DC 24 V ±10% Class 2 (North America) or SELV (Europe)	DC 0 (2) to 10 V or 0 (4) to 20 mA with field furnished 500 ohm 1/4 W resistor Offset: DC 0 V to 10 V; SPAN: DC 2 V to 10 V
Control Impedance	4.7k ohm	100k ohm
Feedback Signal	—	DC 0 (2) to 10 V
Running Torque	VA9320-HGA-2: 180 lb·in (20 N·m); VA9335-HGA-2: 310 lb·in (35 N·m)	
Rotation Range	Mechanically limited to 35...95° ±3° in 5° increments	
Rotation Time for 90° of Travel	VA9320-HGA-2: 90 seconds; VA9335-HGA-2: 150 seconds; constant for all operating conditions	
Rotation Time Auto-calibration	VA9320-HGA-2: 35 seconds; VA9335-HGA-2: 75 seconds	
Cycles	VA9320-HGA-2: 100,000 full stroke cycles; 2,500,000 repositions VA9335-HGA-2: 30,000 full stroke cycles; 750,000 repositions	
Audible Noise	<35 dBA at 0 lb·in to 90 lb·in (10 N·m) load, at a distance of 39-13/32 in. (1 m)	
Electrical Connections	120 in. (3.05 m) UL 444 type CMP plenum rated cable with 19 AWG cable (0.75 mm ²) conductors and 0.25 in. (6 mm) ferrule ends	
Conduit Connections	1/2 in. NPSM (13 mm) threaded conduit connectors with M9300-100 Conduit Connector (optional with the M9310-HGA-2)	
Ambient Conditions	Operating: -22°F to 140°F (-30°C to 60°C), 95% RH, noncondensing Storage: -40°F to 185°F (-40°C to 85°C), 95% RH, noncondensing	
Fluid Temperature Limits (Actuator and Valve Assembly)	VG12x1 and VG18x1 Series: 23°F to 203°F (-5°C to 95°C) VG12x5 and VG18x5 Series: -22°F to 212°F (-30°C to 100°C) VG12x5 and VG18x5 Series with M9000-561 Thermal Barrier Installed: -22°F to 284°F (-30°C to 140°C) water; 15 psig (103 kPa) at 250°F (121°C) saturated steam	
Enclosure	IP54/NEMA 5	
Shipping Weight	2 lb (0.9 kg)	
Compliance 	United States: UL Listed, CCN XAPX, File E27734; to UL 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1; and UL 60730-2-14: Part 2, Particular Requirements for Electric Actuators. Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenum) in accordance with section 300.22 (c) of the National Electrical Code.	
	Canada: UL Listed, CCN XAPX7, File E27734; to CAN/CSA E60730-1:02: Automatic Electrical Controls for Household and Similar Use, Part 1; and CAN/CSA E60730-2-14, Particular Requirements for Electric Actuators.	
	Europe: CE Mark—Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive. Australia and New Zealand: RCM Mark, Australia/NZ Emissions Compliant	

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

M9000-700 Universal Ball Valve Linkage Kit

Description

The M9000-700 Universal Ball Valve Linkage Kit is designed specifically for field mounting Johnson Controls® VA(M)9203 and VA(M)9208 Series Spring Return and VA(M)9104 and VA(M)9310 Series Non-Spring Return Actuators to ball valves from various manufacturers in sizes from 1/2 inch to 2 inches.

These sturdy linkage kits provide easy and stable actuator mounting while preventing loading on the valve stem and stem seals, to ensure longer seal life.

Refer to the *M9000-700 Universal Ball Valve Linkage Kit Product Bulletin (LIT-12012960)* for important product application information.

Features

- Modular design of shaft and actuator allows universal use on ball valves of several manufacturers.
- Sturdy zinc-plated steel shaft and actuator provides exceptional strength and stability which ensures long life even at high torques from 1/2 inch up to two inches.
- Glass-reinforced thermoplastic resin spacer reduces temperature and condensation from the valve to the actuator.
- No special tools required to install which facilitates quick and easy installation.
- Tested for 100,000 full cycles which assures long time reliability on valves from 1/2 inch up to two inches.



M9000-700 Universal Ball Valve Linkage Kit (Continued)

Selection Charts for Johnson Controls Actuators on Ball Valves

Table 1: Belimo B2 and B3 Series Ball Valves

Body Type	Body Size (inches)	Chrome Plated Brass Ball, Nickel Plated Stem	Stainless Steel Ball and Stem	High Temperature Ball Valves	Compatible JCI Actuator See note at foot of table	
Two-way	1/2"	B207B	B207	B215HT029	VA9203 Spring Return	M9203 Spring Return
		B208B	B208	B215HT046		
		B209B	B209	B215HT073	VA9208 Spring Return	M9208 Spring Return
		B210B	B210	B215HT116		
		B211B	B211	B215HT186	VA9104 Non Spring Return	M9104 Non Spring Return
		B212B	B212			
		B213B	B213		VA9310 Non Spring Return	M9310 Non Spring Return
		B214B	B214			
	3/4"	B215B	B215	B220HT290	VA9208 Spring Return	M9208 Spring Return
		B216B	B216	B220HT464		
		B217B	B217	B220HT731	VA9310 Non Spring Return	M9310 Non Spring Return
	1"	B218B	B218	B220HT928		
		B219B	B219	B220HT1320		
		B220B	B220		VA9208 Spring Return	M9208 Spring Return
		B221B	B221			
	1 1/4"		B222	B225HT464	VA9310 Non Spring Return	M9310 Non Spring Return
			B223	B225HT731		
			B224	B225HT1160		
Three-way	1/2"		B225	B225HT1856	VA9208 Spring Return	M9208 Spring Return
			B229	B225HT2800		
			B230		VA9310 Non Spring Return	M9310 Non Spring Return
			B231			
			B232		VA9203 Spring Return	M9203 Spring Return
		B307B	B307		VA9208 Spring Return	M9208 Spring Return
		B308B	B308			
	3/4"	B309B	B309		VA9104 Non Spring Return	M9104 Non Spring Return
		B310B	B310			
		B310B	B310		VA9310 Non Spring Return	M9310 Non Spring Return
	1"	B311B	B311			
		B312B	B312		VA9208 Spring Return	M9208 Spring Return
		B313B	B313			
		B315B	B315		VA9310 Non Spring Return	M9310 Non Spring Return
		B317B	B317			
	1"	B318B	B318		VA9208 Spring Return	M9208 Spring Return
		B320B	B320			
		B321B	B321		VA9310 Non Spring Return	M9310 Non Spring Return
			B322			
			B232		VA9208 Spring Return	M9208 Spring Return
			B325			

Note for VA9208 and M9208 use two field furnished #10-24 x 3 1/2" screws and two locking nuts #10-24

For M9104 use M9000-551 transformation kit and for M9310, use M9310-500 transformation kit

For M9203 and M9208 use M9000-560 transformation kit

M9000-700 Universal Ball Valve Linkage Kit (Continued)

Table 2: Bray Commercial ST Series

Body Size (inches)	Two-way ST Series	Three-way ST Series	Compatible JCI Actuator	
			See note at foot of table	
½"	ST-05-2-004	ST-05-3-003		
	ST-05-2-007	ST-05-3-006		
	ST-05-2-01	ST-05-3-01		
	ST-05-2-003	ST-05-3-02		
	ST-05-2-05	ST-05-3-04		
	ST-05-2-08	ST-05-3-08		
	ST-05-2-12			
¾"	ST-75-2-003	ST-75-3-004		
	ST-75-2-006	ST-75-3-007		
	ST-75-2-01	ST-75-3-01		
	ST-75-2-03	ST-75-3-02		
	ST-75-2-04	ST-75-3-04		
	ST-75-2-10	ST-75-3-13		
	ST-75-2-15			
1"	ST-1-2-004	ST-1-3-004		
	ST-1-2-009	ST-1-3-007		
	ST-1-2-15	ST-1-3-01		
	ST-1-2-26	ST-1-3-02		
	ST-1-2-44	ST-1-3-04		
	ST-1-2-54	ST-1-3-05		
		ST-1-3-09		
1 ¼"		ST-1-3-10		
		ST-1-3-15		
		ST-1-3-22		
		ST-1-3-31		
	ST-125-2-04	ST-125-3-04		
	ST-125-2-08	ST-125-3-08		
	ST-125-2-15	ST-125-3-09		
1 ½"	ST-125-2-37	ST-125-3-13		
	ST-125-2-41	ST-125-3-19		
	ST-125-2-102	ST-125-3-34		
	ST-150-2-23	ST-150-3-04		
	ST-150-2-41	ST-150-3-08		
2"	ST-150-2-74	ST-150-3-13		
	ST-150-2-171	ST-150-3-24		
		ST-150-3-32		
		ST-150-3-61		
	ST-2-2-41	ST-2-3-24		
	ST-2-2-57	ST-2-3-38		
	ST-2-2-71	ST-2-3-57		
	ST-2-2-100	ST-2-3-109		
	ST-2-2-210			
	ST-2-2-266			

Note for VA9208 and M9208 use two field furnished #10-24 x 3 1/2" screws and two locking nuts #10-24

Also for M9208 use M9000-560 transformation kit

For ST2 Series valves the M9000-700 Universal Ball Valve Linkage kit is not required

M9000-700 Universal Ball Valve Linkage Kit (Continued)

Table 3: Griswold Controls Unimizer Series Valves

Body Type	Body Size (inches)	NPT Threaded, Std Stem & Ball	NPT Threaded, Stainless Steel Stem & Ball	BSPP Threaded, Std Stem & Ball	BSPP Threaded, Stainless Steel Stem & Ball	Lead Free, Std Stem & Ball	Lead Free Stainless Steel Stem & Ball	Compatible JCI Actuator See note at foot of table	
Two-way	1/2"	UR2A1FB	UR2A1FS	UR2A1BB	UR2A1BS	UR2A1LB	UR2A1LS		
		UR2A2FB	UR2A2FS	UR2A2BB	UR2A2BS	UR2A2LB	UR2A2LS		
		UR2A3FB	UR2A3FS	UR2A3BB	UR2A3BS	UR2A3LB	UR2A3LS		
		UR2A4FB	UR2A4FS	UR2A4BB	UR2A4BS	UR2A4LB	UR2A4LS		
		UR2A5FB	UR2A5FS	UR2A5BB	UR2A5BS	UR2A5LB	UR2A5LS		
		UR2A6FB	UR2A6FS	UR2A6BB	UR2A6BS	UR2A6LB	UR2A6LS		
		UR2A7FB	UR2A7FS	UR2A7BB	UR2A7BS	UR2A7LB	UR2A7LS		
	3/4"	UR2B1FB	UR2B1FS	UR2B1BB	UR2B1BS	UR2B1LB	UR2B1LS		
		UR2B2FB	UR2B2FS	UR2B2BB	UR2B2BS	UR2B2LB	UR2B2LS		
		UR2B3FB	UR2B3FS	UR2B3BB	UR2B3BS	UR2B3LB	UR2B3LS		
		UR2B4FB	UR2B4FS	UR2B4BB	UR2B4BS	UR2B4LB	UR2B4LS		
		UR2B5FB	UR2B5FS	UR2B5BB	UR2B5BS	UR2B5LB	UR2B5LS		
		UR2B6FB	UR2B6FS	UR2B6BB	UR2B6BS	UR2B6LB	UR2B6LS		
	1"	UR2C1FB	UR2C1FS	UR2C1BB	UR2C1BS	UR2C1LB	UR2C1LS		
		UR2C2FB	UR2C2FS	UR2C2BB	UR2C2BS	UR2C2LB	UR2C2LS		
		UR2C3FB	UR2C3FS	UR2C3BB	UR2C3BS	UR2C3LB	UR2C3LS		
		UR2C4FB	UR2C4FS	UR2C4BB	UR2C4BS	UR2C4LB	UR2C4LS		
		UR2C5FB	UR2C5FS	UR2C5BB	UR2C5BS	UR2C5LB	UR2C5LS		
		UR2C6FB	UR2C6FS	UR2C6BB	UR2C6BS	UR2C6LB	UR2C6LS		
	1 1/4"	UR2D1FB	UR2D1FS	UR2D1BB	UR2D1BS	UR2D1LB	UR2D1LS		
		UR2D2FB	UR2D2FS	UR2D2BB	UR2D2BS	UR2D2LB	UR2D2LS		
		UR2D3FB	UR2D3FS	UR2D3BB	UR2D3BS	UR2D3LB	UR2D3LS		
		UR2D4FB	UR2D4FS	UR2D4BB	UR2D4BS	UR2D4LB	UR2D4LS		
		UR2D5FB	UR2D5FS	UR2D5BB	UR2D5BS	UR2D5LB	UR2D5LS		
		UR2D6FB	UR2D6FS	UR2D6BB	UR2D6BS	UR2D6LB	UR2D6LS		
	1 1/2"	UR2E1FB	UR2E1FS	UR2E1BB	UR2E1BS	UR2E1LB	UR2E1LS		
		UR2E2FB	UR2E2FS	UR2E2BB	UR2E2BS	UR2E2LB	UR2E2LS		
		UR2E3FB	UR2E3FS	UR2E3BB	UR2E3BS	UR2E3LB	UR2E3LS		
	2"	UR2E4FB	UR2E4FS	UR2E4BB	UR2E4BS	UR2E4LB	UR2E4LS		
		UR2E1FB	UR2E1FS	UR2E1BB	UR2E1BS	UR2E1LB	UR2E1LS		
		UR2E2FB	UR2E2FS	UR2E2BB	UR2E2BS	UR2E2LB	UR2E2LS		
		UR2E3FB	UR2E3FS	UR2E3BB	UR2E3BS	UR2E3LB	UR2E3LS		
		UR2E4FB	UR2E4FS	UR2E4BB	UR2E4BS	UR2E4LB	UR2E4LS		
		UR2E5FB	UR2E5FS	UR2E5BB	UR2E5BS	UR2E5LB	UR2E5LS		
		UR2E6FB	UR2E6FS	UR2E6BB	UR2E6BS	UR2E6LB	UR2E6LS		
		UR2E7FB	UR2E7FS	UR2E7BB	UR2E7BS	UR2E7LB	UR2E7LS		

Note for VA9208 and M9208 use two field furnished #10-24 x 3 1/2" screws and two locking nuts #10-24

For M9104 use M9000-551 transformation kit and for M9310, use M9310-500 transformation kit

For M9203 and M9208 use M9000-560 transformation kit

The performance specifications are nominal and conform to acceptable industry standards. For applications at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products. © 2019 Johnson Controls. www.johnsoncontrols.com

M9000-700 Universal Ball Valve Linkage Kit (Continued)

Table 4: Griswold Controls Unimizer Series Valves (continued)

Body Type	Body Size (inches)	NPT threaded, Std Stem & Ball	BSPP threaded, Std Stem & Ball	NPT threaded, New	BSP threaded, New	Compatible JCI Actuator See note at foot of table			
Three-way	½"	UR3AAFB	UR3AABB	3WRAAF	3WRAAB				
		UR3ABFB	UR3ABBB	3WRABF	3WRABB				
		UR3ACFB	UR3ACBB	3WRACF	3WRACB				
		UR3ADFB	UR3ADBB	3WRADF	3WRADB				
		UR3AEFB	UR3AEBB	3WRAEF	3WRAEB				
		UR3AFFB	UR3AFBB	3WRAFF	3WRAFB				
	¾"	UR3BAFB	UR3BABB	3WRBAF	3WRBAB				
		UR3BBFB	UR3BBBB	3WRBBF	3WRBBB				
		UR3BCFB	UR3BCBB	3WRBCF	3WRBCB				
		UR3BDFB	UR3BDBB	3WRBDF	3WRBDB				
		UR3BEFB	UR3BEBB	3WRBEF	3WRBEB				
		UR3BFFB	UR3BFBB	3WRBFF	3WRBFB				
	1"	UR3CAFB	UR3CABB					VA9203 Spring Return	M9203 Spring Return
		UR3CBFB	UR3CBBB					VA9208 Spring Return	M9208 Spring Return
		UR3CCFB	UR3CCBB					VA9104 Non-Spring Return	M9104 Non-Spring Return
		UR3CDFB	UR3CDBB					VA9310 Non-Spring Return	M9310 Non-Spring Return
		UR3CEFB	UR3CEBB						
		UR3CFFB	UR3CFBB						
		UR3CGFB	UR3CGBB						
		UR3CHFB	UR3CHBB						
		UR3CJFB	UR3CJBB						
		UR3CKFB	UR3CKBB						
		UR3CMFB	UR3CMBB						
	1 ¼"	UR3DAFB	UR3DABB						
		UR3DBFB	UR3DBBB						
		UR3DCFB	UR3DCBB						
		UR3DDFB	UR3DDBB						
		UR3DEFB	UR3DEBB						
		UR3DFFB	UR3DFBB						
	1 ½"	UR3EAFB	UR3EABB						
		UR3EBFB	UR3EBBB						
		UR3ECFB	UR3ECBB						
		UR3EDFB	UR3EDBB						
		UR3EEFB	UR3EEBB						
		UR3EFFB	UR3EFBB						
	2"	UR3FAFB	UR3FABB						
UR3FBFB		UR3FBBB							
UR3FCFB		UR3FCBB							
UR3FDFB		UR3FDBB							
UR3FEFB		UR3FEBB							

Note for VA9208 and M9208 use two field furnished #10-24 x 3 1/2" screws and two locking nuts #10-24

For M9104 use M9000-551 transformation kit and for M9310, use M9310-500 transformation kit

For M9203 and M9208 use M9000-560 transformation kit

M9000-700 Universal Ball Valve Linkage Kit (Continued)

Table 5: Honeywell VBN Series Valves

Body Type	Body Size (inches)	Plated Brass Trim, Standard Base	Plated Brass Trim, Low Profile	Plated Brass Trim, MN/MS DCA Actuator Bracket	Stainless Steel Trim, Standard Base	Stainless Steel Trim, Low Profile	Stainless Steel Trim, MN/MS DCA Actuator Bracket	Compatible JCI Actuator See note at foot of table	
Two-way	½"	VB2A000.38PA	VB2A000.38PL	VB2A000.38PX	VB2A000.38SA	VB2A000.38SL	VB2A000.38SX	VA9203 Spring Return VA9208 Spring Return VA9104 Non Spring Return VA9310 Non Spring Return	M9203 Spring Return M9208 Spring Return M9104 Non Spring Return M9310 Non Spring Return
		VB2A000.68PA	VB2A000.68PL	VB2A000.68PX	VB2A000.68SA	VB2A000.68SL	VB2A000.68SX		
		VB2A001.30PA	VB2A001.30PL	VB2A001.30PX	VB2A001.30SA	VB2A001.30SL	VB2A001.30SX		
		VB2A002.00PA	VB2A002.00PL	VB2A002.00PX	VB2A002.00SA	VB2A002.00SL	VB2A002.00SX		
		VB2A002.60PA	VB2A002.60PL	VB2A002.60PX	VB2A002.60SA	VB2A002.60SL	VB2A002.60SX		
		VB2A004.70PA	VB2A004.70PL	VB2A004.70PX	VB2A004.70SA	VB2A004.70SL	VB2A004.70SX		
		VB2A008.00PA	VB2A008.00PL	VB2A008.00PX	VB2A008.00SA	VB2A008.00SL	VB2A008.00SX		
		VB2A011.70PA	VB2A011.70PL	VB2A011.70PX	VB2A011.70SA	VB2A011.70SL	VB2A011.70SX		
	¾"	VB2N2000.31PA	VB2N2000.31PL	VB2N2000.31PX	VB2N2000.31SA	VB2N2000.31SL	VB2N2000.31SX		
		VB2N2000.63PA	VB2N2000.63PL	VB2N2000.63PX	VB2N2000.63SA	VB2N2000.63SL	VB2N2000.63SX		
		VB2N2001.20PA	VB2N2001.20PL	VB2N2001.20PX	VB2N2001.20SA	VB2N2001.20SL	VB2N2001.20SX		
		VB2N2002.50PA	VB2N2002.50PL	VB2N2002.50PX	VB2N2002.50SA	VB2N2002.50SL	VB2N2002.50SX		
		VB2N2B004.30PA	VB2N2B004.30PL	VB2N2B004.30PX	VB2N2B004.30SA	VB2N2B004.30SL	VB2N2B004.30SX		
		VB2N2B007.40PA	VB2N2B007.40PL	VB2N2B007.40PX	VB2N2B007.40SA	VB2N2B007.40SL	VB2N2B007.40SX		
		VB2N2B010.10PA	VB2N2B010.10PL	VB2N2B010.10PX	VB2N2B010.10SA	VB2N2B010.10SL	VB2N2B010.10SX		
		VB2N2B041.70PA	VB2N2B041.70PL	VB2N2B041.70PX	VB2N2B041.70SA	VB2N2B041.70SL	VB2N2B041.70SX		
	1"	VB2N2B029.00PA	VB2N2B029.00PL	VB2N2B029.00PX	VB2N2B029.00SA	VB2N2B029.00SL	VB2N2B029.00SX		
		VB2N2C004.40PA	VB2N2C004.40PL	VB2N2C004.40PX	VB2N2C004.40SA	VB2N2C004.40SL	VB2N2C004.40SX		
		VB2N2C009.00PA	VB2N2C009.00PL	VB2N2C009.00PX	VB2N2C009.00SA	VB2N2C009.00SL	VB2N2C009.00SX		
		VB2N2C015.30PA	VB2N2C015.30PL	VB2N2C015.30PX	VB2N2C015.30SA	VB2N2C015.30SL	VB2N2C015.30SX		
		VB2N2C026.00PA	VB2N2C026.00PL	VB2N2C026.00PX	VB2N2C026.00SA	VB2N2C026.00SL	VB2N2C026.00SX		
	1 ¼"	VB2N2C044.00PA	VB2N2C044.00PL	VB2N2C044.00PX	VB2N2C044.00SA	VB2N2C044.00SL	VB2N2C044.00SX		
		VB2N2C054.00PA	VB2N2C054.00PL	VB2N2C054.00PX	VB2N2C054.00SA	VB2N2C054.00SL	VB2N2C054.00SX		
		VB2N2D004.40PA	VB2N2D004.40PL	VB2N2D004.40PX	VB2N2D004.40SA	VB2N2D004.40SL	VB2N2D004.40SX		
		VB2N2D008.30PA	VB2N2D008.30PL	VB2N2D008.30PX	VB2N2D008.30SA	VB2N2D008.30SL	VB2N2D008.30SX		
		VB2N2D014.90PA	VB2N2D014.90PL	VB2N2D014.90PX	VB2N2D014.90SA	VB2N2D014.90SL	VB2N2D014.90SX		
	1 ½"	VB2N2D025.00PA	VB2N2D025.00PL	VB2N2D025.00PX	VB2N2D025.00SA	VB2N2D025.00SL	VB2N2D025.00SX		
		VB2N2D037.00PA	VB2N2D037.00PL	VB2N2D037.00PX	VB2N2D037.00SA	VB2N2D037.00SL	VB2N2D037.00SX		
		VB2N2D041.00PA	VB2N2D041.00PL	VB2N2D041.00PX	VB2N2D041.00SA	VB2N2D041.00SL	VB2N2D041.00SX		
		VB2N2D102.00PA	VB2N2D102.00PL	VB2N2D102.00PX	VB2N2D102.00SA	VB2N2D102.00SL	VB2N2D102.00SX		
	2"			VB2N2E023.00PX			VB2N2E023.00SX	VA9203 Spring Return VA9310 Non Spring Return	M9203 Spring Return M9310 Non Spring Return
				VB2N2E030.00PX			VB2N2E030.00SX		
				VB2N2E041.00PX			VB2N2E041.00SX		
				VB2N2E074.00PX			VB2N2E074.00SX		
	2"			VB2N2E172.00PX			VB2N2E172.00SX	VA9203 Spring Return VA9310 Non Spring Return	M9203 Spring Return M9310 Non Spring Return
				VB2N2F042.00PX			VB2N2F042.00SX		
				VB2N2F057.00PX			VB2N2F057.00SX		
				VB2N2F071.00PX			VB2N2F071.00SX		
				VB2N2F100.00PX			VB2N2F100.00SX		
	2"			VB2N2F108.00PX			VB2N2F108.00SX		
				VB2N2F201.00PX			VB2N2F201.00SX		
				VB2N2F266.00PX			VB2N2F266.00SX		

Note for VA9208 and M9208 use two field furnished #10-24 x 3 1/2" screws and two locking nuts #10-24

For M9104 use M9000-551 transformation kit and for M9310, use M9310-500 transformation kit

For M9203 and M9208 use M9000-560 transformation kit

M9000-700 Universal Ball Valve Linkage Kit (Continued)

Table 6: Honeywell VBN Series Valves (continued)

Body Type	Body Size (inches)	Plated Brass Trim, Standard Base	Plated Brass Trim, Low Profile	Plated Brass Trim, MN/MS DCA Actuator Bracket	Compatible JCI Actuator See note at foot of table	
Three-way	1/2"	VBN3A000.33PA	VBN3A000.33PL	VBN3A000.33PX	VA9203 Spring Return	M9203 Spring Return
		VBN3A000.59PA	VBN3A000.59PL	VBN3A000.59PX		
		VBN3A001.00PA	VBN3A001.00PL	VBN3A001.00PX		
		VBN3A002.40PA	VBN3A002.40PL	VBN3A002.40PX		
		VBN3A004.30PA	VBN3A004.30PL	VBN3A004.30PX		
		VBN3A008.00PA	VBN3A008.00PL	VBN3A008.00PX		
	3/4"	VBN3B000.40PA	VBN3B000.40PL	VBN3B000.40PX		
		VBN3B000.66PA	VBN3B000.66PL	VBN3B000.66PX		
		VBN3B001.30PA	VBN3B001.30PL	VBN3B001.30PX		
		VBN3B002.40PA	VBN3B002.40PL	VBN3B002.40PX		
		VBN3B003.80PA	VBN3B003.80PL	VBN3B003.80PX		
		VBN3B007.00PA	VBN3B007.00PL	VBN3B007.00PX		
	1"	VBN3B011.00PA	VBN3B011.00PL	VBN3B011.00PX		
		VBN3C000.40PA	VBN3C000.40PL	VBN3C000.40PX	VA9208 Spring Return	M9208 Spring Return
		VBN3C000.65PA	VBN3C000.65PL	VBN3C000.65PX		
		VBN3C001.30PA	VBN3C001.30PL	VBN3C001.30PX		
		VBN3C002.30PA	VBN3C002.30PL	VBN3C002.30PX		
		VBN3C003.50PA	VBN3C003.50PL	VBN3C003.50PX		
		VBN3C004.50PA	VBN3C004.50PL	VBN3C004.50PX		
		VBN3C008.60PA	VBN3C008.60PL	VBN3C008.60PX		
		VBN3C014.90PA	VBN3C014.90PL	VBN3C014.90PX		
		VBN3C022.00PA	VBN3C022.00PL	VBN3C022.00PX		
		VBN3C031.00PA	VBN3C031.00PL	VBN3C031.00PX		
	1 1/4"	VBN3D004.10PA	VBN3D004.10PL	VBN3D004.10PX	VA9104 Non Spring Return	M9104 Non Spring Return
		VBN3D008.70PA	VBN3D008.70PL	VBN3D008.70PX		
		VBN3D012.70PA	VBN3D012.70PL	VBN3D012.70PX		
		VBN3D019.40PA	VBN3D019.40PL	VBN3D019.40PX		
		VBN3D027.00PA	VBN3D027.00PL	VBN3D027.00PX		
	1 1/2"	VBN3D034.00PA	VBN3D034.00PL	VBN3D034.00PX	VA9310 Non Spring Return	M9310 Non Spring Return
	2"			VBN3E0004.00PX	VA9203 Spring Return	M9203 Spring Return
				VBN3E008.30PX		
				VBN3E013.40PX		
				VBN3E024.00PX		
				VBN3E032.00PX		
				VBN3E061.00PX	VA9310 Non Spring Return	M9310 Non Spring Return
				VBN3F024.00PX		
				VBN3F038.00PX		
				VBN3F057.00PX		
				VBN3F083.00PX		
				VBN3F109.00PX		

Note for VA9208 and M9208 use two field furnished #10-24 x 3 1/2" screws and two locking nuts #10-24

For M9104 use M9000-551 transformation kit and for M9310, use M9310-500 transformation kit

For M9203 and M9208 use M9000-560 transformation kit

M9000-700 Universal Ball Valve Linkage Kit (Continued)

Table 7: Siemens 599 Series Ball Valves

Body Size (inches)	Two-Way OLD Chrome-Plated Ball with Brass Stem	Two-Way Current Chrome-Plated Ball with Brass Stem	Two-Way Stainless Steel Ball and Stem	Three-Way OLD Chrome-Plated Ball with Brass Stem	Three-Way Current Chrome-Plated Ball with Brass Stem	Three-Way Stainless Steel Ball and Stem	Compatible JCI Actuator See note at foot of table	
1/2"	599-10203	599-10300	599-10300S	599-10250	599-10350	599-10350S	VA9208 Spring Return VA9310 Non Spring Return	M9208 Spring Return M9310 Non Spring Return
	599-10204	599-10301	599-10301S	599-10251	599-10351	599-10351S		
	599-10208	599-10302	599-10302S	599-102522	599-10352	599-10352S		
	599-10205	599-10303	599-10303S	599-10253	599-10353	599-10353S		
	599-10206	599-10304	599-10304S	599-10254	599-10354	599-10354S		
	599-10207	599-10305	599-10305S	599-10255	599-10355	599-10355S		
		599-10306	599-10306S		599-10356	599-10356S		
3/4"		599-10307	599-10307S		599-10357	599-10357S		
	599-10209	599-10308	599-10308S	599-10256	599-10358	599-10358S		
	599-10210	599-10309	599-10309S		599-10360	599-10360S		
		599-10310	599-10310S					
1"		599-10311	599-10311S					
	599-10211	599-10312	599-10312S	599-10257	599-10361	599-10361S		
	599-10212	599-10313	599-10313S	599-10258	599-10362	599-10362S		
	599-10213	599-10314	599-10314S	599-10259	599-10363	599-10363S		
1 1/4"	599-10214	599-10315	599-10315S					
		599-10316	599-10316S					
	599-10215	599-10317	599-10317S	599-10260	599-10364	599-10364S		
	599-10216	599-10318	599-10318S	599-10261	599-10365	599-10365S		
	599-10217	599-10319	599-10319S		599-10366	599-10366S		
1 1/2"		599-10320	599-10320S					
		599-10321	599-10321S					
	599-10218	599-10322	599-10322S	599-10262	599-10367	599-10367S		
	599-10219	599-10323	599-10323S	599-10263	599-10368	599-10368S		
	599-10220	599-10324	599-10324S	599-10264	599-10369	599-10369S		
2"	599-10221	599-10325	599-10325S					
		599-10326	599-10326S					
	599-10222	599-10327	599-10327S	599-10265	599-10370	599-10370S		
	599-10223	599-10328	599-10328S	599-10266	599-10371	599-10371S		
	599-10224	599-10329	599-10329S	599-10267	599-10372	599-10372S		
	599-10225	599-10330	599-10330S					

Note for VA9208 and M9208 use two field furnished #10-24 x 3 1/2" screws and two locking nuts #10-24

For M9208, use M9000-560 transformation kit and for M9310, use M9310-500 transformation kit

M9000-700 Universal Ball Valve Linkage Kit (Continued)
Technical Specifications

Suitable Johnson Controls Actuators	VA9203 Series Spring Return Actuators VA9208 Series Spring Return Actuators VA9104 Series Non Spring Return Actuators VA9310 Series Non Spring Return Actuators
Suitable Valves	See relevant selection charts
Minimum Fluid Temperature Limits	-22°F (-30°C)
Maximum Fluid Temperature Limits	284°F (140°C)
Minimum Ambient Operating Temperature	-4°F (20°C)
Maximum Ambient Operating Temperature	140°F (60°C) 90% RH maximum, non-condensing
Minimum Ambient Storage Temperature	-40°F (-40°C)
Maximum Ambient Storage Temperature	185°F (85°C) 95% RH maximum, non-condensing
Material	Spacer: glass-reinforced thermoplastic resin Shaft: 12L15 steel zinc-plated Connector: 12L15 steel zinc-plated
Shipping Weight	0.4 lbs (0.2kg)

M9000-51x Series Ball Valve Linkage Kits

Description

M9000-51x Series Valve Linkage Kits are designed specifically for field mounting Johnson Controls® M9124 Series Non-Spring Return and M9220 Series Spring Return Electric Actuators to Johnson Controls VG1000 Series Ball Valves in sizes 1 in. through 6 in. (DN25 through DN150). These sturdy linkage kits provide stable actuator mounting while preventing loading on the valve stem and stem seals, to ensure longer seal life.

Refer to the *M9000-51x Series Ball Valve Linkage Kits Product Bulletin (LIT-977354)*, *VG1000 Forged Brass Ball Valves Product Bulletin (LIT-977132)*, or *VG1000 Series Flanged Ball Valves Product Bulletin (LIT-12011228)*, depending on the linkage kit you are using, for important product application and single point of contact information.

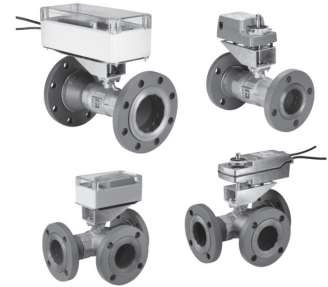
Features

- multi-position setup allows the actuator and linkage kit to be positioned in 45-degree increments, facilitating installation in

confined areas

- adjustable anti-rotation slider allows one linkage to accommodate multiple sizes of valve bodies and electric actuators
- index markings on drive shaft and mounting bracket allow the valve to be positioned in increments from fully open to fully closed, providing visual indication of the current valve position during setup and operation
- installation requiring no special tools facilitates quick and easy installation
- thermal spacer between valve and linkage reduces temperature and condensation from the valve to the actuator
- dual-centering bearing design maintains accurate stem alignment eliminating side loading on the VG1000 Series Ball Valve stem and stem seal to ensure longer seal life (M9000-51x Series Ball Valve Linkage Kit only)
- sturdy aluminum construction provides exceptional strength and stability (M9000-51x Series Ball Valve Linkage Kit only)

M9000-51x Series Linkage Kits Used to Field Mount M9000 Series Electric



Repair Information

If the M9000-5xx Series Ball Valve Linkage Kit fails to operate within its specifications, replace the unit. For a replacement linkage kit, contact the nearest Johnson Controls® representative.

Selection Charts

Valid Ball Valve, Electric Actuator, and Linkage Kit Combinations for Field Assembly

Valve Size, in. (DN)	Valve Code Number	Actuator Base Number ¹	Linkage Kit Code Number	Optional Weathershield
2-1/2 (DN65)	VG12A5Gx, VG18A5Gx VG12A5Kx, VG18A5Kx	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340
3 (DN80)	VG12A5Hx, VG18A5Hx VG12A5Lx, VG18A5Lx	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340
4 (DN100)	VG12A5Jx, VG18A5Jx VG12A5MZ, VG18A5MZ	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340
5 (DN125)	VG12A5NY, VG18A5NY	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340
6 (DN150)	VG12A5PZ, VG18A5PZ	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340

1. M9124 Series are Non-Spring Return Actuators; M9220 Series are Spring-Return Actuators.

Linkages for Discontinued Series Ball Valves

Valve Size, in. (DN)	Valve Code Number	Actuator Base Number	Linkage Kit Code Number
1/2 (DN15)	VG1243Ax, VG1644Ax	VA9300	M9000-561
		VA9208	
3/4 (DN20)	VG1243BC, VG1644BB	VA9300	M9000-561
		VA9208	
1 (DN25)	VG1243CC, VG1644CB	M9124	M9000-518
		M9220	M9000-519
1-1/4 (DN32)	VG1643DC, VG1644DB	M9124	M9000-518
		M9220	M9000-519
2 (DN50)	VG1243EC, VG1644EB	M9124	M9000-518

Repair Parts

Repair Parts (Order Separately)

Code Number	Description
M9000-600	Anti-rotation slider; includes bracket, carriage screw, split lock washer, flat washer, and wing nut
M9000-601	Mounting screws and nuts; includes four M5 (5 mm) x 16 mm machine screws and four M5 (5 mm) serrated washer head nuts
M9000-602	Drive shaft

M9000-51x Series Ball Valve Linkage Kits (Continued)

Technical Specifications

M9000-51x Series Ball Valve Linkage Kits	
Service ¹	Hot water, chilled water, 50/50 glycol solutions, and low pressure steam
Maximum Actuator Fluid Temperature Limits	284°F (140°C)
Maximum Steam Service ²	15 psig saturated steam 250°F (121°C)
	25 psig saturated steam 267°F (130°C)
Minimum Ambient Operating Temperature	-40°F (-40°C)
	-4°F (-20°C)
Maximum Ambient Operating Temperature	122°F (50°C)
	131°F (55°C)
Material	Bracket: Aluminum
	Anti-Rotation Slider: 1018 Steel
	Drive Shaft: 12L14 Steel
	Standoff: Thermoplastic Resin
	Thermo-Isolator: PTFE (Polytetrafluoroethylene)
Shipping Weight	1.5 lb (0.68 kg)

1. Refer to VDI 2035 Guideline for proper water treatment.

2. 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.

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