



VG1000 SERIES VALVE CATALOG



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Valve & Damper Actuators



HVAC Valves & Ball Valves

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VG1000 Series Ball Valves

The VG1000 Series Ball Valve closely matches your exact application requirements and is one of the industry's most complete product lines. The valves are primarily designed to regulate the flow of hot water, chilled water, and 50/50 glycol solutions to the demand of a controller in HVAC systems. Johnson Controls offers valve, linkage, and actuator assemblies for factory or field mounting with either spring return or non-spring return actuators.

The line has been developed with a new range of flow coefficient (Cv/Kv) discs to broaden the range of applications while providing improved temperature control for lower flow fan coil applications. The VG1000 is now available in three new Cv/Kv ranges for the ½" ball valve: 0.3/0.26, 0.5/0.45 and 0.8/0.7. The expanded VG1000 series incorporates a range of flow control discs that provide increased Cv/Kv selection, high rangeability, and equal percentage flow characteristic.

All valve sizes have been tested and found to be leak free after 200,000 cycles in iron oxide contaminated water. The 15% graphite filled PTFE ball seats were found to be superior to seats used by other competitors.

Johnson Controls provides a full five year warranty from date of installation on all VG1000 Series Ball Valves.

Figure 1: VG1000 Series Brass Ball Valve



VG1000 Series Flanged Ball Valves

Description

Figure 2: VG1000 Series Ball Valve



The VG1000 Series Flanged Ball Valves are primarily designed to regulate the flow of hot water, chilled water, and 50/50 glycol solutions to the demand of a controller in HVAC systems. The valves come in sizes of 2-1/2 in., 3 in., 4 in., 5 in., and 6 in. These American Society of Mechanical Engineers (ASME) Class 150 flanged valves come in both two- and three-way configurations. Johnson Controls offers valve, linkage, and actuator assemblies for factory or field mounting with either spring return or non-spring return actuators.

Refer to the *VG1000 Series Flanged Ball Valves Product Bulletin (LIT-12011228)* for important product application information and single point of contact information.

Features

- Closeoff pressure rating: 100 psi for Two-Way Valves; 50 psi for Three-Way Valves — provides tight shutoff.
- 300 stainless steel ball and stem assembly — applies to systems with high-temperature water (0°F to 284°F [-18°C to 140°C]) or 25 psi saturated steam.

- 500:1 rangeability — provides accurate control under all load conditions.
- Amodel® flow characterizing disk — provides equal percentage flow characteristics for best temperature control; available in a wide array of Cv ranges to cover a broad variety of applications.
- Ethylene propylene diene monomer (EPDM) double o-ring stem seal — offers tested leak-free operation for 200,000 cycles in iron-oxide contaminated water.
- Graphite-reinforced Polytetrafluoroethylene (PTFE) seats — include 15% graphite-reinforced ball seals that last twice as long in iron-oxide contaminated water when compared to virgin Teflon® ball seats.
- PTFE thermal spacer — provides thermal isolation between the actuator and the valve.
- Seats backed with EPDM o-rings — maintain a constant seating force that compensates for expansion, contraction, and seat wear without increasing operating torque.
- Maintenance-free design — performs without failure in excess of 200,000 full stroke cycles in iron-oxide contaminated water.
- Available with factory-mounted VA9320 or M9220 series electric actuators — reduces field installation time and cost.
- Weather shields available for field installation — protect the actuator from corrosion, rain, freezing rain, sleet, and snow.

Selection charts

Table 1: Flanged stainless steel trim ball valves with non-spring return electric actuators

Valve	Size, in.	Cv	Closeoff PSIG	AC and DC 24 V	
				On/off, floating, and proportional	On/off, floating, and proportional
				Without switches	With two auxiliary switches
				VA9320-HGA-2 Actuator	VA9320-HGA-2 Actuator with M9300-2 Switch Kit
Two-way					
VG12A5GS	2-1/2	47	100	VG12A5GS+920HGA	VG12A5GS+920HGC
VG12A5KS				VG12A5KS+920HGA	VG12A5KS+920HGC
VG12A5GT		74		VG12A5GT+920HGA	VG12A5GT+920HGC
VG12A5KT				VG12A5KT+920HGA	VG12A5KT+920HGC
VG12A5GU		117		VG12A5GU+920HGA	VG12A5GU+920HGC
VG12A5KU				VG12A5KU+920HGA	VG12A5KU+920HGC
VG12A5HT	3	74	100	VG12A5HT+920HGA	VG12A5HT+920HGC
VG12A5LT				VG12A5LT+920HGA	VG12A5LT+920HGC
VG12A5HU		117		VG12A5HU+920HGA	VG12A5HU+920HGC
VG12A5LU				VG12A5LU+920HGA	VG12A5LU+920HGC
VG12A5HV		176		VG12A5HV+920HGA	VG12A5HV+920HGC
VG12A5LV				VG12A5LV+920HGA	VG12A5LV+920HGC
VG12A5HW		211		VG12A5HW+920HGA	VG12A5HW+920HGC
VG12A5LW				VG12A5LW+920HGA	VG12A5LW+920HGC
VG12A5JU	4	117	100	VG12A5JU+920HGA	VG12A5JU+920HGC
VG12A5JV		176		VG12A5JV+920HGA	VG12A5JV+920HGC
VG12A5MW		190		VG12A5MW+920HGA	VG12A5MW+920HGC
VG12A5NY	5	290		VG12A5NY+920HGA	VG12A5NY+920HGC
VG12A5PZ	6	350		VG12A5PZ+920HGA	VG12A5PZ+920HGC
Three-way					
VG18A5GS	2-1/2	47 / 29	50	VG18A5GS+920HGA	VG18A5GS+920HGC
VG18A5KS				VG18A5KS+920HGA	VG18A5KS+920HGC
VG18A5GT		74 / 47		VG18A5GT+920HGA	VG18A5GT+920HGC
VG18A5KT				VG18A5KT+920HGA	VG18A5KT+920HGC
VG18A5GU		117 / 74		VG18A5GU+920HGA	VG18A5GU+920HGC
VG18A5KU				VG18A5KU+920HGA	VG18A5KU+920HGC
VG18A5HT	3	74 / 47	50	VG18A5HT+920HGA	VG18A5HT+920HGC
VG18A5LT				VG18A5LT+920HGA	VG18A5LT+920HGC
VG18A5HU		117 / 74		VG18A5HU+920HGA	VG18A5HU+920HGC
VG18A5LU				VG18A5LU+920HGA	VG18A5LU+920HGC
VG18A5HV		176 / 88		VG18A5HV+920HGA	VG18A5HV+920HGC
VG18A5LV				VG18A5LV+920HGA	VG18A5LV+920HGC
VG18A5HW		211 / 105		VG18A5HW+920HGA	VG18A5HW+920HGC
VG18A5LW				VG18A5LW+920HGA	VG18A5LW+920HGC
VG18A5JU	4	117 / 74	50	VG18A5JU+920HGA	VG18A5JU+920HGC
VG18A5JV		176 / 88		VG18A5JV+920HGA	VG18A5JV+920HGC
VG18A5MW		190 / 190		VG18A5MW+920HGA	VG18A5MW+920HGC
VG18A5NY	5	290 / 190		VG18A5NY+920HGA	VG18A5NY+920HGC
VG18A5PZ	6	350 / 180		VG18A5PZ+920HGA	VG18A5PZ+920HGC

Table 2: Flanged stainless steel trim ball valves with spring return electric actuators without switches

Valve	Size, in.	Cv	Closeoff PSIG	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Prop.	On/off	On/off
				M9220-AGA-3	M9220-GGA-3	M9220-BGA-3	M9220-BAA-3
Two-way – spring return – valve open (normally open) – without switches							
VG12A5GS	2-1/2	47	100	VG12A5GS+92NAGA	VG12A5GS+92NGGA	VG12A5GS+92NBGA	VG12A5GS+92NBAA
VG12A5KS				VG12A5KS+92NAGA	VG12A5KS+92NGGA	VG12A5KS+92NBGA	VG12A5KS+92NBAA
VG12A5GT		74		VG12A5GT+92NAGA	VG12A5GT+92NGGA	VG12A5GT+92NBGA	VG12A5GT+92NBAA
VG12A5KT				VG12A5KT+92NAGA	VG12A5KT+92NGGA	VG12A5KT+92NBGA	VG12A5KT+92NBAA
VG12A5GU		117		VG12A5GU+92NAGA	VG12A5GU+92NGGA	VG12A5GU+92NBGA	VG12A5GU+92NBAA
VG12A5KU				VG12A5KU+92NAGA	VG12A5KU+92NGGA	VG12A5KU+92NBGA	VG12A5KU+92NBAA
VG12A5HT	3	74	100	VG12A5HT+92NAGA	VG12A5HT+92NGGA	VG12A5HT+92NBGA	VG12A5HT+92NBAA
VG12A5LT				VG12A5LT+92NAGA	VG12A5LT+92NGGA	VG12A5LT+92NBGA	VG12A5LT+92NBAA
VG12A5HU		117		VG12A5HU+92NAGA	VG12A5HU+92NGGA	VG12A5HU+92NBGA	VG12A5HU+92NBAA
VG12A5LU				VG12A5LU+92NAGA	VG12A5LU+92NGGA	VG12A5LU+92NBGA	VG12A5LU+92NBAA
VG12A5HV		176		VG12A5HV+92NAGA	VG12A5HV+92NGGA	VG12A5HV+92NBGA	VG12A5HV+92NBAA
VG12A5LV				VG12A5LV+92NAGA	VG12A5LV+92NGGA	VG12A5LV+92NBGA	VG12A5LV+92NBAA
VG12A5HW		211		VG12A5HW+92NAGA	VG12A5HW+92NGGA	VG12A5HW+92NBGA	VG12A5HW+92NBAA
VG12A5LW				VG12A5LW+92NAGA	VG12A5LW+92NGGA	VG12A5LW+92NBGA	VG12A5LW+92NBAA
VG12A5JU	4	117	100	VG12A5JU+92NAGA	VG12A5JU+92NGGA	VG12A5JU+92NBGA	VG12A5JU+92NBAA
VG12A5JV		176		VG12A5JV+92NAGA	VG12A5JV+92NGGA	VG12A5JV+92NBGA	VG12A5JV+92NBAA
VG12A5MW		190		VG12A5MW+92NAGA	VG12A5MW+92NGGA	VG12A5MW+92NBGA	VG12A5MW+92NBAA
VG12A5NY	5	290		VG12A5NY+92NAGA	VG12A5NY+92NGGA	VG12A5NY+92NBGA	VG12A5NY+92NBAA
VG12A5PZ	6	350		VG12A5PZ+92NAGA	VG12A5PZ+92NGGA	VG12A5PZ+92NBGA	VG12A5PZ+92NBAA
Two-way – spring return – valve closed (normally closed) – without switches							
VG12A5GS	2-1/2	47	100	VG12A5GS+94NAGA	VG12A5GS+94NGGA	VG12A5GS+94NBGA	VG12A5GS+94NBAA
VG12A5KS				VG12A5KS+94NAGA	VG12A5KS+94NGGA	VG12A5KS+94NBGA	VG12A5KS+94NBAA
VG12A5GT		74		VG12A5GT+94NAGA	VG12A5GT+94NGGA	VG12A5GT+94NBGA	VG12A5GT+94NBAA
VG12A5KT				VG12A5KT+94NAGA	VG12A5KT+94NGGA	VG12A5KT+94NBGA	VG12A5KT+94NBAA
VG12A5GU		117		VG12A5GU+94NAGA	VG12A5GU+94NGGA	VG12A5GU+94NBGA	VG12A5GU+94NBAA
VG12A5KU				VG12A5KU+94NAGA	VG12A5KU+94NGGA	VG12A5KU+94NBGA	VG12A5KU+94NBAA
VG12A5HT	3	74	100	VG12A5HT+94NAGA	VG12A5HT+94NGGA	VG12A5HT+94NBGA	VG12A5HT+94NBAA
VG12A5LT				VG12A5LT+94NAGA	VG12A5LT+94NGGA	VG12A5LT+94NBGA	VG12A5LT+94NBAA
VG12A5HU		117		VG12A5HU+94NAGA	VG12A5HU+94NGGA	VG12A5HU+94NBGA	VG12A5HU+94NBAA
VG12A5LU				VG12A5LU+94NAGA	VG12A5LU+94NGGA	VG12A5LU+94NBGA	VG12A5LU+94NBAA
VG12A5HV		176		VG12A5HV+94NAGA	VG12A5HV+94NGGA	VG12A5HV+94NBGA	VG12A5HV+94NBAA
VG12A5LV				VG12A5LV+94NAGA	VG12A5LV+94NGGA	VG12A5LV+94NBGA	VG12A5LV+94NBAA
VG12A5HW		211		VG12A5HW+94NAGA	VG12A5HW+94NGGA	VG12A5HW+94NBGA	VG12A5HW+94NBAA
VG12A5LW				VG12A5LW+94NAGA	VG12A5LW+94NGGA	VG12A5LW+94NBGA	VG12A5LW+94NBAA
VG12A5JU	4	117	100	VG12A5JU+94NAGA	VG12A5JU+94NGGA	VG12A5JU+94NBGA	VG12A5JU+94NBAA
VG12A5JV		176		VG12A5JV+94NAGA	VG12A5JV+94NGGA	VG12A5JV+94NBGA	VG12A5JV+94NBAA
VG12A5MW		190		VG12A5MW+94NAGA	VG12A5MW+94NGGA	VG12A5MW+94NBGA	VG12A5MW+94NBAA
VG12A5NY	5	290		VG12A5NY+94NAGA	VG12A5NY+94NGGA	VG12A5NY+94NBGA	VG12A5NY+94NBAA
VG12A5PZ	6	350		VG12A5PZ+94NAGA	VG12A5PZ+94NGGA	VG12A5PZ+94NBGA	VG12A5PZ+94NBAA
Three-way – spring return counterclockwise – port A (coil) open to port AB (common) – without switches							
VG18A5GS	2-1/2	47 / 29	50	VG18A5GS+92NAGA	VG18A5GS+92NGGA	VG18A5GS+92NBGA	VG18A5GS+92NBAA
VG18A5K				VG18A5KS+92NAGA	VG18A5KS+92NGGA	VG18A5KS+92NBGA	VG18A5KS+92NBAA
VG18A5GT		74 / 47		VG18A5GT+92NAGA	VG18A5GT+92NGGA	VG18A5GT+92NBGA	VG18A5GT+92NBAA
VG18A5KT				VG18A5KT+92NAGA	VG18A5KT+92NGGA	VG18A5KT+92NBGA	VG18A5KT+92NBAA
VG18A5GU		117 / 74		VG18A5GU+92NAGA	VG18A5GU+92NGGA	VG18A5GU+92NBGA	VG18A5GU+92NBAA
VG18A5KU				VG18A5KU+92NAGA	VG18A5KU+92NGGA	VG18A5KU+92NBGA	VG18A5KU+92NBAA

Table 2: Flanged stainless steel trim ball valves with spring return electric actuators without switches

Valve	Size, in.	Cv	Closeoff PSIG	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Prop.	On/off	On/off
				M9220-AGA-3	M9220-GGA-3	M9220-BGA-3	M9220-BAA-3
VG18A5HT	3	74 / 47	50	VG18A5HT+92NAGA	VG18A5HT+92NGGA	VG18A5HT+92NBGA	VG18A5HT+92NBAA
VG18A5LT				VG18A5LT+92NAGA	VG18A5LT+92NGGA	VG18A5LT+92NBGA	VG18A5LT+92NBAA
VG18A5HU		117 / 74		VG18A5HU+92NAGA	VG18A5HU+92NGGA	VG18A5HU+92NBGA	VG18A5HU+92NBAA
VG18A5LU				VG18A5LU+92NAGA	VG18A5LU+92NGGA	VG18A5LU+92NBGA	VG18A5LU+92NBAA
VG18A5HV		176 / 88		VG18A5HV+92NAGA	VG18A5HV+92NGGA	VG18A5HV+92NBGA	VG18A5HV+92NBAA
VG18A5LV				VG18A5LV+92NAGA	VG18A5LV+92NGGA	VG18A5LV+92NBGA	VG18A5LV+92NBAA
VG18A5HW		211 / 105		VG18A5HW+92NAGA	VG18A5HW+92NGGA	VG18A5HW+92NBGA	VG18A5HW+92NBAA
VG18A5LW				VG18A5LW+92NAGA	VG18A5LW+92NGGA	VG18A5LW+92NBGA	VG18A5LW+92NBAA
VG18A5JU	4	117 / 74	50	VG18A5JU+92NAGA	VG18A5JU+92NGGA	VG18A5JU+92NBGA	VG18A5JU+92NBAA
VG18A5JV		176 / 88		VG18A5JV+92NAGA	VG18A5JV+92NGGA	VG18A5JV+92NBGA	VG18A5JV+92NBAA
VG18A5MW		190 / 190		VG18A5MW+92NAGA	VG18A5MW+92NGGA	VG18A5MW+92NBGA	VG18A5MW+92NBAA
VG18A5NY	5	290 / 190		VG18A5NY+92NAGA	VG18A5NY+92NGGA	VG18A5NY+92NBGA	VG18A5NY+92NBAA
VG18A5PZ	6	350 / 180		VG18A5PZ+92NAGA	VG18A5PZ+92NGGA	VG18A5PZ+92NBGA	VG18A5PZ+92NBAA
Three-way – spring return clockwise – port B (bypass) open to port AB (common) – without switches							
VG18A5GS	2-1/2	47 / 29	50	VG18A5GS+94NAGA	VG18A5GS+94NGGA	VG18A5GS+94NBGA	VG18A5GS+94NBAA
VG18A5KS				VG18A5KS+94NAGA	VG18A5KS+94NGGA	VG18A5KS+94NBGA	VG18A5KS+94NBAA
VG18A5GT		74 / 47		VG18A5GT+94NAGA	VG18A5GT+94NGGA	VG18A5GT+94NBGA	VG18A5GT+94NBAA
VG18A5KT				VG18A5KT+94NAGA	VG18A5KT+94NGGA	VG18A5KT+94NBGA	VG18A5KT+94NBAA
VG18A5GU		117 / 74		VG18A5GU+94NAGA	VG18A5GU+94NGGA	VG18A5GU+94NBGA	VG18A5GU+94NBAA
VG18A5KU				VG18A5KU+94NAGA	VG18A5KU+94NGGA	VG18A5KU+94NBGA	VG18A5KU+94NBAA
VG18A5HT	3	74 / 47	50	VG18A5HT+94NAGA	VG18A5HT+94NGGA	VG18A5HT+94NBGA	VG18A5HT+94NBAA
VG18A5LT				VG18A5LT+94NAGA	VG18A5LT+94NGGA	VG18A5LT+94NBGA	VG18A5LT+94NBAA
VG18A5HU		117 / 74		VG18A5HU+94NAGA	VG18A5HU+94NGGA	VG18A5HU+94NBGA	VG18A5HU+94NBAA
VG18A5LU				VG18A5LU+94NAGA	VG18A5LU+94NGGA	VG18A5LU+94NBGA	VG18A5LU+94NBAA
VG18A5HV		176 / 88		VG18A5HV+94NAGA	VG18A5HV+94NGGA	VG18A5HV+94NBGA	VG18A5HV+94NBAA
VG18A5LV				VG18A5LV+94NAGA	VG18A5LV+94NGGA	VG18A5LV+94NBGA	VG18A5LV+94NBAA
VG18A5HW		211 / 105		VG18A5HW+94NAGA	VG18A5HW+94NGGA	VG18A5HW+94NBGA	VG18A5HW+94NBAA
VG18A5LW				VG18A5LW+94NAGA	VG18A5LW+94NGGA	VG18A5LW+94NBGA	VG18A5LW+94NBAA
VG18A5JU	4	117 / 74	50	VG18A5JU+94NAGA	VG18A5JU+94NGGA	VG18A5JU+94NBGA	VG18A5JU+94NBAA
VG18A5JV		176 / 88		VG18A5JV+94NAGA	VG18A5JV+94NGGA	VG18A5JV+94NBGA	VG18A5JV+94NBAA
VG18A5MW		190 / 190		VG18A5MW+94NAGA	VG18A5MW+94NGGA	VG18A5MW+94NBGA	VG18A5MW+94NBAA
VG18A5NY	5	290 / 190		VG18A5NY+94NAGA	VG18A5NY+94NGGA	VG18A5NY+94NBGA	VG18A5NY+94NBAA
VG18A5PZ	6	350 / 180		VG18A5PZ+94NAGA	VG18A5PZ+94NGGA	VG18A5PZ+94NBGA	VG18A5PZ+94NBAA

Table 3: Flanged stainless steel trim ball valves with spring return electric actuators with two switches

Valve	Size, in.	Cv	Closeoff PSIG	AC 24 V			AC 120 V	
				Floating	DC 0 to 10 V Prop.	On/off	On/off	
				M9220-AGC-3	M9220-GGC-3	M9220-BGC-3	M9220-BAC-3	
Two-way – spring return – valve open (normally open) – with two auxiliary switches								
VG12A5GS	2-1/2	47	100	VG12A5GS+92NAGC	VG12A5GS+92NGGC	VG12A5GS+92NBGC	VG12A5GS+92NBAC	
VG12A5KS				VG12A5KS+92NAGC	VG12A5KS+92NGGC	VG12A5KS+92NBGC	VG12A5KS+92NBAC	
VG12A5GT		74		VG12A5GT+92NAGC	VG12A5GT+92NGGC	VG12A5GT+92NBGC	VG12A5GT+92NBAC	
VG12A5KT				VG12A5KT+92NAGC	VG12A5KT+92NGGC	VG12A5KT+92NBGC	VG12A5KT+92NBAC	
VG12A5GU		117		VG12A5GU+92NAGC	VG12A5GU+92NGGC	VG12A5GU+92NBGC	VG12A5GU+92NBAC	
VG12A5KU				VG12A5KU+92NAGC	VG12A5KU+92NGGC	VG12A5KU+92NBGC	VG12A5KU+92NBAC	

Table 3: Flanged stainless steel trim ball valves with spring return electric actuators with two switches

Valve	Size, in.	Cv	Closeoff PSIG	AC 24 V			AC 120 V
				Floating	DC 0 to 10 V Prop.	On/off	On/off
				M9220-AGC-3	M9220-GGC-3	M9220-BGC-3	M9220-BAC-3
VG12A5HT	3	74	100	VG12A5HT+92NAGC	VG12A5HT+92NGGC	VG12A5HT+92NBGC	VG12A5HT+92NBAC
VG12A5LT				VG12A5LT+92NAGC	VG12A5LT+92NGGC	VG12A5LT+92NBGC	VG12A5LT+92NBAC
VG12A5HU		117		VG12A5HU+92NAGC	VG12A5HU+92NGGC	VG12A5HU+92NBGC	VG12A5HU+92NBAC
VG12A5LU				VG12A5LU+92NAGC	VG12A5LU+92NGGC	VG12A5LU+92NBGC	VG12A5LU+92NBAC
VG12A5HV		176		VG12A5HV+92NAGC	VG12A5HV+92NGGC	VG12A5HV+92NBGC	VG12A5HV+92NBAC
VG12A5LV				VG12A5LV+92NAGC	VG12A5LV+92NGGC	VG12A5LV+92NBGC	VG12A5LV+92NBAC
VG12A5HW		211		VG12A5HW+92NAGC	VG12A5HW+92NGGC	VG12A5HW+92NBGC	VG12A5HW+92NBAC
VG12A5LW				VG12A5LW+92NAGC	VG12A5LW+92NGGC	VG12A5LW+92NBGC	VG12A5LW+92NBAC
VG12A5JU	4	117	100	VG12A5JU+92NAGC	VG12A5JU+92NGGC	VG12A5JU+92NBGC	VG12A5JU+92NBAC
VG12A5JV		176		VG12A5JV+92NAGC	VG12A5JV+92NGGC	VG12A5JV+92NBGC	VG12A5JV+92NBAC
VG12A5MW		190		VG12A5MW+92NAGC	VG12A5MW+92NGGC	VG12A5MW+92NBGC	VG12A5MW+92NBAC
VG12A5NY	5	290		VG12A5NY+92NAGC	VG12A5NY+92NGGC	VG12A5NY+92NBGC	VG12A5NY+92NBAC
VG12A5PZ	6	350		VG12A5PZ+92NAGC	VG12A5PZ+92NGGC	VG12A5PZ+92NBGC	VG12A5PZ+92NBAC
Two-way – spring return – valve closed (normally closed) – with two auxiliary switches							
VG12A5GS	2-1/2	47	100	VG12A5GS+94NAGC	VG12A5GS+94NGGC	VG12A5GS+94NBGC	VG12A5GS+94NBAC
VG12A5KS				VG12A5KS+94NAGC	VG12A5KS+94NGGC	VG12A5KS+94NBGC	VG12A5KS+94NBAC
VG12A5GT		74		VG12A5GT+94NAGC	VG12A5GT+94NGGC	VG12A5GT+94NBGC	VG12A5GT+94NBAC
VG12A5KT				VG12A5KT+94NAGC	VG12A5KT+94NGGC	VG12A5KT+94NBGC	VG12A5KT+94NBAC
VG12A5GU		117		VG12A5GU+94NAGC	VG12A5GU+94NGGC	VG12A5GU+94NBGC	VG12A5GU+94NBAC
VG12A5KU				VG12A5KU+94NAGC	VG12A5KU+94NGGC	VG12A5KU+94NBGC	VG12A5KU+94NBAC
VG12A5HT	3	74	100	VG12A5HT+94NAGC	VG12A5HT+94NGGC	VG12A5HT+94NBGC	VG12A5HT+94NBAC
VG12A5LT				VG12A5LT+94NAGC	VG12A5LT+94NGGC	VG12A5LT+94NBGC	VG12A5LT+94NBAC
VG12A5HU		117		VG12A5HU+94NAGC	VG12A5HU+94NGGC	VG12A5HU+94NBGC	VG12A5HU+94NBAC
VG12A5LU				VG12A5LU+94NAGC	VG12A5LU+94NGGC	VG12A5LU+94NBGC	VG12A5LU+94NBAC
VG12A5HV		176		VG12A5HV+94NAGC	VG12A5HV+94NGGC	VG12A5HV+94NBGC	VG12A5HV+94NBAC
VG12A5LV				VG12A5LV+94NAGC	VG12A5LV+94NGGC	VG12A5LV+94NBGC	VG12A5LV+94NBAC
VG12A5HW		211		VG12A5HW+94NAGC	VG12A5HW+94NGGC	VG12A5HW+94NBGC	VG12A5HW+94NBAC
VG12A5LW				VG12A5LW+94NAGC	VG12A5LW+94NGGC	VG12A5LW+94NBGC	VG12A5LW+94NBAC
VG12A5JU	4	117	100	VG12A5JU+94NAGC	VG12A5JU+94NGGC	VG12A5JU+94NBGC	VG12A5JU+94NBAC
VG12A5JV		176		VG12A5JV+94NAGC	VG12A5JV+94NGGC	VG12A5JV+94NBGC	VG12A5JV+94NBAC
VG12A5MW		190		VG12A5MW+94NAGC	VG12A5MW+94NGGC	VG12A5MW+94NBGC	VG12A5MW+94NBAC
VG12A5NY	5	290		VG12A5NY+94NAGC	VG12A5NY+94NGGC	VG12A5NY+94NBGC	VG12A5NY+94NBAC
VG12A5PZ	6	350		VG12A5PZ+94NAGC	VG12A5PZ+94NGGC	VG12A5PZ+94NBGC	VG12A5PZ+94NBAC
Three-way – spring return counterclockwise – port A (coil) open to port AB (common) – with two auxiliary switches							
VG18A5GS	2-1/2	47 / 29	50	VG18A5GS+92NAGC	VG18A5GS+92NGGC	VG18A5GS+92NBGC	VG18A5GS+92NBAC
VG18A5KS				VG18A5KS+92NAGC	VG18A5KS+92NGGC	VG18A5KS+92NBGC	VG18A5KS+92NBAC
VG18A5GT		74 / 47		VG18A5GT+92NAGC	VG18A5GT+92NGGC	VG18A5GT+92NBGC	VG18A5GT+92NBAC
VG18A5KT				VG18A5KT+92NAGC	VG18A5KT+92NGGC	VG18A5KT+92NBGC	VG18A5KT+92NBAC
VG18A5GU		117 / 74		VG18A5GU+92NAGC	VG18A5GU+92NGGC	VG18A5GU+92NBGC	VG18A5GU+92NBAC
VG18A5KU				VG18A5KU+92NAGC	VG18A5KU+92NGGC	VG18A5KU+92NBGC	VG18A5KU+92NBAC
VG18A5HT	3	74 / 47	50	VG18A5HT+92NAGC	VG18A5HT+92NGGC	VG18A5HT+92NBGC	VG18A5HT+92NBAC
VG18A5LT				VG18A5LT+92NAGC	VG18A5LT+92NGGC	VG18A5LT+92NBGC	VG18A5LT+92NBAC
VG18A5HU		117 / 74		VG18A5HU+92NAGC	VG18A5HU+92NGGC	VG18A5HU+92NBGC	VG18A5HU+92NBAC
VG18A5LU				VG18A5LU+92NAGC	VG18A5LU+92NGGC	VG18A5LU+92NBGC	VG18A5LU+92NBAC
VG18A5HV		176 / 88		VG18A5HV+92NAGC	VG18A5HV+92NGGC	VG18A5HV+92NBGC	VG18A5HV+92NBAC
VG18A5LV				VG18A5LV+92NAGC	VG18A5LV+92NGGC	VG18A5LV+92NBGC	VG18A5LV+92NBAC
VG18A5HW		211 / 105		VG18A5HW+92NAGC	VG18A5HW+92NGGC	VG18A5HW+92NBGC	VG18A5HW+92NBAC
VG18A5LW				VG18A5LW+92NAGC	VG18A5LW+92NGGC	VG18A5LW+92NBGC	VG18A5LW+92NBAC

Table 3: Flanged stainless steel trim ball valves with spring return electric actuators with two switches

Valve	Size, in.	Cv	Closeoff PSIG	AC 24 V			AC 120 V	
				Floating	DC 0 to 10 V Prop.	On/off	On/off	
				M9220-AGC-3	M9220-GGC-3	M9220-BGC-3	M9220-BAC-3	
VG18A5JU	4	117 / 74	50	VG18A5JU+92NAGC	VG18A5JU+92NGGC	VG18A5JU+92NBGC	VG18A5JU+92NBAC	
VG18A5JV		176 / 88		VG18A5JV+92NAGC	VG18A5JV+92NGGC	VG18A5JV+92NBGC	VG18A5JV+92NBAC	
VG18A5MW		190 / 190		VG18A5MW+92NAGC	VG18A5MW+92NGGC	VG18A5MW+92NBGC	VG18A5MW+92NBAC	
VG18A5NY	5	290 / 190		VG18A5NY+92NAGC	VG18A5NY+92NGGC	VG18A5NY+92NBGC	VG18A5NY+92NBAC	
VG18A5PZ	6	350 / 180		VG18A5PZ+92NAGC	VG18A5PZ+92NGGC	VG18A5PZ+92NBGC	VG18A5PZ+92NBAC	
Three-way – spring return clockwise – port B (bypass) open to port AB (common) – with two auxiliary switches								
VG18A5GS	2-1/2	47 / 29	50	VG18A5GS+94NAGC	VG18A5GS+94NGGC	VG18A5GS+94NBGC	VG18A5GS+94NBAC	
VG18A5KS		74 / 47		VG18A5KS+94NAGC	VG18A5KS+94NGGC	VG18A5KS+94NBGC	VG18A5KS+94NBAC	
VG18A5GT				VG18A5GT+94NAGC	VG18A5GT+94NGGC	VG18A5GT+94NBGC	VG18A5GT+94NBAC	
VG18A5KT				VG18A5KT+94NAGC	VG18A5KT+94NGGC	VG18A5KT+94NBGC	VG18A5KT+94NBAC	
VG18A5GU		117 / 74		VG18A5GU+94NAGC	VG18A5GU+94NGGC	VG18A5GU+94NBGC	VG18A5GU+94NBAC	
VG18A5KU		117 / 74		VG18A5KU+94NAGC	VG18A5KU+94NGGC	VG18A5KU+94NBGC	VG18A5KU+94NBAC	
VG18A5HT	3			74 / 47	50	VG18A5HT+94NAGC	VG18A5HT+94NGGC	VG18A5HT+94NBGC
VG18A5LT		117 / 74		VG18A5LT+94NAGC		VG18A5LT+94NGGC	VG18A5LT+94NBGC	VG18A5LT+94NBAC
VG18A5HU				VG18A5HU+94NAGC		VG18A5HU+94NGGC	VG18A5HU+94NBGC	VG18A5HU+94NBAC
VG18A5LU				VG18A5LU+94NAGC		VG18A5LU+94NGGC	VG18A5LU+94NBGC	VG18A5LU+94NBAC
VG18A5HV		176 / 88		VG18A5HV+94NAGC		VG18A5HV+94NGGC	VG18A5HV+94NBGC	VG18A5HV+94NBAC
VG18A5LV				VG18A5LV+94NAGC		VG18A5LV+94NGGC	VG18A5LV+94NBGC	VG18A5LV+94NBAC
VG18A5HW		211 / 105		VG18A5HW+94NAGC		VG18A5HW+94NGGC	VG18A5HW+94NBGC	VG18A5HW+94NBAC
VG18A5LW				VG18A5LW+94NAGC		VG18A5LW+94NGGC	VG18A5LW+94NBGC	VG18A5LW+94NBAC
VG18A5JU	4	117 / 74	50	VG18A5JU+94NAGC	VG18A5JU+94NGGC	VG18A5JU+94NBGC	VG18A5JU+94NBAC	
VG18A5JV		176 / 88		VG18A5JV+94NAGC	VG18A5JV+94NGGC	VG18A5JV+94NBGC	VG18A5JV+94NBAC	
VG18A5MW		190 / 190		VG18A5MW+94NAGC	VG18A5MW+94NGGC	VG18A5MW+94NBGC	VG18A5MW+94NBAC	
VG18A5NY	5	290 / 190		VG18A5NY+94NAGC	VG18A5NY+94NGGC	VG18A5NY+94NBGC	VG18A5NY+94NBAC	
VG18A5PZ	6	350 / 180		VG18A5PZ+94NAGC	VG18A5PZ+94NGGC	VG18A5PZ+94NBGC	VG18A5PZ+94NBAC	

Technical specifications

VG1000 Series Flanged Ball Valves		
Service ¹		Hot water, chilled water, 50/50 Glycol solutions, and 25 psig (172 kPa) saturated steam for HVAC systems
Valve fluid temperature limits		0°F to 284°F (-18°C to 140°C)
Valve body pressure/temperature rating	Water	ASME Class 150250 psi at -20°F to 100°F (29°C to 38°C) 235 psi at 200°F (93°C) 218 psi at 284°F (140°C)
	Steam	25 psig (172 kPa) saturated steam for HVAC systems
Maximum closeoff pressure	Two-way	100 psi (689 kPa)
	Three-way	50 psi (345 kPa)
Maximum recommended operating pressure drop		30 psi (207 kPa) for quiet service
Flow characteristics	Two-way	Equal percentage
	Three-way	Equal percentage flow characteristics of in-line port or linear percentage flow characteristics of angle port
Rangeability ²		Greater than 500:1
Minimum ambient operating temperature	-4°F (-20°C)	VA9320 Series Non-Spring Return Actuators
	-40°F (-40°C)	M9220 Series Spring Return Actuators
Maximum ambient operating temperature ³	122°F (50°C)	VA9320 Series Non-Spring Return Actuators
	131°F (55°C)	M9220 Series Spring Return Actuators

VG1000 Series Flanged Ball Valves		
Leakage	Two- or three-way	0.01% of maximum flow, control port, ANSI/FCI 70-2, Class 4
	Three-way	1% of maximum flow, bypass port
End connections		ASME Class 150 Flange
Materials	Body	Brass
	Flanges	Ductile Iron
	Ball	300 Series Stainless Steel
	Stem	300 Series Stainless Steel
	Seats	Graphite reinforced PTFE with EPDM O-ring backing
	Stem seals	EPDM O-rings
	Flow control disk	Amodel AS-1145HS polyphthalamide resin
Compliance	Europe	CE Mark - Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the Pressure Equipment Directive (PED).



- 1 Refer to the VDI 2035 Guideline for proper water treatment.
- 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 Flanged Ball Valves for Assembly in the Field Catalog Page

Description

Figure 3: VG1000 Series Ball Valve



The VG1000 Series Flanged Ball Valves are primarily designed to regulate the flow of hot water, chilled water, and 50/50 glycol solutions to the demand of a controller in HVAC systems. The valves come in sizes of 2-1/2 in., 3 in., 4 in., 5 in., and 6 in. These American Society of Mechanical Engineers (ASME) Class 150 flanged valves come in both two and three-way configurations. Johnson Controls offers valve, linkage, and actuator assemblies for factory or field mounting with either spring return or non-spring return actuators.

Refer to the *VG1000 Series Flanged Ball Valve Product Bulletin (LIT-12011228)* for important product application information and single point of contact information.

Features

- Closeoff pressure rating: 100 psi for two-way valves; 50 psi for three-way valves—provides tight shutoff.
- 300 stainless steel ball and stem assembly—applies to systems with high-temperature water (0°F to 284°F [-18°C to 140°C]) or 25 psi saturated steam.
- 500:1 rangeability—provides accurate control under all load conditions.
- Amodel® flow characterizing disk—provides equal percentage flow characteristics for best temperature control; available in a wide array of Cv ranges to cover a broad variety of applications.
- Ethylene propylene diene monomer (EPDM) double o-ring stem seal—offers tested leak-free operation for 200,000 cycles in iron-oxide contaminated water.
- Graphite-reinforced Polytetrafluoroethylene (PTFE) seats—include 15% graphite-reinforced ball seals that last twice as long in iron-oxide contaminated water when compared to virgin Teflon® ball seats.
- PTFE thermal spacer—provides thermal isolation between the actuator and the valve.
- Seats backed with EPDM o-rings—maintain a constant seating force that compensates for expansion, contraction, and seat wear without increasing operating torque.
- Maintenance-free design—performs without failure in excess of 200,000 full stroke cycles in iron-oxide contaminated water.
- Available with factory-mounted VA9320 or M9220 series electric actuators—reduces field installation time and cost.
- M9000-340 and M9000-343 weather shields available for field installation—protect the actuator from corrosion, rain, freezing rain, sleet, and snow.

Selection charts

Table 4: Flanged ball valves (for assembly in the field)

Part number		Size, in. (DN)	Closeoff psig		Control disk	Control Port A	Control Port B
Two-way	Three-way		Two-way	Three-way		Cv (Kv)	Cv (Kv)
VG12A5GS	VG18A5GS	2-1/2 (DN65)	100	50	Yes	47 (40)	29 (25)
VG12A5KS	VG18A5KS						
VG12A5GT	VG18A5GT					74 (63)	47 (40)
VG12A5KT	VG18A5KT						
VG12A5GU	VG18A5GU					117 (100)	74 (63)
VG12A5KU	VG18A5KU						
VG12A5HT	VG18A5HT	3 (DN80)	100	50	Yes	74 (63)	47 (40)
VG12A5LT	VG18A5LT						
VG12A5HU	VG18A5HU					117 (100)	74 (63)
VG12A5LU	VG18A5LU						
VG12A5HV	VG18A5HV				No	176 (150)	88 (75)
VG12A5LV	VG18A5LV						
VG12A5HW	VG18A5HW					211 (180)	105 (90)
VG12A5LW	VG18A5LW						
VG12A5JU	VG18A5JU	4 (DN100)	100	50	Yes	117 (100)	74 (63)
VG12A5JV	VG18A5JV				No	176 (150)	88 (75)
VG12A5MW	VG18A5MW	4 (DN100)	100	50	Yes	190 (164)	190 (164)
VG12A5NY	VG18A5NY	5 (DN125)	100	50	Yes	290 (251)	190 (164)
VG12A5PZ	VG18A5PZ	6 (DN150)	100	50	No	350 (302)	180 (156)

Table 5: Actuators and linkages (for assembly in the field)

Spring return	Control type				Supply voltage	SPDT aux. switches	Actuator code	Switch kit code	Linkage code	Optional weather shield
	on/off	floating	proportional 0(2)...10 V	proportional 0(4)...20 mA¹						
Yes		X			24 VAC/VDC	0	M9220-AGA-3	-	M9000-519	M9000-340
		X				2	M9220-AGC-3			
	X				120 VAC	0	M9220-BAA-3			
	X					2	M9220-BAC-3			
	X				24 VAC/VDC	0	M9220-BGA-3			
	X					2	M9220-BGC-3			
			X	X	24 VAC/VDC	0	M9220-GGA-3			
			X	X		2	M9220-GGC-3			
	No	X	X	X	X	100...240 VDC	0	M9320-AUA-2	-	-
X		X	X	X	2		M9320-AUA-2	M9300-2		
X		X	X	X	24 VAC/VDC	0	M9320-HGA-2	-		
X		X	X	X		2	M9320-HGA-2	M9300-2		

¹ with field furnished 500 ohm resistor

Technical specifications

Table 6: Technical specifications

VG1000 Series Flanged Ball Valves for assembly in the field		
Service ¹		Hot water, chilled water, 50/50 glycol solutions, and 25 psig (172 kPa) saturated steam for HVAC systems
Valve fluid temperature limits		0°F to 284°F (-18°C to 140°C)
Valve body pressure/ temperature rating	Water	ASME Class 150 250 psi at -20°F to 100°F (29°C to 38°C) 235 psi at 200°F (93°C) 218 psi at 284°F (140°C)
	Steam	25 psig (172 kPa) saturated steam for HVAC systems
Maximum closeoff pressure	Two-Way	100 psi (689 kPa)
	Three-Way	50 psi (345 kPa)
Maximum recommended operating pressure drop		30 psi (207 kPa)
Flow characteristics	Two-way	Equal percentage
	Three-way	Equal percentage flow characteristics of in-line port or Linear percentage flow characteristics of angle port
Rangeability ²		Greater than 500:1
Minimum ambient operating temperature	-4°F (-20°C)	M9320 Series Non-Spring Return Actuators
	-40°F (-40°C)	M9220 Series Spring Return Actuators
Maximum ambient operating temperature ³	122°F (50°C)	M9320 Series Non-Spring Return Actuators
	131°F (55°C)	M9220 Series Spring Return Actuators
Leakage	Two- or three-way	0.01% of maximum flow, control port, ANSI/FCI 70-2, Class 4
	Three-way	1% of maximum flow, bypass port
End connections		ASME Class 150 flange
Materials	Body	Brass
	Flanges	Ductile iron
	Ball	300 Series stainless steel
	Stem	300 Series stainless steel
	Seats	Graphite reinforced PTFE with EPDM O-ring backing
	Stem seals	EPDM O-rings
	Flow control disk	Amodel AS-1145HS polyphthalamide resin
Compliance	Europe	CE Mark - Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the Pressure Equipment Directive (PED).



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

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 Catalog Page

Description

Figure 4: VG1000 Series Brass Ball Valve



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.

Selection charts

Table 7: Valid ball valve, electric actuator, linkage kit, and weather shield combinations (for assembly in the field)

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			
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			

Table 7: Valid ball valve, electric actuator, linkage kit, and weather shield combinations (for assembly in the field)

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])	
1-1/4 (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			
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.

Table 8: 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	0.3 (0.2)	0.2 (0.1)	VG1241AA	VG1841AA	VG1245AA	VG1845AA
			0.5 (0.4)	0.3 (0.2)	VG1241AB	VG1841AB	VG1245AB	VG1845AB
			0.8 (0.7)	0.4 (0.3)	VG1241AC	VG1841AC	VG1245AC	VG1845AC
			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
			7.4 (6.3)	4.7 (4.0)	VG1241BL	VG1841BL	VG1245BL	VG1845BL
		No	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
			11.7 (10.0)	5.8 (5.0)	VG1241CN	VG1841CN	VG1245CN	VG1845CN
		No	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
			18.7 (16.0)	9.4 (8.0)	VG1241DP	VG1841DP	VG1245DP	VG1845DP
		No	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
			29.2 (25.0)	14.6 (12.5)	VG1241ER	VG1841ER	VG1245ER	VG1845ER
		No	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
			46.8 (40.0)	23.4 (20.0)	VG1241FS	VG1841FS	VG1245FS	VG1845FS
		No	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/VA9300 Series Actuators	Unit replacement
M9310-500	Linkage for VA9300/M9300 Actuators	Unit replacement

Technical specifications

VG1000 Series Forged Brass Ball Valves for Assembly in the Field	
Service ¹	Hot water, chilled water, 50/50 Glycol solutions, and 15 psig (103 kPa) saturated steam ² for HVAC systems

VG1000 Series Forged Brass Ball Valves for Assembly in the Field		
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)
	Steam ²	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)
	Steam ²	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)
Rangeability ³		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 temperature ² (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 Series Press End Connection Plated Brass Trim Ball Valves Catalog Page

Description

Figure 5: VG1000 Series Ball Valve



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 per cent 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.

Selection charts

Table 9: VG1000 press end connection valves, plated brass trim, non-spring-return actuators

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-xS ²	VA9104-IGA-xS ²	VA9104-GGA-xS ²
Two-way						
VG1291AA	1/2	0.3 ³	200	VG1291AA+9T4AGA	-	VG1291AA+9T4GGA
VG1291AB		0.5		VG1291AB+9T4AGA	-	VG1291AB+9T4GGA
VG1291AC		0.8		VG1291AC+9T4AGA	-	VG1291AC+9T4GGA
VG1291AD		1.2		VG1291AD+9T4AGA	VG1291AD+9T4IGA	VG1291AD+9T4GGA
VG1291AE		1.9		VG1291AE+9T4AGA	VG1291AE+9T4IGA	VG1291AE+9T4GGA
VG1291AF		2.9		VG1291AF+9T4AGA	VG1291AF+9T4IGA	VG1291AF+9T4GGA
VG1291AG		4.7		VG1291AG+9T4AGA	VG1291AG+9T4IGA	VG1291AG+9T4GGA
VG1291AL		7.4		VG1291AL+9T4AGA	VG1291AL+9T4IGA	VG1291AL+9T4GGA
VG1291AN		11.7		VG1291AN+9T4AGA	VG1291AN+9T4IGA	VG1291AN+9T4GGA
VG1291BG	3/4	4.7	200	VG1291BG+9T4AGA	VG1291BG+9T4IGA	VG1291BG+9T4GGA
VG1291BL		7.4		VG1291BL+9T4AGA	VG1291BL+9T4IGA	VG1291BL+9T4GGA
VG1291BN		11.7		VG1291BN+9T4AGA	VG1291BN+9T4IGA	VG1291BN+9T4GGA
VG1291CL	1	7.4	200	VG1291CL+9T4AGA	VG1291CL+9T4IGA	VG1291CL+9T4GGA
VG1291CN		11.7		VG1291CN+9T4AGA	VG1291CN+9T4IGA	VG1291CN+9T4GGA
VG1291CP		18.7		VG1291CP+9T4AGA	VG1291CP+9T4IGA	VG1291CP+9T4GGA
Three-way						
VG1891AA	1/2	0.3	200	VG1891AA+9T4AGA	-	VG1891AA+9T4GGA
VG1891AB		0.5		VG1891AB+9T4AGA	-	VG1891AB+9T4GGA
VG1891AC		0.8		VG1891AC+9T4AGA	-	VG1891AC+9T4GGA
VG1891AD		1.2		VG1891AD+9T4AGA	VG1891AD+9T4IGA	VG1891AD+9T4GGA
VG1891AE		1.9		VG1891AE+9T4AGA	VG1891AE+9T4IGA	VG1891AE+9T4GGA
VG1891AF		2.9		VG1891AF+9T4AGA	VG1891AF+9T4IGA	VG1891AF+9T4GGA
VG1891AG		4.7		VG1891AG+9T4AGA	VG1891AG+9T4IGA	VG1891AG+9T4GGA
VG1891AL		7.4		VG1891AL+9T4AGA	VG1891AL+9T4IGA	VG1891AL+9T4GGA
VG1891AN		11.7		VG1891AN+9T4AGA	VG1891AN+9T4IGA	VG1891AN+9T4GGA
VG1891BG	3/4	4.7	200	VG1891BG+9T4AGA	VG1891BG+9T4IGA	VG1891BG+9T4GGA
VG1891BL		7.4		VG1891BL+9T4AGA	VG1891BL+9T4IGA	VG1891BL+9T4GGA
VG1891BN		11.7		VG1891BN+9T4AGA	VG1891BN+9T4IGA	VG1891BN+9T4GGA
VG1891CL	1	7.4	200	VG1891CL+9T4AGA	VG1891CL+9T4IGA	VG1891CL+9T4GGA
VG1891CN		11.7		VG1891CN+9T4AGA	VG1891CN+9T4IGA	VG1891CN+9T4GGA
VG1891CP		18.7		VG1891CP+9T4AGA	VG1891CP+9T4IGA	VG1891CP+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.

Table 10: VG1000 Press End Connection Valves, Plated Brass Trim, Two-Way 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
				VA2202-AGA-2	VA2202-GGA-2	VA2202-BGA-2	VA2202-BAA-2
Two-way spring return valve open (normally open)							
VG1291AA	1/2	0.3 ¹	200	VG1291AA+22TAGA	VG1291AA+22TGGA	VG1291AA+22TBGA	-
VG1291AB		0.5		VG1291AB+22TAGA	VG1291AB+22TGGA	VG1291AB+22TBGA	-
VG1291AC		0.8		VG1291AC+22TAGA	VG1291AC+22TGGA	VG1291AC+22TBGA	-
VG1291AD		1.2		VG1291AD+22TAGA	VG1291AD+22TGGA	VG1291AD+22TBGA	VG1291AD+22TBAA
VG1291AE		1.9		VG1291AE+22TAGA	VG1291AE+22TGGA	VG1291AE+22TBGA	VG1291AE+22TBAA
VG1291AF		2.9		VG1291AF+22TAGA	VG1291AF+22TGGA	VG1291AF+22TBGA	VG1291AF+22TBAA
VG1291AG		4.7		VG1291AG+22TAGA	VG1291AG+22TGGA	VG1291AG+22TBGA	VG1291AG+22TBAA
VG1291AL		7.4		VG1291AL+22TAGA	VG1291AL+22TGGA	VG1291AL+22TBGA	VG1291AL+22TBAA
VG1291AN		11.7		VG1291AN+22TAGA	VG1291AN+22TGGA	VG1291AN+22TBGA	VG1291AN+22TBAA
VG1291BG	3/4	4.7	200	VG1291BG+22TAGA	VG1291BG+22TGGA	VG1291BG+22TBGA	VG1291BG+22TBAA
VG1291BL		7.4		VG1291BL+22TAGA	VG1291BL+22TGGA	VG1291BL+22TBGA	VG1291BL+22TBAA
VG1291BN		11.7		VG1291BN+22TAGA	VG1291BN+22TGGA	VG1291BN+22TBGA	VG1291BN+22TBAA
VG1291CL	1	7.4	200	VG1291CL+22TAGA	VG1291CL+22TGGA	VG1291CL+22TBGA	VG1291CL+22TBAA
VG1291CN		11.7		VG1291CN+22TAGA	VG1291CN+22TGGA	VG1291CN+22TBGA	VG1291CN+22TBAA
VG1291CP		18.7		VG1291CP+22TAGA	VG1291CP+22TGGA	VG1291CP+22TBGA	VG1291CP+22TBAA
Two-way spring return valve closed (normally closed)							
VG1291AA	1/2	0.3	200	VG1291AA+24TAGA	VG1291AA+24TGGA	VG1291AA+24TBGA	-
VG1291AB		0.5		VG1291AB+24TAGA	VG1291AB+24TGGA	VG1291AB+24TBGA	-
VG1291AC		0.8		VG1291AC+24TAGA	VG1291AC+24TGGA	VG1291AC+24TBGA	-
VG1291AD		1.2		VG1291AD+24TAGA	VG1291AD+24TGGA	VG1291AD+24TBGA	VG1291AD+24TBAA
VG1291AE		1.9		VG1291AE+24TAGA	VG1291AE+24TGGA	VG1291AE+24TBGA	VG1291AE+24TBAA
VG1291AF		2.9		VG1291AF+24TAGA	VG1291AF+24TGGA	VG1291AF+24TBGA	VG1291AF+24TBAA
VG1291AG		4.7		VG1291AG+24TAGA	VG1291AG+24TGGA	VG1291AG+24TBGA	VG1291AG+24TBAA
VG1291AL		7.4		VG1291AL+24TAGA	VG1291AL+24TGGA	VG1291AL+24TBGA	VG1291AL+24TBAA
VG1291AN		11.7		VG1291AN+24TAGA	VG1291AN+24TGGA	VG1291AN+24TBGA	VG1291AN+24TBAA
VG1291BG	3/4	4.7	200	VG1291BG+24TAGA	VG1291BG+24TGGA	VG1291BG+24TBGA	VG1291BG+24TBAA
VG1291BL		7.4		VG1291BL+24TAGA	VG1291BL+24TGGA	VG1291BL+24TBGA	VG1291BL+24TBAA
VG1291BN		11.7		VG1291BN+24TAGA	VG1291BN+24TGGA	VG1291BN+24TBGA	VG1291BN+24TBAA
VG1291CL	1	7.4	200	VG1291CL+24TAGA	VG1291CL+24TGGA	VG1291CL+24TBGA	VG1291CL+24TBAA
VG1291CN		11.7		VG1291CN+24TAGA	VG1291CN+24TGGA	VG1291CN+24TBGA	VG1291CN+24TBAA
VG1291CP		18.7		VG1291CP+24TAGA	VG1291CP+24TGGA	VG1291CP+24TBGA	VG1291CP+24TBAA

1 Valve has a characterizing disk.

Table 11: Three-Way Spring-Return Actuators

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
				VA2202-AGA-2Z	VA2202-GGA-2Z	VA2202-BGA-2	VA2202-BAA-2
Three-way spring return counterclockwise, Port A (coil) open							
VG1891AA	1/2	0.3 ¹	200	VG1891AA+22TAGA	VG1891AA+22TGGA	VG1891AA+22TBGA	-
VG1891AB		0.5		VG1891AB+22TAGA	VG1891AB+22TGGA	VG1891AB+22TBGA	-
VG1891AC		0.8		VG1891AC+22TAGA	VG1891AC+22TGGA	VG1891AC+22TBGA	-
VG1891AD		1.2		VG1891AD+22TAGA	VG1891AD+22TGGA	VG1891AD+22TBGA	VG1891AD+22TBAA
VG1891AE		1.9		VG1891AE+22TAGA	VG1891AE+22TGGA	VG1891AE+22TBGA	VG1891AE+22TBAA
VG1891AF		2.9		VG1891AF+22TAGA	VG1891AF+22TGGA	VG1891AF+22TBGA	VG1891AF+22TBAA
VG1891AG		4.7		VG1891AG+22TAGA	VG1891AG+22TGGA	VG1891AG+22TBGA	VG1891AG+22TBAA
VG1891AL		7.4		VG1891AL+22TAGA	VG1891AL+22TGGA	VG1891AL+22TBGA	VG1891AL+22TBAA
VG1891AN		11.7		VG1891AN+22TAGA	VG1891AN+22TGGA	VG1891AN+22TBGA	VG1891AN+22TBAA
VG1891BG	3/4	4.7	200	VG1891BG+22TAGA	VG1891BG+22TGGA	VG1891BG+22TBGA	VG1891BG+22TBAA
VG1891BL		7.4		VG1891BL+22TAGA	VG1891BL+22TGGA	VG1891BL+22TBGA	VG1891BL+22TBAA
VG1891BN		11.7		VG1891BN+22TAGA	VG1891BN+22TGGA	VG1891BN+22TBGA	VG1891BN+22TBAA
VG1891CL	1	7.4	200	VG1891CL+22TAGA	VG1891CL+22TGGA	VG1891CL+22TBGA	VG1891CL+22TBAA
VG1891CN		11.7		VG1891CN+22TAGA	VG1891CN+22TGGA	VG1891CN+22TBGA	VG1891CN+22TBAA
VG1891CP		18.7		VG1891CP+22TAGA	VG1891CP+22TGGA	VG1891CP+22TBGA	VG1891CP+22TBAA
Three-way spring return clockwise, Port B (bypass) open							
VG1891AA	1/2	0.3	200	VG1891AA+24TAGA	VG1891AA+24TGGA	VG1891AA+24TBGA	-
VG1891AB		0.5		VG1891AB+24TAGA	VG1891AB+24TGGA	VG1891AB+24TBGA	-
VG1891AC		0.8		VG1891AC+24TAGA	VG1891AC+24TGGA	VG1891AC+24TBGA	-
VG1891AD		1.2		VG1891AD+24TAGA	VG1891AD+24TGGA	VG1891AD+24TBGA	VG1891AD+24TBAA
VG1891AE		1.9		VG1891AE+24TAGA	VG1891AE+24TGGA	VG1891AE+24TBGA	VG1891AE+24TBAA
VG1891AF		2.9		VG1891AF+24TAGA	VG1891AF+24TGGA	VG1891AF+24TBGA	VG1891AF+24TBAA
VG1891AG		4.7		VG1891AG+24TAGA	VG1891AG+24TGGA	VG1891AG+24TBGA	VG1891AG+24TBAA
VG1891AL		7.4		VG1891AL+24TAGA	VG1891AL+24TGGA	VG1891AL+24TBGA	VG1891AL+24TBAA
VG1891AN		11.7		VG1891AN+24TAGA	VG1891AN+24TGGA	VG1891AN+24TBGA	VG1891AN+24TBAA
VG1891BG	3/4	4.7	200	VG1891BG+24TAGA	VG1891BG+24TGGA	VG1891BG+24TBGA	VG1891BG+24TBAA
VG1891BL		7.4		VG1891BL+24TAGA	VG1891BL+24TGGA	VG1891BL+24TBGA	VG1891BL+24TBAA
VG1891BN		11.7		VG1891BN+24TAGA	VG1891BN+24TGGA	VG1891BN+24TBGA	VG1891BN+24TBAA
VG1891CL	1	7.4	200	VG1891CL+24TAGA	VG1891CL+24TGGA	VG1891CL+24TBGA	VG1891CL+24TBAA
VG1891CN		11.7		VG1891CN+24TAGA	VG1891CN+24TGGA	VG1891CN+24TBGA	VG1891CN+24TBAA
VG1891CP		18.7		VG1891CP+24TAGA	VG1891CP+24TGGA	VG1891CP+24TBGA	VG1891CP+24TBAA

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

Linkage	Replacement description
M9000-560	Ball valve linkage kit for M9203 Series Actuators

Technical specifications

VG1000 Series Press End Connection Plated Brass 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 VA2202 Series Spring-Return Actuators	-22°F (-30°C)
	With VA9104 Series Non-Spring-Return Actuators	-4°F (-20°C)
Maximum ambient operating temperature	With VA2202 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	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 Press End Connection Stainless Steel Trim Ball Valves Catalog Page

Description

Figure 6: VG1000 Series Ball Valve



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 per cent 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.

Selection charts

Table 12: VG1000 press end connection valves, plated brass trim, non-spring-return actuators

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-xS ²	VA9104-IGA-xS ²	VA9104-GGA-xS ²
Two-way						
VG1291AA	1/2	0.3 ³	200	VG1291AA+9T4AGA	-	VG1291AA+9T4GGA
VG1291AB		0.5		VG1291AB+9T4AGA	-	VG1291AB+9T4GGA
VG1291AC		0.8		VG1291AC+9T4AGA	-	VG1291AC+9T4GGA
VG1291AD		1.2		VG1291AD+9T4AGA	VG1291AD+9T4IGA	VG1291AD+9T4GGA
VG1291AE		1.9		VG1291AE+9T4AGA	VG1291AE+9T4IGA	VG1291AE+9T4GGA
VG1291AF		2.9		VG1291AF+9T4AGA	VG1291AF+9T4IGA	VG1291AF+9T4GGA
VG1291AG		4.7		VG1291AG+9T4AGA	VG1291AG+9T4IGA	VG1291AG+9T4GGA
VG1291AL		7.4		VG1291AL+9T4AGA	VG1291AL+9T4IGA	VG1291AL+9T4GGA
VG1291AN		11.7		VG1291AN+9T4AGA	VG1291AN+9T4IGA	VG1291AN+9T4GGA
VG1291BG	3/4	4.7	200	VG1291BG+9T4AGA	VG1291BG+9T4IGA	VG1291BG+9T4GGA
VG1291BL		7.4		VG1291BL+9T4AGA	VG1291BL+9T4IGA	VG1291BL+9T4GGA
VG1291BN		11.7		VG1291BN+9T4AGA	VG1291BN+9T4IGA	VG1291BN+9T4GGA
VG1291CL	1	7.4	200	VG1291CL+9T4AGA	VG1291CL+9T4IGA	VG1291CL+9T4GGA
VG1291CN		11.7		VG1291CN+9T4AGA	VG1291CN+9T4IGA	VG1291CN+9T4GGA
VG1291CP		18.7		VG1291CP+9T4AGA	VG1291CP+9T4IGA	VG1291CP+9T4GGA
Three-way						
VG1891AA	1/2	0.3	200	VG1891AA+9T4AGA	-	VG1891AA+9T4GGA
VG1891AB		0.5		VG1891AB+9T4AGA	-	VG1891AB+9T4GGA
VG1891AC		0.8		VG1891AC+9T4AGA	-	VG1891AC+9T4GGA
VG1891AD		1.2		VG1891AD+9T4AGA	VG1891AD+9T4IGA	VG1891AD+9T4GGA
VG1891AE		1.9		VG1891AE+9T4AGA	VG1891AE+9T4IGA	VG1891AE+9T4GGA
VG1891AF		2.9		VG1891AF+9T4AGA	VG1891AF+9T4IGA	VG1891AF+9T4GGA
VG1891AG		4.7		VG1891AG+9T4AGA	VG1891AG+9T4IGA	VG1891AG+9T4GGA
VG1891AL		7.4		VG1891AL+9T4AGA	VG1891AL+9T4IGA	VG1891AL+9T4GGA
VG1891AN		11.7		VG1891AN+9T4AGA	VG1891AN+9T4IGA	VG1891AN+9T4GGA
VG1891BG	3/4	4.7	200	VG1891BG+9T4AGA	VG1891BG+9T4IGA	VG1891BG+9T4GGA
VG1891BL		7.4		VG1891BL+9T4AGA	VG1891BL+9T4IGA	VG1891BL+9T4GGA
VG1891BN		11.7		VG1891BN+9T4AGA	VG1891BN+9T4IGA	VG1891BN+9T4GGA
VG1891CL	1	7.4	200	VG1891CL+9T4AGA	VG1891CL+9T4IGA	VG1891CL+9T4GGA
VG1891CN		11.7		VG1891CN+9T4AGA	VG1891CN+9T4IGA	VG1891CN+9T4GGA
VG1891CP		18.7		VG1891CP+9T4AGA	VG1891CP+9T4IGA	VG1891CP+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.

Table 13: VG1000 Press End Connection Valves, Plated Brass Trim, Two-Way 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
				VA2202-AGA-2	VA2202-GGA-2	VA2202-BGA-2	VA2202-BAA-2
Two-way spring return valve open (normally open)							
VG1291AA	1/2	0.3 ¹	200	VG1291AA+22TAGA	VG1291AA+22TGGA	VG1291AA+22TBGA	-
VG1291AB		0.5		VG1291AB+22TAGA	VG1291AB+22TGGA	VG1291AB+22TBGA	-
VG1291AC		0.8		VG1291AC+22TAGA	VG1291AC+22TGGA	VG1291AC+22TBGA	-
VG1291AD		1.2		VG1291AD+22TAGA	VG1291AD+22TGGA	VG1291AD+22TBGA	VG1291AD+22TBAA
VG1291AE		1.9		VG1291AE+22TAGA	VG1291AE+22TGGA	VG1291AE+22TBGA	VG1291AE+22TBAA
VG1291AF		2.9		VG1291AF+22TAGA	VG1291AF+22TGGA	VG1291AF+22TBGA	VG1291AF+22TBAA
VG1291AG		4.7		VG1291AG+22TAGA	VG1291AG+22TGGA	VG1291AG+22TBGA	VG1291AG+22TBAA
VG1291AL		7.4		VG1291AL+22TAGA	VG1291AL+22TGGA	VG1291AL+22TBGA	VG1291AL+22TBAA
VG1291AN		11.7		VG1291AN+22TAGA	VG1291AN+22TGGA	VG1291AN+22TBGA	VG1291AN+22TBAA
VG1291BG	3/4	4.7	200	VG1291BG+22TAGA	VG1291BG+22TGGA	VG1291BG+22TBGA	VG1291BG+22TBAA
VG1291BL		7.4		VG1291BL+22TAGA	VG1291BL+22TGGA	VG1291BL+22TBGA	VG1291BL+22TBAA
VG1291BN		11.7		VG1291BN+22TAGA	VG1291BN+22TGGA	VG1291BN+22TBGA	VG1291BN+22TBAA
VG1291CL	1	7.4	200	VG1291CL+22TAGA	VG1291CL+22TGGA	VG1291CL+22TBGA	VG1291CL+22TBAA
VG1291CN		11.7		VG1291CN+22TAGA	VG1291CN+22TGGA	VG1291CN+22TBGA	VG1291CN+22TBAA
VG1291CP		18.7		VG1291CP+22TAGA	VG1291CP+22TGGA	VG1291CP+22TBGA	VG1291CP+22TBAA
Two-way spring return valve closed (normally closed)							
VG1291AA	1/2	0.3	200	VG1291AA+24TAGA	VG1291AA+24TGGA	VG1291AA+24TBGA	-
VG1291AB		0.5		VG1291AB+24TAGA	VG1291AB+24TGGA	VG1291AB+24TBGA	-
VG1291AC		0.8		VG1291AC+24TAGA	VG1291AC+24TGGA	VG1291AC+24TBGA	-
VG1291AD		1.2		VG1291AD+24TAGA	VG1291AD+24TGGA	VG1291AD+24TBGA	VG1291AD+24TBAA
VG1291AE		1.9		VG1291AE+24TAGA	VG1291AE+24TGGA	VG1291AE+24TBGA	VG1291AE+24TBAA
VG1291AF		2.9		VG1291AF+24TAGA	VG1291AF+24TGGA	VG1291AF+24TBGA	VG1291AF+24TBAA
VG1291AG		4.7		VG1291AG+24TAGA	VG1291AG+24TGGA	VG1291AG+24TBGA	VG1291AG+24TBAA
VG1291AL		7.4		VG1291AL+24TAGA	VG1291AL+24TGGA	VG1291AL+24TBGA	VG1291AL+24TBAA
VG1291AN		11.7		VG1291AN+24TAGA	VG1291AN+24TGGA	VG1291AN+24TBGA	VG1291AN+24TBAA
VG1291BG	3/4	4.7	200	VG1291BG+24TAGA	VG1291BG+24TGGA	VG1291BG+24TBGA	VG1291BG+24TBAA
VG1291BL		7.4		VG1291BL+24TAGA	VG1291BL+24TGGA	VG1291BL+24TBGA	VG1291BL+24TBAA
VG1291BN		11.7		VG1291BN+24TAGA	VG1291BN+24TGGA	VG1291BN+24TBGA	VG1291BN+24TBAA
VG1291CL	1	7.4	200	VG1291CL+24TAGA	VG1291CL+24TGGA	VG1291CL+24TBGA	VG1291CL+24TBAA
VG1291CN		11.7		VG1291CN+24TAGA	VG1291CN+24TGGA	VG1291CN+24TBGA	VG1291CN+24TBAA
VG1291CP		18.7		VG1291CP+24TAGA	VG1291CP+24TGGA	VG1291CP+24TBGA	VG1291CP+24TBAA

1 Valve has a characterizing disk.

Table 14: Three-Way Spring-Return Actuators

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
				VA2202-AGA-2Z	VA2202-GGA-2Z	VA2202-BGA-2	VA2202-BAA-2
Three-way spring return counterclockwise, Port A (coil) open							
VG1891AA	1/2	0.3 ¹	200	VG1891AA+22TAGA	VG1891AA+22TGGA	VG1891AA+22TBGA	-
VG1891AB		0.5		VG1891AB+22TAGA	VG1891AB+22TGGA	VG1891AB+22TBGA	-
VG1891AC		0.8		VG1891AC+22TAGA	VG1891AC+22TGGA	VG1891AC+22TBGA	-
VG1891AD		1.2		VG1891AD+22TAGA	VG1891AD+22TGGA	VG1891AD+22TBGA	VG1891AD+22TBAA
VG1891AE		1.9		VG1891AE+22TAGA	VG1891AE+22TGGA	VG1891AE+22TBGA	VG1891AE+22TBAA
VG1891AF		2.9		VG1891AF+22TAGA	VG1891AF+22TGGA	VG1891AF+22TBGA	VG1891AF+22TBAA
VG1891AG		4.7		VG1891AG+22TAGA	VG1891AG+22TGGA	VG1891AG+22TBGA	VG1891AG+22TBAA
VG1891AL		7.4		VG1891AL+22TAGA	VG1891AL+22TGGA	VG1891AL+22TBGA	VG1891AL+22TBAA
VG1891AN		11.7		VG1891AN+22TAGA	VG1891AN+22TGGA	VG1891AN+22TBGA	VG1891AN+22TBAA
VG1891BG	3/4	4.7	200	VG1891BG+22TAGA	VG1891BG+22TGGA	VG1891BG+22TBGA	VG1891BG+22TBAA
VG1891BL		7.4		VG1891BL+22TAGA	VG1891BL+22TGGA	VG1891BL+22TBGA	VG1891BL+22TBAA
VG1891BN		11.7		VG1891BN+22TAGA	VG1891BN+22TGGA	VG1891BN+22TBGA	VG1891BN+22TBAA
VG1891CL	1	7.4	200	VG1891CL+22TAGA	VG1891CL+22TGGA	VG1891CL+22TBGA	VG1891CL+22TBAA
VG1891CN		11.7		VG1891CN+22TAGA	VG1891CN+22TGGA	VG1891CN+22TBGA	VG1891CN+22TBAA
VG1891CP		18.7		VG1891CP+22TAGA	VG1891CP+22TGGA	VG1891CP+22TBGA	VG1891CP+22TBAA
Three-way spring return clockwise, Port B (bypass) open							
VG1891AA	1/2	0.3	200	VG1891AA+24TAGA	VG1891AA+24TGGA	VG1891AA+24TBGA	-
VG1891AB		0.5		VG1891AB+24TAGA	VG1891AB+24TGGA	VG1891AB+24TBGA	-
VG1891AC		0.8		VG1891AC+24TAGA	VG1891AC+24TGGA	VG1891AC+24TBGA	-
VG1891AD		1.2		VG1891AD+24TAGA	VG1891AD+24TGGA	VG1891AD+24TBGA	VG1891AD+24TBAA
VG1891AE		1.9		VG1891AE+24TAGA	VG1891AE+24TGGA	VG1891AE+24TBGA	VG1891AE+24TBAA
VG1891AF		2.9		VG1891AF+24TAGA	VG1891AF+24TGGA	VG1891AF+24TBGA	VG1891AF+24TBAA
VG1891AG		4.7		VG1891AG+24TAGA	VG1891AG+24TGGA	VG1891AG+24TBGA	VG1891AG+24TBAA
VG1891AL		7.4		VG1891AL+24TAGA	VG1891AL+24TGGA	VG1891AL+24TBGA	VG1891AL+24TBAA
VG1891AN		11.7		VG1891AN+24TAGA	VG1891AN+24TGGA	VG1891AN+24TBGA	VG1891AN+24TBAA
VG1891BG	3/4	4.7	200	VG1891BG+24TAGA	VG1891BG+24TGGA	VG1891BG+24TBGA	VG1891BG+24TBAA
VG1891BL		7.4		VG1891BL+24TAGA	VG1891BL+24TGGA	VG1891BL+24TBGA	VG1891BL+24TBAA
VG1891BN		11.7		VG1891BN+24TAGA	VG1891BN+24TGGA	VG1891BN+24TBGA	VG1891BN+24TBAA
VG1891CL	1	7.4	200	VG1891CL+24TAGA	VG1891CL+24TGGA	VG1891CL+24TBGA	VG1891CL+24TBAA
VG1891CN		11.7		VG1891CN+24TAGA	VG1891CN+24TGGA	VG1891CN+24TBGA	VG1891CN+24TBAA
VG1891CP		18.7		VG1891CP+24TAGA	VG1891CP+24TGGA	VG1891CP+24TBGA	VG1891CP+24TBAA

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

Linkage	Replacement description
M9000-560	Ball valve linkage kit for M9203 Series Actuators

Technical specifications

VG1000 Series Press End Connection Plated Brass 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 VA2202 Series Spring-Return Actuators	-22°F (-30°C)
	With VA9104 Series Non-Spring-Return Actuators	-4°F (-20°C)
Maximum ambient operating temperature	With VA2202 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	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.

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Description

Figure 7: VG1000 Series Ball Valve



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 per cent 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.

Selection charts

Table 15: 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	VA9104-GGA-3S
Two-way						
VG1271AA	1/2	0.3 ³	200	VG1271AA+9T4AGA	VG1271AA+9T4IGA	VG1271AA+9T4GGA
VG1271AB		0.5		VG1271AB+9T4AGA	VG1271AB+9T4IGA	VG1271AB+9T4GGA
VG1271AC		0.8		VG1271AC+9T4AGA	VG1271AC+9T4IGA	VG1271AC+9T4GGA
VG1271AD		1.2		VG1271AD+9T4AGA	VG1271AD+9T4IGA	VG1271AD+9T4GGA
VG1271AE		1.9		VG1271AE+9T4AGA	VG1271AE+9T4IGA	VG1271AE+9T4GGA
VG1271AF		2.9		VG1271AF+9T4AGA	VG1271AF+9T4IGA	VG1271AF+9T4GGA
VG1271AG		4.7		VG1271AG+9T4AGA	VG1271AG+9T4IGA	VG1271AG+9T4GGA
VG1271AL		7.4		VG1271AL+9T4AGA	VG1271AL+9T4IGA	VG1271AL+9T4GGA
VG1271AN		11.7		VG1271AN+9T4AGA	VG1271AN+9T4IGA	VG1271AN+9T4GGA
VG1271BG	3/4	4.7	200	VG1271BG+9T4AGA	VG1271BG+9T4IGA	VG1271BG+9T4GGA
VG1271BL		7.4		VG1271BL+9T4AGA	VG1271BL+9T4IGA	VG1271BL+9T4GGA
VG1271BN		11.7		VG1271BN+9T4AGA	VG1271BN+9T4IGA	VG1271BN+9T4GGA
VG1271CL	1	7.4	200	VG1271CL+9T4AGA	VG1271CL+9T4IGA	VG1271CL+9T4GGA
VG1271CN		11.7		VG1271CN+9T4AGA	VG1271CN+9T4IGA	VG1271CN+9T4GGA
VG1271CP		18.7		VG1271CP+9T4AGA	VG1271CP+9T4IGA	VG1271CP+9T4GGA
Three-way						
VG1871AD	1/2	1.2	200	VG1871AD+9T4AGA	VG1871AD+9T4IGA	VG1871AD+9T4GGA
VG1871AE		1.9		VG1871AE+9T4AGA	VG1871AE+9T4IGA	VG1871AE+9T4GGA
VG1871AF		2.9		VG1871AF+9T4AGA	VG1871AF+9T4IGA	VG1871AF+9T4GGA
VG1871AG		4.7		VG1871AG+9T4AGA	VG1871AG+9T4IGA	VG1871AG+9T4GGA
VG1871AL		7.4		VG1871AL+9T4AGA	VG1871AL+9T4IGA	VG1871AL+9T4GGA
VG1871AN		11.7		VG1871AN+9T4AGA	VG1871AN+9T4IGA	VG1871AN+9T4GGA
VG1871BG	3/4	4.7	200	VG1871BG+9T4AGA	VG1871BG+9T4IGA	VG1871BG+9T4GGA
VG1871BL		7.4		VG1871BL+9T4AGA	VG1871BL+9T4IGA	VG1871BL+9T4GGA
VG1871BN		11.7		VG1871BN+9T4AGA	VG1871BN+9T4IGA	VG1871BN+9T4GGA
VG1871CL	1	7.4	200	VG1871CL+9T4AGA	VG1871CL+9T4IGA	VG1871CL+9T4GGA
VG1871CN		11.7		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.

Table 16: VG1000 sweat end connection valves, brass trim, spring-return actuators

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)							
VG1271AA	1/2	1	200	VG1271AA+923AGA	VG1271AA+923GGA	VG1271AA+923BGA	-
		0.3					
VG1271AB		0.5		VG1271AB+923AGA	VG1271AB+923GGA	VG1271AB+923BGA	-
VG1271AC		0.8		VG1271AC+923AGA	VG1271AC+923GGA	VG1271AC+923BGA	-
VG1271AD		1.2		VG1271AD+923AGA	VG1271AD+923GGA	VG1271AD+923BGA	VG1271AD+923BUA
VG1271AE		1.9		VG1271AE+923AGA	VG1271AE+923GGA	VG1271AE+923BGA	VG1271AE+923BUA
VG1271AF		2.9		VG1271AF+923AGA	VG1271AF+923GGA	VG1271AF+923BGA	VG1271AF+923BUA
VG1271AG		4.7		VG1271AG+923AGA	VG1271AG+923GGA	VG1271AG+923BGA	VG1271AG+923BUA
VG1271AL		7.4		VG1271AL+923AGA	VG1271AL+923GGA	VG1271AL+923BGA	VG1271AL+923BUA
VG1271AN	11.7	VG1271AN+923AGA	VG1271AN+923GGA	VG1271AN+923BGA	VG1271AN+923BUA		
VG1271BG	3/4	4.7	200	VG1271BG+923AGA	VG1271BG+923GGA	VG1271BG+923BGA	VG1271BG+923BUA
VG1271BL		7.4		VG1271BL+923AGA	VG1271BL+923GGA	VG1271BL+923BGA	VG1271BL+923BUA
VG1271BN		11.7		VG1271BN+923AGA	VG1271BN+923GGA	VG1271BN+923BGA	VG1271BN+923BUA
VG1271CL	1	7.4	200	VG1271CL+923AGA	VG1271CL+923GGA	VG1271CL+923BGA	VG1271CL+923BUA
VG1271CN		11.7		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)							
VG1271AA	1/2	0.3	200	VG1271AD+943AGA	VG1271AD+943GGA	VG1271AD+943BGA	-
VG1271AB		0.5		VG1271AD+943AGA	VG1271AD+943GGA	VG1271AD+943BGA	-
VG1271AC		0.8		VG1271AD+943AGA	VG1271AD+943GGA	VG1271AD+943BGA	-
VG1271AD		1.2		VG1271AD+943AGA	VG1271AD+943GGA	VG1271AD+943BGA	VG1271AD+943BUA
VG1271AE		1.9		VG1271AE+943AGA	VG1271AE+943GGA	VG1271AE+943BGA	VG1271AE+943BUA
VG1271AF		2.9		VG1271AF+943AGA	VG1271AF+943GGA	VG1271AF+943BGA	VG1271AF+943BUA
VG1271AG		4.7		VG1271AG+943AGA	VG1271AG+943GGA	VG1271AG+943BGA	VG1271AG+943BUA
VG1271AL		7.4		VG1271AL+943AGA	VG1271AL+943GGA	VG1271AL+943BGA	VG1271AL+943BUA
VG1271AN		11.7		VG1271AN+943AGA	VG1271AN+943GGA	VG1271AN+943BGA	VG1271AN+943BUA
VG1271BG	3/4	4.7	200	VG1271BG+943AGA	VG1271BG+943GGA	VG1271BG+943BGA	VG1271BG+943BUA
VG1271BL		7.4		VG1271BL+943AGA	VG1271BL+943GGA	VG1271BL+943BGA	VG1271BL+943BUA
VG1271BN		11.7		VG1271BN+943AGA	VG1271BN+943GGA	VG1271BN+943BGA	VG1271BN+943BUA
VG1271CL	1	7.4	200	VG1271CL+943AGA	VG1271CL+943GGA	VG1271CL+943BGA	VG1271CL+943BUA
VG1271CN		11.7		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							

Table 16: VG1000 sweat end connection valves, brass trim, spring-return actuators

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
VG1871AA	1/2	0.3	200	VG1871AA+923AGA	VG1871AA+923GGA	VG1871AA+923BGA	-
VG1871AB		0.5		VG1871AB+923AGA	VG1871AB+923GGA	VG1871AB+923BGA	-
VG1871AC		0.8		VG1871AC+923AGA	VG1871AC+923GGA	VG1871AC+923BGA	-
VG1871AD		1.2		VG1871AD+923AGA	VG1871AD+923GGA	VG1871AD+923BGA	VG1871AD+923BUA
VG1871AE		1.9		VG1871AE+923AGA	VG1871AE+923GGA	VG1871AE+923BGA	VG1871AE+923BUA
VG1871AF		2.9		VG1871AF+923AGA	VG1871AF+923GGA	VG1871AF+923BGA	VG1871AF+923BUA
VG1871AG		4.7		VG1871AG+923AGA	VG1871AG+923GGA	VG1871AG+923BGA	VG1871AG+923BUA
VG1871AL		7.4		VG1871AL+923AGA	VG1871AL+923GGA	VG1871AL+923BGA	VG1871AL+923BUA
VG1871AN		11.7		VG1871AN+923AGA	VG1871AN+923GGA	VG1871AN+923BGA	VG1871AN+923BUA
VG1871BG	3/4	4.7	200	VG1871BG+923AGA	VG1871BG+923GGA	VG1871BG+923BGA	VG1871BG+923BUA
VG1871BL		7.4		VG1871BL+923AGA	VG1871BL+923GGA	VG1871BL+923BGA	VG1871BL+923BUA
VG1871BN		11.7		VG1871BN+923AGA	VG1871BN+923GGA	VG1871BN+923BGA	VG1871BN+923BUA
VG1871CL	1	7.4	200	VG1871CL+923AGA	VG1871CL+923GGA	VG1871CL+923BGA	VG1871CL+923BUA
VG1871CN		11.7		VG1871CN+923AGA	VG1871CN+923GGA	VG1871CN+923BGA	VG1871CN+923BUA
VG1871CP		18.7		VG1871CP+923AGA	VG1871CP+923GGA	VG1871CP+923BGA	VG1871CP+923BUA
Three-way spring return clockwise, port B (bypass) open							
VG1871AA	1/2	0.3	200	VG1871AA+943AGA	VG1871AA+943GGA	VG1871AA+943BGA	-
VG1871AB		0.5		VG1871AB+943AGA	VG1871AB+943GGA	VG1871AB+943BGA	-
VG1871AC		0.8		VG1871AC+943AGA	VG1871AC+943GGA	VG1871AC+943BGA	-
VG1871AD		1.2		VG1871AD+943AGA	VG1871AD+943GGA	VG1871AD+943BGA	VG1871AD+943BUA
VG1871AE		1.9		VG1871AE+943AGA	VG1871AE+943GGA	VG1871AE+943BGA	VG1871AE+943BUA
VG1871AF		2.9		VG1871AF+943AGA	VG1871AF+943GGA	VG1871AF+943BGA	VG1871AF+943BUA
VG1871AG		4.7		VG1871AG+943AGA	VG1871AG+943GGA	VG1871AG+943BGA	VG1871AG+943BUA
VG1871AL		7.4		VG1871AL+943AGA	VG1871AL+943GGA	VG1871AL+943BGA	VG1871AL+943BUA
VG1871AN		11.7		VG1871AN+943AGA	VG1871AN+943GGA	VG1871AN+943BGA	VG1871AN+943BUA
VG1871BG	3/4	4.7	200	VG1871BG+943AGA	VG1871BG+943GGA	VG1871BG+943BGA	VG1871BG+943BUA
VG1871BL		7.4		VG1871BL+943AGA	VG1871BL+943GGA	VG1871BL+943BGA	VG1871BL+943BUA
VG1871BN		11.7		VG1871BN+943AGA	VG1871BN+943GGA	VG1871BN+943BGA	VG1871BN+943BUA
VG1871CL	1	7.4	200	VG1871CL+943AGA	VG1871CL+943GGA	VG1871CL+943BGA	VG1871CL+943BUA
VG1871CN		11.7		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 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

Figure 8: VG1000 Series Ball Valve



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.

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

Selection charts

Table 17: 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						
VG1275AA	1/2	0.3 ³³	200	VG1275AA+9T4AGA	-	VG1275AA+9T4GGA
VG1275AB		0.5 ³		VG1275AB+9T4AGA	-	VG1275AB+9T4GGA
VG1275AC		0.8 ³		VG1275AB+9T4AGA	-	VG1275AC+9T4GGA
VG1275AD		1.2 ³		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						
VG1875AA	1/2	0.3 / 0.2 ³	200	VG1875AA+9T4AGA	-	VG1875AA+9T4GGA
VG1875AB		0.5 / 0.3 ³		VG1875AB+9T4AGA	-	VG1875AB+9T4GGA
VG1875AC		0.8 / 0.4 ³		VG1875AC+9T4AGA	-	VG1875AC+9T4GGA
VG1875AD		1.2 / 0.7 ³		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

Table 17: 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
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.

Table 18: VG1000 sweat 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 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)							
VG1275AA	1/2	0.3 ¹	200	VG1275AA+923AGA	VG1275AA+923GGA	VG1275AA+923BGA	-
VG1275AB		0.5		VG1275AB+923AGA	VG1275AB+923GGA	VG1275AB+923BGA	-
VG1275AC		0.8		VG1275AC+923AGA	VG1275AC+923GGA	VG1275AC+923BGA	-
VG1275AD		1.2		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)							

Table 18: VG1000 sweat 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 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
VG1275AA	1/2	0.3 ¹	200	VG1275AA+943AGA	VG1275AA+943GGA	VG1275AA+943BGA	-
VG1275AB		0.5 ¹		VG1275AB+943AGA	VG1275AB+943GGA	VG1275AB+943BGA	-
VG1275AC		0.8 ¹		VG1275AC+943AGA	VG1275AC+943GGA	VG1275AC+943BGA	-
VG1275AD		1.2 ¹		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							
VG1875AA	1/2	0.3 / 0.2 ¹	200	VG1875AA+923AGA	VG1875AA+923GGA	VG1875AA+923BGA	-
VG1875AB		0.5 0.3 ¹		VG1875AB+923AGA	VG1875AB+923GGA	VG1875AB+923BGA	-
VG1875AC		0.8 / 0.4 ¹		VG1875AD+923AGA	VG1875AD+923GGA	VG1875AD+923BGA	-
VG1875AD		1.2 / 0.7 ¹		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
Three-way spring return clockwise, Port B (bypass) open							

Table 18: VG1000 sweat 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 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
VG1875AA	1/2	0.3 / 0.2 ¹	200	VG1875AA+943AGA	VG1875AA+943GGA	VG1875AA+943BGA	-
VG1875AB		0.5 / 0.3 ¹		VG1875AB+943AGA	VG1875AB+943GGA	VG1875AB+943BGA	-
VG1875AC		0.8 / 0.4 ¹		VG1875AC+943AGA	VG1875AC+943GGA	VG1875AC+943BGA	-
VG1875AD		1.2 / 0.7 ¹		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.

Technical specifications

VG1000 Series Sweat End Connection Stainless Steel Trim Ball Valves			
Service¹		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)	
Rangeability²		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	

VG1000 Series Sweat End Connection Stainless Steel Trim Ball Valves		
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 Three-Way, Plated Brass Ball and Stem, NPT End Connections Ball Valve

Description

Figure 9: VG1000 Series Ball Valve



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 per cent 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.

Selection charts

Table 19: 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	Close off 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
VG1841AA	1/2	0.3 / 0.2 ¹	200	VG1841AA+923AGB	VG1841AA+923GGB	VG1841AA+923BGB	-
VG1841AB		0.5 / 0.3		VG1841AB+923AGB	VG1841AB+923GGB	VG1841AB+923BGB	-
VG1841AC		0.8 / 0.4		VG1841AC+923AGB	VG1841AC+923GGB	VG1841AC+923BGB	-
VG1841AD		1.2 / 0.7		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	3/4	11.7 / 5.8	200	VG1841AN+923AGB	VG1841AN+923GGB	VG1841AN+923BGB	VG1841AN+923BUB
VG1841BG		4.7 / 2.9 ¹		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.

Table 20: 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
VG1841AA	1/2	¹ 0.3 / 0.2 ¹	200	VG1841AA+943AGB	VG1841AA+943GGB	VG1841AA+943BGB	-
VG1841AB		0.5 / 0.3 ¹		VG1841AB+943AGB	VG1841AB+943GGB	VG1841AB+943BGB	-
VG1841AC		0.8 / 0.4 ¹		VG1841AC+943AGB	VG1841AC+943GGB	VG1841AC+943BGB	-
VG1841AD		1.2 / 0.7 ¹		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.

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	

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

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

Description

Figure 10: VG1000 Series Ball Valve



VG1000 Series Ball Valves are designed to regulate the flow of hot or chilled water and, for some models, low-pressure steam in response to the demand of a controller in HVAC systems. Available in sizes 1/2 through 2 in. (DN15 through DN50), this

family of two and three-way forged brass valves is factory or field mounted to Johnson Controls® VA9104 and VA9300 Series Non-Spring Return and VA9203 and VA9208 Series Spring-Return Electric Actuators for on/off, floating, or proportional control.

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

Features

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

Selection charts

Table 21: 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
VG1841AA	1/2	0.3 / 0.2 ²	200	VG1841AA+9T4AGA	-	VG1841AA+9T4GGA
VG1841AB		0.5 / 0.3 ²		VG1841AB+9T4AGA	-	VG1841AB+9T4GGA
VG1841AC		0.8 / 0.4 ²		VG1841AC+9T4AGA	-	VG1841AC+9T4GGA
VG1841AD		1.2 / 0.7		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	3/4	11.7 / 5.8	200	VG1841AN+9T4AGA	VG1841AN+9T4IGA	VG1841AN+9T4GGA
VG1841BG		4.7 / 2.9 ²		VG1841BG+9T4AGA	VG1841BG+9T4IGA	VG1841BG+9T4GGA
VG1841BL		7.4 / 4.7 ²		VG1841BL+9T4AGA	VG1841BL+9T4IGA	VG1841BL+9T4GGA
VG1841BN	1	11.7 / 5.8	200	VG1841BN+9T4AGA	VG1841BN+9T4IGA	VG1841BN+9T4GGA
VG1841CL		7.4 / 4.7 ²		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
VG1841AA	1/2	0.3 / 0.2 ²	200	VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AB		0.5 / 0.3 ²		VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AC		0.8 / 0.4 ²		VG1841AD+9A4AGA	VG1841AD+9A4IGA	VG1841AD+9A4GGA
VG1841AD		1.2 / 0.7 ²		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	3/4	11.7 / 5.8	200	VG1841AN+9A4AGA	VG1841AN+9A4IGA	VG1841AN+9A4GGA
VG1841BG		4.7 / 2.9 ²		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

Table 21: 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
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

1 To avoid excessive wear or drive time on the motor for the AGA models, use a controller or software that provides a timeout function to remove the signal at the end of rotation (stall).

2 Valve has a characterizing disk.

Table 22: 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.

Table 23: 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		

Table 23: 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		
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.

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)

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

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 Three-Way, Plated Brass Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators without Switches Catalog Page

Description

Figure 11: VG1000 Series Ball Valve



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.

Selection chart

Table 24: Three-way — spring return — without switches

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
VG1841AA	1/2	0.3 / 0.2 ¹	200	VG1841AA+923AGA	VG1841AA+923GGA	VG1841AA+923BGA	-
VG1841AB		0.5 / 0.3		VG1841AB+923AGA	VG1841AB+923GGA	VG1841AB+923BGA	-
VG1841AC		0.8 / 0.4		VG1841AC+923AGA	VG1841AC+923GGA	VG1841AC+923BGA	-
VG1841AD		1.2 / 0.7		VG1841AD+923AGA	VG1841AD+923GGA	VG1841AD+923BGA	VG1841AD+923BUA
VG1841AE		1.9 / 1.2		VG1841AE+923AGA	VG1841AE+923GGA	VG1841AE+923BGA	VG1841AE+923BUA
VG1841AF		2.9 / 1.9		VG1841AF+923AGA	VG1841AF+923GGA	VG1841AF+923BGA	VG1841AF+923BUA
VG1841AG		4.7 / 2.9		VG1841AG+923AGA	VG1841AG+923GGA	VG1841AG+923BGA	VG1841AG+923BUA
VG1841AL		7.4 / 4.7		VG1841AL+923AGA	VG1841AL+923GGA	VG1841AL+923BGA	VG1841AL+923BUA
VG1841AN	3/4	11.7 / 7.4	200	VG1841AN+923AGA	VG1841AN+923GGA	VG1841AN+923BGA	VG1841AN+923BUA
VG1841BG		4.7 / 2.9		VG1841BG+923AGA	VG1841BG+923GGA	VG1841BG+923BGA	VG1841BG+923BUA
VG1841BL		7.4 / 4.7		VG1841BL+923AGA	VG1841BL+923GGA	VG1841BL+923BGA	VG1841BL+923BUA
VG1841BN	1	11.7 / 11.7	200	VG1841BN+923AGA	VG1841BN+923GGA	VG1841BN+923BGA	VG1841BN+923BUA
VG1841CL		7.4 / 4.7		VG1841CL+923AGA	VG1841CL+923GGA	VG1841CL+923BGA	VG1841CL+923BUA
VG1841CN		11.7 / 7.4		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	200	VG1841DN+928AGA	VG1841DN+928GGA	VG1841DN+938BGA	VG1841DN+938BAA
VG1841DP		18.7 / 11.7		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	200	VG1841EP+928AGA	VG1841EP+928GGA	VG1841EP+938BGA	VG1841EP+938BAA
VG1841ER		29.2 / 18.7		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	200	VG1841FR+928AGA	VG1841FR+928GGA	VG1841FR+938BGA	VG1841FR+938BAA
VG1841FS		46.8 / 29.2		VG1841FS+928AGA	VG1841FS+928GGA	VG1841FS+938BGA	VG1841FS+938BAA
VG1841FT		73.7 / 36.8		VG1841FT+928AGA	VG1841FT+928GGA	VG1841FT+938BGA	VG1841FT+938BAA
				Spring return port A closed — valve spring return clockwise			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2

Table 24: Three-way — spring return — without switches

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
VG1841AA	1/2	0.3 / 0.2	200	VG1841AD+943AGA	VG1841AD+943GGA	VG1841AD+943BGA	-
VG1841AB		0.5 / 0.3		VG1841AD+943AGA	VG1841AD+943GGA	VG1841AD+943BGA	-
VG1841AC		0.8 / 0.4		VG1841AD+943AGA	VG1841AD+943GGA	VG1841AD+943BGA	-
VG1841AD		1.2 / 0.7		VG1841AD+943AGA	VG1841AD+943GGA	VG1841AD+943BGA	VG1841AD+943BUA
VG1841AE		1.9 / 1.2		VG1841AE+943AGA	VG1841AE+943GGA	VG1841AE+943BGA	VG1841AE+943BUA
VG1841AF		2.9 / 1.9		VG1841AF+943AGA	VG1841AF+943GGA	VG1841AF+943BGA	VG1841AF+943BUA
VG1841AG		4.7 / 2.9		VG1841AG+943AGA	VG1841AG+943GGA	VG1841AG+943BGA	VG1841AG+943BUA
VG1841AL		7.4 / 4.7		VG1841AL+943AGA	VG1841AL+943GGA	VG1841AL+943BGA	VG1841AL+943BUA
VG1841AN		11.7 / 7.4		VG1841AN+943AGA	VG1841AN+943GGA	VG1841AN+943BGA	VG1841AN+943BUA
VG1841BG	3/4	4.7 / 2.9	200	VG1841BG+943AGA	VG1841BG+943GGA	VG1841BG+943BGA	VG1841BG+943BUA
VG1841BL		7.4 / 4.7		VG1841BL+943AGA	VG1841BL+943GGA	VG1841BL+943BGA	VG1841BL+943BUA
VG1841BN		11.7 / 7.4		VG1841BN+943AGA	VG1841BN+943GGA	VG1841BN+943BGA	VG1841BN+943BUA
VG1841CL	1	7.4 / 4.7	200	VG1841CL+943AGA	VG1841CL+943GGA	VG1841CL+943BGA	VG1841CL+943BUA
VG1841CN		11.7 / 7.4		VG1841CN+943AGA	VG1841CN+943GGA	VG1841CN+943BGA	VG1841CN+943BUA
VG1841CP		18.7 / 11.7		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	200	VG1841DN+948AGA	VG1841DN+948GGA	VG1841DN+958BGA	VG1841DN+958BAA
VG1841DP		18.7 / 11.7		VG1841DP+948AGA	VG1841DP+948GGA	VG1841DP+958BGA	VG1841DP+958BAA
VG1841DR		29.2 / 18.7		VG1841DR+948AGA	VG1841DR+948GGA	VG1841DR+958BGA	VG1841DR+958BAA
VG1841EP	1-1/2	18.7 / 11.7	200	VG1841EP+948AGA	VG1841EP+948GGA	VG1841EP+958BGA	VG1841EP+958BAA
VG1841ER		29.2 / 18.7		VG1841ER+948AGA	VG1841ER+948GGA	VG1841ER+958BGA	VG1841ER+958BAA
VG1841ES		46.8 / 29.2		VG1841ES+948AGA	VG1841ES+948GGA	VG1841ES+958BGA	VG1841ES+958BAA
VG1841FR	2	29.2 / 18.7	200	VG1841FR+948AGA	VG1841FR+948GGA	VG1841FR+958BGA	VG1841FR+958BAA
VG1841FS		46.8 / 29.2		VG1841FS+948AGA	VG1841FS+948GGA	VG1841FS+958BGA	VG1841FS+958BAA
VG1841FT		73.7 / 36.8		VG1841FT+948AGA	VG1841FT+948GGA	VG1841FT+958BGA	VG1841FT+958BAA

1 Valve has a characterizing disk.

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)

VG1000 Series three-way, plated brass trim, NPT end connections ball valves with spring-return electric actuators without switches

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
³ 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.

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

Description

Figure 12: VG1000 Series Ball Valve



VG1000 Series Ball Valves are designed to regulate the flow of hot or chilled water and, for some models, low-pressure steam in response to the demand of a controller in HVAC systems. Available in sizes 1/2 through 2 in. (DN15 through DN50), this family of two and three-way forged brass valves is factory or field mounted to Johnson Controls® VA9104, and VA9300 Series Non-Spring Return and

VA9203 and VA9208 Series Spring-Return Electric Actuators for on/off, floating, or proportional control.

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

Features

- Forged brass body — provides 580 psig static pressure rating.
- 200 psi closeoff pressure rating — provides tight shutoff.
- Graphite-reinforced Polytetrafluoroethylene (PTFE) seats — include 15 per cent graphite-reinforced ball seals, providing better wear resistance.
- 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.

Selection charts

Table 25: 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
VG1845AA	1/2	0.3 / 0.2 ¹	200	VG1845AA+9T4AGA	-	VG1845AA+9T4GGA
VG1845AB		0.5 / 0.3		VG1845AB+9T4AGA	-	VG1845AB+9T4GGA
VG1845AC		0.8 / 0.4		VG1845AC+9T4AGA	-	VG1845AC+9T4GGA
VG1845AD		1.2 / 0.7		VG1845AD+9T4AGA	VG1845AD+9T4IGA	VG1845AD+9T4GGA
VG1845AE		1.9 / 1.2		VG1845AE+9T4AGA	VG1845AE+9T4IGA	VG1845AE+9T4GGA
VG1845AF		2.9 / 1.9		VG1845AF+9T4AGA	VG1845AF+9T4IGA	VG1845AF+9T4GGA
VG1845AG		4.7 / 2.9		VG1845AG+9T4AGA	VG1845AG+9T4IGA	VG1845AG+9T4GGA
VG1845AL		7.4 / 4.7		VG1845AL+9T4AGA	VG1845AL+9T4IGA	VG1845AL+9T4GGA
VG1845AN		11.7 / 5.8		VG1845AN+9T4AGA	VG1845AN+9T4IGA	VG1845AN+9T4GGA
VG1845BG	3/4	4.7 / 2.9	200	VG1845BG+9T4AGA	VG1845BG+9T4IGA	VG1845BG+9T4GGA
VG1845BL		7.4 / 4.7		VG1845BL+9T4AGA	VG1845BL+9T4IGA	VG1845BL+9T4GGA
VG1845BN		11.7 / 5.8		VG1845BN+9T4AGA	VG1845BN+9T4IGA	VG1845BN+9T4GGA
VG1845CL	1	7.4 / 4.7	200	VG1845CL+9T4AGA	VG1845CL+9T4IGA	VG1845CL+9T4GGA
VG1845CN		11.7 / 7.4		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
VG1845AA	1/2	0.3 / 0.2	200	VG1845AA+9A4AGA	-	VG1845AA+9A4GGA
VG1845AB		0.5 / 0.3		VG1845AB+9A4AGA	-	VG1845AB+9A4GGA
VG1845AC		0.8 / 0.4		VG1845AC+9A4AGA	-	VG1845AC+9A4GGA
VG1845AD		1.2 / 0.7		VG1845AD+9A4AGA	VG1845AD+9A4IGA	VG1845AD+9A4GGA
VG1845AE		1.9 / 1.2		VG1845AE+9A4AGA	VG1845AE+9A4IGA	VG1845AE+9A4GGA
VG1845AF		2.9 / 1.9		VG1845AF+9A4AGA	VG1845AF+9A4IGA	VG1845AF+9A4GGA
VG1845AG		4.7 / 2.9		VG1845AG+9A4AGA	VG1845AG+9A4IGA	VG1845AG+9A4GGA
VG1845AL		7.4 / 4.7		VG1845AL+9A4AGA	VG1845AL+9A4IGA	VG1845AL+9A4GGA
VG1845AN		11.7 / 5.8		VG1845AN+9A4AGA	VG1845AN+9A4IGA	VG1845AN+9A4GGA
VG1845BG	3/4	4.7 / 2.9	200	VG1845BG+9A4AGA	VG1845BG+9A4IGA	VG1845BG+9A4GGA
VG1845BL		7.4 / 4.7		VG1845BL+9A4AGA	VG1845BL+9A4IGA	VG1845BL+9A4GGA
VG1845BN		11.7 / 5.8		VG1845BN+9A4AGA	VG1845BN+9A4IGA	VG1845BN+9A4GGA
VG1845CL	1	7.4 / 4.7	200	VG1845CL+9A4AGA	VG1845CL+9A4IGA	VG1845CL+9A4GGA
VG1845CN		11.7 / 7.4		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.

Table 26: 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 floatingwith 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
VG1845AA	1/2	0.3 / 0.2 ²	200	VG1845AAH9T4AGA	-	VG1845AAH9T4GGA
VG1845AB		0.5 / 0.3		VG1845ABH9T4AGA	-	VG1845ABH9T4GGA
VG1845AC		0.8 / 0.4		VG1845ACH9T4AGA	-	VG1845ACH9T4GGA
VG1845AD		1.2 / 0.7		VG1845ADH9T4AGA	VG1845ADH9T4IGA	VG1845ADH9T4GGA
VG1845AE		1.9 / 1.2		VG1845AEH9T4AGA	VG1845AEH9T4IGA	VG1845AEH9T4GGA
VG1845AF		2.9 / 1.9		VG1845AFH9T4AGA	VG1845AFH9T4IGA	VG1845AFH9T4GGA
VG1845AG		4.7 / 2.9		VG1845AGH9T4AGA	VG1845AGH9T4IGA	VG1845AGH9T4GGA
VG1845AL		7.4 / 4.7		VG1845ALH9T4AGA	VG1845ALH9T4IGA	VG1845ALH9T4GGA
VG1845AN	3/4	11.7 / 5.8	200	VG1845ANH9T4AGA	VG1845ANH9T4IGA	VG1845ANH9T4GGA
VG1845BG		4.7 / 2.9		VG1845BGH9T4AGA	VG1845BGH9T4IGA	VG1845BGH9T4GGA
VG1845BL		7.4 / 4.7		VG1845BLH9T4AGA	VG1845BLH9T4IGA	VG1845BLH9T4GGA
VG1845BN	1	11.7 / 5.8	200	VG1845BNH9T4AGA	VG1845BNH9T4IGA	VG1845BNH9T4GGA
VG1845CL		7.4 / 4.7		VG1845CLH9T4AGA	VG1845CLH9T4IGA	VG1845CLH9T4GGA
VG1845CN		11.7 / 7.4		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
VG1845AA	1/2	0.3 / 0.2	200	VG1845AAH9A4AGA	-	VG1845AAH9A4GGA
VG1845AB		0.5 / 0.3		VG1845ABH9A4AGA	-	VG1845ABH9A4GGA
VG1845AC		0.8 / 0.4		VG1845ACH9A4AGA	-	VG1845ACH9A4GGA
VG1845AD		1.2 / 0.7		VG1845ADH9A4AGA	VG1845ADH9A4IGA	VG1845ADH9A4GGA
VG1845AE		1.9 / 1.2		VG1845AEH9A4AGA	VG1845AEH9A4IGA	VG1845AEH9A4GGA
VG1845AF		2.9 / 1.9		VG1845AFH9A4AGA	VG1845AFH9A4IGA	VG1845AFH9A4GGA
VG1845AG		4.7 / 2.9		VG1845AGH9A4AGA	VG1845AGH9A4IGA	VG1845AGH9A4GGA
VG1845AL		7.4 / 4.7		VG1845ALH9A4AGA	VG1845ALH9A4IGA	VG1845ALH9A4GGA
VG1845AN	3/4	11.7 / 5.8	200	VG1845ANH9A4AGA	VG1845ANH9A4IGA	VG1845ANH9A4GGA
VG1845BG		4.7 / 2.9		VG1845BGH9A4AGA	VG1845BGH9A4IGA	VG1845BGH9A4GGA
VG1845BL		7.4 / 4.7		VG1845BLH9A4AGA	VG1845BLH9A4IGA	VG1845BLH9A4GGA
VG1845BN	1	11.7 / 5.8	200	VG1845BNH9A4AGA	VG1845BNH9A4IGA	VG1845BNH9A4GGA
VG1845CL		7.4 / 4.7		VG1845CLH9A4AGA	VG1845CLH9A4IGA	VG1845CLH9A4GGA
VG1845CN		11.7 / 7.4		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 The for CV listed is for Port.

Table 27: 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		VG1845DP+910HGA		
VG1845DR		29.2		VG1845DR+910HGA		
VG1845EP	1-1/2	18.7	200	VG1845EP+910HGA		
VG1845ER		29.2		VG1845ER+910HGA		
VG1845ES		46.8		VG1845ES+910HGA		
VG1845FR	2	29.2	200	VG1845FR+910HGA		
VG1845FS		48.8		VG1845FS+910HGA		
VG1845FT		73.7		VG1845FT+910HGA		

1 Valve has a characterizing disk.

Table 28: 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		VG1845AE+910HGC		
VG1845AF		2.9		VG1845AF+910HGC		
VG1845AG		4.7		VG1845AG+910HGC		
VG1845AL		7.4		VG1845AL+910HGC		
VG1845AN		11.7		VG1845AN+910HGC		
VG1845BG	3/4	4.7	200	VG1845BG+910HGC		
VG1845BL		7.4		VG1845BL+910HGC		
VG1845BN		11.7		VG1845BN+910HGC		
VG1845CL	1	7.4	200	VG1845CL+910HGC		
VG1845CN		11.7		VG1845CN+910HGC		
VG1845CP		18.7		VG1845CP+910HGC		
VG1845DN	1-1/4	11.7	200	VG1845DN+910HGC		
VG1845DP		18.7		VG1845DP+910HGC		
VG1845DR		29.2		VG1845DR+910HGC		
VG1845EP	1-1/2	18.7	200	VG1845EP+910HGC		
VG1845ER		29.2		VG1845ER+910HGC		
VG1845ES		46.8		VG1845ES+910HGC		
VG1845FR	2	29.2	200	VG1845FR+910HGC		
VG1845FS		46.8		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.

Table 29: 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	1	200	VG1845DNH910HGA		
		11.7				
VG1845DP		18.7		VG1845DPH910HGA		
VG1845DR	1-1/2	29.2	200	VG1845DRH910HGA		
VG1845EP		18.7		VG1845EPH910HGA		
VG1845ER		29.2		VG1845ERH910HGA		
VG1845ES	2	46.8	200	VG1845ESH910HGA		
VG1845FR		29.2		VG1845FRH910HGA		
VG1845FS		48.8		VG1845FSH910HGA		
VG1845FT		73.7		VG1845FTH910HGA		

1 Valve has a characterizing disk.

Table 30: 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		VG1845AEH910HGC		
VG1845AF		2.9		VG1845AFH910HGC		
VG1845AG		4.7		VG1845AGH910HGC		
VG1845AL		7.4		VG1845ALH910HGC		
VG1845AN		11.7		VG1845ANH910HGC		
VG1845BG	3/4	4.7	200	VG1845BGH910HGC		
VG1845BL		7.4		VG1845BLH910HGC		
VG1845BN		11.7		VG1845BNH910HGC		
VG1845CL	1	7.4	200	VG1845CLH910HGC		
VG1845CN		11.7		VG1845CNH910HGC		
VG1845CP		18.7		VG1845CPH910HGC		
VG1845DN	1-1/4	11.7	200	VG1845DNH910HGC		
VG1845DP		18.7		VG1845DPH910HGC		
VG1845DR		29.2		VG1845DRH910HGC		

Table 30: 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		
VG1845EP	1-1/2	18.7	200	VG1845EPH910HGC		
VG1845ER		29.2		VG1845ERH910HGC		
VG1845ES		46.8		VG1845ESH910HGC		
VG1845FR	2	29.2	200	VG1845FRH910HGC		
VG1845FS		46.8		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.

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)

VG1000 Series three-way, stainless steel trim, NPT end connections ball valves with non-spring return electric actuators

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.

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

Description

Figure 13: VG1000 Series Ball Valve



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.

Selection charts

Table 31: 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
VG1845AA	1/2	0.3 / 0.2 ¹	200	VG1845AA+923AGB	VG1845AA+923GGB	VG1845AA+923BGB	-
VG1845AB		0.5 / 0.3		VG1845AB+923AGB	VG1845AB+923GGB	VG1845AB+923BGB	-
VG1845AC		0.8 / 0.4		VG1845AC+923AGB	VG1845AC+923GGB	VG1845AC+923BGB	-
VG1845AD		1.2 / 0.7		VG1845AD+923AGB	VG1845AD+923GGB	VG1845AD+923BGB	VG1845AD+923BUB
VG1845AE		1.9 / 1.2		VG1845AE+923AGB	VG1845AE+923GGB	VG1845AE+923BGB	VG1845AE+923BUB
VG1845AF		2.9 / 1.9		VG1845AF+923AGB	VG1845AF+923GGB	VG1845AF+923BGB	VG1845AF+923BUB
VG1845AG		4.7 / 2.9		VG1845AG+923AGB	VG1845AG+923GGB	VG1845AG+923BGB	VG1845AG+923BUB
VG1845AL		7.4 / 4.7		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	200	VG1845BG+923AGB	VG1845BG+923GGB	VG1845BG+923BGB	VG1845BG+923BUB
VG1845BL		7.4 / 4.7		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	200	VG1845CL+923AGB	VG1845CL+923GGB	VG1845CL+923BGB	VG1845CL+923BUB
VG1845CN		11.7 / 7.4		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	200	VG1845DN+938AGC	VG1845DN+938GGC	VG1845DN+938BGC	VG1845DN+938BAC
VG1845DP		18.7 / 11.7		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	200	VG1845EP+938AGC	VG1845EP+938GGC	VG1845EP+938BGC	VG1845EP+938BAC
VG1845ER		29.2 / 18.7		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	200	VG1845FR+938AGC	VG1845FR+938GGC	VG1845FR+938BGC	VG1845FR+938BAC
VG1845FS		46.8 / 29.2		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.

Table 32: 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
VG1845AA	1/2	0.3 / 0.2 ¹	200	VG1845AA+943AGB	VG1845AA+943GGB	VG1845AA+943BGB	-
VG1845AB		0.5 / 0.3		VG1845AB+943AGB	VG1845AB+943GGB	VG1845AB+943BGB	-
VG1845AC		0.8 / 0.4		VG1845AC+943AGB	VG1845AC+943GGB	VG1845AC+943BGB	-
VG1845AD		1.2 / 0.7		VG1845AD+943AGB	VG1845AD+943GGB	VG1845AD+943BGB	VG1845AD+943BUB
VG1845AE		1.9 / 1.2		VG1845AE+943AGB	VG1845AE+943GGB	VG1845AE+943BGB	VG1845AE+943BUB
VG1845AF		2.9 / 1.9		VG1845AF+943AGB	VG1845AF+943GGB	VG1845AF+943BGB	VG1845AF+943BUB
VG1845AG		4.7 / 2.9		VG1845AG+943AGB	VG1845AG+943GGB	VG1845AG+943BGB	VG1845AG+943BUB
VG1845AL		7.4 / 4.7		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	200	VG1845BG+943AGB	VG1845BG+943GGB	VG1845BG+943BGB	VG1845BG+943BUB
VG1845BL		7.4 / 4.7		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	200	VG1845CL+943AGB	VG1845CL+943GGB	VG1845CL+943BGB	VG1845CL+943BUB
VG1845CN		11.7 / 7.4		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	200	VG1845DN+958AGC	VG1845DN+958GGC	VG1845DN+958BGC	VG1845DN+958BAC
VG1845DP		18.7 / 11.7		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	200	VG1845EP+958AGC	VG1845EP+958GGC	VG1845EP+958BGC	VG1845EP+958BAC
VG1845ER		29.2 / 18.7		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	200	VG1845FR+958AGC	VG1845FR+958GGC	VG1845FR+958BGC	VG1845FR+958BAC
VG1845FS		46.8 / 29.2		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.

Table 33: Valve assemblies with M9000-561 Thermal Barrier installed — rated for high-temperature fluid service, three-way — spring return — with end switches

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.	CvPort 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
VG1845AA	1/2	0.3 / 0.2 ¹	200	VG1845AAH923AGB	VG1845AAH923GGB	VG1845AAH923BGB	-
VG1845AB		0.5 / 0.3		VG1845ABH923AGB	VG1845ABH923GGB	VG1845ABH923BGB	-
VG1845AC		0.8 / 0.4		VG1845ACH923AGB	VG1845ACH923GGB	VG1845ACH923BGB	-
VG1845AD		1.2 / 0.7		VG1845ADH923AGB	VG1845ADH923GGB	VG1845ADH923BGB	VG1845ADH923BUB
VG1845AE		1.9 / 1.2		VG1845AEH923AGB	VG1845AEH923GGB	VG1845AEH923BGB	VG1845AEH923BUB
VG1845AF		2.9 / 1.9		VG1845AFH923AGB	VG1845AFH923GGB	VG1845AFH923BGB	VG1845AFH923BUB
VG1845AG		4.7 / 2.9		VG1845AGH923AGB	VG1845AGH923GGB	VG1845AGH923BGB	VG1845AGH923BUB
VG1845AL		7.4 / 4.7		VG1845ALH923AGB	VG1845ALH923GGB	VG1845ALH923BGB	VG1845ALH923BUB
VG1845AN		11.7 / 5.8		VG1845ANH923AGB	VG1845ANH923GGB	VG1845ANH923BGB	VG1845ANH923BUB
VG1845BG	3/4	4.7 / 2.9	200	VG1845BGH923AGB	VG1845BGH923GGB	VG1845BGH923BGB	VG1845BGH923BUB
VG1845BL		7.4 / 4.7		VG1845BLH923AGB	VG1845BLH923GGB	VG1845BLH923BGB	VG1845BLH923BUB
VG1845BN		11.7 / 5.8		VG1845BNH923AGB	VG1845BNH923GGB	VG1845BNH923BGB	VG1845BNH923BUB
VG1845CL	1	7.4 / 4.7	200	VG1845CLH923AGB	VG1845CLH923GGB	VG1845CLH923BGB	VG1845CLH923BUB
VG1845CN		11.7 / 7.4		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	200	VG1845DNH938AGC	VG1845DNH938GGC	VG1845DNH938BGC	VG1845DNH938BAC
VG1845DP		18.7 / 11.7		VG1845DPH938AGC	VG1845DPH938GGC	VG1845DPH938BGC	VG1845DPH938BAC
VG1845DR		29.2 / 14.6		VG1845DRH938AGC	VG1845DRH938GGC	VG1845DRH938BGC	VG1845DRH938BAC
VG1845EP	1-1/2	18.7 / 11.7	200	VG1845EPH938AGC	VG1845EPH938GGC	VG1845EPH938BGC	VG1845EPH938BAC
VG1845ER		29.2 / 18.7		VG1845ERH938AGC	VG1845ERH938GGC	VG1845ERH938BGC	VG1845ERH938BAC
VG1845ES		46.8 / 23.4		VG1845ESH938AGC	VG1845ESH938GGC	VG1845ESH938BGC	VG1845ESH938BAC
VG1845FR	2	29.2/18.7	200	VG1845FRH938AGC	VG1845FRH938GGC	VG1845FRH938BGC	VG1845FRH938BAC
VG1845FS		46.8 / 29.2		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

Table 33: Valve assemblies with M9000-561 Thermal Barrier installed — rated for high-temperature fluid service, three-way — spring return — with end switches

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.	CvPort A/ B	Closeoff psig	Floating	0 to 10 VDC proportional	On/off	On/off
VG1845AA	1/2	0.3 / 0.2	200	VG1845AAH943AGB	VG1845AAH943GGB	VG1845AAH943BGB	-
VG1845AB		0.5 / 0.3		VG1845ABH943AGB	VG1845ABH943GGB	VG1845ABH943BGB	-
VG1845AC		0.8 / 0.4		VG1845ACH943AGB	VG1845ACH943GGB	VG1845ACH943BGB	-
VG1845AD		1.2 / 0.72		VG1845ADH943AGB	VG1845ADH943GGB	VG1845ADH943BGB	VG1845ADH943BUB
VG1845AE		1.9 / 1.2		VG1845AEH943AGB	VG1845AEH943GGB	VG1845AEH943BGB	VG1845AEH943BUB
VG1845AF		2.9 / 1.9		VG1845AFH943AGB	VG1845AFH943GGB	VG1845AFH943BGB	VG1845AFH943BUB
VG1845AG		4.7 / 2.9		VG1845AGH943AGB	VG1845AGH943GGB	VG1845AGH943BGB	VG1845AGH943BUB
VG1845AL		7.4 / 4.7		VG1845ALH943AGB	VG1845ALH943GGB	VG1845ALH943BGB	VG1845ALH943BUB
VG1845AN		11.7 / 5.8		VG1845ANH943AGB	VG1845ANH943GGB	VG1845ANH943BGB	VG1845ANH943BUB
VG1845BG	3/4	4.7 / 2.9	200	VG1845BGH943AGB	VG1845BGH943GGB	VG1845BGH943BGB	VG1845BGH943BUB
VG1845BL		7.4 / 4.7		VG1845BLH943AGB	VG1845BLH943GGB	VG1845BLH943BGB	VG1845BLH943BUB
VG1845BN		11.7 / 5.8		VG1845BNH943AGB	VG1845BNH943GGB	VG1845BNH943BGB	VG1845BNH943BUB
VG1845CL	1	7.4 / 4.7	200	VG1845CLH943AGB	VG1845CLH943GGB	VG1845CLH943BGB	VG1845CLH943BUB
VG1845CN		11.7 / 7.4		VG1845CNH943AGB	VG1845CNH943GGB	VG1845CNH943BGB	VG1845CNH943BUB
VG1845CP		18.7 / 9.4		VG1845CPH943AGB	VG1845CPH943GGB	VG1845CPH943BGB	VG1845CPH943BUB
				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	200	VG1845DNH958AGC	VG1845DNH958GGC	VG1845DNH958BGC	VG1845DNH958BAC
VG1845DP		18.7 / 11.7		VG1845DPH958AGC	VG1845DPH958GGC	VG1845DPH958BGC	VG1845DPH958BAC
VG1845DR		29.2 / 14.6		VG1845DRH958AGC	VG1845DRH958GGC	VG1845DRH958BGC	VG1845DRH958BAC
VG1845EP	1-1/2	18.7 / 11.7	200	VG1845EPH958AGC	VG1845EPH958GGC	VG1845EPH958BGC	VG1845EPH958BAC
VG1845ER		29.2 / 18.7		VG1845ERH958AGC	VG1845ERH958GGC	VG1845ERH958BGC	VG1845ERH958BAC
VG1845ES		46.8 / 23.4		VG1845ESH958AGC	VG1845ESH958GGC	VG1845ESH958BGC	VG1845ESH958BAC
VG1845FR	2	29.2 / 18.7	200	VG1845FRH958AGC	VG1845FRH958GGC	VG1845FRH958BGC	VG1845FRH958BAC
VG1845FS		46.8 / 29.2		VG1845FSH958AGC	VG1845FSH958GGC	VG1845FSH958BGC	VG1845FSH958BAC
VG1845FT		73.7 / 36.8		VG1845FTH958AGC	VG1845FTH958GGC	VG1845FTH958BGC	VG1845FTH958BAC

1 Valve has a characterizing disk.

Technical specifications

Table 34: 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)

Table 34: Technical specifications

VG1000 Series three-way, stainless steel trim, NPT end connections ball valves with spring-return electric actuators with switches		
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 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 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 Three-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators without Switches

Description

Figure 14: VG1000 Series Ball Valve



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.

Selection charts

Table 35: Three-way — spring return without 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			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1845AA	1/2	0.3 / 0.2 ¹	200	VG1845AA+923AGA	VG1845AA+923GGA	VG1845AA+923BGA	-
VG1845AB		0.5 / 0.3		VG1845AB+923AGA	VG1845AB+923GGA	VG1845AB+923BGA	-
VG1845AC		0.8 / 0.4		VG1845AC+923AGA	VG1845AC+923GGA	VG1845AC+923BGA	-
VG1845AD		1.2 / 0.7		VG1845AD+923AGA	VG1845AD+923GGA	VG1845AD+923BGA	VG1845AD+923BUA
VG1845AE		1.9 / 1.2 ¹		VG1845AE+923AGA	VG1845AE+923GGA	VG1845AE+923BGA	VG1845AE+923BUA
VG1845AF		2.9 / 1.9 ¹		VG1845AF+923AGA	VG1845AF+923GGA	VG1845AF+923BGA	VG1845AF+923BUA
VG1845AG		4.7 / 2.9 ¹		VG1845AG+923AGA	VG1845AG+923GGA	VG1845AG+923BGA	VG1845AG+923BUA
VG1845AL		7.4 / 4.7 ¹		VG1845AL+923AGA	VG1845AL+923GGA	VG1845AL+923BGA	VG1845AL+923BUA
VG1845AN		11.7 / 5.8		VG1845AN+923AGA	VG1845AN+923GGA	VG1845AN+923BGA	VG1845AN+923BUA
VG1845BG	3/4	4.7 / 2.9 ¹	200	VG1845BG+923AGA	VG1845BG+923GGA	VG1845BG+923BGA	VG1845BG+923BUA
VG1845BL		7.4 / 4.7 ¹		VG1845BL+923AGA	VG1845BL+923GGA	VG1845BL+923BGA	VG1845BL+923BUA
VG1845BN		11.7 / 5.8		VG1845BN+923AGA	VG1845BN+923GGA	VG1845BN+923BGA	VG1845BN+923BUA
VG1845CL	1	7.4 / 4.7 ¹	200	VG1845CL+923AGA	VG1845CL+923GGA	VG1845CL+923BGA	VG1845CL+923BUA
VG1845CN		11.7 / 5.8 ¹		VG1845CN+923AGA	VG1845CN+923GGA	VG1845CN+923BGA	VG1845CN+923BUA
VG1845CP		18.7 / 9.4		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 / 5.8 ¹	200	VG1845DN+928AGA	VG1845DN+928GGA	VG1845DN+938BGA	VG1845DN+938BAA
VG1845DP		18.7 / 9.4 ¹		VG1845DP+928AGA	VG1845DP+928GGA	VG1845DP+938BGA	VG1845DP+938BAA
VG1845DR		29.2 / 14.6		VG1845DR+928AGA	VG1845DR+928GGA	VG1845DR+938BGA	VG1845DR+938BAA
VG1845EP	1-1/2	18.7 / 11.7 ¹	200	VG1845EP+928AGA	VG1845EP+928GGA	VG1845EP+938BGA	VG1845EP+938BAA
VG1845ER		29.2 / 18.7 ¹		VG1845ER+928AGA	VG1845ER+928GGA	VG1845ER+938BGA	VG1845ER+938BAA
VG1845ES		46.8 / 29.2		VG1845ES+928AGA	VG1845ES+928GGA	VG1845ES+938BGA	VG1845ES+938BAA
VG1845FR	2	29.2 / 18.7 ¹	200	VG1845FR+928AGA	VG1845FR+928GGA	VG1845FR+938BGA	VG1845FR+938BAA
VG1845FS		46.8 / 29.2 ¹		VG1845FS+928AGA	VG1845FS+928GGA	VG1845FS+938BGA	VG1845FS+938BAA
VG1845FT		73.7 / 36.8		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

Table 35: Three-way — spring return without 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
VG1845AA	1/2	0.3 / 0.2 ¹	200	VG1845AA+943AGA	VG1845AA+943GGA	VG1845AA+943BGA	-
VG1845AB		0.5 / 0.3 ¹		VG1845AB+943AGA	VG1845AB+943GGA	VG1845AB+943BGA	-
VG1845AC		0.8 / 0.4 ¹		VG1845AC+943AGA	VG1845AC+943GGA	VG1845AC+943BGA	-
VG1845AD		1.2 / 0.7 ¹		VG1845AD+943AGA	VG1845AD+943GGA	VG1845AD+943BGA	VG1845AD+943BUA
VG1845AE		1.9 / 1.2 ¹		VG1845AE+943AGA	VG1845AE+943GGA	VG1845AE+943BGA	VG1845AE+943BUA
VG1845AF		2.9 / 1.9 ¹		VG1845AF+943AGA	VG1845AF+943GGA	VG1845AF+943BGA	VG1845AF+943BUA
VG1845AG		4.7 / 2.9 ¹		VG1845AG+943AGA	VG1845AG+943GGA	VG1845AG+943BGA	VG1845AG+943BUA
VG1845AL		7.4 / 4.7 ¹		VG1845AL+943AGA	VG1845AL+943GGA	VG1845AL+943BGA	VG1845AL+943BUA
VG1845AN		11.7 / 5.8		VG1845AN+943AGA	VG1845AN+943GGA	VG1845AN+943BGA	VG1845AN+943BUA
VG1845BG	3/4	4.7 / 2.9 ¹	200	VG1845BG+943AGA	VG1845BG+943GGA	VG1845BG+943BGA	VG1845BG+943BUA
VG1845BL		7.4 / 4.7 ¹		VG1845BL+943AGA	VG1845BL+943GGA	VG1845BL+943BGA	VG1845BL+943BUA
VG1845BN		11.7 / 5.8		VG1845BN+943AGA	VG1845BN+943GGA	VG1845BN+943BGA	VG1845BN+943BUA
VG1845CL	1	7.4 / 4.7 ¹	200	VG1845CL+943AGA	VG1845CL+943GGA	VG1845CL+943BGA	VG1845CL+943BUA
VG1845CN		11.7 / 7.4 ¹		VG1845CN+943AGA	VG1845CN+943GGA	VG1845CN+943BGA	VG1845CN+943BUA
VG1845CP		18.7 / 9.4		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 / 7.4 ¹	200	VG1845DN+948AGA	VG1845DN+948GGA	VG1845DN+958BGA	VG1845DN+958BAA
VG1845DP		18.7 / 9.4 ¹		VG1845DP+948AGA	VG1845DP+948GGA	VG1845DP+958BGA	VG1845DP+958BAA
VG1845DR		29.2 / 14.6		VG1845DR+948AGA	VG1845DR+948GGA	VG1845DR+958BGA	VG1845DR+958BAA
VG1845EP	1-1/2	18.7 / 9.4 ¹	200	VG1845EP+948AGA	VG1845EP+948GGA	VG1845EP+958BGA	VG1845EP+958BAA
VG1845ER		29.2 / 18.7 ¹		VG1845ER+948AGA	VG1845ER+948GGA	VG1845ER+958BGA	VG1845ER+958BAA
VG1845ES		46.8 / 23.4		VG1845ES+948AGA	VG1845ES+948GGA	VG1845ES+958BGA	VG1845ES+958BAA
VG1845FR	2	29.2 18.7 ¹	200	VG1845FR+948AGA	VG1845FR+948GGA	VG1845FR+958BGA	VG1845FR+958BAA
VG1845FS		46.8 / 29.2 ¹		VG1845FS+948AGA	VG1845FS+948GGA	VG1845FS+958BGA	VG1845FS+958BAA
VG1845FT		73.7 / 36.8		VG1845FT+948AGA	VG1845FT+948GGA	VG1845FT+958BGA	VG1845FT+958BAA

¹ Valve has a characterizing disk.

Table 36: Valve assemblies with M9000-561 Thermal Barrier installed — rated for high-temperature fluid service, three-way — spring return without switches

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
VG1845AA	1/2	0.3 / 0.2 ¹	200	VG1845AAH923AGA	VG1845AAH923GGA	VG1845AAH923BGA	-
VG1845AB		0.5 / 0.3		VG1845ABH923AGA	VG1845ABH923GGA	VG1845ABH923BGA	-
VG1845AC		0.8 / 0.4		VG1845ACH923AGA	VG1845ACH923GGA	VG1845ACH923BGA	-
VG1845AD		1.2 / 0.7		VG1845ADH923AGA	VG1845ADH923GGA	VG1845ADH923BG A	VG1845ADH923BUA
VG1845AE		1.9 / 1.2 ¹		VG1845AEH923AGA	VG1845AEH923GGA	VG1845AEH923BGA	VG1845AEH923BUA
VG1845AF		2.9 / 1.9 ¹		VG1845AFH923AGA	VG1845AFH923GGA	VG1845AFH923BGA	VG1845AFH923BUA
VG1845AG		4.7 / 2.9 ¹		VG1845AGH923AGA	VG1845AGH923GGA	VG1845AGH923BG A	VG1845AGH923BUA
VG1845AL		7.4 / 4.7 ¹		VG1845ALH923AGA	VG1845ALH923GGA	VG1845ALH923BGA	VG1845ALH923BUA
VG1845AN		11.7 / 5.8		VG1845ANH923AG A	VG1845ANH923GGA	VG1845ANH923BG A	VG1845ANH923BUA
VG1845BG	3/4	4.7 / 2.9 ¹	200	VG1845BGH923AGA	VG1845BGH923GGA	VG1845BGH923BG A	VG1845BGH923BUA
VG1845BL		7.4 / 4.7 ¹		VG1845BLH923AGA	VG1845BLH923GGA	VG1845BLH923BGA	VG1845BLH923BUA
VG1845BN		11.7 / 5.8		VG1845BNH923AG A	VG1845BNH923GGA	VG1845BNH923BG A	VG1845BNH923BUA
VG1845CL	1	7.4 / 4.7 ¹	200	VG1845CLH923AGA	VG1845CLH923GGA	VG1845CLH923BGA	VG1845CLH923BUA
VG1845CN		11.7 / 7.4 ¹		VG1845CNH923AGA	VG1845CNH923GGA	VG1845CNH923BG A	VG1845CNH923BUA
VG1845CP		18.7 / 9.4		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 / 5.8 ¹	200	VG1845DNH928AG A	VG1845DNH928GGA	VG1845DNH938BG A	VG1845DNH938BAA
VG1845DP		18.7 / 9.4 ¹		VG1845DPH928AGA	VG1845DPH928GGA	VG1845DPH938BG A	VG1845DPH938BAA
VG1845DR		29.2 / 18.7		VG1845DRH928AGA	VG1845DRH928GGA	VG1845DRH938BG A	VG1845DRH938BAA
VG1845EP	1-1/2	18.7 / 9.4 ¹	200	VG1845EPH928AGA	VG1845EPH928GGA	VG1845EPH938BGA	VG1845EPH938BAA
VG1845ER		29.2 / 18.7 ¹		VG1845ERH928AGA	VG1845ERH928GGA	VG1845ERH938BGA	VG1845ERH938BAA
VG1845ES		46.8 / 23.4		VG1845ESH928AGA	VG1845ESH928GGA	VG1845ESH938BGA	VG1845ESH938BAA
VG1845FR	2	29.2 / 14.6 ¹	200	VG1845FRH928AGA	VG1845FRH928GGA	VG1845FRH938BGA	VG1845FRH938BAA
VG1845FS		46.8 / 23.4 ¹		VG1845FSH928AGA	VG1845FSH928GGA	VG1845FSH938BGA	VG1845FSH938BAA
VG1845FT		73.7 / 36.8		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

Table 36: Valve assemblies with M9000-561 Thermal Barrier installed — rated for high-temperature fluid service, three-way — spring return without switches

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
VG1845AA	1/2	0.3 / 0.2 ¹	200	VG1845AAH943AGA	VG1845AAH943GGA	VG1845AAH943BGA	-
VG1845AB		0.5 / 0.3 ¹		VG1845ABH943AGA	VG1845ABH943GGA	VG1845ABH943BGA	-
VG1845AC		0.8 / 0.4 ¹		VG1845ACH943AGA	VG1845ACH943GGA	VG1845ACH943BGA	-
VG1845AD		1.2 / 0.7 ¹		VG1845ADH943AGA	VG1845ADH943GGA	VG1845ADH943BG A	VG1845ADH943BUA
VG1845AE		1.9 / 1.2 ¹		VG1845AEH943AGA	VG1845AEH943GGA	VG1845AEH943BGA	VG1845AEH943BUA
VG1845AF		2.9 / 1.9 ¹		VG1845AFH943AGA	VG1845AFH943GGA	VG1845AFH943BGA	VG1845AFH943BUA
VG1845AG		4.7 / 2.9 ¹		VG1845AGH943AGA	VG1845AGH943GGA	VG1845AGH943BG A	VG1845AGH943BUA
VG1845AL		7.4 / 4.7 ¹		VG1845ALH943AGA	VG1845ALH943GGA	VG1845ALH943BGA	VG1845ALH943BUA
VG1845AN		11.7 / 7.4		VG1845ANH943AG A	VG1845ANH943GGA	VG1845ANH943BG A	VG1845ANH943BUA
VG1845BG	3/4	4.7 / 2.9 ¹	200	VG1845BGH943AGA	VG1845BGH943GGA	VG1845BGH943BG A	VG1845BGH943BUA
VG1845BL		7.4 / 4.7 ¹		VG1845BLH943AGA	VG1845BLH943GGA	VG1845BLH943BGA	VG1845BLH943BUA
VG1845BN		11.7 / 5.8		VG1845BNH943AG A	VG1845BNH943GGA	VG1845BNH943BG A	VG1845BNH943BUA
VG1845CL	1	7.4 / 4.7 ¹	200	VG1845CLH943AGA	VG1845CLH943GGA	VG1845CLH943BGA	VG1845CLH943BUA
VG1845CN		11.7 / 7.4 ¹		VG1845CNH943AGA	VG1845CNH943GGA	VG1845CNH943BG A	VG1845CNH943BUA
VG1845CP		18.7 / 9.4		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 / 5.8 ¹	200	VG1845DNH948AG A	VG1845DNH948GGA	VG1845DNH958BG A	VG1845DNH958BAA
VG1845DP		18.7 / 9.4 ¹		VG1845DPH948AGA	VG1845DPH948GGA	VG1845DPH958BG A	VG1845DPH958BAA
VG1845DR		29.2 / 14.6		VG1845DRH948AGA	VG1845DRH948GGA	VG1845DRH958BG A	VG1845DRH958BAA
VG1845EP	1-1/2	18.7 / 11.7 ¹	200	VG1845EPH948AGA	VG1845EPH948GGA	VG1845EPH958BGA	VG1845EPH958BAA
VG1845ER		29.2 / 14.6 ¹		VG1845ERH948AGA	VG1845ERH948GGA	VG1845ERH958BGA	VG1845ERH958BAA
VG1845ES		46.8 / 23.4		VG1845ESH948AGA	VG1845ESH948GGA	VG1845ESH958BGA	VG1845ESH958BAA
VG1845FR	2	29.2 / 18.7 ¹	200	VG1845FRH948AGA	VG1845FRH948GGA	VG1845FRH958BGA	VG1845FRH958BAA
VG1845FS		46.8 / 23.4 ¹		VG1845FSH948AGA	VG1845FSH948GGA	VG1845FSH958BGA	VG1845FSH958BAA
VG1845FT		73.7 / 36.8		VG1845FTH948AGA	VG1845FTH948GGA	VG1845FTH958BGA	VG1845FTH958BAA

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 without switches

Service¹		Hot water, chilled water, 50/50 glycol solutions, and 15 psig (103 kPa) saturated steam for HVAC systems
Fluid temperature limits	Water	-22°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)
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 temperature (Limited by the Actuator and Linkage)³	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.

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

Description

Figure 15: VG1000 Series Ball Valve



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.

Selection charts

Table 37: 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
VG1241AA	1/2	0.3 ²	200	VG1241AA+9T4AGA	-	VG1241AA+9T4GGA
VG1241AB		0.5		VG1241AB+9T4AGA	-	VG1241AB+9T4GGA
VG1241AC		0.8		VG1241AC+9T4AGA	-	VG1241AC+9T4GGA
VG1241AD		1.2		VG1241AD+9T4AGA	VG1241AD+9T4IGA	VG1241AD+9T4GGA
VG1241AE		1.9		VG1241AE+9T4AGA	VG1241AE+9T4IGA	VG1241AE+9T4GGA
VG1241AF		2.9		VG1241AF+9T4AGA	VG1241AF+9T4IGA	VG1241AF+9T4GGA
VG1241AG		4.7		VG1241AG+9T4AGA	VG1241AG+9T4IGA	VG1241AG+9T4GGA
VG1241AL		7.4		VG1241AL+9T4AGA	VG1241AL+9T4IGA	VG1241AL+9T4GGA
VG1241AN		11.7		VG1241AN+9T4AGA	VG1241AN+9T4IGA	VG1241AN+9T4GGA
VG1241BG	3/4	4.7	200	VG1241BG+9T4AGA	VG1241BG+9T4IGA	VG1241BG+9T4GGA
VG1241BL		7.4		VG1241BL+9T4AGA	VG1241BL+9T4IGA	VG1241BL+9T4GGA
VG1241BN		11.7		VG1241BN+9T4AGA	VG1241BN+9T4IGA	VG1241BN+9T4GGA
VG1241CL	1	7.4	200	VG1241CL+9T4AGA	VG1241CL+9T4IGA	VG1241CL+9T4GGA
VG1241CN		11.7		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
VG1241AA	1/2	0.3	200	VG1241AA+9A4AGA	-	VG1241AA+9A4GGA
VG1241AB		0.5		VG1241AB+9A4AGA	-	VG1241AB+9A4GGA
VG1241AC		0.8		VG1241AC+9A4AGA	-	VG1241AC+9A4GGA
VG1241AD		1.2		VG1241AD+9A4AGA	VG1241AD+9A4IGA	VG1241AD+9A4GGA
VG1241AE		1.9		VG1241AE+9A4AGA	VG1241AE+9A4IGA	VG1241AE+9A4GGA
VG1241AF		2.9		VG1241AF+9A4AGA	VG1241AF+9A4IGA	VG1241AF+9A4GGA
VG1241AG		4.7		VG1241AG+9A4AGA	VG1241AG+9A4IGA	VG1241AG+9A4GGA
VG1241AL		7.4		VG1241AL+9A4AGA	VG1241AL+9A4IGA	VG1241AL+9A4GGA
VG1241AN		11.7		VG1241AN+9A4AGA	VG1241AN+9A4IGA	VG1241AN+9A4GGA
VG1241BG	3/4	4.7	200	VG1241BG+9A4AGA	VG1241BG+9A4IGA	VG1241BG+9A4GGA
VG1241BL		7.4		VG1241BL+9A4AGA	VG1241BL+9A4IGA	VG1241BL+9A4GGA
VG1241BN		11.7		VG1241BN+9A4AGA	VG1241BN+9A4IGA	VG1241BN+9A4GGA
VG1241CL	1	7.4	200	VG1241CL+9A4AGA	VG1241CL+9A4IGA	VG1241CL+9A4GGA
VG1241CN		11.7		VG1241CN+9A4AGA	VG1241CN+9A4IGA	VG1241CN+9A4GGA
VG1241CP		18.7		VG1241CP+9A4AGA	VG1241CP+9A4IGA	VG1241CP+9A4GGA

- ¹ To avoid excessive wear or drive time on the motor for the AGA models, use a controller or software that provides a timeout function to remove the signal at the end of rotation (stall).
- ² Valve has a characterizing disk.

Table 38: 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.

Technical specifications

Table 39: 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

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

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 Catalog Page

Description

Figure 16: VG1000 Series Ball Valve



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 per cent 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.

Selection charts

Table 40: 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
VG1241AA	1/2	0.3 ¹	200	VG1241AA+923AGB	VG1241AA+923GGB	VG1241AA+923BGB	-
VG1241AB		0.5		VG1241AB+923AGB	VG1241AB+923GGB	VG1241AB+923BGB	-
VG1241AC		0.8		VG1241AC+923AGB	VG1241AC+923GGB	VG1241AC+923BGB	-
VG1241AD		1.2		VG1241AD+923AGB	VG1241AD+923GGB	VG1241AD+923BGB	VG1241AD+923BUB
VG1241AE		1.9		VG1241AE+923AGB	VG1241AE+923GGB	VG1241AE+923BGB	VG1241AE+923BUB
VG1241AF		2.9		VG1241AF+923AGB	VG1241AF+923GGB	VG1241AF+923BGB	VG1241AF+923BUB
VG1241AG		4.7		VG1241AG+923AGB	VG1241AG+923GGB	VG1241AG+923BGB	VG1241AG+923BUB
VG1241AL		7.4		VG1241AL+923AGB	VG1241AL+923GGB	VG1241AL+923BGB	VG1241AL+923BUB
VG1241AN		11.7		VG1241AN+923AGB	VG1241AN+923GGB	VG1241AN+923BGB	VG1241AN+923BUB
VG1241BG	3/4	4.7	200	VG1241BG+923AGB	VG1241BG+923GGB	VG1241BG+923BGB	VG1241BG+923BUB
VG1241BL		7.4		VG1241BL+923AGB	VG1241BL+923GGB	VG1241BL+923BGB	VG1241BL+923BUB
VG1241BN		11.7		VG1241BN+923AGB	VG1241BN+923GGB	VG1241BN+923BGB	VG1241BN+923BUB
VG1241CL	1	7.4	200	VG1241CL+923AGB	VG1241CL+923GGB	VG1241CL+923BGB	VG1241CL+923BUB
VG1241CN		11.7		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	200	VG1241DN+938AGC	VG1241DN+938GGC	VG1241DN+938BGC	VG1241DN+938BAC
VG1241DP		18.7		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	200	VG1241EP+938AGC	VG1241EP+938GGC	VG1241EP+938BGC	VG1241EP+938BAC
VG1241ER		29.2		VG1241ER+938AGC	VG1241ER+938GGC	VG1241ER+938BGC	VG1241ER+938BAC
VG1241ES		46.8		VG1241ES+938AGC	VG1241ES+938GGC	VG1241ES+938BGC	VG1241ES+938BAC
VG1241FR	2	29.2	200	VG1241FR+938AGC	VG1241FR+938GGC	VG1241FR+938BGC	VG1241FR+938BAC
VG1241FS		46.8		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.

Table 41: 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
VG1241AA	1/2	0.3 ¹	200	VG1241AA+943AGB	VG1241AA+943GGB	VG1241AA+943BGB	-
VG1241AB		0.5		VG1241AB+943AGB	VG1241AB+943GGB	VG1241AB+943BGB	-
VG1241AC		0.8		VG1241AC+943AGB	VG1241AC+943GGB	VG1241AC+943BGB	-
VG1241AD		1.2		VG1241AD+943AGB	VG1241AD+943GGB	VG1241AD+943BGB	VG1241AD+943BUB
VG1241AE		1.9		VG1241AE+943AGB	VG1241AE+943GGB	VG1241AE+943BGB	VG1241AE+943BUB
VG1241AF		2.9		VG1241AF+943AGB	VG1241AF+943GGB	VG1241AF+943BGB	VG1241AF+943BUB
VG1241AG		4.7		VG1241AG+943AGB	VG1241AG+943GGB	VG1241AG+943BGB	VG1241AG+943BUB
VG1241AL		7.4		VG1241AL+943AGB	VG1241AL+943GGB	VG1241AL+943BGB	VG1241AL+943BUB
VG1241AN		11.7		VG1241AN+943AGB	VG1241AN+943GGB	VG1241AN+943BGB	VG1241AN+943BUB
VG1241BG	3/4	4.7	200	VG1241BG+943AGB	VG1241BG+943GGB	VG1241BG+943BGB	VG1241BG+943BUB
VG1241BL		7.4		VG1241BL+943AGB	VG1241BL+943GGB	VG1241BL+943BGB	VG1241BL+943BUB
VG1241BN		11.7		VG1241BN+943AGB	VG1241BN+943GGB	VG1241BN+943BGB	VG1241BN+943BUB
VG1241CL	1	7.4	200	VG1241CL+943AGB	VG1241CL+943GGB	VG1241CL+943BGB	VG1241CL+943BUB
VG1241CN		11.7		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	200	VG1241DN+958AGC	VG1241DN+958GGC	VG1241DN+958BGC	VG1241DN+958BAC
VG1241DP		18.7		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	200	VG1241EP+958AGC	VG1241EP+958GGC	VG1241EP+958BGC	VG1241EP+958BAC
VG1241ER		29.2		VG1241ER+958AGC	VG1241ER+958GGC	VG1241ER+958BGC	VG1241ER+958BAC
VG1241ES		46.8		VG1241ES+958AGC	VG1241ES+958GGC	VG1241ES+958BGC	VG1241ES+958BAC
VG1241FR	2	29.2	200	VG1241FR+958AGC	VG1241FR+958GGC	VG1241FR+958BGC	VG1241FR+958BAC
VG1241FS		46.8		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.

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)	

VG1000 Series two-way, plated brass trim, NPT end connections ball valves with spring-return electric actuators with switches

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.

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

Description

Figure 17: VG1000 Series Ball Valve



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.

Selection chart

Table 42: Two-way — spring return without 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			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2
VG1241AA	1/2	10.3	200	VG1241AD+923AGA	VG1241AD+923GGA	VG1241AD+923BGA	-
VG1241AB		0.5		VG1241AD+923AGA	VG1241AD+923GGA	VG1241AD+923BGA	-
VG1241AC		0.8		VG1241AD+923AGA	VG1241AD+923GGA	VG1241AD+923BGA	-
VG1241AD		1.2		VG1241AD+923AGA	VG1241AD+923GGA	VG1241AD+923BGA	VG1241AD+923BUA
VG1241AE		1.9		VG1241AE+923AGA	VG1241AE+923GGA	VG1241AE+923BGA	VG1241AE+923BUA
VG1241AF		2.9		VG1241AF+923AGA	VG1241AF+923GGA	VG1241AF+923BGA	VG1241AF+923BUA
VG1241AG		4.7		VG1241AG+923AGA	VG1241AG+923GGA	VG1241AG+923BGA	VG1241AG+923BUA
VG1241AL		7.4		VG1241AL+923AGA	VG1241AL+923GGA	VG1241AL+923BGA	VG1241AL+923BUA
VG1241AN		11.7		VG1241AN+923AGA	VG1241AN+923GGA	VG1241AN+923BGA	VG1241AN+923BUA
VG1241BG	3/4	4.7	200	VG1241BG+923AGA	VG1241BG+923GGA	VG1241BG+923BGA	VG1241BG+923BUA
VG1241BL		7.4		VG1241BL+923AGA	VG1241BL+923GGA	VG1241BL+923BGA	VG1241BL+923BUA
VG1241BN		11.7		VG1241BN+923AGA	VG1241BN+923GGA	VG1241BN+923BGA	VG1241BN+923BUA
VG1241CL	1	7.4	200	VG1241CL+923AGA	VG1241CL+923GGA	VG1241CL+923BGA	VG1241CL+923BUA
VG1241CN		11.7		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	200	VG1241DN+928AGA	VG1241DN+928GGA	VG1241DN+938BGA	VG1241DN+938BAA
VG1241DP		18.7		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	200	VG1241EP+928AGA	VG1241EP+928GGA	VG1241EP+938BGA	VG1241EP+938BAA
VG1241ER		29.2		VG1241ER+928AGA	VG1241ER+928GGA	VG1241ER+938BGA	VG1241ER+938BAA
VG1241ES		46.8		VG1241ES+928AGA	VG1241ES+928GGA	VG1241ES+938BGA	VG1241ES+938BAA
VG1241FR	2	29.2	200	VG1241FR+928AGA	VG1241FR+928GGA	VG1241FR+938BGA	VG1241FR+938BAA
VG1241FS		46.8		VG1241FS+928AGA	VG1241FS+928GGA	VG1241FS+938BGA	VG1241FS+938BAA
VG1241FT		73.7		VG1241FT+928AGA	VG1241FT+928GGA	VG1241FT+938BGA	VG1241FT+938BAA
				Spring return closed — valve normally closed			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2

Table 42: Two-way — spring return without 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
VG1241AA	1/2	0.3	200	VG1241AA+943AGA	VG1241AA+943GGA	VG1241AA+943BGA	-
VG1241AB		0.5		VG1241AB+943AGA	VG1241AB+943GGA	VG1241AB+943BGA	-
VG1241AC		0.8		VG1241AC+943AGA	VG1241AC+943GGA	VG1241AC+943BGA	-
VG1241AD		1.2		VG1241AD+943AGA	VG1241AD+943GGA	VG1241AD+943BGA	VG1241AD+943BUA
VG1241AE		1.9		VG1241AE+943AGA	VG1241AE+943GGA	VG1241AE+943BGA	VG1241AE+943BUA
VG1241AF		2.9		VG1241AF+943AGA	VG1241AF+943GGA	VG1241AF+943BGA	VG1241AF+943BUA
VG1241AG		4.7		VG1241AG+943AGA	VG1241AG+943GGA	VG1241AG+943BGA	VG1241AG+943BUA
VG1241AL		7.4		VG1241AL+943AGA	VG1241AL+943GGA	VG1241AL+943BGA	VG1241AL+943BUA
VG1241AN		11.7		VG1241AN+943AGA	VG1241AN+943GGA	VG1241AN+943BGA	VG1241AN+943BUA
VG1241BG	3/4	4.7	200	VG1241BG+943AGA	VG1241BG+943GGA	VG1241BG+943BGA	VG1241BG+943BUA
VG1241BL		7.4		VG1241BL+943AGA	VG1241BL+943GGA	VG1241BL+943BGA	VG1241BL+943BUA
VG1241BN		11.7		VG1241BN+943AGA	VG1241BN+943GGA	VG1241BN+943BGA	VG1241BN+943BUA
VG1241CL	1	7.4	200	VG1241CL+943AGA	VG1241CL+943GGA	VG1241CL+943BGA	VG1241CL+943BUA
VG1241CN		11.7		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	200	VG1241DN+948AGA	VG1241DN+948GGA	VG1241DN+958BGA	VG1241DN+958BAA
VG1241DP		18.7		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	200	VG1241EP+948AGA	VG1241EP+948GGA	VG1241EP+958BGA	VG1241EP+958BAA
VG1241ER		29.2		VG1241ER+948AGA	VG1241ER+948GGA	VG1241ER+958BGA	VG1241ER+958BAA
VG1241ES		46.8		VG1241ES+948AGA	VG1241ES+948GGA	VG1241ES+958BGA	VG1241ES+958BAA
VG1241FR	2	29.2	200	VG1241FR+948AGA	VG1241FR+948GGA	VG1241FR+958BGA	VG1241FR+958BAA
VG1241FS		46.8		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.

Technical specifications

Table 43: 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)

Table 43: Technical specifications

VG1000 Series two-way, plated brass trim, NPT end connections ball valves with spring-return electric actuators without switches		
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.

VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Non-Spring Return Electric Actuators Catalog Page

Description

Figure 18: VG1000 Series Ball Valve



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.

Selection charts

Table 44: 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
VG1245AA	1/2	0.3 ²	200	VG1245AA+9T4AGA	-	VG1245AA+9T4GGA
VG1245AB		0.5 ²		VG1245AB+9T4AGA	-	VG1245AB+9T4GGA
VG1245AC		0.8 ²		VG1245AC+9T4AGA	-	VG1245AC+9T4GGA
VG1245AD		1.2 ²		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	3/4	11.7	200	VG1245AN+9T4AGA	VG1245AN+9T4IGA	VG1245AN+9T4GGA
VG1245BG		4.7 ²		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
VG1245AA	1/2	0.3 ²	200	VG1245AA+9A4AGA	-	VG1245AA+9A4GGA
VG1245AB		0.5 ²		VG1245AB+9A4AGA	-	VG1245AB+9A4GGA
VG1245AC		0.8 ²		VG1245AC+9A4AGA	-	VG1245AC+9A4GGA
VG1245AD		1.2 ²		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	3/4	11.7	200	VG1245AN+9A4AGA	VG1245AN+9A4IGA	VG1245AN+9A4GGA
VG1245BG		4.7 ²		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.

Table 45: 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		
				On/off and/or floating without timeout ¹	On/off and/or floating with timeout	DC 0 to 10 V proportional
Valve	Size, in.	Cv	Closeoff psig			
Actuators with M3 screw terminals with M9000-561 Thermal Barrier installed				VA9104-AGA-3S	VA9104-IGA-3S	VA9104-GGA-3S
VG1245AA	1/2	0.3 ²	200	VG1245AAH9T4AGA	-	VG1245AAH9T4GGA
VG1245AB		0.5 ²		VG1245ABH9T4AGA	-	VG1245ABH9T4GGA
VG1245AC		0.8 ²		VG1245ACH9T4AGA	-	VG1245ACH9T4GGA
VG1245AD		2		VG1245ADH9T4AGA	VG1245ADH9T4IGA	VG1245ADH9T4GGA
		1.2 ²				
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
VG1245AA	1/2	0.3 ²	200	VG1245AAH9A4AGA	-	VG1245AAH9A4AGA
VG1245AB		0.5 ²		VG1245ABH9A4AGA	-	VG1245ABH9A4AGA
VG1245AC		0.8 ²		VG1245ACH9A4AGA	-	VG1245ACH9A4AGA
VG1245AD		1.2 ²		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
VG1245BG	3/4	4.7 ²	200	VG1245BGH9A4AGA	VG1245BGH9A4IGA	VG1245BGH9A4GGA
VG1245BL		7.4 ²		VG1245BLH9A4AGA	VG1245BLH9A4IGA	VG1245BLH9A4GGA
VG1245BN		11.7		VG1245BNH9A4AGA	VG1245BNH9A4IGA	VG1245BNH9A4GGA

Table 45: 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
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.

Table 46: 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		
Valve	Size, in.	Cv	Closeoff psi	On/Off	Floating	DC 0(2) to 10 V proportional
VA9310-HGA-2 with M9000-561 Thermal Barrier						
VG1245DN	1-1/4	11.7	200		VG1245DN+910HGA	
VG1245DP		18.7			VG1245DP+910HGA	
VG1245DR		29.2			VG1245DR+910HGA	
VG1245EP	1-1/2	18.7	200		VG1245EP+910HGA	
VG1245ER		29.2			VG1245ER+910HGA	
VG1245ES		46.8			VG1245ES+910HGA	
VG1245FR	2	29.2	200		VG1245FR+910HGA	
VG1245FS		48.8			VG1245FS+910HGA	
VG1245FT		73.7			VG1245FT+910HGA	

Table 47: 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		
Valve	Size, in.	Cv	Closeoff psi	On/Off	Floating	DC 0(2) to 10 V proportional
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	

Table 47: 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		
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.

Table 48: 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	1	200	VG1245DNH910HGA		
		11.7 ¹				
VG1245DP		18.7 ¹		VG1245DPH910HGA		
VG1245DR	1-1/2	29.2	200	VG1245DRH910HGA		
VG1245EP		18.7 ¹		VG1245EPH910HGA		
VG1245ER		29.2 ¹		VG1245ERH910HGA		
VG1245ES	2	46.8	200	VG1245ESH910HGA		
VG1245FR		29.2 ¹		VG1245FRH910HGA		
VG1245FS		48.8 ¹		VG1245FSH910HGA		
VG1245FT		73.7		VG1245FTH910HGA		

¹ Valve has a characterizing disk.

Table 49: 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.

Technical specifications

Table 50: 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

Table 50: Technical specifications

VG1000 Series two-way, stainless steel trim, NPT end connections ball valves with non-spring return electric actuators		
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.

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

Description

Figure 19: VG1000 Series Ball Valve



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 per cent 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.

Selection charts

Table 51: 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
VG1245AA	1/2	0.3 ¹	200	VG1245AA+923AGB	VG1245AC+923GGB	VG1245AC+923BGB	-
VG1245AB		0.5 ¹		VG1245AB+923AGB	VG1245AC+923GGB	VG1245AC+923BGB	-
VG1245AC		0.8 ¹		VG1245AC+923AGB	VG1245AC+923GGB	VG1245AC+923BGB	-
VG1245AD		1.2 ¹		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.

Table 52: 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
VG1245AA	1/2	0.3 ¹	200	VG1245AA+923AGB	VG1245AC+923GGB	VG1245AC+923BGB	-
VG1245AB		0.5 ¹		VG1245AB+923AGB	VG1245AC+923GGB	VG1245AC+923BGB	-
VG1245AC		0.8 ¹		VG1245AC+923AGB	VG1245AC+923GGB	VG1245AC+923BGB	-
VG1245AD		1.2 ¹		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	3/4	11.7	200	VG1245AN+943AGB	VG1245AN+943GGB	VG1245AN+943BGB	VG1245AN+943BUB
VG1245BG		4.7 ¹		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.

Table 53: 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
VG1245AA	1/2	0.3 ¹	200	VG1245AAH923AGB	VG1245AAH923GGB	VG1245AAH923BGB	-
VG1245AB		0.5 ¹		VG1245ABH923AGB	VG1245ABH923GGB	VG1245ABH923BGB	-
VG1245AC		0.8 ¹		VG1245ACH923AGB	VG1245ACH923GGB	VG1245ACH923BGB	-
VG1245AD		1		VG1245ADH923AGB	VG1245ADH923GGB	VG1245ADH923BGB	VG1245ADH923BUB
VG1245AE		1.2 ¹		VG1245AEH923AGB	VG1245AEH923GGB	VG1245AEH923BGB	VG1245AEH923BUB
VG1245AF		1.9 ¹					
VG1245AG		2.9 ¹					
VG1245AL		4.7 ¹					
VG1245AN		7.4 ¹					
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

Table 53: 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
VG1245AA	1/2	0.3 ¹	200	VG1245AAH943AGB	VG1245AAH943GGB	VG1245AAH943BGB	-
VG1245AB		0.5 ¹		VG1245ABH943AGB	VG1245ABH923GGB	VG1245ABH943BGB	-
VG1245AC		0.8 ¹		VG1245ACH943AGB	VG1245ACH943GGB	VG1245ACH943BGB	-
VG1245AD		1.2 ¹		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.

Technical specifications

VG1000 Series Two-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 (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)	

VG1000 Series Two-Way, Stainless Steel Trim, NPT End Connections Ball Valves with Spring-Return Electric Actuators with Switches		
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
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 (limited by the actuator) ³	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.

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

Description

Figure 20: VG1000 Series Ball Valve



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 per cent 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.

Selection charts

Table 54: Two-way — spring return valves — without switches (not rated for steam service)

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
VG1245AA	1/2	0.3 ¹	200	VG1245AA+923AGA	VG1245AA+923GGA	VG1245AA+923BGA	-
VG1245AB		0.5 ¹		VG1245AB+923AGA	VG1245AB+923GGA	VG1245AB+923BGA	-
VG1245AC		0.8 ¹		VG1245AC+923AGA	VG1245AC+923GGA	VG1245AC+923BGA	-
VG1245AD		1.2 ¹		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
				Spring return closed — valve normally closed			
				VA9203-AGA-2Z	VA9203-GGA-2Z	VA9203-BGA-2	VA9203-BUA-2

Table 54: Two-way — spring return valves — without switches (not rated for steam service)

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
VG1245AA	1/2	0.3 ¹	200	VG1245AA+943AGA	VG1245AA+943GGA	VG1245AA+943BGA	-
VG1245AB		0.5 ¹		VG1245AB+943AGA	VG1245AB+943GGA	VG1245AB+943BGA	-
VG1245AC		0.8 ¹		VG1245AC+943AGA	VG1245AC+943GGA	VG1245AC+943BGA	-
VG1245AD		1.2		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.

Table 55: 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

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
VG1245AA	1/2	0.3 ¹	200	VG1245AAH923AGA	VG1245AAH923GGA	VG1245AAH923BGA	-
VG1245AB		0.5 ¹		VG1245ABH923AGA	VG1245ABH923GGA	VG1245ABH923BGA	-
VG1245AC		0.8 ¹		VG1245ACH923AGA	VG1245ACH923GGA	VG1245ACH923BGA	-
VG1245AD		1.2 ¹		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
				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

Table 55: 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

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
VG1245AA	1/2	0.3 ¹	200	VG1245AAH943AGA	VG1245AAH943GGA	VG1245AAH943BGA	-
VG1245AB		0.5 ¹		VG1245ABH943AGA	VG1245ABH943GGA	VG1245ABH943BGA	-
VG1245AC		0.8 ¹		VG1245ACH943AGA	VG1245ACH943GGA	VG1245ACH943BGA	-
VG1245AD		1.2 ¹		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	1	7.4 ¹	200	VG1245BLH943AGA	VG1245BLH943GGA	VG1245BLH943BGA	VG1245BLH943BUA
VG1245BN		11.7		VG1245BNH943AGA	VG1245BNH943GGA	VG1245BNH943BGA	VG1245BNH943BUA
VG1245CL		7.4 ¹		VG1245CLH943AGA	VG1245CLH943GGA	VG1245CLH943BGA	VG1245CLH943BUA
VG1245CN	1	11.7 ¹	200	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	1-1/2	18.7 ¹	200	VG1245DPH948AGA	VG1245DPH948GGA	VG1245DPH958BGA	VG1245DPH958BAA
VG1245DR		29.2		VG1245DRH948AGA	VG1245DRH948GGA	VG1245DRH958BGA	VG1245DRH958BAA
VG1245EP	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.

Technical specifications

Table 56: 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

Table 56: Technical specifications

VG1000 Series two-way, stainless steel trim, NPT end connections ball valves with spring-return electric actuators without switches		
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.

VG1000 Smart Ball Valves Catalog Page

Description

Figure 21: VG1000 Smart Ball Valve



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® low characterizing disk
- 200 psi closeoff pressure rating
- Chrome-plated brass ball and stem assembly standard
- 500:1 rangeability

Selection charts

Table 57: Ordering data¹

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- 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.

Table 58: 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			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.			
Valve								+	Actuator											

- 1 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.
- 2 Refer to *Metasys® System Field Equipment Controllers and Related Products Product Bulletin (LIT-12011042)* for detailed VMA information.

Table 59: 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.

Table 60: 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.

Table 61: 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.

Figure 22: VMA1656 Actuated VG1241 and VG1841 Ball Valve with NPT End Connections dimensions, in. (mm)

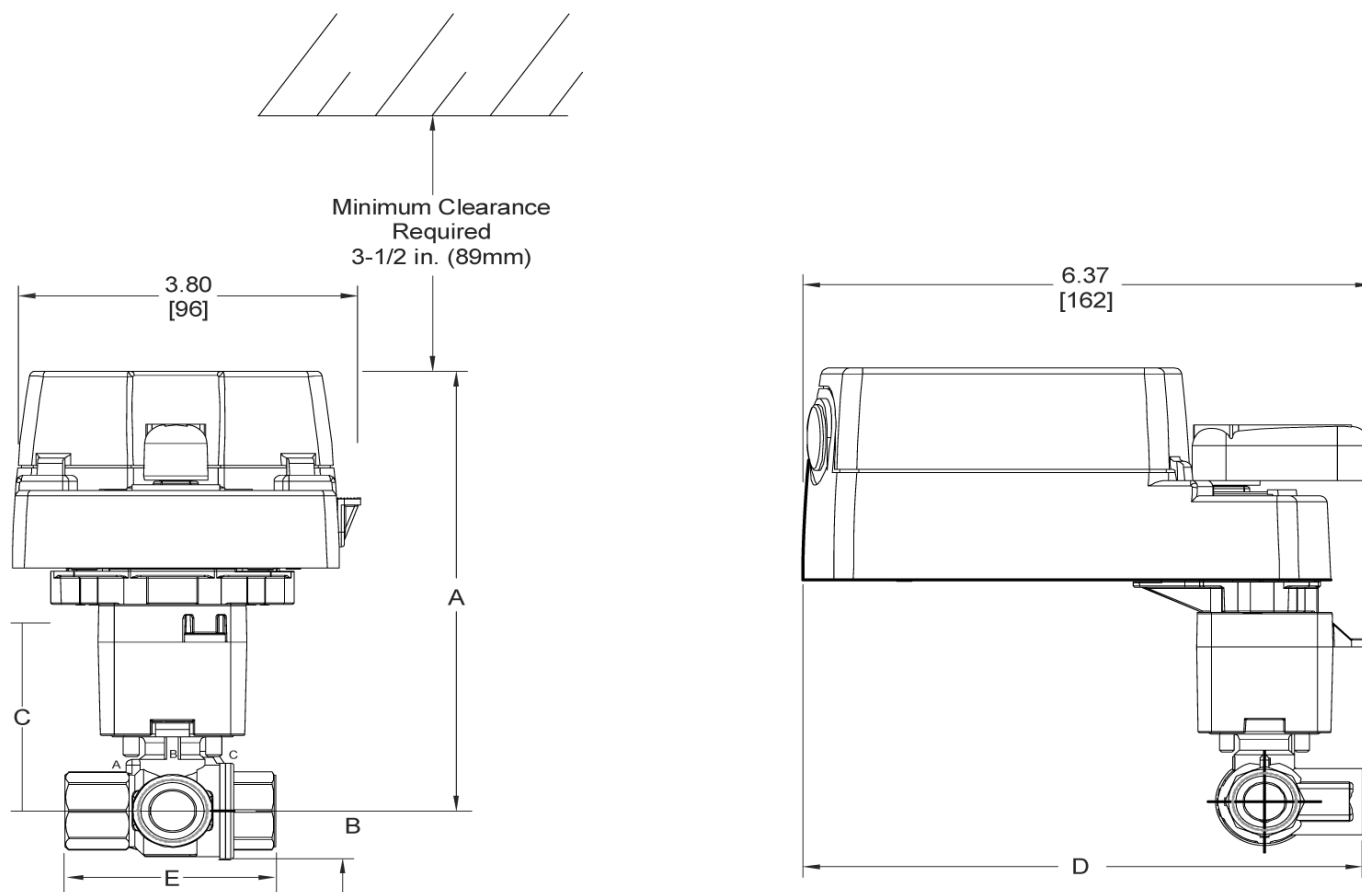


Table 62: VMA1656 Actuated VG1241 and VG1841 Series Ball Valve with optional M9000-551 Linkage Kit dimensions, in. (mm)

Valve Size, in. (DN) ¹	A	B	C	D	E	F	G
1/2 (DN15)	5-15/16 (151)	21/32 (17)	1-7/32 (31)	2-13/16 (71)	2-33/64 (64)	11/32 (9)	1-1/4 (32)
3/4 (DN20)	5-15/16 (151)	21/32 (17)	1-7/32 (31)	2-13/16 (71)	2-51/64 (71)	11/32 (9)	1-13/32 (36)
1 (DN25)	6 (153)	3/4 (19)	1-19/64 (33)	2-7/8 (73)	3-13/32 (87)	11/32 (9)	1-11/16 (43)

¹ Port A must always be connected to the coil.

Technical specifications

Table 63: VG1000 Series Forged Brass Ball Valves

Specification		Description
Service ¹		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)
Rangeability ²		Greater than 500:1
Minimum ambient operating temperature		-4°F (-20°C)
Maximum ambient operating temperature ³ (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
Shipping weight lb (kg)	1.6 (0.7)	

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.

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

Description

Figure 23: VG1000 Smart Ball Valve with VAV Box Controller



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

Selection charts

Table 64: Ordering data¹

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						A		E		Size and maximum Cv						Size		Control disk		Control port Cv (Kvs)		Bypass port Cv (Kvs) (Three-way only)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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		V		G		1		2		4		1		A		E		+																Example: Forged brass ball valve, two-way, threaded (NPT), brass trim, equal %, 1/2 in. (DN15) 1.9 Cv.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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- 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.

Table 65: 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.

Table 66: 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

- Valve has a characterizing disk.

Table 67: 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.

Table 68: 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)

Table 69: 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.

Figure 24: FX-PCV1656 Actuated VG1241 and VG1841 Ball Valve with NPT End Connections Dimensions, in. (mm)

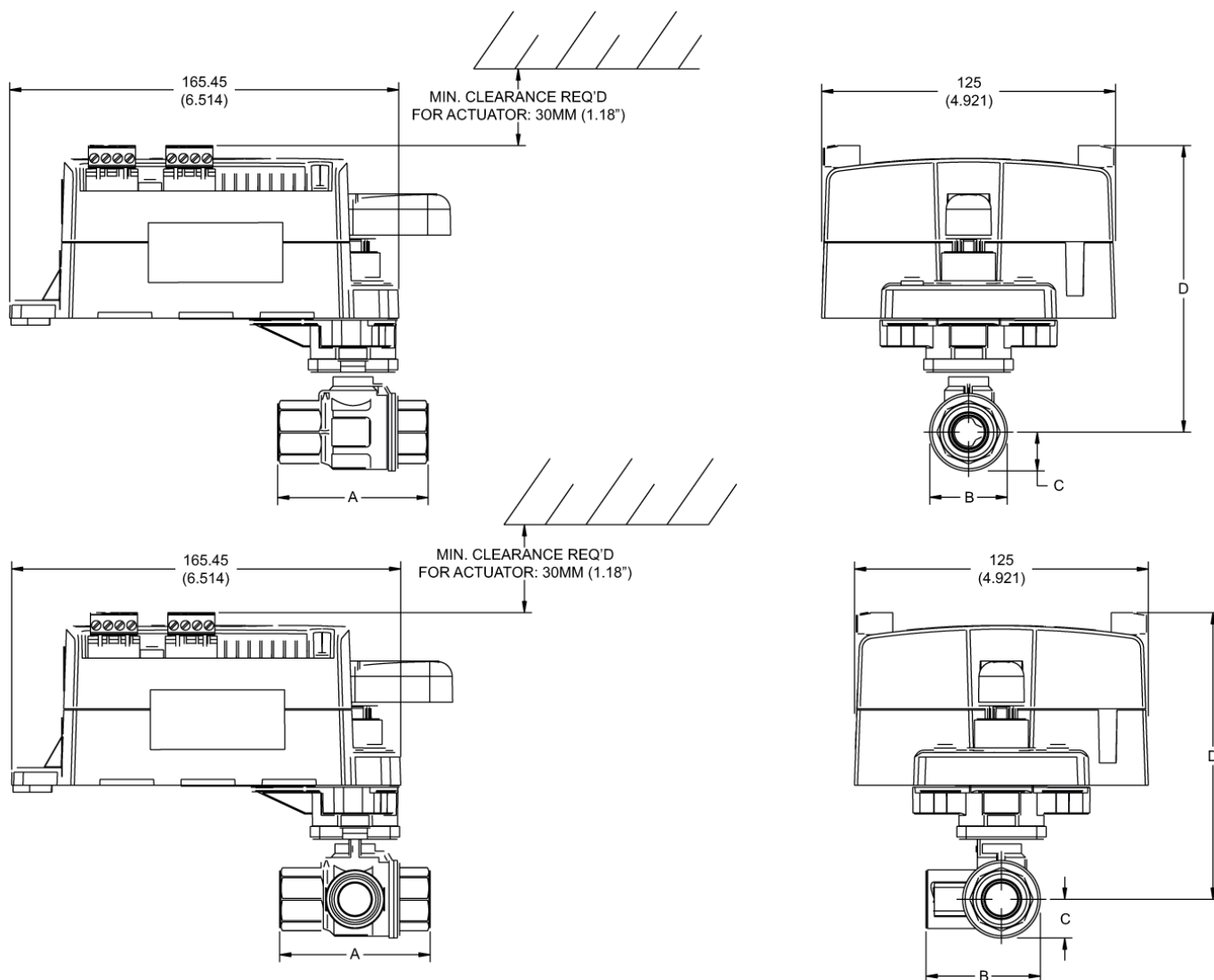


Table 70: FX-PCV1656 Actuated VG1241 and VG1841 Series Ball Valve with optional M9000-551 Linkage Kit dimensions, in. (mm)

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.

Technical specifications

Table 71: VG1000 Series Forged Brass Ball Valves

Specification		Description
Service ¹		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)
Rangeability ²		Greater than 500:1
Minimum ambient operating temperature		32°F (0°C)
Maximum ambient operating temperature ³ (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.

Product and Contact Information

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

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

Repair information

If the product fails to operate within its specifications, replace the unit. For a replacement, contact the nearest Johnson Controls® representative.

Patents

Patents: <https://jciapat.com>

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

Single point of contact

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

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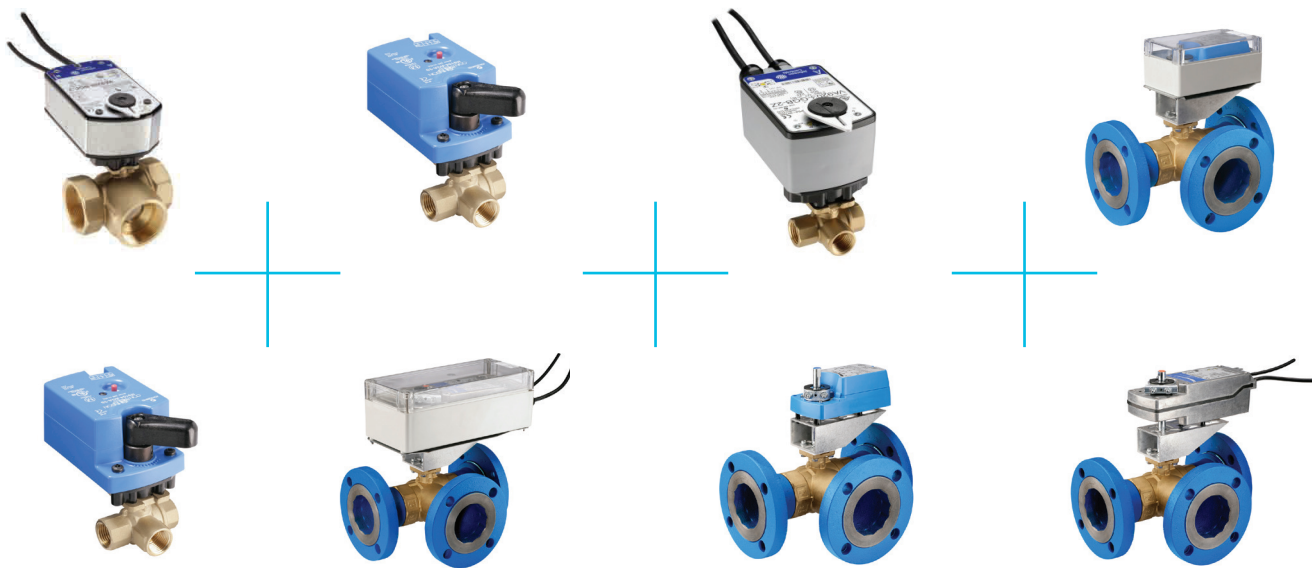
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