JOHNSON CONTROLS

VG1000 SERIES BALL VALVES

Strategic Marketing Guide

A Product Line So Complete...

It Reaches Around The Globe

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INTRODUCTION

PURPOSE OF THIS GUIDE

This Strategic Marketing Guide has been developed to introduce you to major additions to the Johnson Controls family of valve products. The VG1000 Series line of ball valves has been redesigned with enhanced features, so they now cover a much broader range of applications. The expanded VG1000 Series is a world-class, global product offering — with the latest additions, Johnson Controls has standardized on this product offering worldwide.

LONG-TERM OBJECTIVES

Johnson Controls' long-term objective is to be a full-range, best-value supplier of Automatic Temperature Control (ATC) valves for the commercial Heating, Ventilating, and Air Conditioning (HVAC) market. We plan to accomplish this objective by offering a complete product line that provides high reliability and maximum performance at a competitive price. With Six-Sigma Programs in place, we incorporate the industries' most rigorous testing programs to ensure that our products conform to specifications and provide many years of trouble-free operation. It is our goal to make Johnson Controls your preferred supplier of valves for HVAC applications.

GLOBALIZATION

The Johnson Controls VG1000, VG4000, and VG7000 Series product families are the result of cooperation between five Johnson Controls design and manufacturing facilities worldwide, including locations in Essen Germany, Lomagna Italy, Reynosa Mexico, Shanghai China, and Milwaukee Wisconsin. Johnson Controls provides dependable, high-performance valves and valve actuators at competitive prices, to customers across the globe.

SALES-SUPPORT MATERIALS

Product Selection and Sizing Color Brochures

- VG1000 Series Ball Valves, Plated Brass Ball and Stem: PUBL-3734
- VG1000 Series Ball Valves, Stainless Steel Ball and Stem: PUBL-3735
- VG1000 Series Ball Valves, Full Port Assemblies: PUBL-3736

Pre-Sale Documentation

- VG1000 Series Forged Brass Ball Valves Product Bulletin: LIT-977132
- M9000-520 Ball Valve Linkage Kits Product Bulletin: LIT-1201547
- M9000-51x Ball Valve Linkage Kits Product Bulletin: LIT-977354
- M9106-xGx-2 Series Electric Non-spring Return Actuators: LIT-2681123
- M9109 Series Electric Non-spring Return Actuators: LIT-120112
- M9206 Series Electric Spring Return Actuators: LIT-2681118
- M9206-Bxx-2S Series On/Off Electric Spring Return Actuators: LIT-120110
- M9216 Series Electric Spring Return Actuators: LIT-2681068

INTRODUCTION

SALES-SUPPORT MATERIALS

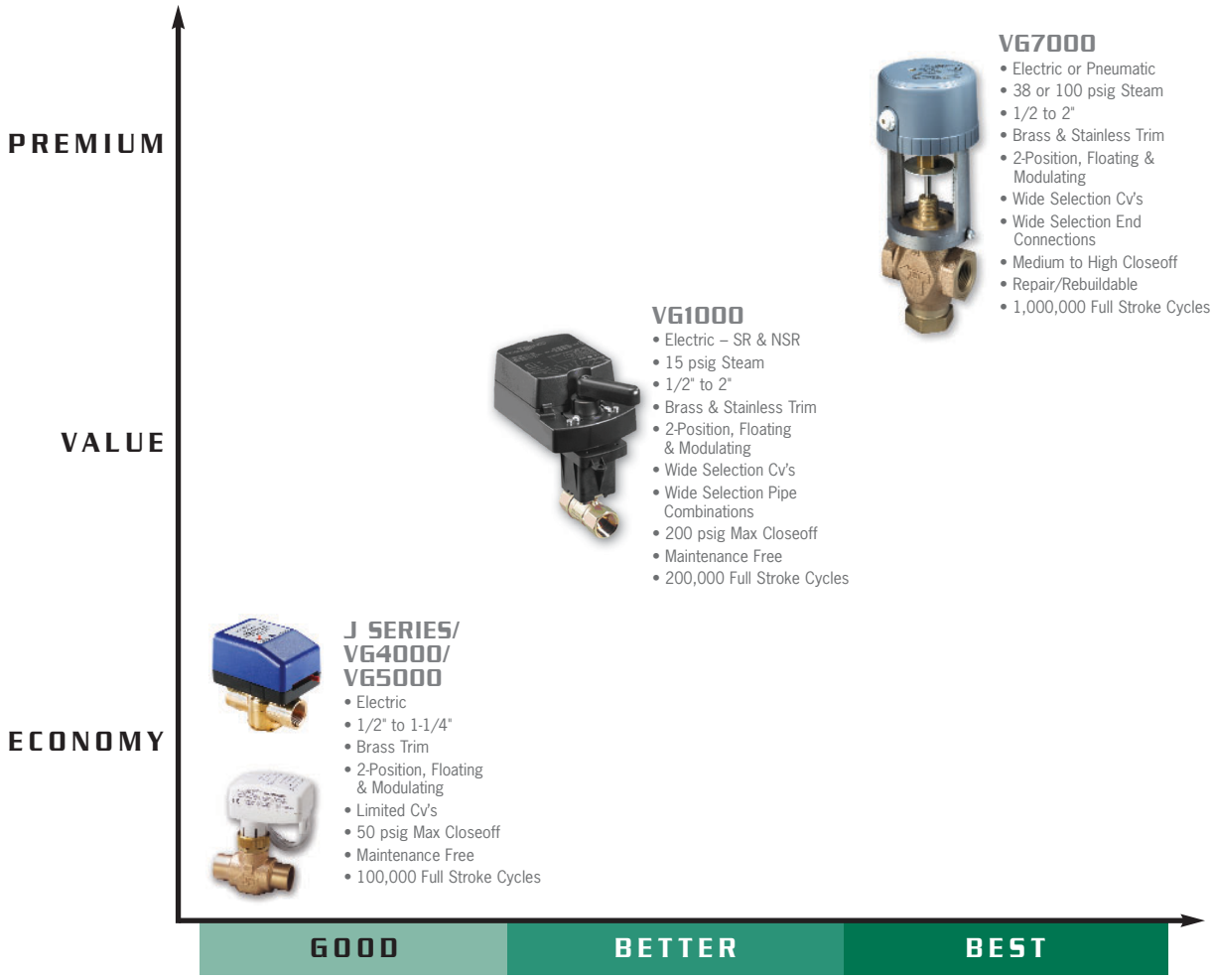
Post-Sale Documentation

- VG1000 Series Forged Brass Ball Valves Installation Instructions: 14-1201-5
- M9000-520 Ball Valve Linkage Kits Installation Instructions: 14-1297-5
- M9000-51x Ball Valve Linkage Kits Installation Instructions: 14-1201-13
- M9106-xGx-2 Series Electric Non-spring Return Actuators: 34-636-1085
- M9109 Series Electric Non-spring Return Actuators: 34-636-1190
- M9206 Series Electric Spring Return Actuators: 34-1280-9
- M9206-Bxx-2S Series On/Off Electric Spring Return Actuators: 34-1280-122
- M9216 Series Electric Spring Return Actuators: 34-636-461
- M9216-BAx-2 Assemblies: 34-636-801

Johnson Controls HVAC Product Selection Guide: MISC-263

These sales-support materials will assist you while selling and demonstrating the many features and benefits of Johnson Controls VG1000 Series ball valves. We aim to make the entire process easy for you — from initial sizing and selection, ordering, and delivering on-time, to installation and commissioning.

SALES POSITIONING

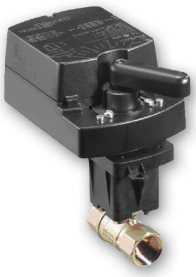


JOHNSON CONTROLS VALVE LINE OVERVIEW

Johnson Controls provides a comprehensive offering of valves for a wide range of HVAC applications. While many features will differ between the valve families, more than one valve offering may meet the system requirements for a specific application. Our comprehensive product offering can be divided into three basic categories:

GOOD — Johnson Controls VG4000, VG5000, and J Series valves are a limited line of 1/2 through 1-1/4" zone valves designed specifically for high-volume, fan coil or reheat valve applications using either hot or chilled water. These valves meet the requirements for many fan coil and VAV reheat applications, providing the benefit of being small and compact and low first-cost. Electric actuators are available for two-position On/Off, three-wire floating, and 0 to 10 VDC proportional applications. Actuator and valve assemblies have a life expectancy of approximately 100,000 full stroke cycles or ten years of service, in systems where the water treatment is properly maintained. VG4000, VG5000, and J Series valves are an excellent choice for applications where compact size and low first-cost are critical to securing the job.

SALES POSITIONING



BETTER — The newly expanded offering of VG1000 Series valves now includes a complete line of forged brass ball valves in 1/2 through 2" sizes, available in chrome-plated brass and stainless steel trim. The VG1000 Series incorporates many features such as a 200 psi closeoff pressure rating, greater than a 500:1 rangeability, equal percentage flow characteristics, and a wide range of Cv's. Stainless steel trim versions can be used on systems with up to 15 psi saturated steam. The VG1000 Series has been tested for use in systems with iron-oxide contaminated water for up to 200,000 full stroke cycles, providing an average of 15 to 20 years of maintenance-free service in a properly sized and commissioned application. These valves are an excellent choice for value-minded customers who want top-notch temperature control, require a higher closeoff pressure, and need a reliable valve that is capable of providing many years of trouble-free service.

BEST — The highly-respected VG7000 Series cast bronze globe valves offer customers our broadest range of application flexibility. Complete ranges of 1/2 through 2" models are available with threaded (NPT), union sweat, union globe, and union angle end connections. The VG7000 Series is available in both electric and pneumatic actuated models. Valve assemblies featuring a brass seat and disk are designed for use in hot or chilled water applications, or saturated steam applications up to 38 psig. Models featuring a stainless steel seat and disk are designed for saturated steam applications up to 100 psig.

The VG7000 Series has been tested for use in systems with iron-oxide contaminated water for up to 1,000,000 full stroke cycles, providing over 30 years of maintenance-free service in a properly sized and commissioned application. When compared to competitive globe valves, the VG7000 Series can stroke up to 10 times longer before the valve needs to be repacked. VG7000 Series valves can be reconditioned to like-new condition without removing the valve body from the piping system, using the new stem, plug, and packing included in the reconditioning kit. These valves are an excellent choice for customers who desire the world's best, most reliable product, along with the application flexibility that can only be found with the VG7000 Series.

JOHNSON CONTROLS VALVE LINE COMPARISONS




	GOOD J SERIES	GOOD VG4000/5000	BETTER VG1000	BEST VG7000
VALVE TYPE	Paddle Valve	Globe Valve	Ball Valve	Globe Valve
PIPE SIZES	1/2" to 1-1/4"	1/2" to 1"	1/2" to 2"	1/2" to 2"
CONNECTIONS	NPT Sweat	NPT Sweat	NPT	NPT Union Straight Union Angle Union Sweat
2-WAY	NO and NC	NO and NC	NO and NC	NO and NC
3-WAY	Mixing Diverting	Mixing	Mixing Diverting	Mixing
CONTROL	Electronic	Electronic	Electronic	Electronic/Pneumatic
TWO-POSITION	SR	SR	SR NSR	SR NSR
FLOATING	SR NSR	NSR	SR NSR	SR NSR
MODULATING	SR NSR	NSR	SR NSR	SR NSR
FLOW CHARACTERISTICS	Equal Percentage	Quick Opening	Equal Percentage	Equal % 2-Way Linear – 3-Way
RANGEABILITY	25:1	Not Measured	>500:1	25:1
FLUID TEMPERATURE RATINGS	32 to 200ºF 32 to 250ºF	35 to 203ºF	23 to 200ºF (BT) 23 to 250ºF (SS)	35 to 284ºF (BT) 35 to 338ºF (SS)
STEAM RATING	15 psig HT Models Only	N/A	15 psig (SS)	38 psig (BT) 100 psig (SS)
CLOSEOFF PRESSURE	17 to 75 psig	9 to 50 psig	200 psig	6 to 365 psig
FEATURES	Manual Override	Manual Override 2-Position Only	Manual Override Std on NSR	Manual Override VA-4233 Only
TYPICAL APPLICATIONS	Fan Coil Baseboard VAV Reheat	Fan Coil Baseboard VAV Reheat	Fan Coil Perimeter Heat VAV, Air Handler	Perimeter Heat VAV, Fan Coil Air Handler
LIFE CYCLE TESTING	100,000	100,000	200,000	1,000,000
RECONDITIONING KITS	None	None	None	VG7000 can be reconditioned while valve is installed
ELECTRIC ACTUATORS SPRING RETURN	On-Off Floating Proportional	On-Off	On-Off Floating Proportional	On-Off Floating Proportional
ELECTRIC ACTUATORS NON-SPRING RETURN	Floating Proportional	Floating Proportional	Floating Proportional	Floating Proportional
PNEUMATIC ACTUATORS 4, 8, 25, AND 50 SQUARE INCH	N/A	N/A	N/A	3 to 6 psig, 4 to 8 psig 9 to 13 psig
WHERE MADE	Loves Park, IL Meets Buy America Act	Italy Mexico China	Italy Mexico	Italy, Mexico Versions Meet Buy America Act

BT = Brass Trim HT = High Temperature Model SS = Stainless Steel Trim SR = Spring Return NSR = Non-Spring Return
NO = Normally Open NC = Normally Closed

THE JOHNSON CONTROLS DIFFERENCE – TESTING AND QUALITY CONTROL

TESTING AND QUALITY CONTROL

Incorporating validation testing and Six-Sigma quality control programs are the clear difference between Johnson Controls valves and our competition. While many competitors don't test their valves or test only a small quantity of their products, Johnson Controls maintains the most rigorous validation testing programs in the industry. As a result, Johnson Controls VG1000 Series ball valves have a very low return rate. Since their introduction in 1997, we have maintained a defect rate of less than 40 parts per million for all valves shipped.

Below are a few of the tests conducted which validate that valve assemblies shipped are of the highest quality:

STEM AND SEAT LEAKAGE TESTING

Johnson Controls VG1000 Series ball valves are validation tested under the worst-case conditions, using 1,000 ppm of 150 to 325 mesh iron-oxide contaminated water. This test simulates valves operating in hydronic systems that are not well maintained. The contamination levels we select for testing are approximately 2-1/2 times worse than those we've measured in field installations where water treatment is not well maintained. In a typical test, 32 valves of a particular size are cycled for over 200,000 full stroke cycles to evaluate stem and ball seals. A failure is defined as any leakage through the valve stem seals, or ball seat leakage exceeding our specification of ANSI Class IV (0.01% of maximum Cv) upon initial installation, and ANSI Class III (0.1% of maximum Cv) at the end of life testing. All 32 valves must conform to our standards for stem and seat leakage tests. While running these tests, Johnson Controls discovered that ball valves with 15% graphite-filled Teflon® ball seats performed much better than valves with virgin Teflon® ball seats. The graphite-filled ball seats ran two life tests under contaminated water conditions without any leakage. As a result, Johnson Controls chose 15% graphite-filled Teflon® ball seats for use in all VG1000 Series ball valves, in order to provide our customers with products that exceed their expectations for reliability and durability.

MAXIMUM VALVE TORQUE

When operating in contaminated water, we have discovered that ball valves exhibit a characteristic where the initial torque required to turn the valve will increase as the valve is cycled, and then decrease once a peak valve torque is established. The peak valve torque generally occurs at about 8,000 to 10,000 full stroke cycles. As the valve continues to cycle, the torque decreases as the ball seats wear. We have found that, when operating in iron-oxide contaminated water, the peak valve torque can be four to eight times the initial torque reading for a particular valve. In addition, ball valves exhibit a temporary higher stiction torque when left in the open or closed position for an extended period of time (such as during seasonal shutdown). At Johnson Controls, we conduct a test where valves are cycled using the actuator that is recommended for the specific application. We check each valve every 1,000 full stroke cycles for running torque and stiction torque, to find the peak valve torque. The peak valve torque needs to be less than the rated torque for the

actuator selected. This test ensures that the actuators we recommend for an application can drive the valve without stalling under all conditions, in order to provide trouble-free service over the life of the assembly. Peak valve torque is also measured on a sample of 32 valves for each size, providing good statistical evidence that we conform to specifications.

HYDROSTATIC BURST PRESSURE TESTING

We perform a hydrostatic test per UL standard 429 to validate the working or static pressure rating for the valve. Valves are pressurized to 2,900 psig (five times the maximum working or static pressure rating) for 2 minutes. The valve must meet all performance specifications before and after this test. Our VG1000 Series ball valves have a 580 psig static or working pressure rating, which allows the VG1000 Series to be used in a very broad range of applications.

CLOSEOFF PRESSURE RATING

The closeoff pressure rating is checked at pressures ranging from a minimum of 3 psig to a maximum of 200 psig. For VG1000 Series ball valves, the test at 3 psig is as critical as the test at 200 psig. With our testing, Johnson Controls has found that a high inlet pressure pushes the ball against the down-stream ball seat, helping to seal the valve. A ball that seals properly at 200 psig may not necessarily seal properly at 3 psig. As a result, we also check the closeoff at low pressures to simulate the lowest pressures encountered in a hydronic system. At Johnson Controls, we want to ensure that VG1000 Series ball valves will reliably seal under the entire range of pressures found in a hydronic system.

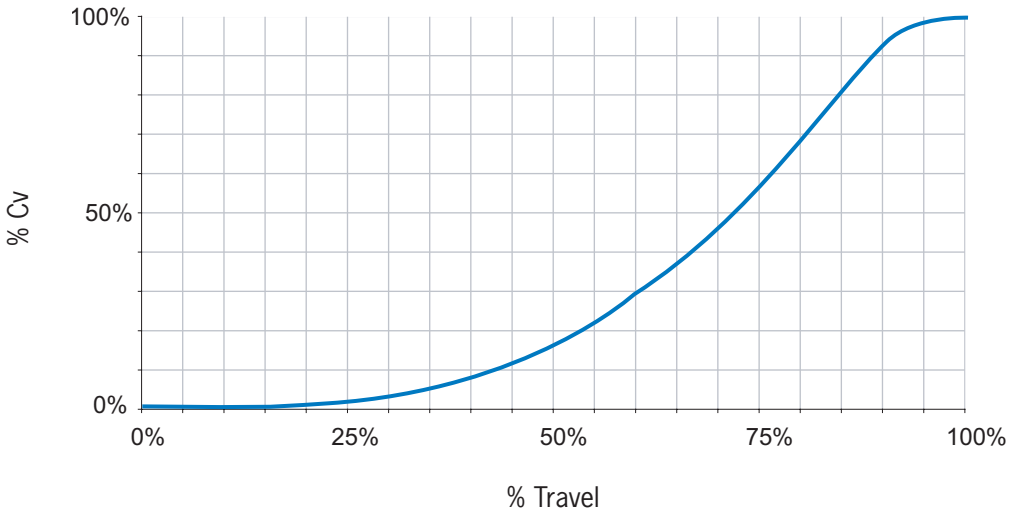
TORQUE AND BENDING STRESSES

VG1000 Series valve bodies are evaluated against European standard EN331 and UL standard 429 for torque and bending stresses encountered in a normal installation. These tests validate that the valve body is mechanically strong enough to withstand the normal stresses encountered during installation.

THE JOHNSON CONTROLS DIFFERENCE – TESTING AND QUALITY CONTROL

FLOW CHARACTERISTIC

The flow characteristic of VG1000 Series ball valves was evaluated against standard ANSI/ISA-S75.11-1985, and European standards CEI EN60534-2-4 and VDI/VDE 2173. Each valve size and Cv is checked to ensure that the flow curve is generally equal percentage, and that the flow is within the specification for the rated flow. All VG1000 Series two-way valves have a flow characteristic which is generally equal percentage. VG1000 Series three-way valves have an equal percentage flow characteristic through the coil port, and a linear flow characteristic through the bypass port.



VALVE RANGEABILITY

The rangeability of VG1000 Series ball valves is defined as the ratio of the maximum flow to the minimum controllable flow. Rangeability is basically a measure of the valve's ability to provide modulating control under light loads and at low flows. A rangeability of 25:1 or higher is normally considered adequate for most HVAC applications. A valve with 25:1 rangeability will provide modulating control at 1/25th or 4% of the maximum flow. Higher rangeabilities are sometimes needed. A valve with 100:1 rangeability will provided better modulating control under light loads than a valve with 25:1 rangeability, since the 100:1 valve is capable of modulating down to 1% of the maximum flow. Rangeability only needs to be considered for modulating applications, and is not a factor for two-position applications.

The valve rangeability needed depends on the specific application. For room control applications, a valve with a rangeability of 25:1 will provide excellent proportional control, as the valve will modulate down to about 4% of the total flow. For discharge air control of a central station air handler, a valve with a rangeability of 50:1 or higher would be desirable. A valve with 50:1 rangeability will modulate at 2% of the maximum flow, providing better control under light loads.

THE JOHNSON CONTROLS DIFFERENCE – TESTING AND QUALITY CONTROL

The rangeability of VG1000 Series ball valves was measured by opening and closing the valve using a Johnson Controls M9100 Series proportional 0 to 10 VDC actuator, to determine the minimum controllable flow. This flow is then compared to the maximum flow when the valve is fully open. Johnson Controls measured the rangeability of VG1000 Series ball valves using a 5 psi pressure drop across the valve. We measured rangeability values greater than 2,000:1. Our rangeability specification for VG1000 Series is conservatively greater than 500:1. The inherent rangeability of VG1000 Series ball valves is so high and the flow curve is so good, that you never have to concern yourself with rangeability when specifying this product for your applications.

CHARACTERIZATION DISK BLOWOUT TESTING

The characterization disk for VG1000 Series ball valves is rated for a 50 psi maximum differential pressure. This rating is the maximum differential pressure that should occur across the valve when the ball is fully open, exposing the entire face of the disk to the fluid pressure. In HVAC applications, it is unusual practice to design a system with a maximum differential pressure higher than 30 psi, as this differential pressure is the threshold where valves begin to cavitate and make noise. We have tested the characterization disk for VG1000 Series ball valves to a differential pressure of 100 psi, to be certain that the disk does not become loose or come out. We also check the strength of the disk at 100 psi, to provide a 100% safety factor.

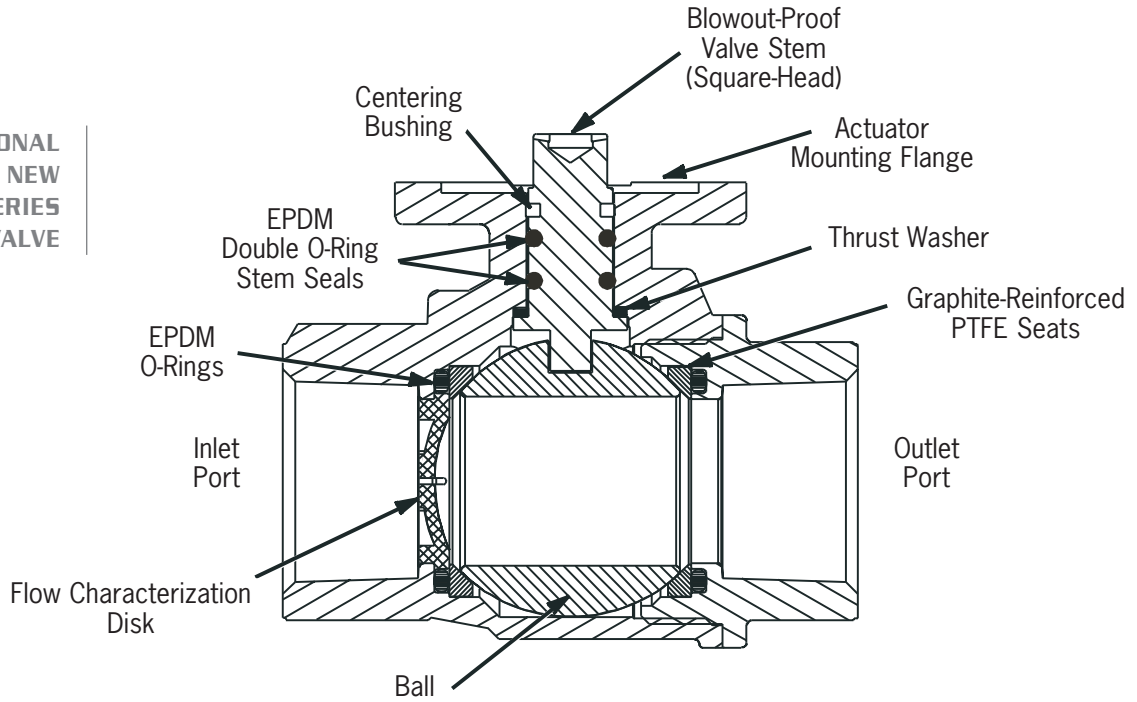
MATERIALS COMPATIBILITY

The Amodel® flow characterization disk was placed in a 50% water, 50% ethylene glycol solution at 203ºF (95ºC) for 1,000 hours. A second sample was placed in a 50% water, 50% propylene glycol solution at 203ºF (95ºC) for 1,000 hours. The flow characterization disk was compared before and after testing for tensile strength, elongation, and mass change. The flow characterization disk was found to be compatible with antifreeze solution commonly used in hydronic heating and cooling systems.

Amodel® is a registered trademark of BP Amoco Polymers, Inc.

FEATURES THAT MAKE JOHNSON CONTROLS BALL VALVES A GREAT VALUE

CROSS-SECTIONAL VIEW OF THE NEW VG1000 SERIES BALL VALVE



FEATURE	BENEFIT
Amodel® flow characterization disk	Provides equal percentage flow with a broad range of Cv's.
High closeoff pressure rating	VG1000 Series ball valves are rated for 200 psi closeoff pressure for all sizes.
Rangeability greater than 500:1	VG1000 Series ball valves are capable of providing precise and accurate modulating control of hot water, chilled water, or steam down to less than 0.2% of maximum flow.
Forged brass valve body	Provides a 580 psig working pressure rating to cover a broad range of applications.
Chrome-plated ball with nickel-plated stem	Most cost-effective ball and stem for hot and chilled water applications. 23 to 203ºF (-5 to 95ºC)
Optional stainless steel ball and stem	Used for chilled water, high temperature hot water, and steam applications, as well as applications where water treatment may not be well maintained. 23 to 250ºF (-5 to 120ºC)
Dual EPDM stem seals	Tested for over 200,000 full stroke cycles in iron-oxide contaminated water.
15% graphite-reinforced PTFE ball seats	Provides superior life and leak-free operation in iron-oxide contaminated water.
Maintenance-free operation	Stem and ball seals are lubricated for the life of the product. The product never needs servicing.
Flat mounting flange	Prevents condensation from accumulating on the top of the valve, protecting the valve seals.

FEATURES THAT MAKE JOHNSON CONTROLS BALL VALVES A GREAT VALUE

FLOW CHARACTERIZATION DISK

1/2" and 3/4" Flow Characterization Disks

1.2 Cv | 1.9 Cv | 2.9 Cv | 4.7 Cv | 7.4 Cv | 11.7 Cv

On February 16, 1971 Herbert Bentley-Leek of the Saunders Valve Company received United States Patent 3,563,511 for a ball valve with a special flow characterization disk that is used to regulate the flow characteristics of the valve. This patent has expired, and all valve companies are now free to use Mr. Bentley-Leek's invention in the design of their ball valves. The flow characterization disk can be made in many shapes and sizes, to provide a wide variety of flow characteristics and flow capacities. Johnson Controls has designed flow characterization disks that provide an equal percentage flow characteristic, resulting in the best overall control for hot or chilled water applications.

The expanded VG1000 Series ball valve line is available in a wide range of Cv's to cover a broad range of applications. The VG1000 Series was designed to provide for each valve pipe size one Cv size larger and one Cv size smaller than is available in our traditional globe valve line. The wide range of Cv's helps save on installation labor and material cost, by eliminating pipe reducers commonly needed if a smaller valve capacity is required for a given pipe size.

Valve Pipe Size	Available Cv	Valve Pipe Size	Available Cv
1/2"	1.2 1.9 2.9 4.7 7.4 11.7	1-1/4"	11.7 18.7 29.3
		1-1/2"	18.7 29.3 46.7
3/4"	4.7 7.4 11.7	2"	29.3 46.7 73.7
1"	7.4 11.7 18.7	–	–

1.9 Cv

7.4 Cv

FEATURES THAT MAKE JOHNSON CONTROLS BALL VALVES A GREAT VALUE

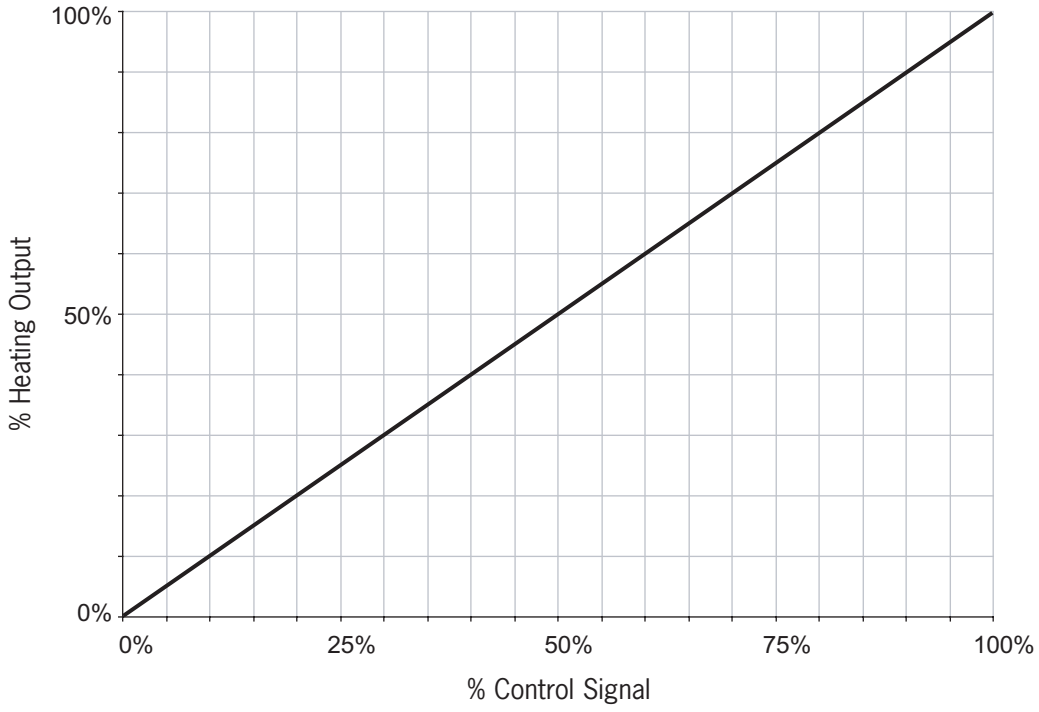
THE IMPORTANCE OF EQUAL PERCENTAGE FLOW CHARACTERISTIC

The desired result of a modern temperature control system is to provide tight temperature control. Depending on the controller used for the application, Johnson Controls uses a wide number of advanced control strategies. These strategies include:

- Proportional control (P)
- Proportional plus Integral control (PI)
- Proportional plus Integral plus Derivative control (PID)
- Fuzzy Logic

Proper valve sizing and selection is an important factor in order for the above control strategies to be effective. When designing a control system, it is desirable that the heat output of the heat exchanger be linear with the control signal. Having the heat output linear to the control signal makes it easier for the control system to perform properly, resulting in tight temperature control.

DESIRED HEATING SYSTEM RESULT



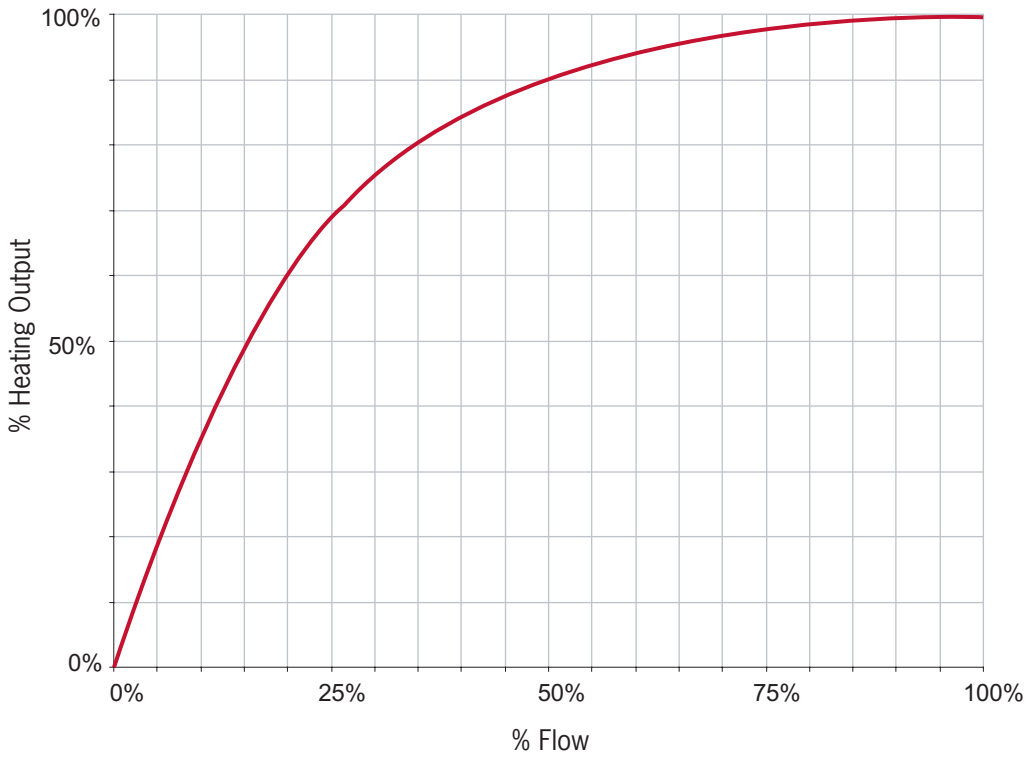
FEATURES THAT MAKE JOHNSON CONTROLS BALL VALVES A GREAT VALUE

The heat output of a typical hydronic heat exchanger is inherently non-linear with the rate of water flow. The reason being the amount of heat measured in BtuH's per gallon of water transferred from the water to the coil decreases as the velocity or flow of the water moving through the coil increases. This makes sense because, as the water moves faster and faster through the coil, it does not have as much time to exchange heat from the water to the coil.

At 5% flow, the water in a typical heating system may enter the coil at 180°F and leave the coil at 120°F. The amount of heat exchanged per gallon of water is defined by the following equation: BtuH = 8.345 lb/gallon x 60°F (DT) = 500 BtuH per gallon of water. At full flow, the water may enter the coil at 180°F and leave the coil at 160°F. The amount of heat exchanged is defined by the following equation:
BtuH = 8.345 lb/gallon x 20°F (DT) = 167 BtuH.

The decrease in the rate at which heat is exchanged as the velocity of the water moving through the coil increases causes the non-linear effect.

HEAT TRANSFER CHARACTERISTIC OF A TYPICAL WATER COIL

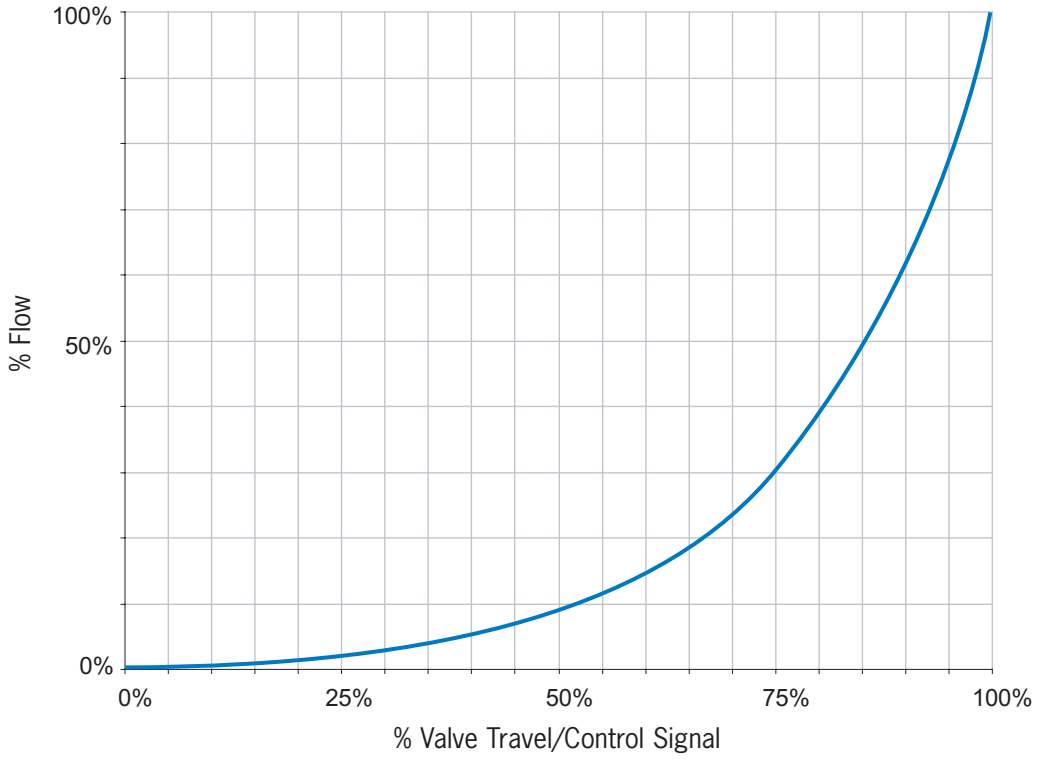


FEATURES THAT MAKE JOHNSON CONTROLS BALL VALVES A GREAT VALUE

To make the heat output linear with the control signal, we need to compensate for the non-linear effect of the heat exchanger. To accomplish this, we need a valve which is also non-linear but in the opposite direction.

An equal percentage flow valve gets its namesake because like-movements in valve travel cause the flow through the valve to change by the same percentage. One thing to remember is that the flow through the valve is non-linear, and compensates for the non-linear heat output of the heat exchanger. The valve is also called a slow-opening valve. It provides better throttling, especially under light loads where systems are often hard to control.

EQUAL PERCENTAGE VALVE FLOW CHARACTERISTICS

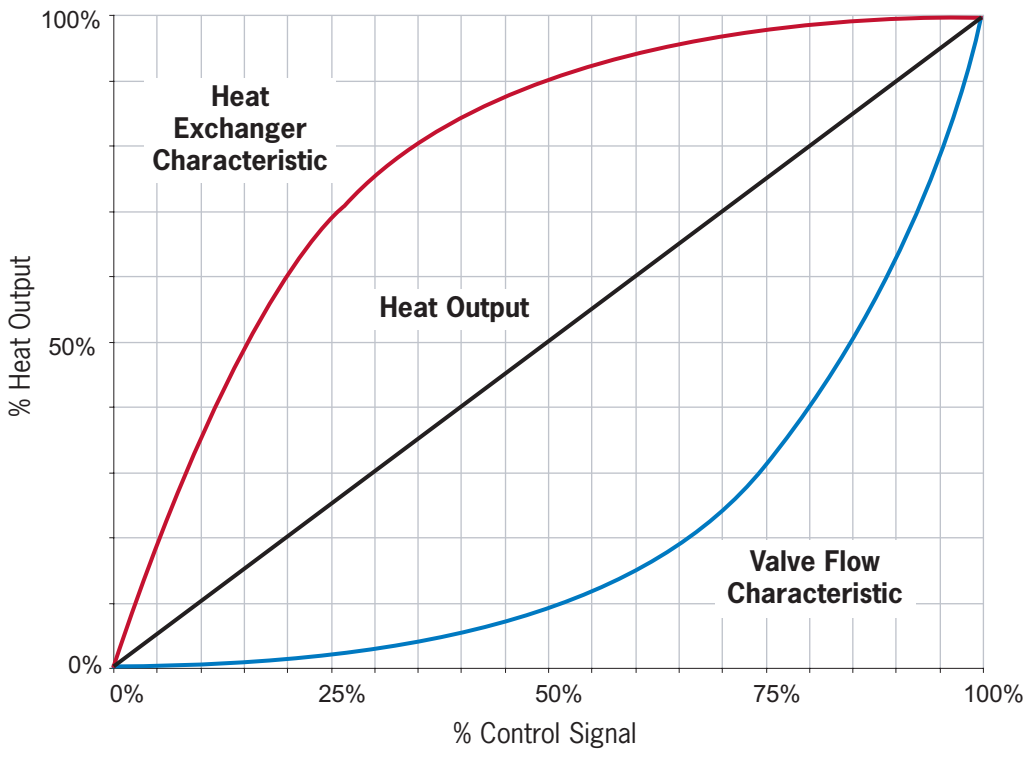


FEATURES THAT MAKE JOHNSON CONTROLS BALL VALVES A GREAT VALUE

When you combine the non-linear effects of the heat exchanger with the opposite non-linear effects of the equal percentage valve, the result is a heat output that is reasonably linear and proportional to the control signal.

You might argue that it is impossible to match the exact characteristic of every heat exchanger, as they vary quite a bit due to the number and size of the individual water circuits. It is important to note that it does not need to be perfect. You only need to obtain a heat output that is reasonably linear with the control signal, since today's modern, self-tuning control systems (with PI or PID control loops) can compensate for non-linearity in the heat output of the heat exchanger.

HEAT OUTPUT LINEAR WITH CONTROL SIGNAL



REASONS TO SELECT VG1000 SERIES BALL VALVES FOR YOUR NEXT PROJECT

BETTER

NOW OUR MOST COMPLETE VALVE LINE

Johnson Controls VG1000 Series ball valves conform to our widest selection of pipe sizes and Cv's. There are 21 distinct combinations of pipe sizes and Cv's to chose from, in 1/2 through 2" sizes. There are over 80 distinct valve bodies, and there are over 1,800 unique valve and actuator assemblies.

You are more likely to find a valve that matches your application requirements exactly from our VG1000 Series product offering than in any of our other valve families.

Valve piping has been simplified. The flow characterization disk used with VG1000 Series ball valves enables us to provide a broad range of properly selected Cv's in each pipe size. Having a range of properly selected Cv's saves money by eliminating the unnecessary cost and installation expense of pipe reducers.

Valve sizing has also been simplified. Unlike some competitive models, when applying a VG1000 Series ball valve, it is no longer necessary to be concerned with piping reduction factors when calculating the effective Cv of the valve. The flow characterization disk and reduced ball size in the VG1000 Series provides just enough pressure drop to eliminate the concern of pipe reduction.

There are six Cv's to choose from for 1/2" VG1000 Series valve bodies, and three Cv's to choose from for all other valve sizes.

Valve	Available Cv									
Pipe Size	1.2	1.9	2.9	4.7	7.4	11.7	18.7	29.3	46.7	73.7
1/2"	X	X	X	X	X	X				
3/4"				X	X	X				
1"					X	X	X			
1-1/4"						X	X	X		
1-1/2"							X	X	X	
2"								X	X	X

REASONS TO SELECT VG1000 SERIES BALL VALVES A GREAT VALUE

OUR HIGHEST PRESSURE RATINGS

The pressure ratings of the expanded VG1000 Series product offering are the highest overall of any valve family we manufacture. The pressure ratings of our expanded VG1000 Series product offering are so high that you will never need to concern yourself with pressure ratings for HVAC applications.

- Working Pressure 580 psig
- Closeoff Pressure 200 psi
- Differential Pressure 150 psi — without Flow Characterization Disk
- Differential Pressure 50 psi — with Flow Characterization Disk
- Differential Pressure 30 psi Maximum for Quiet Service

OUR HIGHEST RANGEABILITY (GREATER THAN 500:1)

The measured rangeability of VG1000 Series ball valves is greater than 2,000:1. This means that the valve will provide excellent proportional control under light load conditions. The rangeability of the VG1000 Series is so high that you never need to be concerned about it in any HVAC application.

INCORPORATES AN AMODEL® FLOW CHARACTERIZATION DISK

VG1000 Series ball valves are constructed with an Amodel® flow characterization disk that provides an equal percentage flow characteristic. This flow characteristic allows the valve to provide tight control in light load or heavy load conditions, by matching the flow control characteristics of the valve. The flow curves of the newly expanded VG1000 Series valve offering are so good that you never need to be concerned about them in any HVAC application.

NOW AVAILABLE IN BOTH STAINLESS STEEL AND BRASS TRIM

VG1000 Series ball valves provide the right level of cost-effectiveness and performance for your application requirements. These valves feature a chrome-plated brass ball with a nickel-plated stem, and have a temperature range of 23 to 203ºF (-5 to 95ºC). For more demanding applications, we offer VG1000 Series with a stainless steel ball and stem. The VG1000 Series with a stainless steel ball and stem have a temperature range of 23 to 250ºF (-5 to 120ºC), and can be used with up to 15 psig (1 Bar) saturated steam. Both trim designs are compatible with up to 50% glycol solution.

REASONS TO SELECT VG1000 SERIES BALL VALVES FOR YOUR NEXT PROJECT

SIMPLIFIED ACTUATOR AND LINKAGE KIT SELECTION

Actuator selection has been simplified with the newly expanded VG1000 Series ball valve offering. Fewer actuators are required compared with some competitive models, and all actuator families provide two-position, floating, or 0 to 10 VDC proportional control with or without auxiliary switches.

Valve Size	Non-Spring Return Actuator Linkage	Spring Return Actuator Linkage
1/2" through 1-1/2"	M9106 M9000-520	M9206 M9000-520
2"	M9109 M9000-520	M9216 M9000-510

ENGINEERING-GRADE HIGH-TEMPERATURE PLASTIC

The new M9000-520 Valve Linkage Kit provides excellent thermal isolation between the valve and actuator, to maximize performance and actuator life. This linkage kit will not sweat in chilled water applications, and it will thermally isolate the actuator in heating applications. The M9000-520 was designed to allow for ample space for pipe insulation, simplifying installation.

15% GRAPHITE-FILLED BALL SEATS AND DUAL EPDM STEM SEALS

VG1000 Series ball valves are designed to provide many years of leak-free service. All valve sizes were tested in iron-oxide contaminated water, and were found to be leak-free after 200,000 full stroke cycles. The wear-resistant, 15% graphite-filled PTFE ball seats were found to be superior to those of our competitors. The dual EPDM stem seals remain resilient over the entire temperature range, providing double protection against stem leaks.

COMPACT SIZE

VG1000 Series ball valves are compact, allowing the valve to be installed in tight-fit locations.

LOWER COST

VG1000 Series ball valves are priced 30 to 40% lower than our VG7000 Series family of globe valves, providing excellent price, performance, and value to our customers.

SIX SIGMA QUALITY

Johnson Controls maintains the industries' most rigorous processes, from initial concept through order fulfillment. We are ISO 9001 certified. As a result, the VG1000 Series has had an excellent quality history since its introduction in 1997. Out of hundreds of thousands of valves shipped, we have received a total of only five returns since their introduction. Warranty is never an issue if you don't have products that fail!

BACKED BY JOHNSON CONTROLS

Johnson Controls is the world's leading supplier of building automation products. We provide a three-year warranty, and have hundreds of office locations ready to solve all of your valve needs.

REASONS WHY VG7000 SERIES GLOBE VALVES MAY BE THE BEST CHOICE FOR MANY APPLICATIONS

BEST

VG7000 Series globe valves will continue to be an important product in the Johnson Controls valve portfolio. These globe valves should be considered for use in buildings where the longest possible product life is desired. The VG7000 Series offers several advantages:

TESTED FOR 1,000,0000 FULL STROKE CYCLES IN IRON-OXIDE CONTAMINATED WATER

VG7000 Series globe valves are our longest-life valve for heating and cooling applications. These valves should be considered for use in buildings where the service life of the facility is 30 to 50 years or longer. The seats and packings used with VG7000 Series globe valves have been tested for 1,000,000 leak-free, full stroke cycles in iron-oxide contaminated water, providing 30 years or more of trouble-free service.

VG7000 SERIES GLOBE VALVES CAN BE REBUILT

VG7000 Series globe valves can be rebuilt with a new stem and plug assembly while the valve is still in place, extending the useful life of the product.

PNEUMATIC AND ELECTRIC ACTUATION

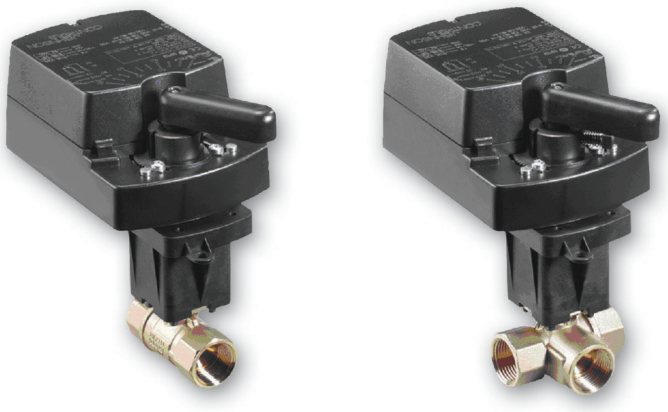
VG7000 Series globe valves can be used with both pneumatic and electric actuators, and are available in a wide range of end connections.

STEAM SERVICE

VG7000 Series globe valves with brass trim are rated for 38 psig saturated steam. VG7000 Series globe valves with stainless steel trim are rated for 100 psig saturated steam.

PLATED BRASS BALL AND STEM

Two-Way and Three-Way Valve Assemblies with Non-Spring Return Actuator



FEATURES

- Flow characterization disk with wide range of Cv's
- Chrome-plated ball and nickel-plated stem
- Floating and 0 to 10 VDC proportional actuators
- Optional auxiliary switches
- 15% graphite-reinforced PTFE ball seats
- Dual EPDM stem seals
- Blowout-proof stem
- Equal percentage flow characteristics
- Rated for water or 50% glycol solutions
- 23 to 203°F (-5 to 95°C) fluid temperature rating
- 200 psi closeoff pressure rating
- 580 psig static pressure rating
- 50 psi maximum differential pressure
- Tested to greater than 200,000 full stroke cycles in iron-oxide contaminated water

TO ORDER | Specify the code number from the following selection charts.

PLATED BRASS BALL AND STEM

Two-Way Valve Assemblies with Non-Spring Return Actuator

				24 VAC		
				On/Off - Floating without Timeout	On/Off - Floating with Timeout	Proportional 0 to 10 VDC
Valve	Size in.	Cv	*Closeoff psig*	M9106-AGx-2 M9109-AGx-2	M9106-IGx-2	M9106-GGx-2 M9109-GGx-2
				Two-Way – Non-Spring Return without Switches		
VG1241AD	1/2	1.2*	200	VG1241AD+906AGA	VG1241AD+906IGA	VG1241AD+906GGA
VG1241AE	1/2	1.9*	200	VG1241AE+906AGA	VG1241AE+906IGA	VG1241AE+906GGA
VG1241AF	1/2	2.9*	200	VG1241AF+906AGA	VG1241AF+906IGA	VG1241AF+906GGA
VG1241AG	1/2	4.7*	200	VG1241AG+906AGA	VG1241AG+906IGA	VG1241AG+906GGA
VG1241AL	1/2	7.4*	200	VG1241AL+906AGA	VG1241AL+906IGA	VG1241AL+906GGA
VG1241AN	1/2	11.7	200	VG1241AN+906AGA	VG1241AN+906IGA	VG1241AN+906GGA
VG1241BG	3/4	4.7*	200	VG1241BG+906AGA	VG1241BG+906IGA	VG1241BG+906GGA
VG1241BL	3/4	7.4*	200	VG1241BL+906AGA	VG1241BL+906IGA	VG1241BL+906GGA
VG1241BN	3/4	11.7	200	VG1241BN+906AGA	VG1241BN+906IGA	VG1241BN+906GGA
VG1241CL	1	7.4*	200	VG1241CL+906AGA	VG1241CL+906IGA	VG1241CL+906GGA
VG1241CN	1	11.7*	200	VG1241CN+906AGA	VG1241CN+906IGA	VG1241CN+906GGA
VG1241CP	1	18.7	200	VG1241CP+906AGA	VG1241CP+906IGA	VG1241CP+906GGA
VG1241DN	1-1/4	11.7*	200	VG1241DN+906AGA	VG1241DN+906IGA	VG1241DN+906GGA
VG1241DP	1-1/4	18.7*	200	VG1241DP+906AGA	VG1241DP+906IGA	VG1241DP+906GGA
VG1241DR	1-1/4	29.2	200	VG1241DR+906AGA	VG1241DR+906IGA	VG1241DR+906GGA
VG1241EP	1-1/2	18.7*	200	VG1241EP+906AGA	VG1241EP+906IGA	VG1241EP+906GGA
VG1241ER	1-1/2	29.2*	200	VG1241ER+906AGA	VG1241ER+906IGA	VG1241ER+906GGA
VG1241ES	1-1/2	46.8	200	VG1241ES+906AGA	VG1241ES+906IGA	VG1241ES+906GGA
VG1241FR	2	29.2*	200	VG1241FR+909AGA	–	VG1241FR+909GGA
VG1241FS	2	46.8*	200	VG1241FS+909AGA	–	VG1241FS+909GGA
VG1241FT	2	73.7	200	VG1241FT+909AGA	–	VG1241FT+909GGA
				Two-Way – Non-Spring Return with Two Switches		
VG1241AD	1/2	1.2*	200	VG1241AD+906AGC	VG1241AD+906IGC	VG1241AD+906GGC
VG1241AE	1/2	1.9*	200	VG1241AE+906AGC	VG1241AE+906IGC	VG1241AE+906GGC
VG1241AF	1/2	2.9*	200	VG1241AF+906AGC	VG1241AF+906IGC	VG1241AF+906GGC
VG1241AG	1/2	4.7*	200	VG1241AG+906AGC	VG1241AG+906IGC	VG1241AG+906GGC
VG1241AL	1/2	7.4*	200	VG1241AL+906AGC	VG1241AL+906IGC	VG1241AL+906GGC
VG1241AN	1/2	11.7	200	VG1241AN+906AGC	VG1241AN+906IGC	VG1241AN+906GGC
VG1241BG	3/4	4.7*	200	VG1241BG+906AGC	VG1241BG+906IGC	VG1241BG+906GGC
VG1241BL	3/4	7.4*	200	VG1241BL+906AGC	VG1241BL+906IGC	VG1241BL+906GGC
VG1241BN	3/4	11.7	200	VG1241BN+906AGC	VG1241BN+906IGC	VG1241BN+906GGC
VG1241CL	1	7.4*	200	VG1241CL+906AGC	VG1241CL+906IGC	VG1241CL+906GGC
VG1241CN	1	11.7*	200	VG1241CN+906AGC	VG1241CN+906IGC	VG1241CN+906GGC
VG1241CP	1	18.7	200	VG1241CP+906AGC	VG1241CP+906IGC	VG1241CP+906GGC
VG1241DN	1-1/4	11.7*	200	VG1241DN+906AGC	VG1241DN+906IGC	VG1241DN+906GGC
VG1241DP	1-1/4	18.7*	200	VG1241DP+906AGC	VG1241DP+906IGC	VG1241DP+906GGC
VG1241DR	1-1/4	29.2	200	VG1241DR+906AGC	VG1241DR+906IGC	VG1241DR+906GGC
VG1241EP	1-1/2	18.7*	200	VG1241EP+906AGC	VG1241EP+906IGC	VG1241EP+906GGC
VG1241ER	1-1/2	29.2*	200	VG1241ER+906AGC	VG1241ER+906IGC	VG1241ER+906GGC
VG1241ES	1-1/2	46.8	200	VG1241ES+906AGC	VG1241ES+906IGC	VG1241ES+906GGC
VG1241FR	2	29.2*	200	VG1241FR+909AGC	–	VG1241FR+909GGC
VG1241FS	2	46.8*	200	VG1241FS+909AGC	–	VG1241FS+909GGC
VG1241FT	2	73.7	200	VG1241FT+909AGC	–	VG1241FT+909GGC

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9106 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9109 Series Actuator with an M9000-520 Linkage Kit. For actuators without switches, order M910x-xGA-2 code number; for actuators with switches, order M910x-xGC-2 code number.

PLATED BRASS BALL AND STEM

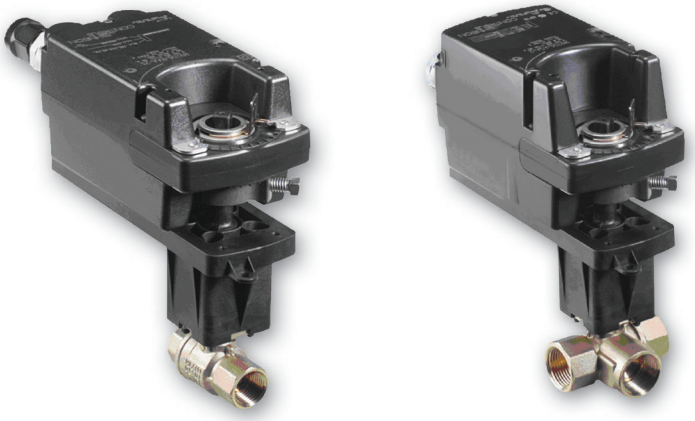
Three-Way Valve Assemblies with Non-Spring Return Actuator

				24 VAC		
				On/Off - Floating without Timeout	On/Off - Floating with Timeout	Proportional 0 to 10 VDC
Valve	Size in.	Cv	*Closeoff psig*	M9106-AGx-2 M9109-AGx-2	M9106-IGx-2	M9106-GGx-2 M9109-GGx-2
				Three-Way – Non-Spring Return without Switches		
VG1841AD	1/2	1.2 / 0.7*	200	VG1841AD+906AGA	VG1841AD+906IGA	VG1841AD+906GGA
VG1841AE	1/2	1.9 / 1.2*	200	VG1841AE+906AGA	VG1841AE+906IGA	VG1841AE+906GGA
VG1841AF	1/2	2.9 / 1.9*	200	VG1841AF+906AGA	VG1841AF+906IGA	VG1841AF+906GGA
VG1841AG	1/2	4.7 / 2.9*	200	VG1841AG+906AGA	VG1841AG+906IGA	VG1841AG+906GGA
VG1841AL	1/2	7.4 / 4.7*	200	VG1841AL+906AGA	VG1841AL+906IGA	VG1841AL+906GGA
VG1841AN	1/2	11.7 / 5.8	200	VG1841AN+906AGA	VG1841AN+906IGA	VG1841AN+906GGA
VG1841BG	3/4	4.7 / 2.9*	200	VG1841BG+906AGA	VG1841BG+906IGA	VG1841BG+906GGA
VG1841BL	3/4	7.4 / 4.7*	200	VG1841BL+906AGA	VG1841BL+906IGA	VG1841BL+906GGA
VG1841BN	3/4	11.7 / 5.8	200	VG1841BN+906AGA	VG1841BN+906IGA	VG1841BN+906GGA
VG1841CL	1	7.4 / 4.7*	200	VG1841CL+906AGA	VG1841CL+906IGA	VG1841CL+906GGA
VG1841CN	1	11.7 / 7.4*	200	VG1841CN+906AGA	VG1841CN+906IGA	VG1841CN+906GGA
VG1841CP	1	18.7 / 9.4	200	VG1841CP+906AGA	VG1841CP+906IGA	VG1841CP+906GGA
VG1841DN	1-1/4	11.7 / 7.4*	200	VG1841DN+906AGA	VG1841DN+906IGA	VG1841DN+906GGA
VG1841DP	1-1/4	18.7 / 11.7*	200	VG1841DP+906AGA	VG1841DP+906IGA	VG1841DP+906GGA
VG1841DR	1-1/4	29.2 / 14.6	200	VG1841DR+906AGA	VG1841DR+906IGA	VG1841DR+906GGA
VG1841EP	1-1/2	18.7 / 11.7*	200	VG1841EP+906AGA	VG1841EP+906IGA	VG1841EP+906GGA
VG1841ER	1-1/2	29.2 / 18.7*	200	VG1841ER+906AGA	VG1841ER+906IGA	VG1841ER+906GGA
VG1841ES	1-1/2	46.8 / 23.4	200	VG1841ES+906AGA	VG1841ES+906IGA	VG1841ES+906GGA
VG1841FR	2	29.2 / 18.7*	200	VG1841FR+909AGA	–	VG1841FR+909GGA
VG1841FS	2	46.8 / 29.2*	200	VG1841FS+909AGA	–	VG1841FS+909GGA
VG1841FT	2	73.7 / 36.8	200	VG1841FT+909AGA	–	VG1841FT+909GGA
				Three-Way – Non-Spring Return with Two Switches		
VG1241AD	1/2	1.2 / 0.7*	200	VG1241AD+906AGC	VG1241AD+906IGC	VG1241AD+906GGC
VG1241AE	1/2	1.9 / 1.2*	200	VG1241AE+906AGC	VG1241AE+906IGC	VG1241AE+906GGC
VG1241AF	1/2	2.9 / 1.9*	200	VG1241AF+906AGC	VG1241AF+906IGC	VG1241AF+906GGC
VG1241AG	1/2	4.7 / 2.9*	200	VG1241AG+906AGC	VG1241AG+906IGC	VG1241AG+906GGC
VG1241AL	1/2	7.4 / 4.7*	200	VG1241AL+906AGC	VG1241AL+906IGC	VG1241AL+906GGC
VG1241AN	1/2	11.7 / 5.8	200	VG1241AN+906AGC	VG1241AN+906IGC	VG1241AN+906GGC
VG1241BG	3/4	4.7 / 2.9*	200	VG1241BG+906AGC	VG1241BG+906IGC	VG1241BG+906GGC
VG1241BL	3/4	7.4 / 4.7*	200	VG1241BL+906AGC	VG1241BL+906IGC	VG1241BL+906GGC
VG1241BN	3/4	11.7 / 5.8	200	VG1241BN+906AGC	VG1241BN+906IGC	VG1241BN+906GGC
VG1241CL	1	7.4 / 4.7*	200	VG1241CL+906AGC	VG1241CL+906IGC	VG1241CL+906GGC
VG1241CN	1	11.7 / 7.4*	200	VG1241CN+906AGC	VG1241CN+906IGC	VG1241CN+906GGC
VG1241CP	1	18.7 / 9.4	200	VG1241CP+906AGC	VG1241CP+906IGC	VG1241CP+906GGC
VG1241DN	1-1/4	11.7 / 7.4*	200	VG1241DN+906AGC	VG1241DN+906IGC	VG1241DN+906GGC
VG1241DP	1-1/4	18.7 / 11.7*	200	VG1241DP+906AGC	VG1241DP+906IGC	VG1241DP+906GGC
VG1241DR	1-1/4	29.2 / 14.6	200	VG1241DR+906AGC	VG1241DR+906IGC	VG1241DR+906GGC
VG1241EP	1-1/2	18.7 / 11.7*	200	VG1241EP+906AGC	VG1241EP+906IGC	VG1241EP+906GGC
VG1241ER	1-1/2	29.2 / 18.7*	200	VG1241ER+906AGC	VG1241ER+906IGC	VG1241ER+906GGC
VG1241ES	1-1/2	46.8 / 23.4	200	VG1241ES+906AGC	VG1241ES+906IGC	VG1241ES+906GGC
VG1241FR	2	29.2 / 18.7*	200	VG1241FR+909AGC	–	VG1241FR+909GGC
VG1241FS	2	46.8 / 29.2*	200	VG1241FS+909AGC	–	VG1241FS+909GGC
VG1241FT	2	73.7 / 36.8	200	VG1241FT+909AGC	–	VG1241FT+909GGC

** Has characterized flow control disk.*
Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9106 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9109 Series Actuator with an M9000-520 Linkage Kit. For actuators without switches, order M910x-xGA-2 code number; for actuators with switches, order M910x-xGC-2 code number.

PLATED BRASS BALL AND STEM

Two-Way and Three-Way Valve Assemblies with Spring Return Actuator



FEATURES

- Flow characterization disk with wide range of Cv's
- Chrome-plated ball and nickel-plated stem
- Floating and 0 to 10 VDC proportional actuators
- Optional auxiliary switches
- 15% graphite-reinforced PTFE ball seats
- Dual EPDM stem seals
- Blowout-proof stem
- Equal percentage flow characteristics
- Rated for water or 50% glycol solutions
- 23 to 203°F (-5 to 95°C) fluid temperature rating
- 200 psi closeoff pressure rating
- 580 psig static pressure rating
- 50 psi maximum differential pressure
- Tested to greater than 200,000 cycles in iron-oxide contaminated water

TO ORDER Specify the code number from the following selection charts.

PLATED BRASS BALL AND STEM

Two-Way Valve Assemblies with Spring Return Actuator without End Switches

				24 VAC			120 VAC
				Floating	Proportional 0 to 10 VDC	On/Off	On/Off
Valve	Size in.	Cv	*Closeoff psig*	M9206-AGA-2 M9216-AGA-2	M9206-GGA-2 M9216-GGA-2	M9206-BGA-2S M9216-BGA-2	M9206-BAA-2S M9216-BAA-2
				Two-Way – Spring Return Valve Open – Normally Open			
VG1241AD	1/2	1.2*	200	VG1241AD+936AGA	VG1241AD+936GGA	VG1241AD+936BGA	VG1241AD+936BAA
VG1241AE	1/2	1.9*	200	VG1241AE+936AGA	VG1241AE+936GGA	VG1241AE+936BGA	VG1241AE+936BAA
VG1241AF	1/2	2.9*	200	VG1241AF+936AGA	VG1241AF+936GGA	VG1241AF+936BGA	VG1241AF+936BAA
VG1241AG	1/2	4.7*	200	VG1241AG+936AGA	VG1241AG+936GGA	VG1241AG+936BGA	VG1241AG+936BAA
VG1241AL	1/2	7.4*	200	VG1241AL+936AGA	VG1241AL+936GGA	VG1241AL+936BGA	VG1241AL+936BAA
VG1241AN	1/2	11.7	200	VG1241AN+936AGA	VG1241AN+936GGA	VG1241AN+936BGA	VG1241AN+936BAA
VG1241BG	3/4	4.7*	200	VG1241BG+936AGA	VG1241BG+936GGA	VG1241BG+936BGA	VG1241BG+936BAA
VG1241BL	3/4	7.4*	200	VG1241BL+936AGA	VG1241BL+936GGA	VG1241BL+936BGA	VG1241BL+936BAA
VG1241BN	3/4	11.7	200	VG1241BN+936AGA	VG1241BN+936GGA	VG1241BN+936BGA	VG1241BN+936BAA
VG1241CL	1	7.4*	200	VG1241CL+936AGA	VG1241CL+936GGA	VG1241CL+936BGA	VG1241CL+936BAA
VG1241CN	1	11.7*	200	VG1241CN+936AGA	VG1241CN+936GGA	VG1241CN+936BGA	VG1241CN+936BAA
VG1241CP	1	18.7	200	VG1241CP+936AGA	VG1241CP+936GGA	VG1241CP+936BGA	VG1241CP+936BAA
VG1241DN	1-1/4	11.7*	200	VG1241DN+936AGA	VG1241DN+936GGA	VG1241DN+936BGA	VG1241DN+936BAA
VG1241DP	1-1/4	18.7*	200	VG1241DP+936AGA	VG1241DP+936GGA	VG1241DP+936BGA	VG1241DP+936BAA
VG1241DR	1-1/4	29.2	200	VG1241DR+936AGA	VG1241DR+936GGA	VG1241DR+936BGA	VG1241DR+936BAA
VG1241EP	1-1/2	18.7*	200	VG1241EP+936AGA	VG1241EP+936GGA	VG1241EP+936BGA	VG1241EP+936BAA
VG1241ER	1-1/2	29.2*	200	VG1241ER+936AGA	VG1241ER+936GGA	VG1241ER+936BGA	VG1241ER+936BAA
VG1241ES	1-1/2	46.8	200	VG1241ES+936AGA	VG1241ES+936GGA	VG1241ES+936BGA	VG1241ES+936BAA
VG1241FR	2	29.2*	200	VG1241FR+926AGA	VG1241FR+926GGA	VG1241FR+926BGA	VG1241FR+926BAA
VG1241FS	2	46.8*	200	VG1241FS+926AGA	VG1241FS+926GGA	VG1241FS+926BGA	VG1241FS+926BAA
VG1241FT	2	73.7	200	VG1241FT+926AGA	VG1241FT+926GGA	VG1241FT+926BGA	VG1241FT+926BAA
				Two-Way – Spring Return Valve Closed – Normally Closed			
VG1241AD	1/2	1.2*	200	VG1241AD+956AGA	VG1241AD+956GGA	VG1241AD+956BGA	VG1241AD+956BAA
VG1241AE	1/2	1.9*	200	VG1241AE+956AGA	VG1241AE+956GGA	VG1241AE+956BGA	VG1241AE+956BAA
VG1241AF	1/2	2.9*	200	VG1241AF+956AGA	VG1241AF+956GGA	VG1241AF+956BGA	VG1241AF+956BAA
VG1241AG	1/2	4.7*	200	VG1241AG+956AGA	VG1241AG+956GGA	VG1241AG+956BGA	VG1241AG+956BAA
VG1241AL	1/2	7.4*	200	VG1241AL+956AGA	VG1241AL+956GGA	VG1241AL+956BGA	VG1241AL+956BAA
VG1241AN	1/2	11.7	200	VG1241AN+956AGA	VG1241AN+956GGA	VG1241AN+956BGA	VG1241AN+956BAA
VG1241BG	3/4	4.7*	200	VG1241BG+956AGA	VG1241BG+956GGA	VG1241BG+956BGA	VG1241BG+956BAA
VG1241BL	3/4	7.4*	200	VG1241BL+956AGA	VG1241BL+956GGA	VG1241BL+956BGA	VG1241BL+956BAA
VG1241BN	3/4	11.7	200	VG1241BN+956AGA	VG1241BN+956GGA	VG1241BN+956BGA	VG1241BN+956BAA
VG1241CL	1	7.4*	200	VG1241CL+956AGA	VG1241CL+956GGA	VG1241CL+956BGA	VG1241CL+956BAA
VG1241CN	1	11.7*	200	VG1241CN+956AGA	VG1241CN+956GGA	VG1241CN+956BGA	VG1241CN+956BAA
VG1241CP	1	18.7	200	VG1241CP+956AGA	VG1241CP+956GGA	VG1241CP+956BGA	VG1241CP+956BAA
VG1241DN	1-1/4	11.7*	200	VG1241DN+956AGA	VG1241DN+956GGA	VG1241DN+956BGA	VG1241DN+956BAA
VG1241DP	1-1/4	18.7*	200	VG1241DP+956AGA	VG1241DP+956GGA	VG1241DP+956BGA	VG1241DP+956BAA
VG1241DR	1-1/4	29.2	200	VG1241DR+956AGA	VG1241DR+956GGA	VG1241DR+956BGA	VG1241DR+956BAA
VG1241EP	1-1/2	18.7*	200	VG1241EP+956AGA	VG1241EP+956GGA	VG1241EP+956BGA	VG1241EP+956BAA
VG1241ER	1-1/2	29.2*	200	VG1241ER+956AGA	VG1241ER+956GGA	VG1241ER+956BGA	VG1241ER+956BAA
VG1241ES	1-1/2	46.8	200	VG1241ES+956AGA	VG1241ES+956GGA	VG1241ES+956BGA	VG1241ES+956BAA
VG1241FR	2	29.2*	200	VG1241FR+946AGA	VG1241FR+946GGA	VG1241FR+946BGA	VG1241FR+946BAA
VG1241FS	2	46.8*	200	VG1241FS+946AGA	VG1241FS+946GGA	VG1241FS+946BGA	VG1241FS+946BAA
VG1241FT	2	73.7	200	VG1241FT+946AGA	VG1241FT+946GGA	VG1241FT+946BGA	VG1241FT+946BAA

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9206 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9216 Series Actuator with an M9000-510 Linkage Kit.

PLATED BRASS BALL AND STEM

Two-Way Valve Assemblies with Spring Return Actuator with End Switch(es)

				24 VAC			120 VAC
				Floating with 2 Switches	Proportional 0 to 10 VDC, 2 Switches	On/Off with End Switch(es)	On/Off with End Switch(es)
Valve	Size in.	Cv	*Closeoff psig*	M9206-AGC-2 M9216-AGC-2	M9206-GGC-2 M9216-GGC-2	M9206-BGB-2S, 1Sw M9216-BGC-2, 2Sw	M9206-BAB-2S, 1Sw M9216-BAC-2, 2Sw
				Two-Way – Spring Return Valve Open – Normally Open			
VG1241AD	1/2	1.2*	200	VG1241AD+936AGC	VG1241AD+936GGC	VG1241AD+936BGB	VG1241AD+936BAB
VG1241AE	1/2	1.9*	200	VG1241AE+936AGC	VG1241AE+936GGC	VG1241AE+936BGB	VG1241AE+936BAB
VG1241AF	1/2	2.9*	200	VG1241AF+936AGC	VG1241AF+936GGC	VG1241AF+936BGB	VG1241AF+936BAB
VG1241AG	1/2	4.7*	200	VG1241AG+936AGC	VG1241AG+936GGC	VG1241AG+936BGB	VG1241AG+936BAB
VG1241AL	1/2	7.4*	200	VG1241AL+936AGC	VG1241AL+936GGC	VG1241AL+936BGB	VG1241AL+936BAB
VG1241AN	1/2	11.7	200	VG1241AN+936AGC	VG1241AN+936GGC	VG1241AN+936BGB	VG1241AN+936BAB
VG1241BG	3/4	4.7*	200	VG1241BG+936AGC	VG1241BG+936GGC	VG1241BG+936BGB	VG1241BG+936BAB
VG1241BL	3/4	7.4*	200	VG1241BL+936AGC	VG1241BL+936GGC	VG1241BL+936BGB	VG1241BL+936BAB
VG1241BN	3/4	11.7	200	VG1241BN+936AGC	VG1241BN+936GGC	VG1241BN+936BGB	VG1241BN+936BAB
VG1241CL	1	7.4*	200	VG1241CL+936AGC	VG1241CL+936GGC	VG1241CL+936BGB	VG1241CL+936BAB
VG1241CN	1	11.7*	200	VG1241CN+936AGC	VG1241CN+936GGC	VG1241CN+936BGB	VG1241CN+936BAB
VG1241CP	1	18.7	200	VG1241CP+936AGC	VG1241CP+936GGC	VG1241CP+936BGB	VG1241CP+936BAB
VG1241DN	1-1/4	11.7*	200	VG1241DN+936AGC	VG1241DN+936GGC	VG1241DN+936BGB	VG1241DN+936BAB
VG1241DP	1-1/4	18.7*	200	VG1241DP+936AGC	VG1241DP+936GGC	VG1241DP+936BGB	VG1241DP+936BAB
VG1241DR	1-1/4	29.2	200	VG1241DR+936AGC	VG1241DR+936GGC	VG1241DR+936BGB	VG1241DR+936BAB
VG1241EP	1-1/2	18.7*	200	VG1241EP+936AGC	VG1241EP+936GGC	VG1241EP+936BGB	VG1241EP+936BAB
VG1241ER	1-1/2	29.2*	200	VG1241ER+936AGC	VG1241ER+936GGC	VG1241ER+936BGB	VG1241ER+936BAB
VG1241ES	1-1/2	46.8	200	VG1241ES+936AGC	VG1241ES+936GGC	VG1241ES+936BGB	VG1241ES+936BAB
VG1241FR	2	29.2*	200	VG1241FR+926AGC	VG1241FR+926GGC	VG1241FR+926BGC	VG1241FR+926BAC
VG1241FS	2	46.8*	200	VG1241FS+926AGC	VG1241FS+926GGC	VG1241FS+926BGC	VG1241FS+926BAC
VG1241FT	2	73.7	200	VG1241FT+926AGC	VG1241FT+926GGC	VG1241FT+926BGC	VG1241FT+926BAC
				Two-Way – Spring Return Valve Closed – Normally Closed			
VG1241AD	1/2	1.2*	200	VG1241AD+956AGC	VG1241AD+956GGC	VG1241AD+956BGB	VG1241AD+956BAB
VG1241AE	1/2	1.9*	200	VG1241AE+956AGC	VG1241AE+956GGC	VG1241AE+956BGB	VG1241AE+956BAB
VG1241AF	1/2	2.9*	200	VG1241AF+956AGC	VG1241AF+956GGC	VG1241AF+956BGB	VG1241AF+956BAB
VG1241AG	1/2	4.7*	200	VG1241AG+956AGC	VG1241AG+956GGC	VG1241AG+956BGB	VG1241AG+956BAB
VG1241AL	1/2	7.4*	200	VG1241AL+956AGC	VG1241AL+956GGC	VG1241AL+956BGB	VG1241AL+956BAB
VG1241AN	1/2	11.7	200	VG1241AN+956AGC	VG1241AN+956GGC	VG1241AN+956BGB	VG1241AN+956BAB
VG1241BG	3/4	4.7*	200	VG1241BG+956AGC	VG1241BG+956GGC	VG1241BG+956BGB	VG1241BG+956BAB
VG1241BL	3/4	7.4*	200	VG1241BL+956AGC	VG1241BL+956GGC	VG1241BL+956BGB	VG1241BL+956BAB
VG1241BN	3/4	11.7	200	VG1241BN+956AGC	VG1241BN+956GGC	VG1241BN+956BGB	VG1241BN+956BAB
VG1241CL	1	7.4*	200	VG1241CL+956AGC	VG1241CL+956GGC	VG1241CL+956BGB	VG1241CL+956BAB
VG1241CN	1	11.7*	200	VG1241CN+956AGC	VG1241CN+956GGC	VG1241CN+956BGB	VG1241CN+956BAB
VG1241CP	1	18.7	200	VG1241CP+956AGC	VG1241CP+956GGC	VG1241CP+956BGB	VG1241CP+956BAB
VG1241DN	1-1/4	11.7*	200	VG1241DN+956AGC	VG1241DN+956GGC	VG1241DN+956BGB	VG1241DN+956BAB
VG1241DP	1-1/4	18.7*	200	VG1241DP+956AGC	VG1241DP+956GGC	VG1241DP+956BGB	VG1241DP+956BAB
VG1241DR	1-1/4	29.2	200	VG1241DR+956AGC	VG1241DR+956GGC	VG1241DR+956BGB	VG1241DR+956BAB
VG1241EP	1-1/2	18.7*	200	VG1241EP+956AGC	VG1241EP+956GGC	VG1241EP+956BGB	VG1241EP+956BAB
VG1241ER	1-1/2	29.2*	200	VG1241ER+956AGC	VG1241ER+956GGC	VG1241ER+956BGB	VG1241ER+956BAB
VG1241ES	1-1/2	46.8	200	VG1241ES+956AGC	VG1241ES+956GGC	VG1241ES+956BGB	VG1241ES+956BAB
VG1241FR	2	29.2*	200	VG1241FR+946AGC	VG1241FR+946GGC	VG1241FR+946BGC	VG1241FR+946BAC
VG1241FS	2	46.8*	200	VG1241FS+946AGC	VG1241FS+946GGC	VG1241FS+946BGC	VG1241FS+946BAC
VG1241FT	2	73.7	200	VG1241FT+946AGC	VG1241FT+946GGC	VG1241FT+946BGC	VG1241FT+946BAC

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9206 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9216 Series Actuator with an M9000-510 Linkage Kit.

PLATED BRASS BALL AND STEM

Three-Way Valve Assemblies with Spring Return Actuator without End Switches

				24 VAC			120 VAC
				Floating	Proportional 0 to 10 VDC	On/Off	On/Off
Valve	Size in.	Cv	*Closeoff psig*	M9206-AGA-2 M9216-AGA-2	M9206-GGA-2 M9216-GGA-2	M9206-BGA-2S M9216-BGA-2	M9206-BAA-2S M9216-BAA-2
				Three-Way – Spring Return Counterclockwise - Port "A" (Coil) Open			
VG1841AD	1/2	1.2 / 0.7*	200	VG1841AD+936AGA	VG1841AD+936GGA	VG1841AD+936BGA	VG1841AD+936BAA
VG1841AE	1/2	1.9 / 1.2*	200	VG1841AE+936AGA	VG1841AE+936GGA	VG1841AE+936BGA	VG1841AE+936BAA
VG1841AF	1/2	2.9 / 1.9*	200	VG1841AF+936AGA	VG1841AF+936GGA	VG1841AF+936BGA	VG1841AF+936BAA
VG1841AG	1/2	4.7 / 2.9*	200	VG1841AG+936AGA	VG1841AG+936GGA	VG1841AG+936BGA	VG1841AG+936BAA
VG1841AL	1/2	7.4 / 4.7*	200	VG1841AL+936AGA	VG1841AL+936GGA	VG1841AL+936BGA	VG1841AL+936BAA
VG1841AN	1/2	11.7 / 5.8	200	VG1841AN+936AGA	VG1841AN+936GGA	VG1841AN+936BGA	VG1841AN+936BAA
VG1841BG	3/4	4.7 / 2.9*	200	VG1841BG+936AGA	VG1841BG+936GGA	VG1841BG+936BGA	VG1841BG+936BAA
VG1841BL	3/4	7.4 / 4.7*	200	VG1841BL+936AGA	VG1841BL+936GGA	VG1841BL+936BGA	VG1841BL+936BAA
VG1841BN	3/4	11.7 / 5.8	200	VG1841BN+936AGA	VG1841BN+936GGA	VG1841BN+936BGA	VG1841BN+936BAA
VG1841CL	1	7.4 / 4.7*	200	VG1841CL+936AGA	VG1841CL+936GGA	VG1841CL+936BGA	VG1841CL+936BAA
VG1841CN	1	11.7 / 7.4*	200	VG1841CN+936AGA	VG1841CN+936GGA	VG1841CN+936BGA	VG1841CN+936BAA
VG1841CP	1	18.7 / 9.4	200	VG1841CP+936AGA	VG1841CP+936GGA	VG1841CP+936BGA	VG1841CP+936BAA
VG1841DN	1-1/4	11.7 / 7.4*	200	VG1841DN+936AGA	VG1841DN+936GGA	VG1841DN+936BGA	VG1841DN+936BAA
VG1841DP	1-1/4	18.7 / 11.7*	200	VG1841DP+936AGA	VG1841DP+936GGA	VG1841DP+936BGA	VG1841DP+936BAA
VG1841DR	1-1/4	29.2 / 14.6	200	VG1841DR+936AGA	VG1841DR+936GGA	VG1841DR+936BGA	VG1841DR+936BAA
VG1841EP	1-1/2	18.7 / 11.7*	200	VG1841EP+936AGA	VG1841EP+936GGA	VG1841EP+936BGA	VG1841EP+936BAA
VG1841ER	1-1/2	29.2 / 18.7*	200	VG1841ER+936AGA	VG1841ER+936GGA	VG1841ER+936BGA	VG1841ER+936BAA
VG1841ES	1-1/2	46.8 / 23.4	200	VG1841ES+936AGA	VG1841ES+936GGA	VG1841ES+936BGA	VG1841ES+936BAA
VG1841FR	2	29.2 / 18.7*	200	VG1841FR+926AGA	VG1841FR+926GGA	VG1841FR+926BGA	VG1841FR+926BAA
VG1841FS	2	46.8 / 29.2*	200	VG1841FS+926AGA	VG1841FS+926GGA	VG1841FS+926BGA	VG1841FS+926BAA
VG1841FT	2	73.7 / 36.8	200	VG1841FT+926AGA	VG1841FT+926GGA	VG1841FT+926BGA	VG1841FT+926BAA
				Three-Way – Spring Return Clockwise - Port "B" (Bypass) Open			
VG1841AD	1/2	1.2 / 0.7*	200	VG1841AD+956AGA	VG1841AD+956GGA	VG1841AD+956BGA	VG1841AD+956BAA
VG1841AE	1/2	1.9 / 1.2*	200	VG1841AE+956AGA	VG1841AE+956GGA	VG1841AE+956BGA	VG1841AE+956BAA
VG1841AF	1/2	2.9 / 1.9*	200	VG1841AF+956AGA	VG1841AF+956GGA	VG1841AF+956BGA	VG1841AF+956BAA
VG1841AG	1/2	4.7 / 2.9*	200	VG1841AG+956AGA	VG1841AG+956GGA	VG1841AG+956BGA	VG1841AG+956BAA
VG1841AL	1/2	7.4 / 4.7*	200	VG1841AL+956AGA	VG1841AL+956GGA	VG1841AL+956BGA	VG1841AL+956BAA
VG1841AN	1/2	11.7 / 5.8	200	VG1841AN+956AGA	VG1841AN+956GGA	VG1841AN+956BGA	VG1841AN+956BAA
VG1841BG	3/4	4.7 / 2.9*	200	VG1841BG+956AGA	VG1841BG+956GGA	VG1841BG+956BGA	VG1841BG+956BAA
VG1841BL	3/4	7.4 / 4.7*	200	VG1841BL+956AGA	VG1841BL+956GGA	VG1841BL+956BGA	VG1841BL+956BAA
VG1841BN	3/4	11.7 / 5.8	200	VG1841BN+956AGA	VG1841BN+956GGA	VG1841BN+956BGA	VG1841BN+956BAA
VG1841CL	1	7.4 / 4.7*	200	VG1841CL+956AGA	VG1841CL+956GGA	VG1841CL+956BGA	VG1841CL+956BAA
VG1841CN	1	11.7 / 7.4*	200	VG1841CN+956AGA	VG1841CN+956GGA	VG1841CN+956BGA	VG1841CN+956BAA
VG1841CP	1	18.7 / 9.4	200	VG1841CP+956AGA	VG1841CP+956GGA	VG1841CP+956BGA	VG1841CP+956BAA
VG1841DN	1-1/4	11.7 / 7.4*	200	VG1841DN+956AGA	VG1841DN+956GGA	VG1841DN+956BGA	VG1841DN+956BAA
VG1841DP	1-1/4	18.7 / 11.7*	200	VG1841DP+956AGA	VG1841DP+956GGA	VG1841DP+956BGA	VG1841DP+956BAA
VG1841DR	1-1/4	29.2 / 14.6	200	VG1841DR+956AGA	VG1841DR+956GGA	VG1841DR+956BGA	VG1841DR+956BAA
VG1841EP	1-1/2	18.7 / 11.7*	200	VG1841EP+956AGA	VG1841EP+956GGA	VG1841EP+956BGA	VG1841EP+956BAA
VG1841ER	1-1/2	29.2 / 18.7*	200	VG1841ER+956AGA	VG1841ER+956GGA	VG1841ER+956BGA	VG1841ER+956BAA
VG1841ES	1-1/2	46.8 / 23.4	200	VG1841ES+956AGA	VG1841ES+956GGA	VG1841ES+956BGA	VG1841ES+956BAA
VG1841FR	2	29.2 / 18.7*	200	VG1841FR+946AGA	VG1841FR+946GGA	VG1841FR+946BGA	VG1841FR+946BAA
VG1841FS	2	46.8 / 29.2*	200	VG1841FS+946AGA	VG1841FS+946GGA	VG1841FS+946BGA	VG1841FS+946BAA
VG1841FT	2	73.7 / 36.8	200	VG1841FT+946AGA	VG1841FT+946GGA	VG1841FT+946BGA	VG1841FT+946BAA

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9206 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9216 Series Actuator with an M9000-510 Linkage Kit.

PLATED BRASS BALL AND STEM

Three-Way Valve Assemblies with Spring Return Actuator with End Switch(es)

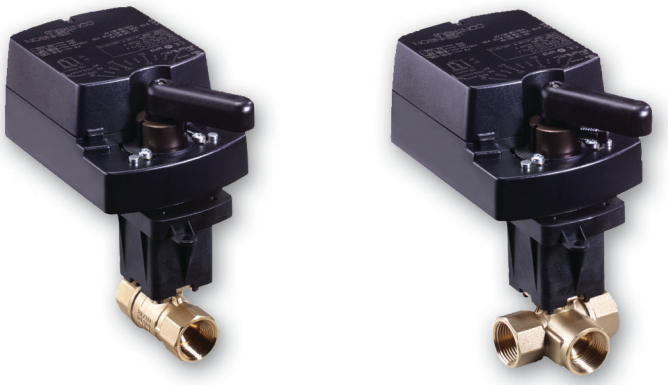
				24 VAC			120 VAC
				Floating with 2 Switches	Proportional 0 to 10 VDC, 2 Switches	On/Off with End Switch(es)	On/Off with End Switch(es)
Valve	Size in.	Cv	*Closeoff psig*	M9206-AGC-2 M9216-AGC-2	M9206-GGC-2 M9216-GGC-2	M9206-BGB-2S, 1Sw M9216-BGC-2, 2Sw	M9206-BAB-2S, 1Sw M9216-BAC-2, 2Sw
				Three-Way – Spring Return Counterclockwise - Port "A" (Coil) Open			
VG1841AD	1/2	1.2 / 0.7*	200	VG1841AD+936AGC	VG1841AD+936GGC	VG1841AD+936BGB	VG1841AD+936BAB
VG1841AE	1/2	1.9 / 1.2*	200	VG1841AE+936AGC	VG1841AE+936GGC	VG1841AE+936BGB	VG1841AE+936BAB
VG1841AF	1/2	2.9 / 1.9*	200	VG1841AF+936AGC	VG1841AF+936GGC	VG1841AF+936BGB	VG1841AF+936BAB
VG1841AG	1/2	4.7 / 2.9*	200	VG1841AG+936AGC	VG1841AG+936GGC	VG1841AG+936BGB	VG1841AG+936BAB
VG1841AL	1/2	7.4 / 4.7*	200	VG1841AL+936AGC	VG1841AL+936GGC	VG1841AL+936BGB	VG1841AL+936BAB
VG1841AN	1/2	11.7 / 5.8	200	VG1841AN+936AGC	VG1841AN+936GGC	VG1841AN+936BGB	VG1841AN+936BAB
VG1841BG	3/4	4.7 / 2.9*	200	VG1841BG+936AGC	VG1841BG+936GGC	VG1841BG+936BGB	VG1841BG+936BAB
VG1841BL	3/4	7.4 / 4.7*	200	VG1841BL+936AGC	VG1841BL+936GGC	VG1841BL+936BGB	VG1841BL+936BAB
VG1841BN	3/4	11.7 / 5.8	200	VG1841BN+936AGC	VG1841BN+936GGC	VG1841BN+936BGB	VG1841BN+936BAB
VG1841CL	1	7.4 / 4.7*	200	VG1841CL+936AGC	VG1841CL+936GGC	VG1841CL+936BGB	VG1841CL+936BAB
VG1841CN	1	11.7 / 7.4*	200	VG1841CN+936AGC	VG1841CN+936GGC	VG1841CN+936BGB	VG1841CN+936BAB
VG1841CP	1	18.7 / 9.4	200	VG1841CP+936AGC	VG1841CP+936GGC	VG1841CP+936BGB	VG1841CP+936BAB
VG1841DN	1-1/4	11.7 / 7.4*	200	VG1841DN+936AGC	VG1841DN+936GGC	VG1841DN+936BGB	VG1841DN+936BAB
VG1841DP	1-1/4	18.7 / 11.7*	200	VG1841DP+936AGC	VG1841DP+936GGC	VG1841DP+936BGB	VG1841DP+936BAB
VG1841DR	1-1/4	29.2 / 14.6	200	VG1841DR+936AGC	VG1841DR+936GGC	VG1841DR+936BGB	VG1841DR+936BAB
VG1841EP	1-1/2	18.7 / 11.7*	200	VG1841EP+936AGC	VG1841EP+936GGC	VG1841EP+936BGB	VG1841EP+936BAB
VG1841ER	1-1/2	29.2 / 18.7*	200	VG1841ER+936AGC	VG1841ER+936GGC	VG1841ER+936BGB	VG1841ER+936BAB
VG1841ES	1-1/2	46.8 / 23.4	200	VG1841ES+936AGC	VG1841ES+936GGC	VG1841ES+936BGB	VG1841ES+936BAB
VG1841FR	2	29.2 / 18.7*	200	VG1841FR+926AGC	VG1841FR+926GGC	VG1841FR+926BGC	VG1841FR+926BAC
VG1841FS	2	46.8 / 29.2*	200	VG1841FS+926AGC	VG1841FS+926GGC	VG1841FS+926BGC	VG1841FS+926BAC
VG1841FT	2	73.7 / 36.8	200	VG1841FT+926AGC	VG1841FT+926GGC	VG1841FT+926BGC	VG1841FT+926BAC
				Three-Way – Spring Return Clockwise - Port "B" (Bypass) Open			
VG1841AD	1/2	1.2 / 0.7*	200	VG1841AD+956AGC	VG1841AD+956GGC	VG1841AD+956BGB	VG1841AD+956BAB
VG1841AE	1/2	1.9 / 1.2*	200	VG1841AE+956AGC	VG1841AE+956GGC	VG1841AE+956BGB	VG1841AE+956BAB
VG1841AF	1/2	2.9 / 1.9*	200	VG1841AF+956AGC	VG1841AF+956GGC	VG1841AF+956BGB	VG1841AF+956BAB
VG1841AG	1/2	4.7 / 2.9*	200	VG1841AG+956AGC	VG1841AG+956GGC	VG1841AG+956BGB	VG1841AG+956BAB
VG1841AL	1/2	7.4 / 4.7*	200	VG1841AL+956AGC	VG1841AL+956GGC	VG1841AL+956BGB	VG1841AL+956BAB
VG1841AN	1/2	11.7 / 5.8	200	VG1841AN+956AGC	VG1841AN+956GGC	VG1841AN+956BGB	VG1841AN+956BAB
VG1841BG	3/4	4.7 / 2.9*	200	VG1841BG+956AGC	VG1841BG+956GGC	VG1841BG+956BGB	VG1841BG+956BAB
VG1841BL	3/4	7.4 / 4.7*	200	VG1841BL+956AGC	VG1841BL+956GGC	VG1841BL+956BGB	VG1841BL+956BAB
VG1841BN	3/4	11.7 / 5.8	200	VG1841BN+956AGC	VG1841BN+956GGC	VG1841BN+956BGB	VG1841BN+956BAB
VG1841CL	1	7.4 / 4.7*	200	VG1841CL+956AGC	VG1841CL+956GGC	VG1841CL+956BGB	VG1841CL+956BAB
VG1841CN	1	11.7 / 7.4*	200	VG1841CN+956AGC	VG1841CN+956GGC	VG1841CN+956BGB	VG1841CN+956BAB
VG1841CP	1	18.7 / 9.4	200	VG1841CP+956AGC	VG1841CP+956GGC	VG1841CP+956BGB	VG1841CP+956BAB
VG1841DN	1-1/4	11.7 / 7.4*	200	VG1841DN+956AGC	VG1841DN+956GGC	VG1841DN+956BGB	VG1841DN+956BAB
VG1841DP	1-1/4	18.7 / 11.7*	200	VG1841DP+956AGC	VG1841DP+956GGC	VG1841DP+956BGB	VG1841DP+956BAB
VG1841DR	1-1/4	29.2 / 14.6	200	VG1841DR+956AGC	VG1841DR+956GGC	VG1841DR+956BGB	VG1841DR+956BAB
VG1841EP	1-1/2	18.7 / 11.7*	200	VG1841EP+956AGC	VG1841EP+956GGC	VG1841EP+956BGB	VG1841EP+956BAB
VG1841ER	1-1/2	29.2 / 18.7*	200	VG1841ER+956AGC	VG1841ER+956GGC	VG1841ER+956BGB	VG1841ER+956BAB
VG1841ES	1-1/2	46.8 / 23.4	200	VG1841ES+956AGC	VG1841ES+956GGC	VG1841ES+956BGB	VG1841ES+956BAB
VG1841FR	2	29.2 / 18.7*	200	VG1841FR+946AGC	VG1841FR+946GGC	VG1841FR+946BGC	VG1841FR+946BAC
VG1841FS	2	46.8 / 29.2*	200	VG1841FS+946AGC	VG1841FS+946GGC	VG1841FS+946BGC	VG1841FS+946BAC
VG1841FT	2	73.7 / 36.8	200	VG1841FT+946AGC	VG1841FT+946GGC	VG1841FT+946BGC	VG1841FT+946BAC

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9206 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9216 Series Actuator with an M9000-510 Linkage Kit.

STAINLESS STEEL BALL AND STEM

Two-Way and Three-Way Valve Assemblies with Non-Spring Return Actuator



FEATURES

- Flow characterization disk with wide range of Cv's
- Stainless steel ball and stem
- Floating and 0 to 10 VDC proportional actuators
- Optional auxiliary switches
- 15% graphite-reinforced PTFE ball seats
- Dual EPDM stem seals
- Blowout-proof stem
- Equal percentage flow characteristics
- Rated for water or 50% glycol solutions
- 23 to 250°F (-5 to 120°C) fluid temperature rating
- 200 psi closeoff pressure rating
- 580 psig static pressure rating
- 50 psi maximum differential pressure
- Tested to greater than 200,000 cycles in iron-oxide contaminated water

TO ORDER | Specify the code number from the following selection charts.

STAINLESS STEEL BALL AND STEM

Two-Way Valve Assemblies with Non-Spring Return Actuator

				24 VAC		
				On/Off - Floating without Timeout	On/Off - Floating with Timeout	Proportional 0 to 10 VDC
Valve	Size in.	Cv	*Closeoff psig*	M9106-AGx-2 M9109-AGx-2	M9106-IGx-2	M9106-GGx-2 M9109-GGx-2
				Two-Way – Non-Spring Return without Switches		
VG1245AD	1/2	1.2*	200	VG1245AD+906AGA	VG1245AD+906IGA	VG1245AD+906GGA
VG1245AE	1/2	1.9*	200	VG1245AE+906AGA	VG1245AE+906IGA	VG1245AE+906GGA
VG1245AF	1/2	2.9*	200	VG1245AF+906AGA	VG1245AF+906IGA	VG1245AF+906GGA
VG1245AG	1/2	4.7*	200	VG1245AG+906AGA	VG1245AG+906IGA	VG1245AG+906GGA
VG1245AL	1/2	7.4*	200	VG1245AL+906AGA	VG1245AL+906IGA	VG1245AL+906GGA
VG1245AN	1/2	11.7	200	VG1245AN+906AGA	VG1245AN+906IGA	VG1245AN+906GGA
VG1245BG	3/4	4.7*	200	VG1245BG+906AGA	VG1245BG+906IGA	VG1245BG+906GGA
VG1245BL	3/4	7.4*	200	VG1245BL+906AGA	VG1245BL+906IGA	VG1245BL+906GGA
VG1245BN	3/4	11.7	200	VG1245BN+906AGA	VG1245BN+906IGA	VG1245BN+906GGA
VG1245CL	1	7.4*	200	VG1245CL+906AGA	VG1245CL+906IGA	VG1245CL+906GGA
VG1245CN	1	11.7*	200	VG1245CN+906AGA	VG1245CN+906IGA	VG1245CN+906GGA
VG1245CP	1	18.7	200	VG1245CP+906AGA	VG1245CP+906IGA	VG1245CP+906GGA
VG1245DN	1-1/4	11.7*	200	VG1245DN+906AGA	VG1245DN+906IGA	VG1245DN+906GGA
VG1245DP	1-1/4	18.7*	200	VG1245DP+906AGA	VG1245DP+906IGA	VG1245DP+906GGA
VG1245DR	1-1/4	29.2	200	VG1245DR+906AGA	VG1245DR+906IGA	VG1245DR+906GGA
VG1245EP	1-1/2	18.7*	200	VG1245EP+906AGA	VG1245EP+906IGA	VG1245EP+906GGA
VG1245ER	1-1/2	29.2*	200	VG1245ER+906AGA	VG1245ER+906IGA	VG1245ER+906GGA
VG1245ES	1-1/2	46.8	200	VG1245ES+906AGA	VG1245ES+906IGA	VG1245ES+906GGA
VG1245FR	2	29.2*	200	VG1245FR+909AGA	–	VG1245FR+909GGA
VG1245FS	2	46.8*	200	VG1245FS+909AGA	–	VG1245FS+909GGA
VG1245FT	2	73.7	200	VG1245FT+909AGA	–	VG1245FT+909GGA
				Two-Way – Non-Spring Return with Two Switches		
VG1245AD	1/2	1.2*	200	VG1245AD+906AGC	VG1245AD+906IGC	VG1245AD+906GGC
VG1245AE	1/2	1.9*	200	VG1245AE+906AGC	VG1245AE+906IGC	VG1245AE+906GGC
VG1245AF	1/2	2.9*	200	VG1245AF+906AGC	VG1245AF+906IGC	VG1245AF+906GGC
VG1245AG	1/2	4.7*	200	VG1245AG+906AGC	VG1245AG+906IGC	VG1245AG+906GGC
VG1245AL	1/2	7.4*	200	VG1245AL+906AGC	VG1245AL+906IGC	VG1245AL+906GGC
VG1245AN	1/2	11.7	200	VG1245AN+906AGC	VG1245AN+906IGC	VG1245AN+906GGC
VG1245BG	3/4	4.7*	200	VG1245BG+906AGC	VG1245BG+906IGC	VG1245BG+906GGC
VG1245BL	3/4	7.4*	200	VG1245BL+906AGC	VG1245BL+906IGC	VG1245BL+906GGC
VG1245BN	3/4	11.7	200	VG1245BN+906AGC	VG1245BN+906IGC	VG1245BN+906GGC
VG1245CL	1	7.4*	200	VG1245CL+906AGC	VG1245CL+906IGC	VG1245CL+906GGC
VG1245CN	1	11.7*	200	VG1245CN+906AGC	VG1245CN+906IGC	VG1245CN+906GGC
VG1245CP	1	18.7	200	VG1245CP+906AGC	VG1245CP+906IGC	VG1245CP+906GGC
VG1245DN	1-1/4	11.7*	200	VG1245DN+906AGC	VG1245DN+906IGC	VG1245DN+906GGC
VG1245DP	1-1/4	18.7*	200	VG1245DP+906AGC	VG1245DP+906IGC	VG1245DP+906GGC
VG1245DR	1-1/4	29.2	200	VG1245DR+906AGC	VG1245DR+906IGC	VG1245DR+906GGC
VG1245EP	1-1/2	18.7*	200	VG1245EP+906AGC	VG1245EP+906IGC	VG1245EP+906GGC
VG1245ER	1-1/2	29.2*	200	VG1245ER+906AGC	VG1245ER+906IGC	VG1245ER+906GGC
VG1245ES	1-1/2	46.8	200	VG1245ES+906AGC	VG1245ES+906IGC	VG1245ES+906GGC
VG1245FR	2	29.2*	200	VG1245FR+909AGC	–	VG1245FR+909GGC
VG1245FS	2	46.8*	200	VG1245FS+909AGC	–	VG1245FS+909GGC
VG1245FT	2	73.7	200	VG1245FT+909AGC	–	VG1245FT+909GGC

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9106 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9109 Series Actuator with an M9000-520 Linkage Kit. For actuators without switches, order M910x-xGA-2 code number; for actuators with switches, order M910x-xGC-2 code number.

Three-Way Valve Assemblies with Non-Spring Return Actuator

				24 VAC		
				On/Off - Floating without Timeout	On/Off - Floating with Timeout	Proportional 0 to 10 VDC
Valve	Size in.	Cv	*Closeoff psig*	M9106-AGx-2 M9109-AGx-2	M9106-IGx-2	M9106-GGx-2 M9109-GGx-2
				Three-Way – Non-Spring Return without Switches		
VG1845AD	1/2	1.2 / 0.7*	200	VG1845AD+906AGA	VG1845AD+906IGA	VG1845AD+906GGA
VG1845AE	1/2	1.9 / 1.2*	200	VG1845AE+906AGA	VG1845AE+906IGA	VG1845AE+906GGA
VG1845AF	1/2	2.9 / 1.9*	200	VG1845AF+906AGA	VG1845AF+906IGA	VG1845AF+906GGA
VG1845AG	1/2	4.7 / 2.9*	200	VG1845AG+906AGA	VG1845AG+906IGA	VG1845AG+906GGA
VG1845AL	1/2	7.4 / 4.7*	200	VG1845AL+906AGA	VG1845AL+906IGA	VG1845AL+906GGA
VG1845AN	1/2	11.7 / 5.8	200	VG1845AN+906AGA	VG1845AN+906IGA	VG1845AN+906GGA
VG1845BG	3/4	4.7 / 2.9*	200	VG1845BG+906AGA	VG1845BG+906IGA	VG1845BG+906GGA
VG1845BL	3/4	7.4 / 4.7*	200	VG1845BL+906AGA	VG1845BL+906IGA	VG1845BL+906GGA
VG1845BN	3/4	11.7 / 5.8	200	VG1845BN+906AGA	VG1845BN+906IGA	VG1845BN+906GGA
VG1845CL	1	7.4 / 4.7*	200	VG1845CL+906AGA	VG1845CL+906IGA	VG1845CL+906GGA
VG1845CN	1	11.7 / 7.4*	200	VG1845CN+906AGA	VG1845CN+906IGA	VG1845CN+906GGA
VG1845CP	1	18.7 / 9.4	200	VG1845CP+906AGA	VG1845CP+906IGA	VG1845CP+906GGA
VG1845DN	1-1/4	11.7 / 7.4*	200	VG1845DN+906AGA	VG1845DN+906IGA	VG1845DN+906GGA
VG1845DP	1-1/4	18.7 / 11.7*	200	VG1845DP+906AGA	VG1845DP+906IGA	VG1845DP+906GGA
VG1845DR	1-1/4	29.2 / 14.6	200	VG1845DR+906AGA	VG1845DR+906IGA	VG1845DR+906GGA
VG1845EP	1-1/2	18.7 / 11.7*	200	VG1845EP+906AGA	VG1845EP+906IGA	VG1845EP+906GGA
VG1845ER	1-1/2	29.2 / 18.7*	200	VG1845ER+906AGA	VG1845ER+906IGA	VG1845ER+906GGA
VG1845ES	1-1/2	46.8 / 23.4	200	VG1845ES+906AGA	VG1845ES+906IGA	VG1845ES+906GGA
VG1845FR	2	29.2 / 18.7*	200	VG1845FR+909AGA	–	VG1845FR+909GGA
VG1845FS	2	46.8 / 29.2*	200	VG1845FS+909AGA	–	VG1845FS+909GGA
VG1845FT	2	73.7 / 36.8	200	VG1845FT+909AGA	–	VG1845FT+909GGA
				Three-Way – Non-Spring Return with Two Switches		
VG1845AD	1/2	1.2 / 0.7*	200	VG1845AD+906AGC	VG1845AD+906IGC	VG1845AD+906GGC
VG1845AE	1/2	1.9 / 1.2*	200	VG1845AE+906AGC	VG1845AE+906IGC	VG1845AE+906GGC
VG1845AF	1/2	2.9 / 1.9*	200	VG1845AF+906AGC	VG1845AF+906IGC	VG1845AF+906GGC
VG1845AG	1/2	4.7 / 2.9*	200	VG1845AG+906AGC	VG1845AG+906IGC	VG1845AG+906GGC
VG1845AL	1/2	7.4 / 4.7*	200	VG1845AL+906AGC	VG1845AL+906IGC	VG1845AL+906GGC
VG1845AN	1/2	11.7 / 5.8	200	VG1845AN+906AGC	VG1845AN+906IGC	VG1845AN+906GGC
VG1845BG	3/4	4.7 / 2.9*	200	VG1845BG+906AGC	VG1845BG+906IGC	VG1845BG+906GGC
VG1845BL	3/4	7.4 / 4.7*	200	VG1845BL+906AGC	VG1845BL+906IGC	VG1845BL+906GGC
VG1845BN	3/4	11.7 / 5.8	200	VG1845BN+906AGC	VG1845BN+906IGC	VG1845BN+906GGC
VG1845CL	1	7.4 / 4.7*	200	VG1845CL+906AGC	VG1845CL+906IGC	VG1845CL+906GGC
VG1845CN	1	11.7 / 7.4*	200	VG1845CN+906AGC	VG1845CN+906IGC	VG1845CN+906GGC
VG1845CP	1	18.7 / 9.4	200	VG1845CP+906AGC	VG1845CP+906IGC	VG1845CP+906GGC
VG1845DN	1-1/4	11.7 / 7.4*	200	VG1845DN+906AGC	VG1845DN+906IGC	VG1845DN+906GGC
VG1845DP	1-1/4	18.7 / 11.7*	200	VG1845DP+906AGC	VG1845DP+906IGC	VG1845DP+906GGC
VG1845DR	1-1/4	29.2 / 14.6	200	VG1845DR+906AGC	VG1845DR+906IGC	VG1845DR+906GGC
VG1845EP	1-1/2	18.7 / 11.7*	200	VG1845EP+906AGC	VG1845EP+906IGC	VG1845EP+906GGC
VG1845ER	1-1/2	29.2 / 18.7*	200	VG1845ER+906AGC	VG1845ER+906IGC	VG1845ER+906GGC
VG1845ES	1-1/2	46.8 / 23.4	200	VG1845ES+906AGC	VG1845ES+906IGC	VG1845ES+906GGC
VG1845FR	2	29.2 / 18.7*	200	VG1845FR+909AGC	–	VG1845FR+909GGC
VG1845FS	2	46.8 / 29.2*	200	VG1845FS+909AGC	–	VG1845FS+909GGC
VG1845FT	2	73.7 / 36.8	200	VG1845FT+909AGC	–	VG1845FT+909GGC

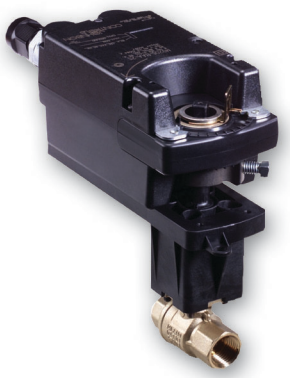
** Has characterized flow control disk.*

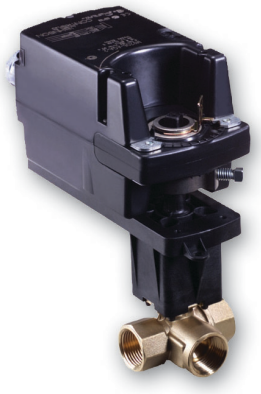
Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9106 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9109 Series Actuator with an M9000-520 Linkage Kit. For actuators without switches, order M910x-xGA-2 code number; for actuators with switches, order M910x-xGC-2 code number.

VG1000 SERIES
BALL VALVES

STAINLESS STEEL BALL AND STEM

Two-Way and Three-Way Valve Assemblies with Spring Return Actuator





FEATURES

- Flow characterization disk with wide range of Cv's
- Stainless steel ball and stem
- Floating and 0 to 10 VDC proportional actuators
- Optional auxiliary switches
- 15% graphite-reinforced PTFE ball seats
- Dual EPDM stem seals
- Blowout-proof stem
- Equal percentage flow characteristics
- Rated for water or 50% glycol solutions
- 23 to 250°F (-5 to 120°C) fluid temperature rating
- 200 psi closeoff pressure rating
- 580 psig static pressure rating
- 50 psi maximum differential pressure
- Tested to greater than 200,000 cycles in iron-oxide contaminated water

TO ORDER | Specify the code number from the following selection charts.

STAINLESS STEEL BALL AND STEM

Two-Way Valve Assemblies with Spring Return Actuator without End Switches

				24 VAC			120 VAC
				Floating	Proportional 0 to 10 VDC	On/Off	On/Off
Valve	Size in.	Cv	*Closeoff psig*	M9206-AGA-2 M9216-AGA-2	M9206-GGA-2 M9216-GGA-2	M9206-BGA-2S M9216-BGA-2	M9206-BAA-2S M9216-BAA-2
				Two-Way – Spring Return Valve Open – Normally Open			
VG1245AD	1/2	1.2*	200	VG1245AD+936AGA	VG1245AD+936GGA	VG1245AD+936BGA	VG1245AD+936BAA
VG1245AE	1/2	1.9*	200	VG1245AE+936AGA	VG1245AE+936GGA	VG1245AE+936BGA	VG1245AE+936BAA
VG1245AF	1/2	2.9*	200	VG1245AF+936AGA	VG1245AF+936GGA	VG1245AF+936BGA	VG1245AF+936BAA
VG1245AG	1/2	4.7*	200	VG1245AG+936AGA	VG1245AG+936GGA	VG1245AG+936BGA	VG1245AG+936BAA
VG1245AL	1/2	7.4*	200	VG1245AL+936AGA	VG1245AL+936GGA	VG1245AL+936BGA	VG1245AL+936BAA
VG1245AN	1/2	11.7	200	VG1245AN+936AGA	VG1245AN+936GGA	VG1245AN+936BGA	VG1245AN+936BAA
VG1245BG	3/4	4.7*	200	VG1245BG+936AGA	VG1245BG+936GGA	VG1245BG+936BGA	VG1245BG+936BAA
VG1245BL	3/4	7.4*	200	VG1245BL+936AGA	VG1245BL+936GGA	VG1245BL+936BGA	VG1245BL+936BAA
VG1245BN	3/4	11.7	200	VG1245BN+936AGA	VG1245BN+936GGA	VG1245BN+936BGA	VG1245BN+936BAA
VG1245CL	1	7.4*	200	VG1245CL+936AGA	VG1245CL+936GGA	VG1245CL+936BGA	VG1245CL+936BAA
VG1245CN	1	11.7*	200	VG1245CN+936AGA	VG1245CN+936GGA	VG1245CN+936BGA	VG1245CN+936BAA
VG1245CP	1	18.7	200	VG1245CP+936AGA	VG1245CP+936GGA	VG1245CP+936BGA	VG1245CP+936BAA
VG1245DN	1-1/4	11.7*	200	VG1245DN+936AGA	VG1245DN+936GGA	VG1245DN+936BGA	VG1245DN+936BAA
VG1245DP	1-1/4	18.7*	200	VG1245DP+936AGA	VG1245DP+936GGA	VG1245DP+936BGA	VG1245DP+936BAA
VG1245DR	1-1/4	29.2	200	VG1245DR+936AGA	VG1245DR+936GGA	VG1245DR+936BGA	VG1245DR+936BAA
VG1245EP	1-1/2	18.7*	200	VG1245EP+936AGA	VG1245EP+936GGA	VG1245EP+936BGA	VG1245EP+936BAA
VG1245ER	1-1/2	29.2*	200	VG1245ER+936AGA	VG1245ER+936GGA	VG1245ER+936BGA	VG1245ER+936BAA
VG1245ES	1-1/2	46.8	200	VG1245ES+936AGA	VG1245ES+936GGA	VG1245ES+936BGA	VG1245ES+936BAA
VG1245FR	2	29.2*	200	VG1245FR+926AGA	VG1245FR+926GGA	VG1245FR+926BGA	VG1245FR+926BAA
VG1245FS	2	46.8*	200	VG1245FS+926AGA	VG1245FS+926GGA	VG1245FS+926BGA	VG1245FS+926BAA
VG1245FT	2	73.7	200	VG1245FT+926AGA	VG1245FT+926GGA	VG1245FT+926BGA	VG1245FT+926BAA
				Two-Way – Spring Return Valve Closed – Normally Closed			
VG1245AD	1/2	1.2*	200	VG1245AD+956AGA	VG1245AD+956GGA	VG1245AD+956BGA	VG1245AD+956BAA
VG1245AE	1/2	1.9*	200	VG1245AE+956AGA	VG1245AE+956GGA	VG1245AE+956BGA	VG1245AE+956BAA
VG1245AF	1/2	2.9*	200	VG1245AF+956AGA	VG1245AF+956GGA	VG1245AF+956BGA	VG1245AF+956BAA
VG1245AG	1/2	4.7*	200	VG1245AG+956AGA	VG1245AG+956GGA	VG1245AG+956BGA	VG1245AG+956BAA
VG1245AL	1/2	7.4*	200	VG1245AL+956AGA	VG1245AL+956GGA	VG1245AL+956BGA	VG1245AL+956BAA
VG1245AN	1/2	11.7	200	VG1245AN+956AGA	VG1245AN+956GGA	VG1245AN+956BGA	VG1245AN+956BAA
VG1245BG	3/4	4.7*	200	VG1245BG+956AGA	VG1245BG+956GGA	VG1245BG+956BGA	VG1245BG+956BAA
VG1245BL	3/4	7.4*	200	VG1245BL+956AGA	VG1245BL+956GGA	VG1245BL+956BGA	VG1245BL+956BAA
VG1245BN	3/4	11.7	200	VG1245BN+956AGA	VG1245BN+956GGA	VG1245BN+956BGA	VG1245BN+956BAA
VG1245CL	1	7.4*	200	VG1245CL+956AGA	VG1245CL+956GGA	VG1245CL+956BGA	VG1245CL+956BAA
VG1245CN	1	11.7*	200	VG1245CN+956AGA	VG1245CN+956GGA	VG1245CN+956BGA	VG1245CN+956BAA
VG1245CP	1	18.7	200	VG1245CP+956AGA	VG1245CP+956GGA	VG1245CP+956BGA	VG1245CP+956BAA
VG1245DN	1-1/4	11.7*	200	VG1245DN+956AGA	VG1245DN+956GGA	VG1245DN+956BGA	VG1245DN+956BAA
VG1245DP	1-1/4	18.7*	200	VG1245DP+956AGA	VG1245DP+956GGA	VG1245DP+956BGA	VG1245DP+956BAA
VG1245DR	1-1/4	29.2	200	VG1245DR+956AGA	VG1245DR+956GGA	VG1245DR+956BGA	VG1245DR+956BAA
VG1245EP	1-1/2	18.7*	200	VG1245EP+956AGA	VG1245EP+956GGA	VG1245EP+956BGA	VG1245EP+956BAA
VG1245ER	1-1/2	29.2*	200	VG1245ER+956AGA	VG1245ER+956GGA	VG1245ER+956BGA	VG1245ER+956BAA
VG1245ES	1-1/2	46.8	200	VG1245ES+956AGA	VG1245ES+956GGA	VG1245ES+956BGA	VG1245ES+956BAA
VG1245FR	2	29.2*	200	VG1245FR+946AGA	VG1245FR+946GGA	VG1245FR+946BGA	VG1245FR+946BAA
VG1245FS	2	46.8*	200	VG1245FS+946AGA	VG1245FS+946GGA	VG1245FS+946BGA	VG1245FS+946BAA
VG1245FT	2	73.7	200	VG1245FT+946AGA	VG1245FT+946GGA	VG1245FT+946BGA	VG1245FT+946BAA

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9206 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9216 Series Actuator with an M9000-510 Linkage Kit.

STAINLESS STEEL BALL AND STEM

Two-Way Valve Assemblies with Spring Return Actuator with End Switch(es)

				24 VAC			120 VAC
				Floating with 2 Switches	Proportional 0 to 10 VDC, 2 Switches	On/Off with End Switch	On/Off with End Switch
Valve	Size in.	Cv	*Closeoff psig*	M9206-AGC-2 M9216-AGC-2	M9206-GGC-2 M9216-GGC-2	M9206-BGB-2S, 1Sw M9216-BGC-2, 2Sw	M9206-BAB-2S, 1Sw M9216-BAC-2, 2Sw
				Two-Way – Spring Return Valve Open – Normally Open			
VG1245AD	1/2	1.2*	200	VG1245AD+936AGC	VG1245AD+936GGC	VG1245AD+936BGB	VG1245AD+936BAB
VG1245AE	1/2	1.9*	200	VG1245AE+936AGC	VG1245AE+936GGC	VG1245AE+936BGB	VG1245AE+936BAB
VG1245AF	1/2	2.9*	200	VG1245AF+936AGC	VG1245AF+936GGC	VG1245AF+936BGB	VG1245AF+936BAB
VG1245AG	1/2	4.7*	200	VG1245AG+936AGC	VG1245AG+936GGC	VG1245AG+936BGB	VG1245AG+936BAB
VG1245AL	1/2	7.4*	200	VG1245AL+936AGC	VG1245AL+936GGC	VG1245AL+936BGB	VG1245AL+936BAB
VG1245AN	1/2	11.7	200	VG1245AN+936AGC	VG1245AN+936GGC	VG1245AN+936BGB	VG1245AN+936BAB
VG1245BG	3/4	4.7*	200	VG1245BG+936AGC	VG1245BG+936GGC	VG1245BG+936BGB	VG1245BG+936BAB
VG1245BL	3/4	7.4*	200	VG1245BL+936AGC	VG1245BL+936GGC	VG1245BL+936BGB	VG1245BL+936BAB
VG1245BN	3/4	11.7	200	VG1245BN+936AGC	VG1245BN+936GGC	VG1245BN+936BGB	VG1245BN+936BAB
VG1245CL	1	7.4*	200	VG1245CL+936AGC	VG1245CL+936GGC	VG1245CL+936BGB	VG1245CL+936BAB
VG1245CN	1	11.7*	200	VG1245CN+936AGC	VG1245CN+936GGC	VG1245CN+936BGB	VG1245CN+936BAB
VG1245CP	1	18.7	200	VG1245CP+936AGC	VG1245CP+936GGC	VG1245CP+936BGB	VG1245CP+936BAB
VG1245DN	1-1/4	11.7*	200	VG1245DN+936AGC	VG1245DN+936GGC	VG1245DN+936BGB	VG1245DN+936BAB
VG1245DP	1-1/4	18.7*	200	VG1245DP+936AGC	VG1245DP+936GGC	VG1245DP+936BGB	VG1245DP+936BAB
VG1245DR	1-1/4	29.2	200	VG1245DR+936AGC	VG1245DR+936GGC	VG1245DR+936BGB	VG1245DR+936BAB
VG1245EP	1-1/2	18.7*	200	VG1245EP+936AGC	VG1245EP+936GGC	VG1245EP+936BGB	VG1245EP+936BAB
VG1245ER	1-1/2	29.2*	200	VG1245ER+936AGC	VG1245ER+936GGC	VG1245ER+936BGB	VG1245ER+936BAB
VG1245ES	1-1/2	46.8	200	VG1245ES+936AGC	VG1245ES+936GGC	VG1245ES+936BGB	VG1245ES+936BAB
VG1245FR	2	29.2*	200	VG1245FR+926AGC	VG1245FR+926GGC	VG1245FR+926BGC	VG1245FR+926BAC
VG1245FS	2	46.8*	200	VG1245FS+926AGC	VG1245FS+926GGC	VG1245FS+926BGC	VG1245FS+926BAC
VG1245FT	2	73.7	200	VG1245FT+926AGC	VG1245FT+926GGC	VG1245FT+926BGC	VG1245FT+926BAC
				Two-Way – Spring Return Valve Closed – Normally Closed			
VG1245AD	1/2	1.2*	200	VG1245AD+956AGC	VG1245AD+956GGC	VG1245AD+956BGB	VG1245AD+956BAB
VG1245AE	1/2	1.9*	200	VG1245AE+956AGC	VG1245AE+956GGC	VG1245AE+956BGB	VG1245AE+956BAB
VG1245AF	1/2	2.9*	200	VG1245AF+956AGC	VG1245AF+956GGC	VG1245AF+956BGB	VG1245AF+956BAB
VG1245AG	1/2	4.7*	200	VG1245AG+956AGC	VG1245AG+956GGC	VG1245AG+956BGB	VG1245AG+956BAB
VG1245AL	1/2	7.4*	200	VG1245AL+956AGC	VG1245AL+956GGC	VG1245AL+956BGB	VG1245AL+956BAB
VG1245AN	1/2	11.7	200	VG1245AN+956AGC	VG1245AN+956GGC	VG1245AN+956BGB	VG1245AN+956BAB
VG1245BG	3/4	4.7*	200	VG1245BG+956AGC	VG1245BG+956GGC	VG1245BG+956BGB	VG1245BG+956BAB
VG1245BL	3/4	7.4*	200	VG1245BL+956AGC	VG1245BL+956GGC	VG1245BL+956BGB	VG1245BL+956BAB
VG1245BN	3/4	11.7	200	VG1245BN+956AGC	VG1245BN+956GGC	VG1245BN+956BGB	VG1245BN+956BAB
VG1245CL	1	7.4*	200	VG1245CL+956AGC	VG1245CL+956GGC	VG1245CL+956BGB	VG1245CL+956BAB
VG1245CN	1	11.7*	200	VG1245CN+956AGC	VG1245CN+956GGC	VG1245CN+956BGB	VG1245CN+956BAB
VG1245CP	1	18.7	200	VG1245CP+956AGC	VG1245CP+956GGC	VG1245CP+956BGB	VG1245CP+956BAB
VG1245DN	1-1/4	11.7*	200	VG1245DN+956AGC	VG1245DN+956GGC	VG1245DN+956BGB	VG1245DN+956BAB
VG1245DP	1-1/4	18.7*	200	VG1245DP+956AGC	VG1245DP+956GGC	VG1245DP+956BGB	VG1245DP+956BAB
VG1245DR	1-1/4	29.2	200	VG1245DR+956AGC	VG1245DR+956GGC	VG1245DR+956BGB	VG1245DR+956BAB
VG1245EP	1-1/2	18.7*	200	VG1245EP+956AGC	VG1245EP+956GGC	VG1245EP+956BGB	VG1245EP+956BAB
VG1245ER	1-1/2	29.2*	200	VG1245ER+956AGC	VG1245ER+956GGC	VG1245ER+956BGB	VG1245ER+956BAB
VG1245ES	1-1/2	46.8	200	VG1245ES+956AGC	VG1245ES+956GGC	VG1245ES+956BGB	VG1245ES+956BAB
VG1245FR	2	29.2*	200	VG1245FR+946AGC	VG1245FR+946GGC	VG1245FR+946BGC	VG1245FR+946BAC
VG1245FS	2	46.8*	200	VG1245FS+946AGC	VG1245FS+946GGC	VG1245FS+946BGC	VG1245FS+946BAC
VG1245FT	2	73.7	200	VG1245FT+946AGC	VG1245FT+946GGC	VG1245FT+946BGC	VG1245FT+946BAC

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9206 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9216 Series Actuator with an M9000-510 Linkage Kit.

STAINLESS STEEL BALL AND STEM

Three-Way Valve Assemblies with Spring Return Actuator without End Switches

				24 VAC			120 VAC
				Floating	Proportional 0 to 10 VDC	On/Off	On/Off
Valve	Size in.	Cv	*Closeoff psig*	M9206-AGA-2 M9216-AGA-2	M9206-GGA-2 M9216-GGA-2	M9206-BGA-2S M9216-BGA-2	M9206-BAA-2S M9216-BAA-2
				Three-Way – Spring Return Counterclockwise - Port "A" (Coil) Open			
VG1845AD	1/2	1.2 / 0.7*	200	VG1845AD+936AGA	VG1845AD+936GGA	VG1845AD+936BGA	VG1845AD+936BAA
VG1845AE	1/2	1.9 / 1.2*	200	VG1845AE+936AGA	VG1845AE+936GGA	VG1845AE+936BGA	VG1845AE+936BAA
VG1845AF	1/2	2.9 / 1.9*	200	VG1845AF+936AGA	VG1845AF+936GGA	VG1845AF+936BGA	VG1845AF+936BAA
VG1845AG	1/2	4.7 / 2.9*	200	VG1845AG+936AGA	VG1845AG+936GGA	VG1845AG+936BGA	VG1845AG+936BAA
VG1845AL	1/2	7.4 / 4.7*	200	VG1845AL+936AGA	VG1845AL+936GGA	VG1845AL+936BGA	VG1845AL+936BAA
VG1845AN	1/2	11.7 / 5.8	200	VG1845AN+936AGA	VG1845AN+936GGA	VG1845AN+936BGA	VG1845AN+936BAA
VG1845BG	3/4	4.7 / 2.9*	200	VG1845BG+936AGA	VG1845BG+936GGA	VG1845BG+936BGA	VG1845BG+936BAA
VG1845BL	3/4	7.4 / 4.7*	200	VG1845BL+936AGA	VG1845BL+936GGA	VG1845BL+936BGA	VG1845BL+936BAA
VG1845BN	3/4	11.7 / 5.8	200	VG1845BN+936AGA	VG1845BN+936GGA	VG1845BN+936BGA	VG1845BN+936BAA
VG1845CL	1	7.4 / 4.7*	200	VG1845CL+936AGA	VG1845CL+936GGA	VG1845CL+936BGA	VG1845CL+936BAA
VG1845CN	1	11.7 / 7.4*	200	VG1845CN+936AGA	VG1845CN+936GGA	VG1845CN+936BGA	VG1845CN+936BAA
VG1845CP	1	18.7 / 9.4	200	VG1845CP+936AGA	VG1845CP+936GGA	VG1845CP+936BGA	VG1845CP+936BAA
VG1845DN	1-1/4	11.7 / 7.4*	200	VG1845DN+936AGA	VG1845DN+936GGA	VG1845DN+936BGA	VG1845DN+936BAA
VG1845DP	1-1/4	18.7 / 11.7*	200	VG1845DP+936AGA	VG1845DP+936GGA	VG1845DP+936BGA	VG1845DP+936BAA
VG1845DR	1-1/4	29.2 / 14.6	200	VG1845DR+936AGA	VG1845DR+936GGA	VG1845DR+936BGA	VG1845DR+936BAA
VG1845EP	1-1/2	18.7 / 11.7*	200	VG1845EP+936AGA	VG1845EP+936GGA	VG1845EP+936BGA	VG1845EP+936BAA
VG1845ER	1-1/2	29.2 / 18.7*	200	VG1845ER+936AGA	VG1845ER+936GGA	VG1845ER+936BGA	VG1845ER+936BAA
VG1845ES	1-1/2	46.8 / 23.4	200	VG1845ES+936AGA	VG1845ES+936GGA	VG1845ES+936BGA	VG1845ES+936BAA
VG1845FR	2	29.2 / 18.7*	200	VG1845FR+926AGA	VG1845FR+926GGA	VG1845FR+926BGA	VG1845FR+926BAA
VG1845FS	2	46.8 / 29.2*	200	VG1845FS+926AGA	VG1845FS+926GGA	VG1845FS+926BGA	VG1845FS+926BAA
VG1845FT	2	73.7 / 36.8	200	VG1845FT+926AGA	VG1845FT+926GGA	VG1845FT+926BGA	VG1845FT+926BAA
				Three-Way – Spring Return Clockwise - Port "B" (Bypass) Open			
VG1845AD	1/2	1.2 / 0.7*	200	VG1845AD+956AGA	VG1845AD+956GGA	VG1845AD+956BGA	VG1845AD+956BAA
VG1845AE	1/2	1.9 / 1.2*	200	VG1845AE+956AGA	VG1845AE+956GGA	VG1845AE+956BGA	VG1845AE+956BAA
VG1845AF	1/2	2.9 / 1.9*	200	VG1845AF+956AGA	VG1845AF+956GGA	VG1845AF+956BGA	VG1845AF+956BAA
VG1845AG	1/2	4.7 / 2.9*	200	VG1845AG+956AGA	VG1845AG+956GGA	VG1845AG+956BGA	VG1845AG+956BAA
VG1845AL	1/2	7.4 / 4.7*	200	VG1845AL+956AGA	VG1845AL+956GGA	VG1845AL+956BGA	VG1845AL+956BAA
VG1845AN	1/2	11.7 / 5.8	200	VG1845AN+956AGA	VG1845AN+956GGA	VG1845AN+956BGA	VG1845AN+956BAA
VG1845BG	3/4	4.7 / 2.9*	200	VG1845BG+956AGA	VG1845BG+956GGA	VG1845BG+956BGA	VG1845BG+956BAA
VG1845BL	3/4	7.4 / 4.7*	200	VG1845BL+956AGA	VG1845BL+956GGA	VG1845BL+956BGA	VG1845BL+956BAA
VG1845BN	3/4	11.7 / 5.8	200	VG1845BN+956AGA	VG1845BN+956GGA	VG1845BN+956BGA	VG1845BN+956BAA
VG1845CL	1	7.4 / 4.7*	200	VG1845CL+956AGA	VG1845CL+956GGA	VG1845CL+956BGA	VG1845CL+956BAA
VG1845CN	1	11.7 / 7.4*	200	VG1845CN+956AGA	VG1845CN+956GGA	VG1845CN+956BGA	VG1845CN+956BAA
VG1845CP	1	18.7 / 9.4	200	VG1845CP+956AGA	VG1845CP+956GGA	VG1845CP+956BGA	VG1845CP+956BAA
VG1845DN	1-1/4	11.7 / 7.4*	200	VG1845DN+956AGA	VG1845DN+956GGA	VG1845DN+956BGA	VG1845DN+956BAA
VG1845DP	1-1/4	18.7 / 11.7*	200	VG1845DP+956AGA	VG1845DP+956GGA	VG1845DP+956BGA	VG1845DP+956BAA
VG1845DR	1-1/4	29.2 / 14.6	200	VG1845DR+956AGA	VG1845DR+956GGA	VG1845DR+956BGA	VG1845DR+956BAA
VG1845EP	1-1/2	18.7 / 11.7*	200	VG1845EP+956AGA	VG1845EP+956GGA	VG1845EP+956BGA	VG1845EP+956BAA
VG1845ER	1-1/2	29.2 / 18.7*	200	VG1845ER+956AGA	VG1845ER+956GGA	VG1845ER+956BGA	VG1845ER+956BAA
VG1845ES	1-1/2	46.8 / 23.4	200	VG1845ES+956AGA	VG1845ES+956GGA	VG1845ES+956BGA	VG1845ES+956BAA
VG1845FR	2	29.2 / 18.7*	200	VG1845FR+946AGA	VG1845FR+946GGA	VG1845FR+946BGA	VG1845FR+946BAA
VG1845FS	2	46.8 / 29.2*	200	VG1845FS+946AGA	VG1845FS+946GGA	VG1845FS+946BGA	VG1845FS+946BAA
VG1845FT	2	73.7 / 36.8	200	VG1845FT+946AGA	VG1845FT+946GGA	VG1845FT+946BGA	VG1845FT+946BAA

* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9206 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9216 Series Actuator with an M9000-510 Linkage Kit.

STAINLESS STEEL BALL AND STEM

Three-Way Valve Assemblies with Spring Return Actuator with End Switch(es)

				24 VAC			120 VAC
				Floating with 2 Switches	Proportional 0 to 10 VDC, 2 Switches	On/Off with End Switch(es)	On/Off with End Switch(es)
Valve	Size in.	Cv	*Closeoff psig*	M9206-AGC-2 M9216-AGC-2	M9206-GGC-2 M9216-GGC-2	M9206-BGB-2S, 1Sw M9216-BGC-2, 2Sw	M9206-BAB-2S, 1Sw M9216-BAC-2, 2Sw
				Three-Way – Spring Return Counterclockwise - Port "A" (Coil) Open			
VG1845AD	1/2	1.2 / 0.7*	200	VG1845AD+936AGC	VG1845AD+936GGC	VG1845AD+936BGB	VG1845AD+936BAB
VG1845AE	1/2	1.9 / 1.2*	200	VG1845AE+936AGC	VG1845AE+936GGC	VG1845AE+936BGB	VG1845AE+936BAB
VG1845AF	1/2	2.9 / 1.9*	200	VG1845AF+936AGC	VG1845AF+936GGC	VG1845AF+936BGB	VG1845AF+936BAB
VG1845AG	1/2	4.7 / 2.9*	200	VG1845AG+936AGC	VG1845AG+936GGC	VG1845AG+936BGB	VG1845AG+936BAB
VG1845AL	1/2	7.4 / 4.7*	200	VG1845AL+936AGC	VG1845AL+936GGC	VG1845AL+936BGB	VG1845AL+936BAB
VG1845AN	1/2	11.7 / 5.8	200	VG1845AN+936AGC	VG1845AN+936GGC	VG1845AN+936BGB	VG1845AN+936BAB
VG1845BG	3/4	4.7 / 2.9*	200	VG1845BG+936AGC	VG1845BG+936GGC	VG1845BG+936BGB	VG1845BG+936BAB
VG1845BL	3/4	7.4 / 4.7*	200	VG1845BL+936AGC	VG1845BL+936GGC	VG1845BL+936BGB	VG1845BL+936BAB
VG1845BN	3/4	11.7 / 5.8	200	VG1845BN+936AGC	VG1845BN+936GGC	VG1845BN+936BGB	VG1845BN+936BAB
VG1845CL	1	7.4 / 4.7*	200	VG1845CL+936AGC	VG1845CL+936GGC	VG1845CL+936BGB	VG1845CL+936BAB
VG1845CN	1	11.7 / 7.4*	200	VG1845CN+936AGC	VG1845CN+936GGC	VG1845CN+936BGB	VG1845CN+936BAB
VG1845CP	1	18.7 / 9.4	200	VG1845CP+936AGC	VG1845CP+936GGC	VG1845CP+936BGB	VG1845CP+936BAB
VG1845DN	1-1/4	11.7 / 7.4*	200	VG1845DN+936AGC	VG1845DN+936GGC	VG1845DN+936BGB	VG1845DN+936BAB
VG1845DP	1-1/4	18.7 / 11.7*	200	VG1845DP+936AGC	VG1845DP+936GGC	VG1845DP+936BGB	VG1845DP+936BAB
VG1845DR	1-1/4	29.2 / 14.6	200	VG1845DR+936AGC	VG1845DR+936GGC	VG1845DR+936BGB	VG1845DR+936BAB
VG1845EP	1-1/2	18.7 / 11.7*	200	VG1845EP+936AGC	VG1845EP+936GGC	VG1845EP+936BGB	VG1845EP+936BAB
VG1845ER	1-1/2	29.2 / 18.7*	200	VG1845ER+936AGC	VG1845ER+936GGC	VG1845ER+936BGB	VG1845ER+936BAB
VG1845ES	1-1/2	46.8 / 23.4	200	VG1845ES+936AGC	VG1845ES+936GGC	VG1845ES+936BGB	VG1845ES+936BAB
VG1845FR	2	29.2 / 18.7*	200	VG1845FR+926AGC	VG1845FR+926GGC	VG1845FR+926BGC	VG1845FR+926BAC
VG1845FS	2	46.8 / 29.2*	200	VG1845FS+926AGC	VG1845FS+926GGC	VG1845FS+926BGC	VG1845FS+926BAC
VG1845FT	2	73.7 / 36.8	200	VG1845FT+926AGC	VG1845FT+926GGC	VG1845FT+926BGC	VG1845FT+926BAC
				Three-Way – Spring Return Clockwise - Port "B" (Bypass) Open			
VG1845AD	1/2	1.2 / 0.7*	200	VG1845AD+956AGC	VG1845AD+956GGC	VG1845AD+956BGB	VG1845AD+956BAB
VG1845AE	1/2	1.9 / 1.2*	200	VG1845AE+956AGC	VG1845AE+956GGC	VG1845AE+956BGB	VG1845AE+956BAB
VG1845AF	1/2	2.9 / 1.9*	200	VG1845AF+956AGC	VG1845AF+956GGC	VG1845AF+956BGB	VG1845AF+956BAB
VG1845AG	1/2	4.7 / 2.9*	200	VG1845AG+956AGC	VG1845AG+956GGC	VG1845AG+956BGB	VG1845AG+956BAB
VG1845AL	1/2	7.4 / 4.7*	200	VG1845AL+956AGC	VG1845AL+956GGC	VG1845AL+956BGB	VG1845AL+956BAB
VG1845AN	1/2	11.7 / 5.8	200	VG1845AN+956AGC	VG1845AN+956GGC	VG1845AN+956BGB	VG1845AN+956BAB
VG1845BG	3/4	4.7 / 2.9*	200	VG1845BG+956AGC	VG1845BG+956GGC	VG1845BG+956BGB	VG1845BG+956BAB
VG1845BL	3/4	7.4 / 4.7*	200	VG1845BL+956AGC	VG1845BL+956GGC	VG1845BL+956BGB	VG1845BL+956BAB
VG1845BN	3/4	11.7 / 5.8	200	VG1845BN+956AGC	VG1845BN+956GGC	VG1845BN+956BGB	VG1845BN+956BAB
VG1845CL	1	7.4 / 4.7*	200	VG1845CL+956AGC	VG1845CL+956GGC	VG1845CL+956BGB	VG1845CL+956BAB
VG1845CN	1	11.7 / 7.4*	200	VG1845CN+956AGC	VG1845CN+956GGC	VG1845CN+956BGB	VG1845CN+956BAB
VG1845CP	1	18.7 / 9.4	200	VG1845CP+956AGC	VG1845CP+956GGC	VG1845CP+956BGB	VG1845CP+956BAB
VG1845DN	1-1/4	11.7 / 7.4*	200	VG1845DN+956AGC	VG1845DN+956GGC	VG1845DN+956BGB	VG1845DN+956BAB
VG1845DP	1-1/4	18.7 / 11.7*	200	VG1845DP+956AGC	VG1845DP+956GGC	VG1845DP+956BGB	VG1845DP+956BAB
VG1845DR	1-1/4	29.2 / 14.6	200	VG1845DR+956AGC	VG1845DR+956GGC	VG1845DR+956BGB	VG1845DR+956BAB
VG1845EP	1-1/2	18.7 / 11.7*	200	VG1845EP+956AGC	VG1845EP+956GGC	VG1845EP+956BGB	VG1845EP+956BAB
VG1845ER	1-1/2	29.2 / 18.7*	200	VG1845ER+956AGC	VG1845ER+956GGC	VG1845ER+956BGB	VG1845ER+956BAB
VG1845ES	1-1/2	46.8 / 23.4	200	VG1845ES+956AGC	VG1845ES+956GGC	VG1845ES+956BGB	VG1845ES+956BAB
VG1845FR	2	29.2 / 18.7*	200	VG1845FR+946AGC	VG1845FR+946GGC	VG1845FR+946BGC	VG1845FR+946BAC
VG1845FS	2	46.8 / 29.2*	200	VG1845FS+946AGC	VG1845FS+946GGC	VG1845FS+946BGC	VG1845FS+946BAC
VG1845FT	2	73.7 / 36.8	200	VG1845FT+946AGC	VG1845FT+946GGC	VG1845FT+946BGC	VG1845FT+946BAC

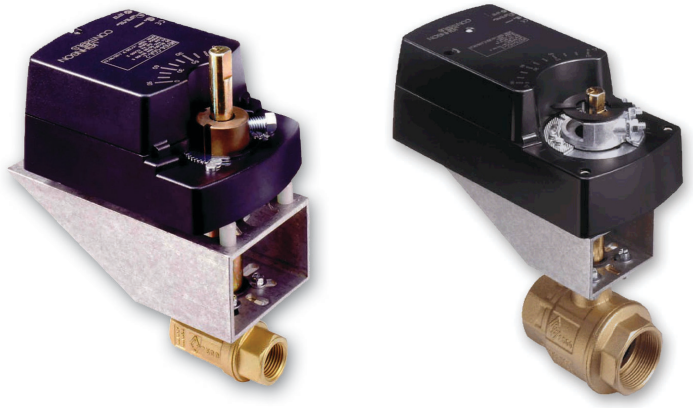
* *Has characterized flow control disk.*

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown. 1/2 through 1-1/2 in. valves use an M9206 Series Actuator with an M9000-520 Linkage Kit; 2 in. assemblies use an M9216 Series Actuator with an M9000-510 Linkage Kit.

VG1000 SERIES
BALL VALVES

HIGH CAPACITY FULL PORT VALVES STAINLESS STEEL BALL AND STEM

Two-Way Valve Assemblies with Spring Return and Non-Spring Return Actuator



FEATURES

- Stainless steel ball and stem
- Floating and 0 to 10 VDC proportional actuators
- Optional auxiliary switches
- 15% graphite-reinforced PTFE ball seats
- Dual EPDM stem seals
- Blowout-proof stem
- Equal percentage flow characteristics
- Rated for water or 50% glycol solutions
- 23 to 250°F (-5 to 120°C) fluid temperature rating
- 200 psi closeoff pressure rating
- 580 psig static pressure rating
- 50 psi maximum differential pressure
- Tested to greater than 200,000 cycles in iron-oxide contaminated water

TO ORDER | Specify the code number from the following selection charts.

HIGH CAPACITY FULL PORT VALVES
STAINLESS STEEL BALL AND STEM

Two-Way Valve Assemblies with Spring Return and Non-Spring Return Actuator

Valve	Size in.	Cv	Closeoff psig	Spring Return: without Switches — On/Off - Floating	Spring Return: without Switches — Proportional 0 to 10 VDC	Spring Return: with 2 End Switches — On/Off - Floating	Spring Return: with 2 End Switches — Proportional 0 to 10 VDC
				M9206-AGA-2 M9216-AGA-2	M9206-GGA-2 M9216-HGA-2	M9206-AGC-2 M9216-AGC-2	M9206-GGC-2 M9216-HGC-2
				Two-Way – Spring Return Valve Open – Normally Open			
VG1243BC	3/4	28.7	150	VG1243BC+936AGA	VG1243BC+936GGA	VG1243BC+936AGC	VG1243BC+936GGC
VG1243CC	1	48.3	150	VG1243CC+926AGA	VG1243CC+926HGA	VG1243CC+926AGC	VG1243CC+926HGC
VG1243DC	1-1/4	82.6	150	VG1243DC+926AGA	VG1243DC+926HGA	VG1243DC+926AGC	VG1243DC+926HGC
				Two-Way – Spring Return Valve Closed – Normally Closed			
VG1243BC	3/4	28.7	150	VG1243BC+956AGA	VG1243BC+956GGA	VG1243BC+956AGC	VG1243BC+956GGC
VG1243CC	1	48.3	150	VG1243CC+946AGA	VG1243CC+946HGA	VG1243CC+946AGC	VG1243CC+946HGC
VG1243DC	1-1/4	82.6	150	VG1243DC+946AGA	VG1243DC+946HGA	VG1243DC+946AGC	VG1243DC+946HGC

Valve	Size in.	Cv	Closeoff psig	Non-Spring Return: without Switches — On/Off - Floating	Non-Spring Return: without Switches — Proportional 0 to 10 VDC	Non-Spring Return: with 2 End Switches — On/Off - Floating	Non-Spring Return: with 2 End Switches — Proportional 0 to 10 VDC
				M9106-AGA-2 M9116-AGA-2 M9124-AGA-2	M9106-GGA-2 M9116-GGA-2 M9124-GGA-2	M9106-AGC-2 M9116-AGC-2 M9124-AGC-2	M9106-GGC-2 M9116-GGC-2 M9124-GGC-2
VG1243BC	3/4	28.7	150	VG1243BC+906AGA	VG1243BC+906GGA	VG1243BC+906AGC	VG1243BC+906GGC
VG1243CC	1	48.3	150	VG1243CC+916AGA	VG1243CC+916GGA	VG1243CC+916AGC	VG1243CC+916GGC
VG1243DC	1-1/4	82.6	150	VG1243DC+916AGA	VG1243DC+916GGA	VG1243DC+916AGC	VG1243DC+916GGC
VG1243EC	1-1/2	143.4	150	VG1243EC+924AGA	VG1243EC+924GGA	VG1243EC+924AGC	VG1243EC+924GGC

Actuators and valve bodies can be ordered separately using the valve and actuator code numbers shown.

Selection Chart: all Valid Ball Valve, Electric Actuator, and Linkage Kit Combinations (for Field Assembly)

Valve Size	Valve Code Number	Actuator Base Code Number*	Linkage Kit Code Number
1/2" (DN15) through 1-1/2" (DN40)	VG1241, VG1245 VG1841, VG1845	M9106 M9206	M9000-520
2 in. (DN50)	VG1241, VG1245 VG1841, VG1845	M9109	M9000-520
		M9216	M9000-510
3/4 in. (DN20) Two-Way	VG1243BC	M9106	M9000-512
		M9206	M9000-513
1 in. (DN25) Two-Way 1-1/4 in. (DN32) Two-Way	VG1243DC	M9116 M9216	M9000-510
1-1/2 in. (DN40) Two-Way	VG1243EC	M9124	M9000-511

** M9106, M9109, M9116, and M9124 Series actuators are non-spring return, and M9206 and M9216 Series actuators are spring return.*

CROSS-REFERENCE OF DISCONTINUED VG1000 SERIES

Two-Way Ball Valves

DISCONTINUED MODEL	SUGGESTED REPLACEMENT	DISCONTINUED MODEL	SUGGESTED REPLACEMENT
VG1243AC	VG1245AN*	VG1243AD	VG1245AD
VG1243AC+906AGA	VG1245AN+906AGA*	VG1243AD+906AGA	VG1245AD+906AGA
VG1243AC+906AGC	VG1245AN+906AGC*	VG1243AD+906AGC	VG1245AD+906AGC
VG1243AC+906GGA	VG1245AN+906GGA*	VG1243AD+906GGA	VG1245AD+906GGA
VG1243AC+906GGC	VG1245AN+906GGC*	VG1243AD+906GGC	VG1245AD+906GGC
VG1243AC+908AGA	VG1245AN+906IGA*	VG1243AD+908AGA	VG1245AD+906IGA
VG1243AC+908AGC	VG1245AN+906IGC*	VG1243AD+908AGC	VG1245AD+906IGC
VG1243AC+908GGA	VG1245AN+906GGA*	VG1243AD+908GGA	VG1245AD+906GGA
VG1243AC+908GGC	VG1245AN+906GGC*	VG1243AD+908GGC	VG1245AD+906GGC
VG1243AC+916AGA	VG1245AN+906IGA*	VG1243AD+916AGA	VG1245AD+906IGA
VG1243AC+916AGC	VG1245AN+906IGC*	VG1243AD+916AGC	VG1245AD+906IGC
VG1243AC+916GGA	VG1245AN+906GGA*	VG1243AD+916GGA	VG1245AD+906GGA
VG1243AC+916GGC	VG1245AN+906GGC*	VG1243AD+916GGC	VG1245AD+906GGC
VG1243AC+924AGA	VG1245AN+906IGA*	VG1243AD+924AGA	VG1245AD+906IGA
VG1243AC+924AGC	VG1245AN+906IGC*	VG1243AD+924AGC	VG1245AD+906IGC
VG1243AC+924GGA	VG1245AN+906GGA*	VG1243AD+924GGA	VG1245AD+906GGA
VG1243AC+924GGC	VG1245AN+906GGC*	VG1243AD+924GGC	VG1245AD+906GGC
VG1243AC+926AGA	VG1245AN+936AGA*	VG1243AD+926AGA	VG1245AD+936AGA
VG1243AC+926AGC	VG1245AN+936AGC*	VG1243AD+926AGC	VG1245AD+936AGC
VG1243AC+926BGA	VG1245AN+936BGA*	VG1243AD+926BGA	VG1245AD+936BGA
VG1243AC+926BGC	VG1245AN+936BGC*	VG1243AD+926BGC	VG1245AD+936BGC
VG1243AC+926HGA	VG1245AN+936GGA*	VG1243AD+926HGA	VG1245AD+936GGA
VG1243AC+926HGC	VG1245AN+936GGC*	VG1243AD+926HGC	VG1245AD+936GGC
VG1243AC+936AGA	VG1245AN+936AGA*	VG1243AD+936AGA	VG1245AD+936AGA
VG1243AC+936AGC	VG1245AN+936AGC*	VG1243AD+936AGC	VG1245AD+936AGC
VG1243AC+936GGA	VG1245AN+936GGA*	VG1243AD+936GGA	VG1245AD+936GGA
VG1243AC+936GGC	VG1245AN+936GGC*	VG1243AD+936GGC	VG1245AD+936GGC
VG1243AC+946AGA	VG1245AN+956AGA*	VG1243AD+946AGA	VG1245AD+956AGA
VG1243AC+946AGC	VG1245AN+956AGC*	VG1243AD+946AGC	VG1245AD+956AGC
VG1243AC+946BGA	VG1245AN+956BGA*	VG1243AD+946BGA	VG1245AD+956BGA
VG1243AC+946BGC	VG1245AN+956BGC*	VG1243AD+946BGC	VG1245AD+956BGC
VG1243AC+946HGA	VG1245AN+956GGA*	VG1243AD+946HGA	VG1245AD+956GGA
VG1243AC+946HGC	VG1245AN+956GGC*	VG1243AD+946HGC	VG1245AD+956GGC
VG1243AC+956AGA	VG1245AN+956AGA*	VG1243AD+956AGA	VG1245AD+956AGA
VG1243AC+956AGC	VG1245AN+956AGC*	VG1243AD+956AGC	VG1245AD+956AGC
VG1243AC+956GGA	VG1245AN+956GGA*	VG1243AD+956GGA	VG1245AD+956GGA
VG1243AC+956GGC	VG1245AN+956GGC*	VG1243AD+956GGC	VG1245AD+956GGC

*The VG1245AN valve has a Cv of 11.7 compared to the 15.1 CV of the older VG1243AC, check application needs before making substitution.

CROSS-REFERENCE OF DISCONTINUED VG1000 SERIES

Two-Way Ball Valves

DISCONTINUED MODEL	SUGGESTED REPLACEMENT	DISCONTINUED MODEL	SUGGESTED REPLACEMENT
VG1243AE	VG1245AE	VG1243AF	VG1245AN
VG1243AE+906AGA	VG1245AE+906AGA	VG1243AF+906AGA	VG1245AN+906AGA
VG1243AE+906AGC	VG1245AE+906AGC	VG1243AF+906AGC	VG1245AN+906AGC
VG1243AE+906GGA	VG1245AE+906GGA	VG1243AF+906GGA	VG1245AN+906GGA
VG1243AE+906GGC	VG1245AE+906GGC	VG1243AF+906GGC	VG1245AN+906GGC
VG1243AE+908AGA	VG1245AE+906IGA	VG1243AF+908AGA	VG1245AN+906IGA
VG1243AE+908AGC	VG1245AE+906IGC	VG1243AF+908AGC	VG1245AN+906IGC
VG1243AE+908GGA	VG1245AE+906GGA	VG1243AF+908GGA	VG1245AN+906GGA
VG1243AE+908GGC	VG1245AE+906GGC	VG1243AF+908GGC	VG1245AN+906GGC
VG1243AE+916AGA	VG1245AE+906IGA	VG1243AF+916AGA	VG1245AN+906IGA
VG1243AE+916AGC	VG1245AE+906IGC	VG1243AF+916AGC	VG1245AN+906IGC
VG1243AE+916GGA	VG1245AE+906GGA	VG1243AF+916GGA	VG1245AN+906GGA
VG1243AE+916GGC	VG1245AE+906GGC	VG1243AF+916GGC	VG1245AN+906GGC
VG1243AE+924AGA	VG1245AE+906IGA	VG1243AF+924AGA	VG1245AN+906IGA
VG1243AE+924AGC	VG1245AE+906IGC	VG1243AF+924AGC	VG1245AN+906IGC
VG1243AE+924GGA	VG1245AE+906GGA	VG1243AF+924GGA	VG1245AN+906GGA
VG1243AE+924GGC	VG1245AE+906GGC	VG1243AF+924GGC	VG1245AN+906GGC
VG1243AE+926AGA	VG1245AE+936AGA	VG1243AF+926AGA	VG1245AN+936AGA
VG1243AE+926AGC	VG1245AE+936AGC	VG1243AF+926AGC	VG1245AN+936AGC
VG1243AE+926BGA	VG1245AE+936BGA	VG1243AF+926BGA	VG1245AN+936BGA
VG1243AE+926BGC	VG1245AE+936BGC	VG1243AF+926BGC	VG1245AN+936BGC
VG1243AE+926HGA	VG1245AE+936GGA	VG1243AF+926HGA	VG1245AN+936GGA
VG1243AE+926HGC	VG1245AE+936GGC	VG1243AF+926HGC	VG1245AN+936GGC
VG1243AE+936AGA	VG1245AE+936AGA	VG1243AF+936AGA	VG1245AN+936AGA
VG1243AE+936AGC	VG1245AE+936AGC	VG1243AF+936AGC	VG1245AN+936AGC
VG1243AE+936GGA	VG1245AE+936GGA	VG1243AF+936GGA	VG1245AN+936GGA
VG1243AE+936GGC	VG1245AE+936GGC	VG1243AF+936GGC	VG1245AN+936GGC
VG1243AE+946AGA	VG1245AE+956AGA	VG1243AF+946AGA	VG1245AN+956AGA
VG1243AE+946AGC	VG1245AE+956AGC	VG1243AF+946AGC	VG1245AN+956AGC
VG1243AE+946BGA	VG1245AE+956BGA	VG1243AF+946BGA	VG1245AN+956BGA
VG1243AE+946BGC	VG1245AE+956BGC	VG1243AF+946BGC	VG1245AN+956BGC
VG1243AE+946HGA	VG1245AE+956GGA	VG1243AF+946HGA	VG1245AN+956GGA
VG1243AE+946HGC	VG1245AE+956GGC	VG1243AF+946HGC	VG1245AN+956GGC
VG1243AE+956AGA	VG1245AE+956AGA	VG1243AF+956AGA	VG1245AN+956AGA
VG1243AE+956AGC	VG1245AE+956AGC	VG1243AF+956AGC	VG1245AN+956AGC
VG1243AE+956GGA	VG1245AE+956GGA	VG1243AF+956GGA	VG1245AN+956GGA
VG1243AE+956GGC	VG1245AE+956GGC	VG1243AF+956GGC	VG1245AN+956GGC

CROSS-REFERENCE OF DISCONTINUED VG1000 SERIES

Two-Way Ball Valves

DISCONTINUED MODEL	SUGGESTED REPLACEMENT	DISCONTINUED MODEL	SUGGESTED REPLACEMENT
VG1243AG	VG1245AL	VG1243AG+926BGA	VG1245AL+936BGA
VG1243AG+906AGA	VG1245AL+906AGA	VG1243AG+926BGC	VG1245AL+936BGC
VG1243AG+906AGC	VG1245AL+906AGC	VG1243AG+926HGA	VG1245AL+936GGA
VG1243AG+906GGA	VG1245AL+906GGA	VG1243AG+926HGC	VG1245AL+936GGC
VG1243AG+906GGC	VG1245AL+906GGC	VG1243AG+936AGA	VG1245AL+936AGA
VG1243AG+908AGA	VG1245AL+906IGA	VG1243AG+936AGC	VG1245AL+936AGC
VG1243AG+908AGC	VG1245AL+906IGC	VG1243AG+936GGA	VG1245AL+936GGA
VG1243AG+908GGA	VG1245AL+906GGA	VG1243AG+936GGC	VG1245AL+936GGC
VG1243AG+908GGC	VG1245AL+906GGC	VG1243AG+946AGA	VG1245AL+956AGA
VG1243AG+916AGA	VG1245AL+906IGA	VG1243AG+946AGC	VG1245AL+956AGC
VG1243AG+916AGC	VG1245AL+906IGC	VG1243AG+946BGA	VG1245AL+956BGA
VG1243AG+916GGA	VG1245AL+906GGA	VG1243AG+946BGC	VG1245AL+956BGC
VG1243AG+916GGC	VG1245AL+906GGC	VG1243AG+946HGA	VG1245AL+956GGA
VG1243AG+924AGA	VG1245AL+906IGA	VG1243AG+946HGC	VG1245AL+956GGC
VG1243AG+924AGC	VG1245AL+906IGC	VG1243AG+956AGA	VG1245AL+956AGA
VG1243AG+924GGA	VG1245AL+906GGA	VG1243AG+956AGC	VG1245AL+956AGC
VG1243AG+924GGC	VG1245AL+906GGC	VG1243AG+956GGA	VG1245AL+956GGA
VG1243AG+926AGA	VG1245AL+936AGA	VG1243AG+956GGC	VG1245AL+956GGC
VG1243AG+926AGC	VG1245AL+936AGC	–	–

CROSS-REFERENCE OF DISCONTINUED VG1000 SERIES

Three-Way Ball Valves

IMPORTANT: VG1845 Series three-way valves have a different port configuration than VG1644 Series three-way valves. Piping changes will be required when converting from VG1644 Series to VG1845 Series.

DISCONTINUED MODEL	SUGGESTED REPLACEMENT	DISCONTINUED MODEL	SUGGESTED REPLACEMENT
VG1644AB	VG1845AG	VG1644BB+926AGA	VG1845BL+936AGA
VG1644AB+906AGA	VG1845AG+906AGA	VG1644BB+926AGC	VG1845BL+936AGC
VG1644AB+906AGC	VG1845AG+906AGC	VG1644BB+926BGA	VG1845BL+936BGA
VG1644AB+906GGA	VG1845AG+906GGA	VG1644BB+926BGC	VG1845BL+936BGC
VG1644AB+906GGC	VG1845AG+906GGC	VG1644BB+926GGA	VG1845BL+936GGA
VG1644AB+908AGA	VG1845AG+906IGA	VG1644BB+926GGC	VG1845BL+936GGC
VG1644AB+908AGC	VG1845AG+906IGC	VG1644BB+946AGA	VG1845BL+956AGA
VG1644AB+908GGA	VG1845AG+906GGA	VG1644BB+946AGC	VG1845BL+956AGC
VG1644AB+908GGC	VG1845AG+906GGC	VG1644BB+946BGA	VG1845BL+956BGA
VG1644AB+926AGA	VG1845AG+936AGA	VG1644BB+946BGC	VG1845BL+956BGC
VG1644AB+926AGC	VG1845AG+936AGC	VG1644BB+946GGA	VG1845BL+956GGA
VG1644AB+926BGA	VG1845AG+936BGA	VG1644BB+946GGC	VG1845BL+956GGC
VG1644AB+926BGC	VG1845AG+936BGC	VG1644CB	VG1845CP
VG1644AB+926HGA	VG1845AG+936GGA	VG1644CB+916AGA	VG1845CP+906IGA
VG1644AB+926HGC	VG1845AG+936GGC	VG1644CB+916AGC	VG1845CP+906IGC
VG1644AB+936AGA	VG1845AG+936AGA	VG1644CB+916GGA	VG1845CP+906GGA
VG1644AB+936AGC	VG1845AG+936AGC	VG1644CB+916GGC	VG1845CP+906GGC
VG1644AB+936GGA	VG1845AG+936GGA	VG1644CB+926AGA	VG1845CP+936AGA
VG1644AB+936GGC	VG1845AG+936GGC	VG1644CB+926AGC	VG1845CP+936AGC
VG1644AB+946AGA	VG1845AG+956AGA	VG1644CB+926BGA	VG1845CP+936BGA
VG1644AB+946AGC	VG1845AG+956AGC	VG1644CB+926BGC	VG1845CP+936BGC
VG1644AB+946BGA	VG1845AG+956BGA	VG1644CB+926GGA	VG1845CP+936GGA
VG1644AB+946BGC	VG1845AG+956BGC	VG1644CB+926GGC	VG1845CP+936GGC
VG1644AB+946HGA	VG1845AG+956GGA	VG1644CB+946AGA	VG1845CP+956AGA
VG1644AB+946HGC	VG1845AG+956GGC	VG1644CB+946AGC	VG1845CP+956AGC
VG1644AB+956AGA	VG1845AG+956AGA	VG1644CB+946BGA	VG1845CP+956BGA
VG1644AB+956AGC	VG1845AG+956AGC	VG1644CB+946BGC	VG1845CP+956BGC
VG1644AB+956GGA	VG1845AG+956GGA	VG1644CB+946GGA	VG1845CP+956GGA
VG1644AB+956GGC	VG1845AG+956GGC	VG1644CB+946GGC	VG1845CP+956GGC
VG1644BB	VG1845BL	VG1644DB	VG1845DR
VG1644BB+908AGA	VG1845BL+906IGA	VG1644DB+916AGA	VG1845DR+906IGA
VG1644BB+908AGC	VG1845BL+906IGC	VG1644DB+916AGC	VG1845DR+906IGC
VG1644BB+908GGA	VG1845BL+906GGA	VG1644DB+916GGA	VG1845DR+906GGA
VG1644BB+908GGC	VG1845BL+906GGC	VG1644DB+916GGC	VG1845DR+906GGC

CROSS-REFERENCE OF DISCONTINUED VG1000 SERIES

Three-Way Ball Valves

IMPORTANT: VG1845 Series three-way valves have a different port configuration than VG1644 Series three-way valves. Piping changes will be required when converting from VG1644 Series to VG1845 Series.

DISCONTINUED MODEL	SUGGESTED REPLACEMENT	DISCONTINUED MODEL	SUGGESTED REPLACEMENT
VG1644DB+926AGA	VG1845DR+936AGA	VG1644DB+946BGC	VG1845DR+956BGC
VG1644DB+926AGC	VG1845DR+936AGC	VG1644DB+946GGA	VG1845DR+956GGA
VG1644DB+926BGA	VG1845DR+936BGA	VG1644DB+946GGC	VG1845DR+956GGC
VG1644DB+926BGC	VG1845DR+936BGC	VG1644EB	VG1845ES
VG1644DB+926GGA	VG1845DR+936GGA	VG1644EB+924AGA	VG1845ES+906IGA
VG1644DB+926GGC	VG1845DR+936GGC	VG1644EB+924AGA	VG1845ES+906IGC
VG1644DB+946AGA	VG1845DR+956AGA	VG1644EB+924AGA	VG1845ES+906GGA
VG1644DB+946AGC	VG1845DR+956AGC	VG1644EB+924AGA	VG1845ES+906GGC
VG1644DB+946BGA	VG1845DR+956BGA	–	–

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Non-Spring Return

	Siemens			Johnson Controls		
	Two-Way Non-Spring Return					
Size (in.)	**Cv**	**Floating**	**Proportional**	**Cv**	**Floating**	**Proportional**
1/2	0.4	171A-10203	171C-10203	–	–	–
	0.63	171A-10204	171C-10204	1.2	VG1241AD+906AGA	VG1241AD+906GGA
	1.6	171A-10205	171C-10205	1.9	VG1241AE+906AGA	VG1241AE+906GGA
	2.5	171A-10206	171C-10206	2.9	VG1241AF+906AGA	VG1241AF+906GGA
	4	171A-10207	171C-10207	4.7	VG1241AG+906AGA	VG1241AG+906GGA
	–	–	–	7.4	VG1241AL+906AGA	VG1241AL+906GGA
	10	171A-10208	171C-10208	11.7	VG1241AN+906AGA	VG1241AN+906GGA
3/4	–	–	–	4.7	VG1241BG+906AGA	VG1241BG+906GGA
	–	–	–	7.4	VG1241BL+906AGA	VG1241BL+906GGA
	10	171A-10209	171C-10209	11.7	VG1241BN+906AGA	VG1241BN+906GGA
	25	171A-10210	171C-10210	28.7	VG1243BC+906AGA	VG1243BC+906GGA
1	–	–	–	7.4	VG1241CL+906AGA	VG1241CL+906GGA
	10	171A-10211	171C-10211	11.7	VG1241CN+906AGA	VG1241CN+906GGA
	16	171A-10213	171C-10213	18.7	VG1241CP+906AGA	VG1241CP+906GGA
	25	171A-10212	171C-10212	48.3	VG1243CC+916AGA	VG1243CC+916HGA
	63	171A-10214	171C-10214	–	–	–
1-1/4	–	–	–	11.7	VG1241DN+906AGA	VG1241DN+906GGA
	16	171A-10215	171C-10215	18.7	VG1241DP+906AGA	VG1241DP+906GGA
	–	–	–	29.2	VG1241DR+906AGA	VG1241DR+906GGA
	40	171A-10216	171C-10216	82.6	VG1243DC+916AGA	VG1243DC+916HGA
	100	171A-10217	171C-10217	–	–	–
1-1/2	–	–	–	18.7	VG1241EP+906AGA	VG1241EP+906GGA
	25	171B-10218	171D-10218	29.2	VG1241ER+906AGA	VG1241ER+906GGA
	40	171B-10220	171D-10220	46.8	VG1241ES+906AGA	VG1241ES+906GGA
	63	171B-10219	171D-10219	–	–	–
	160	171B-10221	171D-10221	143.4	VG1243EC+924AGA	VG1243EC+924HGA
2	–	–	–	29.2	VG1241FR+909AGA	VG1241FR+909GGA
	40	171B-10222	171D-10222	46.8	VG1241FS+909AGA	VG1241FS+909GGA
	63	171B-10224	171D-10224	73.7	VG1241FT+909AGA	VG1241FT+909GGA
	100	171B-10223	171D-10223	–	–	–
	250	171B-10225	171D-10225	–	–	–
	Three-Way Non-Spring Return					
1/2	0.4	171A-10250	171C-10250	–	–	–
	0.63	171A-10251	171C-10251	1.2	VG1841AD+906AGA	VG1841AD+906GGA
	1.0	171A-10252	171C-10252	1.9	VG1841AE+906AGA	VG1841AE+906GGA
	2.5	171A-10253	171C-10253	2.9	VG1841AF+906AGA	VG1841AF+906GGA
	4	171A-10254	171C-10254	4.7	VG1841AG+906AGA	VG1841AG+906GGA
	–	–	–	7.4	VG1841AL+906AGA	VG1841AL+906GGA
	10	171A-10255	171C-10255	11.7	VG1841AN+906AGA	VG1841AN+906GGA
3/4	–	–	–	4.7	VG1841BG+906AGA	VG1841BG+906GGA
	–	–	–	7.4	VG1841BL+906AGA	VG1841BL+906GGA
	–	–	–	11.7	VG1841BN+906AGA	VG1841BN+906GGA
	16	171A-10256	171C-10256	–	–	–
1	–	–	–	7.4	VG1841CL+906AGA	VG1841CL+906GGA
	10	171A-10257	171C-10257	11.7	VG1841CN+906AGA	VG1841CN+906GGA
	16	171A-10258	171C-10258	18.7	VG1841CP+906AGA	VG1841CP+906GGA
	25	171A-10259	171C-10259	–	–	–
1-1/4	–	–	–	11.7	VG1841DN+906AGA	VG1841DN+906GGA
	16	171A-10260	171C-10260	18.7	VG1841DP+906AGA	VG1841DP+906GGA
	–	–	–	29.2	VG1841DR+906AGA	VG1841DR+906GGA
	40	171A-10261	171C-10261	–	–	–
1-1/2	16	171B-10262	171D-10262	18.7	VG1841EP+906AGA	VG1841EP+906GGA
	25	171B-10263	171D-10263	29.2	VG1841ER+906AGA	VG1841ER+906GGA
	–	–	–	46.8	VG1841ES+906AGA	VG1841ES+906GGA
	63	171B-10264	171D-10264	–	–	–
2	25	171B-10265	171D-10265	29.2	VG1841FR+909AGA	VG1841FR+909GGA
	40	171B-10266	171D-10266	46.8	VG1841FS+909AGA	VG1841FS+909GGA
	–	–	–	73.7	VG1841FT+909AGA	VG1841FT+909GGA
	100	171B-10267	171D-10267	–	–	–

CROSS-REFERENCE
SIEMENS to JOHNSON CONTROLS

Spring Return

	Siemens				Johnson Controls			
	Two-Way Spring Return							
Size (in.)	**Cv**	**On/Off**	**Floating**	**Proportional**	**Cv**	**On/Off**	**Floating**	**Proportional**
1/2	0.4	171E-10203	171F-10203	171G-10203	–	–	–	–
	0.63	171E-10204	171F-10204	171G-10204	1.2	VG1241AD+936BGA	VG1241AD+936AGA	VG1241AD+936G
	1.6	171E-10205	171F-10205	171G-10205	1.9	VG1241AE+936BGA	VG1241AE+936AGA	VG1241AE+936GGA
	2.5	171E-10206	171F-10206	171G-10206	2.9	VG1241AF+936BGA	VG1241AF+936AGA	VG1241AF+936GGA
	4	171E-10207	171F-10207	171G-10207	4.7	VG1241AG+936BGA	VG1241AG+936AGA	VG1241AG+936GGA
	–	–	–	–	7.4	VG1241AL+936BGA	VG1241AL+936AGA	VG1241AL+936GGA
	10	171E-10208	171F-10208	171G-10208	11.7	VG1241AN+936BGA	VG1241AN+936AGA	VG1241AN+936GGA
3/4	–	–	–	–	4.7	VG1241BG+936BGA	VG1241BG+936AGA	VG1241BG+936GGA
	–	–	–	–	7.4	VG1241BL+936BGA	VG1241BL+936AGA	VG1241BL+936GGA
	10	171E-10209	171F-10209	171G-10209	11.7	VG1241BN+936BGA	VG1241BN+936AGA	VG1241BN+936GGA
	25	171E-10210	171F-10210	171G-10210	28.7	Same as floating	VG1243BC+906AGA	VG1243BC+906GGA
1	–	–	–	–	7.4	VG1241CL+936BGA	VG1241CL+936AGA	VG1241CL+936GGA
	10	171E-10211	171F-10211	171G-10211	11.7	VG1241CN+936BGA	VG1241CN+936AGA	VG1241CN+936GGA
	16	171E-10213	171F-10213	171G-10213	18.7	VG1241CP+936BGA	VG1241CP+936AGA	VG1241CP+936GGA
	25	171E-10212	171F-10212	171G-10212	48.3	–	VG1243CC+926AGA	VG1243CC+926HGA
	63	171E-10214	171F-10214	171G-10214	–	–	–	–
1-1/4	–	–	–	–	11.7	VG1241DN+936BGA	VG1241DN+936AGA	VG1241DN+936GGA
	16	171E-10215	171F-10215	171G-10215	18.7	VG1241DP+936BGA	VG1241DP+936AGA	VG1241DP+936GGA
	–	–	–	–	29.2	VG1241DR+936BGA	VG1241DR+936AGA	VG1241DR+936GGA
	40	171E-10216	171F-10216	171G-10216	82.6	–	VG1243DC+926AGA	VG1243DC+926HGA
	100	171E-10217	171F-10217	171G-10217	–	–	–	–
1-1/2	–	–	–	–	18.7	VG1241EP+936BGA	VG1241EP+936AGA	VG1241EP+936GGA
	25	171E-10218	171F-10218	171G-10218	29.2	VG1241ER+936BGA	VG1241ER+936AGA	VG1241ER+936GGA
	40	171E-10220	171F-10220	171G-10220	46.8	VG1241ES+936BGA	VG1241ES+936AGA	VG1241ES+936GGA
	63	171E-10219	171F-10219	171G-10219	–	–	–	–
	160	171E-10221	171F-10221	171G-10221	–	–	–	–
2	–	–	–	–	29.2	VG1241FR+926BGA	VG1241FR+926AGA	VG1241FR+926GGA
	40	171E-10222	171F-10222	171G-10222	46.8	VG1241FS+926BGA	VG1241FS+926AGA	VG1241FS+926GGA
	63	171E-10224	171F-10224	171G-10224	73.7	VG1241FT+926BGA	VG1241FT+926AGA	VG1241FT+926GGA
	100	171E-10223	171F-10223	171G-10223	–	–	–	–
	250	171E-10225	171F-10225	171G-10225	–	–	–	–
	Three-Way Spring Return							
1/2	0.4	171E-10250	171F-10250	171G-10250	–	–	–	–
	0.63	171E-10251	171F-10251	171G-10251	1.2	VG1841AD+936BGA	VG1841AD+936AGA	VG1841AD+936GGA
	1.6	171E-10252	171F-10252	171G-10252	1.9	VG1841AE+936BGA	VG1841AE+936AGA	VG1841AE+936GGA
	2.5	171E-10253	171F-10253	171G-10253	2.9	VG1841AF+936BGA	VG1841AF+936AGA	VG1841AF+936GGA
	4	171E-10254	171F-10254	171G-10254	4.7	VG1841AG+936BGA	VG1841AG+936AGA	VG1841AG+936GGA
	–	–	–	–	7.4	VG1841AL+936BGA	VG1841AL+936AGA	VG1841AL+936GGA
	10	171E-10255	171F-10255	171G-10255	11.7	VG1841AN+936BGA	VG1841AN+936AGA	VG1841AN+936GGA
3/4	–	–	–	–	4.7	VG1841BG+936BGA	VG1841BG+936AGA	VG1841BG+936GGA
	–	–	–	–	7.4	VG1841BL+936BGA	VG1841BL+936AGA	VG1841BL+936GGA
	–	–	–	–	11.7	VG1841BN+936BGA	VG1841BN+936AGA	VG1841BN+936GGA
	16	171E-10256	171F-10256	171G-10256	–	–	–	–
1	–	–	–	–	7.4	VG1841DN+936BGA	VG1841DN+936AGA	VG1841DN+936GGA
	10	171E-10257	171F-10257	171G-10257c	11.7	VG1841DP+936BGA	VG1841DP+936AGA	VG1841DP+936GGA
	16	171E-10258	171F-10258	171G-10258	18.7	VG1841DR+936BGA	VG1841DR+936AGA	VG1841DR+936GGA
	25	171E-10259	171F-10259	171G-10259	–	–	–	–
1-1/4	–	–	–	–	11.7	VG1841DN+936BGA	VG1841DN+936AGA	VG1841DN+936GGA
	16	171E-10260	171F-10260	171G-10260	18.7	VG1841DP+936BGA	VG1841DP+936AGA	VG1841DP+936GGA
	–	–	–	–	29.2	VG1841DR+936BGA	VG1841DR+936AGA	VG1841DR+936GGA
	40	171E-10261	171F-10261	171G-10261	–	–	–	–
1-1/2	16	171E-10262	171F-10262	171G-10262	18.7	VG1841EP+936BGA	VG1841EP+936AGA	VG1841EP+936GGA
	25	171E-10263	171F-10263	171G-10263	29.2	VG1841ER+936BGA	VG1841ER+936AGA	VG1841ER+936GGA
	–	–	–	–	46.8	VG1841ES+936BGA	VG1841ES+936AGA	VG1841ES+936GGA
	63	171E-10264	171F-10264	171G-10264	–	–	–	–
2	25	171E-10265	171F-10265	171G-10265	29.2	VG1841FR+926BGA	VG1841FR+926AGA	VG1841FR+926GGA
	40	171E-10266	171F-10266	171G-10266	46.8	VG1841FS+926BGA	VG1841FS+926AGA	VG1841FS+926GGA
	–	–	–	–	73.7	VG1841FT+926BGA	VG1841FT+926AGA	VG1841FT+926GGA
	100	171E-10267	171F-10267	171G-10267	–	–	–	–

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Non-Spring Return

	Belimo			Johnson Controls			
	Two-Way Non-Spring Return – Chrome Plated Brass Ball						
	without Auxiliary Switches			without Auxiliary Switches			
Size (in.)	Cv	Floating	Proportional	Cv	Floating	Floating without timeout	Proportional with timeout
1/2	0.8	B209B-LR24-3 US	B209B-LR24-SR US	–	–	–	–
	1.2	B210B-LR24-3 US	B210B-LR24-SR US	1.2	VG1241AD+906AGA	VG1241AD+906IGA	VG1241AD+906GGA
	1.9	B211B-LR24-3 US	B211B-LR24-SR US	1.9	VG1241AE+906AGA	VG1241AE+906IGA	VG1241AE+906GGA
	3.0	B212B-LR24-3 US	B212B-LR24-SR US	2.9	VG1241AF+906AGA	VG1241AF+906IGA	VG1241AF+906GGA
	4.7	B213B-LR24-3 US	B213B-LR24-SR US	4.7	VG1241AG+906AGA	VG1241AG+906IGA	VG1241AG+906GGA
	7.4	B214B-LR24-3 US	B214B-LR24-SR US	7.4	VG1241AL+906AGA	VG1241AL+906IGA	VG1241AL+906GGA
	10	B215B-LR24-3 US	B215B-LR24-SR US	11.7	VG1241AN+906AGA	VG1241AN+906IGA	VG1241AN+906GGA
3/4	4.7	B217B-LR24-3 US	B217B-LR24-SR US	4.7	VG1241BG+906AGA	VG1241BG+906IGA	VG1241BG+906GGA
	7.4	B218B-LR24-3 US	B218B-LR24-SR US	7.4	VG1241BL+906AGA	VG1241BL+906IGA	VG1241BL+906GGA
	10	B219B-LR24-3 US	B219B-LR24-SR US	11.7	VG1241BN+906AGA	VG1241BN+906IGA	VG1241BN+906GGA
	24	B220B-LR24-3 US	B220B-LR24-SR US	28.7	VG1243BC+906AGA	–	VG1243BC+906GGA
1	7.4	B222B-LR24-3 US	B222B-LR24-SR US	7.4	VG1241CL+906AGA	VG1241CL+906IGA	VG1241CL+906GGA
	10	B223B-LR24-3 US	B223B-LR24-SR US	11.7	VG1241CN+906AGA	VG1241CN+906IGA	VG1241CN+906GGA
	19	B224B-LR24-3 US	B224B-LR24-SR US	18.7	VG1241CP+906AGA	VG1241CP+906IGA	VG1241CP+906GGA
	30	B225B-LR24-3 US	B225B-LR24-SR US	48.3	VG1243CC+916AGA	–	VG1243CC+916HGA
1-1/4	10	B229B-LR24-3 US	B229B-LR24-SR US	11.7	VG1241DN+906AGA	VG1241DN+906IGA	VG1241DN+906GGA
	19	B230B-LR24-3 US	B230B-LR24-SR US	18.7	VG1241DP+906AGA	VG1241DP+906IGA	VG1241DP+906GGA
	25	B231B-NM24 US	B231B-NM24-SR US	29.2	VG1241DR+906AGA	VG1241DR+906IGA	VG1241DR+906GGA
	37	B232B-NM24 US	B232B-NM24-SR US	82.6	VG1243DC+916AGA	–	VG1243DC+916HGA
1-1/2	19	B238B-NM24 US	B238B-NM24-SR US	18.7	VG1241EP+906AGA	VG1241EP+906IGA	VG1241EP+906GGA
	29	B239B-NM24 US	B239B-NM24-SR US	29.2	VG1241ER+906AGA	VG1241ER+906IGA	VG1241ER+906GGA
	37	B240B-NM24 US	B240B-NM24-SR US	46.8	VG1241ES+906AGA	VG1241ES+906IGA	VG1241ES+906GGA
	–	–	–	143.4	VG1243EC+924AGA	–	VG1243EC+924HGA
2	29	B248B-NM24 US	B248B-NM24-SR US	29.2	VG1241FR+909AGA	–	VG1241FR+909GGA
	46	B249B-NM24 US	B249B-NM24-SR US	46.8	VG1241FS+909AGA	–	VG1241FS+909GGA
	57	B250B-NM24 US	B250B-NM24-SR US	73.7	VG1241FT+909AGA	–	VG1241FT+909GGA
	with One Auxiliary Switch			with Two Auxiliary Switches			
1/2	0.8	B209B-LR24-3-S US	–	–	–	–	–
	1.2	B210B-LR24-3-S US	–	1.2	VG1241AD+906AGC	VG1241AD+906IGC	VG1241AD+906GGC
	1.9	B211B-LR24-3-S US	–	1.9	VG1241AE+906AGC	VG1241AE+906IGC	VG1241AE+906GGC
	3.0	B212B-LR24-3-S US	–	2.9	VG1241AF+906AGC	VG1241AF+906IGC	VG1241AF+906GGC
	4.7	B213B-LR24-3-S US	–	4.7	VG1241AG+906AGC	VG1241AG+906IGC	VG1241AG+906GGC
	7.4	B214B-LR24-3-S US	–	7.4	VG1241AL+906AGC	VG1241AL+906IGC	VG1241AL+906GGC
	10	B215B-LR24-3-S US	–	11.7	VG1241AN+906AGC	VG1241AN+906IGC	VG1241AN+906GGC
3/4	4.7	B217B-LR24-3-S US	–	4.7	VG1241BG+906AGC	VG1241BG+906IGC	VG1241BG+906GGC
	7.4	B218B-LR24-3-S US	–	7.4	VG1241BL+906AGC	VG1241BL+906IGC	VG1241BL+906GGC
	10	B219B-LR24-3-S US	–	11.7	VG1241BN+906AGC	VG1241BN+906IGC	VG1241BN+906GGC
	24	B220B-LR24-3-S US	–	28.7	VG1243BC+906AGC	–	VG1243BC+906GGC
1	7.4	B222B-LR24-3-S US	–	7.4	VG1241CL+906AGC	VG1241CL+906IGC	VG1241CL+906GGC
	10	B223B-LR24-3-S US	–	11.7	VG1241CN+906AGC	VG1241CN+906IGC	VG1241CN+906GGC
	19	B224B-LR24-3-S US	–	18.7	VG1241CP+906AGC	VG1241CP+906IGC	VG1241CP+906GGC
	30	B225B-LR24-3-S US	–	48.3	VG1243CC+916AGC	–	VG1243CC+916HGC
1-1/4	10	B229B-LR24-3-S US	–	11.7	VG1241DN+906AGC	VG1241DN+906IGC	VG1241DN+906GGC
	19	B230B-LR24-3-S US	–	18.7	VG1241DP+906AGC	VG1241DP+906IGC	VG1241DP+906GGC
	–	–	–	29.2	VG1241DR+906AGC	VG1241DR+906IGC	VG1241DR+906GGC
1-1/2	–	–	–	18.7	VG1241EP+906AGC	VG1241EP+906IGC	VG1241EP+906GGC
	–	–	–	29.2	VG1241ER+906AGC	VG1241ER+906IGC	VG1241ER+906GGC
	–	–	–	46.8	VG1241ES+906AGC	VG1241ES+906IGC	VG1241ES+906GGC
2	–	–	–	29.2	VG1241FR+909AGC	–	VG1241FR+909GGC
	–	–	–	46.8	VG1241FS+909AGC	–	VG1241FS+909GGC
	–	–	–	73.7	VG1241FT+909AGC	–	VG1241FT+909GGC

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Non-Spring Return

	Belimo			Johnson Controls			
	Three-Way Non-Spring Return – Chrome Plated Brass Ball						
	without Auxiliary Switches			without Auxiliary Switches			
Size (in.)	Cv	Floating	Proportional	Cv	Floating without timeout	Floating with timeout	Proportional
1/2	0.8	B309B-LR24-3 US	B309B-LR24-SR US	–	–	–	–
	1.2	B310B-LR24-3 US	B310B-LR24-SR US	1.2	VG1841AD+906AGA	VG1841AD+906IGA	VG1841AD+906GGA
	1.9	B311B-LR24-3 US	B311B-LR24-SR US	1.9	VG1841AE+906AGA	VG1841AE+906IGA	VG1841AE+906GGA
	3.0	B312B-LR24-3 US	B312B-LR24-SR US	2.9	VG1841AF+906AGA	VG1841AF+906IGA	VG1841AF+906GGA
	4.7	B313B-LR24-3 US	B313B-LR24-SR US	4.7	VG1841AG+906AGA	VG1841AG+906IGA	VG1841AG+906GGA
	–	–	–	7.4	VG1841AL+906AGA	VG1841AL+906IGA	VG1841AL+906GGA
	10	B315B-LR24-3 US	B315B-LR24-SR US	11.7	VG1841AN+906AGA	VG1841AN+906IGA	VG1841AN+906GGA
3/4	4.7	B317B-LR24-3 US	B317B-LR24-SR US	4.7	VG1841BG+906AGA	VG1841BG+906IGA	VG1841BG+906GGA
	7.4	B318B-LR24-3 US	B318B-LR24-SR US	7.4	VG1841BL+906AGA	VG1841BL+906IGA	VG1841BL+906GGA
	–	–	–	11.7	VG1841BN+906AGA	VG1841BN+906IGA	VG1841BN+906GGA
	24	B320B-LR24-3 US	B320B-LR24-SR US	–	–	–	–
1	7.4	B322B-LR24-3 US	B322B-LR24-SR US	7.4	VG1841CL+906AGA	VG1841CL+906IGA	VG1841CL+906GGA
	10	B323B-LR24-3 US	B323B-LR24-SR US	11.7	VG1841CN+906AGA	VG1841CN+906IGA	VG1841CN+906GGA
	–	–	–	18.7	VG1841CP+906AGA	VG1841CP+906IGA	VG1841CP+906GGA
	30	B325B-LR24-3 US	B325B-LR24-SR US	–	–	–	–
1-1/4	10	B329B-LR24-3 US	B329B-LR24-SR US	11.7	VG1841DN+906AGA	VG1841DN+906IGA	VG1841DN+906GGA
	19	B330B-LR24-3 US	B330B-LR24-SR US	18.7	VG1841DP+906AGA	VG1841DP+906IGA	VG1841DP+906GGA
	25	B331B-NM24 US	B331B-NM24-SR US	29.2	VG1841DR+906AGA	VG1841DR+906IGA	VG1841DR+906GGA
	37	B332B-NM24 US	B332B-NM24-SR US	–	–	–	–
1-1/2	19	B338B-NM24 US	B338B-NM24-SR US	18.7	VG1841EP+906AGA	VG1841EP+906IGA	VG1841EP+906GGA
	29	B339B-NM24 US	B339B-NM24-SR US	29.2	VG1841ER+906AGA	VG1841ER+906IGA	VG1841ER+906GGA
	37	B340B-NM24 US	B340B-NM24-SR US	46.8	VG1841ES+906AGA	VG1841ES+906IGA	VG1841ES+906GGA
2	29	B348B-NM24 US	B348B-NM24-SR US	29.2	VG1841FR+909AGA	–	VG1841FR+909GGA
	46	B349B-NM24 US	B349B-NM24-SR US	46.8	VG1841FS+909AGA	–	VG1841FS+909GGA
	57	B350B-NM24 US	B350B-NM24-SR US	73.7	VG1841FT+909AGA	–	VG1841FT+909GGA
	with One Auxiliary Switch			with Two Auxiliary Switches			
1/2	0.8	B309B-LR24-3-S US	–	–	–	–	–
	1.2	B310B-LR24-3-S US	–	1.2	VG1841AD+906AGC	VG1841AD+906IGC	VG1841AD+906GGC
	1.9	B311B-LR24-3-S US	–	1.9	VG1841AE+906AGC	VG1841AE+906IGC	VG1841AE+906GGC
	3.0	B312B-LR24-3-S US	–	2.9	VG1841AF+906AGC	VG1841AF+906IGC	VG1841AF+906GGC
	4.7	B313B-LR24-3-S US	–	4.7	VG1841AG+906AGC	VG1841AG+906IGC	VG1841AG+906GGC
	–	–	–	7.4	VG1841AL+906AGC	VG1841AL+906IGC	VG1841AL+906GGC
	10	B315B-LR24-3-S US		11.7	VG1841AN+906AGC	VG1841AN+906IGC	VG1841AN+906GGC
3/4	4.7	B317B-LR24-3-S US	–	4.7	VG1841BG+906AGC	VG1841BG+906IGC	VG1841BG+906GGC
	7.4	B318B-LR24-3-S US	–	7.4	VG1841BL+906AGC	VG1841BL+906IGC	VG1841BL+906GGC
	–	–	–	11.7	VG1841BN+906AGC	VG1841BN+906IGC	VG1841BN+906GGC
	24	B320B-LR24-3-S US	–	–	–	–	–
1	7.4	B322B-LR24-3-S US	–	7.4	VG1841CL+906AGC	VG1841CL+906IGC	VG1841CL+906GGC
	10	B323B-LR24-3-S US	–	11.7	VG1841CN+906AGC	VG1841CN+906IGC	VG1841CN+906GGC
	–	–	–	18.7	VG1841CP+906AGC	VG1841CP+906IGC	VG1841CP+906GGC
	30	B325B-LR24-3-S US	–	–	–	–	–
1-1/4	10	B329B-LR24-3-S US	–	11.7	VG1841DN+906AGC	VG1841DN+906IGC	VG1841DN+906GGC
	19	B330B-LR24-3-S US	–	18.7	VG1841DP+906AGC	VG1841DP+906IGC	VG1841DP+906GGC
	–	–	–	29.2	VG1841DR+906AGC	VG1841DR+906IGC	VG1841DR+906GGC
1-1/2	–	–	–	18.7	VG1841EP+906AGC	VG1841EP+906IGC	VG1841EP+906GGC
	–	–	–	29.2	VG1841ER+906AGC	VG1841ER+906IGC	VG1841ER+906GGC
	–	–	–	46.8	VG1841ES+906AGC	VG1841ES+906IGC	VG1841ES+906GGC
2	–	–	–	29.2	VG1841FR+909AGC	–	VG1841FR+909GGC
	–	–	–	46.8	VG1841FS+909AGC	–	VG1841FS+909GGC
	–	–	–	73.7	VG1841FT+909AGC	–	VG1841FT+909GGC

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Spring Return

	Belimo			Johnson Controls		
	Two-Way Spring Return – Chrome Plated Brass Ball					
	On/Off Control without Auxiliary Switches			On/Off Control without Auxiliary Switches		
Size (in.)	Cv	24 VAC	120 VAC	Cv	24 VAC	120 VAC
1/2	0.8	B209B-LF24 US	B209B-LF120 US	–	–	–
	1.2	B210B-LF24 US	B210B-LF120 US	1.2	VG1241AD+936BGA	VG1241AD+936BAA
	1.9	B211B-LF24 US	B211B-LF120 US	1.9	VG1241AE+936BGA	VG1241AE+936BAA
	3.0	B212B-LF24 US	B212B-LF120 US	2.9	VG1241AF+936BGA	VG1241AF+936BAA
	4.7	B213B-LF24 US	B213B-LF120 US	4.7	VG1241AG+936BGA	VG1241AG+936BAA
	7.4	B214B-LF24 US	B214B-LF120 US	7.4	VG1241AL+936BGA	VG1241AL+936BAA
	10	B215B-LF24 US	B215B-LF120 US	11.7	VG1241AN+936BGA	VG1241AN+936BAA
3/4	4.7	B217B-LF24 US	B217B-LF120 US	4.7	VG1241BG+936BGA	VG1241BG+936BAA
	7.4	B218B-LF24 US	B218B-LF120 US	7.4	VG1241BL+936BGA	VG1241BL+936BAA
	10	B219B-LF24 US	B219B-LF120 US	11.7	VG1241BN+936BGA	VG1241BN+936BAA
	24	B220B-LF24 US	B220B-LF120 US	–	–	–
1	7.4	B222B-LF24 US	B222B-LF120 US	7.4	VG1241CL+936BGA	VG1241CL+936BAA
	10	B223B-LF24 US	B223B-LF120 US	11.7	VG1241CN+936BGA	VG1241CN+936BAA
	19	B224B-LF24 US	B224B-LF120 US	18.7	VG1241CP+936BGA	VG1241CP+936BAA
	30	B225B-LF24 US	B225B-LF120 US	–	–	–
1-1/4	10	B229B-LF24 US	B229B-LF120 US	11.7	VG1241DN+936BGA	VG1241DN+936BAA
	19	B230B-LF24 US	B230B-LF120 US	18.7	VG1241DP+936BGA	VG1241DP+936BAA
	25	B231B-NF24 US	B231B-NF120 US	29.2	VG1241DR+936BGA	VG1241DR+936BAA
	37	B232B-NF24 US	B232B-NF120 US	–	–	–
1-1/2	19	B238B-NF24 US	B238B-NF120 US	18.7	VG1241EP+936BGA	VG1241EP+936BAA
	29	B239B-NF24 US	B239B-NF120 US	29.2	VG1241ER+936BGA	VG1241ER+936BAA
	37	B240B-NF24 US	B240B-NF120 US	46.8	VG1241ES+936BGA	VG1241ES+936BAA
2	29	B248B-AF24 US	B248B-AF120 US	29.2	VG1241FR+926BGA	VG1241FR+926BAA
	46	B249B-AF24 US	B249B-AF120 US	46.8	VG1241FS+926BGA	VG1241FS+926BAA
	57	B250B-AF24 US	B250B-AF120 US	73.7	VG1241FT+926BGA	VG1241FT+926BAA
	On/Off Control with One Auxiliary Switch			On/Off Control with One Auxiliary Switch		
1/2	0.8	B209B-LF24-S US	B209B-LF120-S US	–	–	–
	1.2	B210B-LF24-S US	B210B-LF120-S US	1.2	VG1241AD+936BGB	VG1241AD+936BAB
	1.9	B211B-LF24-S US	B211B-LF120-S US	1.9	VG1241AE+936BGB	VG1241AE+936BAB
	3.0	B212B-LF24-S US	B212B-LF120-S US	2.9	VG1241AF+936BGB	VG1241AF+936BAB
	4.7	B213B-LF24-S US	B213B-LF120-S US	4.7	VG1241AG+936BGB	VG1241AG+936BAB
	7.4	B214B-LF24-S US	B214B-LF120-S US	7.4	VG1241AL+936BGB	VG1241AL+936BAB
	10	B215B-LF24-S US	B215B-LF120-S US	11.7	VG1241AN+936BGB	VG1241AN+936BAB
3/4	4.7	B217B-LF24-S US	B217B-LF120-S US	4.7	VG1241BG+936BGB	VG1241BG+936BAB
	7.4	B218B-LF24-S US	B218B-LF120-S US	7.4	VG1241BL+936BGB	VG1241BL+936BAB
	10	B219B-LF24-S US	B219B-LF120-S US	11.7	VG1241BN+936BGB	VG1241BN+936BAB
	24	B220B-LF24-S US	B220B-LF120-S US	–	–	–
1	7.4	B222B-LF24-S US	B222B-LF120-S US	7.4	VG1241CL+936BGB	VG1241CL+936BAB
	10	B223B-LF24-S US	B223B-LF120-S US	11.7	VG1241CN+936BGB	VG1241CN+936BAB
	19	B224B-LF24-S US	B224B-LF120-S US	18.7	VG1241CP+936BGB	VG1241CP+936BAB
	30	B225B-LF24-S US	B225B-LF120-S US	–	–	–
1-1/4	10	B229B-LF24-S US	B229B-LF120-S US	11.7	VG1241DN+936BGB	VG1241DN+936BAB
	19	B230B-LF24-S US	B230B-LF120-S US	18.7	VG1241DP+936BGB	VG1241DP+936BAB
	25	B231B-NF24-S US	B231B-NF120-S US	29.2	VG1241DR+936BGB	VG1241DR+936BAB
	37	B232B-NF24-S US	B232B-NF120-S US	–	–	–
1-1/2	19	B238B-NF24-S US	B238B-NF120-S US	18.7	VG1241EP+936BGB	VG1241EP+936BAB
	29	B239B-NF24-S US	B239B-NF120-S US	29.2	VG1241ER+936BGB	VG1241ER+936BAB
	37	B240B-NF24-S US	B240B-NF120-S US	46.8	VG1241ES+936BGB	VG1241ES+936BAB
2	29	B248B-AF24-S US*	B248B-AF120-S US*	29.2	VG1241FR+926BGC	VG1241FR+926BAC
	46	B249B-AF24-S US*	B249B-AF120-S US*	46.8	VG1241FS+926BGC	VG1241FS+926BAC
	57	B250B-AF24-S US*	B250B-AF120-S US*	73.7	VG1241FT+926BGC	VG1241FT+926BAC

* AF Series Actuator have Two Single-Pole-Double-Throw Switches

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Spring Return

	Belimo			Johnson Controls		
	Two-Way Spring Return – Chrome Plated Brass Ball					
	without Auxiliary Switches			without Auxiliary Switches		
Size (in.)	Cv	24 VAC Floating	0 to 10 VDC Proportional	Cv	24 VAC Floating	0 to 10 VDC Proportional
1/2	0.8	B209B-LF24-3 US	B209B-LF24-SR US	–	–	–
	1.2	B210B-LF24-3 US	B210B-LF24-SR US	1.2	VG1241AD+936AGA	VG1241AD+936GGA
	1.9	B211B-LF24-3 US	B211B-LF24-SR US	1.9	VG1241AE+936AGA	VG1241AE+936GGA
	3.0	B212B-LF24-3 US	B212B-LF24-SR US	2.9	VG1241AF+936AGA	VG1241AF+936GGA
	4.7	B213B-LF24-3 US	B213B-LF24-SR US	4.7	VG1241AG+936AGA	VG1241AG+936GGA
	7.4	B214B-LF24-3 US	B214B-LF24-SR US	7.4	VG1241AL+936AGA	VG1241AL+936GGA
	10	B215B-LF24-3 US	B215B-LF24-SR US	11.7	VG1241AN+936AGA	VG1241AN+936GGA
3/4	4.7	B217B-LF24-3 US	B217B-LF24-SR US	4.7	VG1241BG+936AGA	VG1241BG+936GGA
	7.4	B218B-LF24-3 US	B218B-LF24-SR US	7.4	VG1241BL+936AGA	VG1241BL+936GGA
	10	B219B-LF24-3 US	B219B-LF24-SR US	11.7	VG1241BN+936AGA	VG1241BN+936GGA
	24	B220B-LF24-3 US	B220B-LF24-SR US	28.7	VG1243BC+936AGA	VG1243BC+936GGA
1	7.4	B222B-LF24-3 US	B222B-LF24-SR US	7.4	VG1241CL+936AGA	VG1241CL+936GGA
	10	B223B-LF24-3 US	B223B-LF24-SR US	11.7	VG1241CN+936AGA	VG1241CN+936GGA
	19	B224B-LF24-3 US	B224B-LF24-SR US	18.7	VG1241CP+936AGA	VG1241CP+936GGA
	30	B225B-LF24-3 US	B225B-LF24-SR US	48.3	VG1243CC+926AGA	VG1243CC+916GGA
1-1/4	10	B229B-LF24-3 US	B229B-LF24-SR US	11.7	VG1241DN+936AGA	VG1241DN+936GGA
	19	B230B-LF24-3 US	B230B-LF24-SR US	18.7	VG1241DP+936AGA	VG1241DP+936GGA
	25	B231B-AF24-3 US	B231B-NF24-SR US	29.2	VG1241DR+936AGA	VG1241DR+936GGA
	37	B232B-AF24-3 US	B232B-NF24-SR US	82.6	VG1243DC+926AGA	VG1243DC+926GGA
1-1/2	19	B238B-AF24-3 US	B238B-NF24-SR US	18.7	VG1241EP+936AGA	VG1241EP+936GGA
	29	B239B-AF24-3 US	B239B-NF24-SR US	29.2	VG1241ER+936AGA	VG1241ER+936GGA
	37	B240B-AF24-3 US	B240B-NF24-SR US	46.8	VG1241ES+936AGA	VG1241ES+936GGA
2	29	B248B-AF24-3 US	B248B-AF24-SR US	29.2	VG1241FR+926AGA	VG1241FR+926GGA
	46	B249B-AF24-3 US	B249B-AF24-SR US	46.8	VG1241FS+926AGA	VG1241FS+926GGA
	57	B250B-AF24-3 US	B250B-AF24-SR US	73.7	VG1241FT+926AGA	VG1241FT+926GGA
		with One Auxiliary Switch			with Two Auxiliary Switches	
1/2	0.8	B209B-LF24-3-S US	B209B-LF24-SR-S US	–	–	–
	1.2	B210B-LF24-3-S US	B210B-LF24-SR-S US	1.2	VG1241AD+936AGC	VG1241AD+936GGC
	1.9	B211B-LF24-3-S US	B211B-LF24-SR-S US	1.9	VG1241AE+936AGC	VG1241AE+936GGC
	3.0	B212B-LF24-3-S US	B212B-LF24-SR-S US	2.9	VG1241AF+936AGC	VG1241AF+936GGC
	4.7	B213B-LF24-3-S US	B213B-LF24-SR-S US	4.7	VG1241AG+936AGC	VG1241AG+936GGC
	7.4	B214B-LF24-3-S US	B214B-LF24-SR-S US	7.4	VG1241AL+936AGC	VG1241AL+936GGC
	10	B215B-LF24-3-S US	B215B-LF24-SR-S US	11.7	VG1241AN+936AGC	VG1241AN+936GGC
3/4	4.7	B217B-LF24-3-S US	B217B-LF24-SR-S US	4.7	VG1241BG+936AGC	VG1241BG+936GGC
	7.4	B218B-LF24-3-S US	B218B-LF24-SR-S US	7.4	VG1241BL+936AGC	VG1241BL+936GGC
	10	B219B-LF24-3-S US	B219B-LF24-SR-S US	11.7	VG1241BN+936AGC	VG1241BN+936GGC
	24	B220B-LF24-3-S US	B220B-LF24-SR-S US	28.7	VG1243BC+906AGC	VG1243BC+906GGC
1	7.4	B222B-LF24-3-S US	B222B-LF24-SR-S US	7.4	VG1241CL+936AGC	VG1241CL+936GGC
	10	B223B-LF24-3-S US	B223B-LF24-SR-S US	11.7	VG1241CN+936AGC	VG1241CN+936GGC
	19	B224B-LF24-3-S US	B224B-LF24-SR-S US	18.7	VG1241CP+936AGC	VG1241CP+936GGC
	30	B225B-LF24-3-S US	B225B-LF24-SR-S US	48.3	VG1243CC+926AGC	VG1243CC+916GGC
1-1/4	10	B229B-LF24-3-S US	B229B-LF24-SR-S US	11.7	VG1241DN+936AGC	VG1241DN+936GGC
	19	B230B-LF24-3-S US	B230B-LF24-SR-S US	18.7	VG1241DP+936AGC	VG1241DP+936GGC
	25	B231B-AF24-3-S US	B231B-NF24-SR-S US	29.2	VG1241DR+936AGC	VG1241DR+936GGC
	37	B232B-AF24-3-S US	B232B-NF24-SR-S US	82.6	VG1243DC+926AGC	VG1243DC+926GGC
1-1/2	19	B238B-AF24-3-S US	B238B-NF24-SR-S US	18.7	VG1241EP+936AGC	VG1241EP+936GGC
	29	B239B-AF24-3-S US	B239B-NF24-SR-S US	29.2	VG1241ER+936AGC	VG1241ER+936GGC
	37	B240B-AF24-3-S US	B240B-NF24-SR-S US	46.8	VG1241ES+936AGC	VG1241ES+936GGC
2	29	B248B-AF24-3-S US*	–	29.2	VG1241FR+926AGC	VG1241FR+926GGC
	46	B249B-AF24-3-S US*	–	46.8	VG1241FS+926AGC	VG1241FS+926GGC
	57	B250B-AF24-3-S US*	–	73.7	VG1241FT+926AGC	VG1241FT+926GGC

* AF Series Actuator have Two Single-Pole-Double-Throw Switches

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Spring Return

	Belimo			Johnson Controls		
	Three-Way Spring Return – Chrome Plated Brass Ball					
	On/Off Control without Auxiliary Switches			On/Off Control without Auxiliary Switches		
Size (in.)	Cv	24 VAC	120 VAC	Cv	24 VAC	120 VAC
1/2	0.8	B309B-LF24 US	B309B-LF120 US	–	–	–
	1.2	B310B-LF24 US	B310B-LF120 US	1.2	VG1841AD+936BGA	VG1841AD+936BAA
	1.9	B311B-LF24 US	B311B-LF120 US	1.9	VG1841AE+936BGA	VG1841AE+936BAA
	3.0	B312B-LF24 US	B312B-LF120 US	2.9	VG1841AF+936BGA	VG1841AF+936BAA
	4.7	B313B-LF24 US	B313B-LF120 US	4.7	VG1841AG+936BGA	VG1841AG+936BAA
	–	–	–	7.4	VG1841AL+936BGA	VG1841AL+936BAA
	10	B315B-LF24 US	B315B-LF120 US	11.7	VG1841AN+936BGA	VG1841AN+936BAA
3/4	4.7	B317B-LF24 US	B317B-LF120 US	4.7	VG1841BG+936BGA	VG1841BG+936BAA
	7.4	B318B-LF24 US	B318B-LF120 US	7.4	VG1841BL+936BGA	VG1841BL+936BAA
	–	–	–	11.7	VG1841BN+936BGA	VG1841BN+936BAA
	24	B320B-LF24 US	B320B-LF120 US	–	–	–
1	7.4	B322B-LF24 US	B322B-LF120 US	7.4	VG1841CL+936BGA	VG1841CL+936BAA
	10	B323B-LF24 US	B323B-LF120 US	11.7	VG1841CN+936BGA	VG1841CN+936BAA
	–	–	–	18.7	VG1841CP+936BGA	VG1841CP+936BAA
	30	B325B-LF24 US	B325B-LF120 US	–	–	–
1-1/4	10	B329B-LF24 US	B329B-LF120 US	11.7	VG1841DN+936BGA	VG1841DN+936BAA
	19	B330B-LF24 US	B330B-LF120 US	18.7	VG1841DP+936BGA	VG1841DP+936BAA
	25	B331B-NF24 US	B331B-NF120 US	29.2	VG1841DR+936BGA	VG1841DR+936BAA
	37	B332B-NF24 US	B332B-NF120 US	–	–	–
1-1/2	19	B338B-NF24 US	B338B-NF120 US	18.7	VG1841EP+936BGA	VG1841EP+936BAA
	29	B339B-NF24 US	B339B-NF120 US	29.2	VG1841ER+936BGA	VG1841ER+936BAA
	37	B340B-NF24 US	B340B-NF120 US	46.8	VG1841ES+936BGA	VG1841ES+936BAA
2	29	B348B-AF24 US	B348B-AF120 US	29.2	VG1841FR+926BGA	VG1841FR+926BAA
	46	B349B-AF24 US	B349B-AF120 US	46.8	VG1841FS+926BGA	VG1841FS+926BAA
	57	B350B-AF24 US	B350B-AF120 US	73.7	VG1841FT+926BGA	VG1841FT+926BAA
	On/Off Control with One Auxiliary Switch			On/Off Control with One Auxiliary Switch		
1/2	0.8	B309B-LF24-S US	B309B-LF120-S US	–	–	–
	1.2	B310B-LF24-S US	B310B-LF120-S US	1.2	VG1841AD+936BGB	VG1841AD+936BAB
	1.9	B311B-LF24-S US	B311B-LF120-S US	1.9	VG1841AE+936BGB	VG1841AE+936BAB
	3.0	B312B-LF24-S US	B312B-LF120-S US	2.9	VG1841AF+936BGB	VG1841AF+936BAB
	4.7	B313B-LF24-S US	B313B-LF120-S US	4.7	VG1841AG+936BGB	VG1841AG+936BAB
	–	–	–	7.4	VG1841AL+936BGB	VG1841AL+936BAB
	10	B315B-LF24-S US	B315B-LF120-S US	11.7	VG1841AN+936BGB	VG1841AN+936BAB
3/4	4.7	B317B-LF24-S US	B317B-LF120-S US	4.7	VG1841BG+936BGB	VG1841BG+936BAB
	7.4	B318B-LF24-S US	B318B-LF120-S US	7.4	VG1841BL+936BGB	VG1841BL+936BAB
	–	–	–	11.7	VG1841BN+936BGB	VG1841BN+936BAB
	24	B320B-LF24-S US	B320B-LF120-S US	–	–	–
1	7.4	B322B-LF24-S US	B322B-LF120-S US	7.4	VG1841CL+936BGB	VG1841CL+936BAB
	10	B323B-LF24-S US	B323B-LF120-S US	11.7	VG1841CN+936BGB	VG1841CN+936BAB
	–	–	–	18.7	VG1841CP+936BGB	VG1841CP+936BAB
	30	B325B-LF24-S US	B325B-LF120-S US	–	–	–
1-1/4	10	B329B-LF24-S US	B329B-LF120-S US	11.7	VG1841DN+936BGB	VG1841DN+936BAB
	19	B330B-LF24-S US	B330B-LF120-S US	18.7	VG1841DP+936BGB	VG1841DP+936BAB
	25	B331B-NF24-S US	B331B-NF120-S US	29.2	VG1841DR+936BGB	VG1841DR+936BAB
	37	B332B-NF24-S US	B332B-NF120-S US	–	–	–
1-1/2	19	B338B-NF24-S US	B338B-NF120-S US	18.7	VG1841EP+936BGB	VG1841EP+936BAB
	29	B339B-NF24-S US	B339B-NF120-S US	29.2	VG1841ER+936BGB	VG1841ER+936BAB
	37	B340B-NF24-S US	B340B-NF120-S US	46.8	VG1841ES+936BGB	VG1841ES+936BAB
2	29	B348B-AF24-S US*	B348B-AF120-S US*	29.2	VG1841FR+926BGC	VG1841FR+926BAC
	46	B349B-AF24-S US*	B349B-AF120-S US*	46.8	VG1841FS+926BGC	VG1841FS+926BAC
	57	B350B-AF24-S US*	B350B-AF120-S US*	73.7	VG1841FT+926BGC	VG1841FT+926BAC

* AF Series Actuator have Two Single-Pole-Double-Throw Switches

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Spring Return

	Belimo			Johnson Controls		
	Three-Way Spring Return – Chrome Plated Brass Ball					
	without Auxiliary Switches			without Auxiliary Switches		
Size (in.)	Cv	24 VAC Floating	0 to 10 VDC Proportional	Cv	24 VAC Floating	0 to 10 VDC Proportional
1/2	0.8	B309B-LF24-3 US	B309B-LF24-SR US	–	–	–
	1.2	B310B-LF24-3 US	B310B-LF24-SR US	1.2	VG1841AD+936AGA	VG1841AD+936GGA
	1.9	B311B-LF24-3 US	B311B-LF24-SR US	1.9	VG1841AE+936AGA	VG1841AE+936GGA
	3.0	B312B-LF24-3 US	B312B-LF24-SR US	2.9	VG1841AF+936AGA	VG1841AF+936GGA
	4.7	B313B-LF24-3 US	B313B-LF24-SR US	4.7	VG1841AG+936AGA	VG1841AG+936GGA
	–	–	–	7.4	VG1841AL+936AGA	VG1841AL+936GGA
	10	B315B-LF24-3 US	B315B-LF24-SR US	11.7	VG1841AN+936AGA	VG1841AN+936GGA
3/4	4.7	B317B-LF24-3 US	B317B-LF24-SR US	4.7	VG1841BG+936AGA	VG1841BG+936GGA
	7.4	B318B-LF24-3 US	B318B-LF24-SR US	7.4	VG1841BL+936AGA	VG1841BL+936GGA
	–	–	–	11.7	VG1841BN+936AGA	VG1841BN+936GGA
	24	B320B-LF24-3 US	B320B-LF24-SR US	–	–	–
1	7.4	B322B-LF24-3 US	B322B-LF24-SR US	7.4	VG1841CL+936AGA	VG1841CL+936GGA
	10	B323B-LF24-3 US	B323B-LF24-SR US	11.7	VG1841CN+936AGA	VG1841CN+936GGA
	–	–	–	18.7	VG1841CP+936AGA	VG1841CP+936GGA
	30	B325B-LF24-3 US	B325B-LF24-SR US	–	–	–
1-1/4	10	B329B-LF24-3 US	B329B-LF24-SR US	11.7	VG1841DN+936AGA	VG1841DN+936GGA
	19	B330B-LF24-3 US	B330B-LF24-SR US	18.7	VG1841DP+936AGA	VG1841DP+936GGA
	25	B331B-AF24-3 US	B331B-NF24-SR US	29.2	VG1841DR+936AGA	VG1841DR+936GGA
	37	B332B-AF24-3 US	B332B-NF24-SR US	–	–	–
1-1/2	19	B338B-AF24-3 US	B338B-NF24-SR US	18.7	VG1841EP+936AGA	VG1841EP+936GGA
	29	B339B-AF24-3 US	B339B-NF24-SR US	29.2	VG1841ER+936AGA	VG1841ER+936GGA
	37	B340B-AF24-3 US	B340B-NF24-SR US	46.8	VG1841ES+936AGA	VG1841ES+936GGA
2	29	B348B-AF24-3 US	B348B-AF24-SR US	29.2	VG1841FR+926AGA	VG1841FR+926GGA
	46	B349B-AF24-3 US	B349B-AF24-SR US	46.8	VG1841FS+926AGA	VG1841FS+926GGA
	57	B350B-AF24-3 US	B350B-AF24-SR US	73.7	VG1841FT+926AGA	VG1841FT+926GGA
	with One Auxiliary Switch			with Two Auxiliary Switches		
1/2	0.8	B309B-LF24-3-S US	B309B-LF24-SR-S US	–	–	–
	1.2	B310B-LF24-3-S US	B310B-LF24-SR-S US	1.2	VG1841AD+936AGC	VG1841AD+936GGC
	1.9	B311B-LF24-3-S US	B311B-LF24-SR-S US	1.9	VG1841AE+936AGC	VG1841AE+936GGC
	3.0	B312B-LF24-3-S US	B312B-LF24-SR-S US	2.9	VG1841AF+936AGC	VG1841AF+936GGC
	4.7	B313B-LF24-3-S US	B313B-LF24-SR-S US	4.7	VG1841AG+936AGC	VG1841AG+936GGC
	–	–	–	7.4	VG1841AL+936AGC	VG1841AL+936GGC
	10	B315B-LF24-3-S US	B315B-LF24-SR-S US	11.7	VG1841AN+936AGC	VG1841AN+936GGC
3/4	4.7	B317B-LF24-3-S US	B317B-LF24-SR-S US	4.7	VG1841BG+936AGC	VG1841BG+936GGC
	7.4	B318B-LF24-3-S US	B318B-LF24-SR-S US	7.4	VG1841BL+936AGC	VG1841BL+936GGC
	–	–	–	11.7	VG1841BN+936AGC	VG1841BN+936GGC
	24	B320B-LF24-3-S US	B320B-LF24-SR-S US	–	–	–
1	7.4	B322B-LF24-3-S US	B322B-LF24-SR-S US	7.4	VG1841CL+936AGC	VG1841CL+936GGC
	10	B323B-LF24-3-S US	B323B-LF24-SR-S US	11.7	VG1841CN+936AGC	VG1841CN+936GGC
	–	–	–	18.7	VG1841CP+936AGC	VG1841CP+936GGC
	30	B325B-LF24-3-S US	B325B-LF24-SR-S US	–	–	–
1-1/4	10	B329B-LF24-3-S US	B329B-LF24-SR-S US	11.7	VG1841DN+936AGC	VG1841DN+936GGC
	19	B330B-LF24-3-S US	B330B-LF24-SR-S US	18.7	VG1841DP+936AGC	VG1841DP+936GGC
	25	B331B-NF24-3-S US	B331B-NF24-SR-S US	29.2	VG1841DR+936AGC	VG1841DR+936GGC
	37	B332B-NF24-3-S US	B332B-NF24-SR-S US	–	–	–
1-1/2	19	B338B-AF24-3-S US*	B338B-NF24-SR-S US	18.7	VG1841EP+936AGC	VG1841EP+936GGC
	29	B339B-AF24-3-S US*	B339B-NF24-SR-S US	29.2	VG1841ER+936AGC	VG1841ER+936GGC
	37	B340B-AF24-3-S US*	B340B-NF24-SR-S US	46.8	VG1841ES+936AGC	VG1841ES+936GGC
2	29	B348B-AF24-3-S US*	–	29.2	VG1841FR+926AGC	VG1841FR+926GGC
	46	B349B-AF24-3-S US*	–	46.8	VG1841FS+926AGC	VG1841FS+926GGC
	57	B350B-AF24-3-S US*	–	73.7	VG1841FT+926AGC	VG1841FT+926GGC

* AF Series Actuator have Two Single-Pole-Double-Throw Switches

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Non-Spring Return

	Belimo			Johnson Controls			
Two-Way Non-Spring Return – Stainless Steel Ball and Stem							
	without Auxiliary Switches			without Auxiliary Switches			
Size (in.)	Cv	Floating	Proportional	Cv	Floating without timeout	Floating with timeout	Proportional
1/2	0.8	B209-LR24-3 US	B209-LR24-SR US	–	–	–	–
	1.2	B210-LR24-3 US	B210-LR24-SR US	1.2	VG1245AD+906AGA	VG1245AD+906IGA	VG1245AD+906GGA
	1.9	B211-LR24-3 US	B211-LR24-SR US	1.9	VG1245AE+906AGA	VG1245AE+906IGA	VG1245AE+906GGA
	3.0	B212-LR24-3 US	B212-LR24-SR US	2.9	VG1245AF+906AGA	VG1245AF+906IGA	VG1245AF+906GGA
	4.7	B213-LR24-3 US	B213-LR24-SR US	4.7	VG1245AG+906AGA	VG1245AG+906IGA	VG1245AG+906GGA
	7.4	B214-LR24-3 US	B214-LR24-SR US	7.4	VG1245AL+906AGA	VG1245AL+906IGA	VG1245AL+906GGA
	10	B215-LR24-3 US	B215-LR24-SR US	11.7	VG1245AN+906AGA	VG1245AN+906IGA	VG1245AN+906GGA
3/4	4.7	B217-LR24-3 US	B217-LR24-SR US	4.7	VG1245BG+906AGA	VG1245BG+906IGA	VG1245BG+906GGA
	7.4	B218-LR24-3 US	B218-LR24-SR US	7.4	VG1245BL+906AGA	VG1245BL+906IGA	VG1245BL+906GGA
	10	B219-LR24-3 US	B219-LR24-SR US	11.7	VG1245BN+906AGA	VG1245BN+906IGA	VG1245BN+906GGA
	24	B220-LR24-3 US	B220-LR24-SR US	28.7	VG1243BC+906AGA	–	VG1243BC+906GGA
1	7.4	B222-LR24-3 US	B222-LR24-SR US	7.4	VG1245CL+906AGA	VG1245CL+906IGA	VG1245CL+906GGA
	10	B223-LR24-3 US	B223-LR24-SR US	11.7	VG1245CN+906AGA	VG1245CN+906IGA	VG1245CN+906GGA
	19	B224-LR24-3 US	B224-LR24-SR US	18.7	VG1245CP+906AGA	VG1245CP+906IGA	VG1245CP+906GGA
	30	B225-LR24-3 US	B225-LR24-SR US	48.3	VG1243CC+916AGA	–	VG1243CC+916HGA
1-1/4	10	B229-LR24-3 US	B229-LR24-SR US	11.7	VG1245DN+906AGA	VG1245DN+906IGA	VG1245DN+906GGA
	19	B230-LR24-3 US	B230-LR24-SR US	18.7	VG1245DP+906AGA	VG1245DP+906IGA	VG1245DP+906GGA
	25	B231-NM24 US	B231-NM24-SR US	29.2	VG1245DR+906AGA	VG1245DR+906IGA	VG1245DR+906GGA
	37	B232-NM24 US	B232-NM24-SR US	82.6	VG1243DC+916AGA	–	VG1243DC+916HGA
1-1/2	19	B238-NM24 US	B238-NM24-SR US	18.7	VG1245EP+906AGA	VG1245EP+906IGA	VG1245EP+906GGA
	29	B239-NM24 US	B239-NM24-SR US	29.2	VG1245ER+906AGA	VG1245ER+906IGA	VG1245ER+906GGA
	37	B240-NM24 US	B240-NM24-SR US	46.8	VG1245ES+906AGA	VG1245ES+906IGA	VG1245ES+906GGA
	–	–	–	143.4	VG1243EC+924AGA	–	VG1243EC+924HGA
2	29	B248-NM24 US	B248-NM24-SR US	29.2	VG1245FR+909AGA	–	VG1245FR+909GGA
	46	B249-NM24 US	B249-NM24-SR US	46.8	VG1245FS+909AGA	–	VG1245FS+909GGA
	57	B250-NM24 US	B250-NM24-SR US	73.7	VG1245FT+909AGA	–	VG1245FT+909GGA
		with One Auxiliary Switch			with Two Auxiliary Switches		
1/2	0.8	B209-LR24-3-S US	–	–	–	–	–
	1.2	B210-LR24-3-S US	–	1.2	VG1245AD+906AGC	VG1245AD+906IGC	VG1245AD+906GGC
	1.9	B211-LR24-3-S US	–	1.9	VG1245AE+906AGC	VG1245AE+906IGC	VG1245AE+906GGC
	3.0	B212-LR24-3-S US	–	2.9	VG1245AF+906AGC	VG1245AF+906IGC	VG1245AF+906GGC
	4.7	B213-LR24-3-S US	–	4.7	VG1245AG+906AGC	VG1245AG+906IGC	VG1245AG+906GGC
	7.4	B214-LR24-3-S US	–	7.4	VG1245AL+906AGC	VG1245AL+906IGC	VG1245AL+906GGC
	10	B215-LR24-3-S US	–	11.7	VG1245AN+906AGC	VG1245AN+906IGC	VG1245AN+906GGC
3/4	4.7	B217-LR24-3-S US	–	4.7	VG1245BG+906AGC	VG1245BG+906IGC	VG1245BG+906GGC
	7.4	B218-LR24-3-S US	–	7.4	VG1245BL+906AGC	VG1245BL+906IGC	VG1245BL+906GGC
	10	B219-LR24-3-S US	–	11.7	VG1245BN+906AGC	VG1245BN+906IGC	VG1245BN+906GGC
	24	B220-LR24-3-S US	–	28.7	VG1243BC+906AGC	–	VG1243BC+906GGC
1	7.4	B222-LR24-3-S US	–	7.4	VG1245CL+906AGC	VG1245CL+906IGC	VG1245CL+906GGC
	10	B223-LR24-3-S US	–	11.7	VG1245CN+906AGC	VG1245CN+906IGC	VG1245CN+906GGC
	19	B224-LR24-3-S US	–	18.7	VG1245CP+906AGC	VG1245CP+906IGC	VG1245CP+906GGC
	30	B225-LR24-3-S US	–	48.3	VG1243CC+916AGC	–	VG1243CC+916HGC
1-1/4	10	B229-LR24-3-S US	–	11.7	VG1245DN+906AGC	VG1245DN+906IGC	VG1245DN+906GGC
	19	B230-LR24-3-S US	–	18.7	VG1245DP+906AGC	VG1245DP+906IGC	VG1245DP+906GGC
	–	–	–	29.2	VG1245DR+906AGC	VG1245DR+906IGC	VG1245DR+906GGC
	–	–	–	82.6	VG1243DC+916AGC	–	VG1243DC+916HGC
1-1/2	–	–	–	18.7	VG1245EP+906AGC	VG1245EP+906IGC	VG1245EP+906GGC
	–	–	–	29.2	VG1245ER+906AGC	VG1245ER+906IGC	VG1245ER+906GGC
	–	–	–	46.8	VG1245ES+906AGC	VG1245ES+906IGC	VG1245ES+906GGC
	–	–	–	143.4	VG1243EC+924AGC	–	VG1243EC+924HGC
2	–	–	–	29.2	VG1245FR+909AGC	–	VG1245FR+909GGC
	–	–	–	46.8	VG1245FS+909AGC	–	VG1245FS+909GGC
	–	–	–	73.7	VG1245FT+909AGC	–	VG1245FT+909GGC

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Non-Spring Return

	Belimo			Johnson Controls			
Three-Way Non-Spring Return – Stainless Steel Ball and Stem							
	without Auxiliary Switches			without Auxiliary Switches			
Size (in.)	Cv	Floating	Proportional	Cv	Floating	Floating without timeout	Proportional with timeout
1/2	0.8	B309-LR24-3 US	B309-LR24-SR US	–	–	–	–
	1.2	B310-LR24-3 US	B310-LR24-SR US	1.2	VG1845AD+906AGA	VG1845AD+906IGA	VG1845AD+906GGA
	1.9	B311-LR24-3 US	B311-LR24-SR US	1.9	VG1845AE+906AGA	VG1845AE+906IGA	VG1845AE+906GGA
	3.0	B312-LR24-3 US	B312-LR24-SR US	2.9	VG1845AF+906AGA	VG1845AF+906IGA	VG1845AF+906GGA
	4.7	B313-LR24-3 US	B313-LR24-SR US	4.7	VG1845AG+906AGA	VG1845AG+906IGA	VG1845AG+906GGA
	–	–	–	7.4	VG1845AL+906AGA	VG1845AL+906IGA	VG1845AL+906GGA
	10	B315-LR24-3 US	B315-LR24-SR US	11.7	VG1845AN+906AGA	VG1845AN+906IGA	VG1845AN+906GGA
3/4	4.7	B317-LR24-3 US	B317-LR24-SR US	4.7	VG1845BG+906AGA	VG1845BG+906IGA	VG1845BG+906GGA
	7.4	B318-LR24-3 US	B318-LR24-SR US	7.4	VG1845BL+906AGA	VG1845BL+906IGA	VG1845BL+906GGA
	–	–	–	11.7	VG1845BN+906AGA	VG1845BN+906IGA	VG1845BN+906GGA
	24	B320-LR24-3 US	B320-LR24-SR US	–	–	–	–
1	7.4	B322-LR24-3 US	B322-LR24-SR US	7.4	VG1845CL+906AGA	VG1845CL+906IGA	VG1845CL+906GGA
	10	B323-LR24-3 US	B323-LR24-SR US	11.7	VG1845CN+906AGA	VG1845CN+906IGA	VG1845CN+906GGA
	–	–	–	18.7	VG1845CP+906AGA	VG1845CP+906IGA	VG1845CP+906GGA
	30	B325-LR24-3 US	B325-LR24-SR US	–	–	–	–
1-1/4	10	B329-LR24-3 US	B329-LR24-SR US	11.7	VG1845DN+906AGA	VG1845DN+906IGA	VG1845DN+906GGA
	19	B330-LR24-3 US	B330-LR24-SR US	18.7	VG1845DP+906AGA	VG1845DP+906IGA	VG1845DP+906GGA
	25	B331-NM24 US	B331-NM24-SR US	29.2	VG1845DR+906AGA	VG1845DR+906IGA	VG1845DR+906GGA
	37	B332-NM24 US	B332-NM24-SR US	–	–	–	–
1-1/2	19	B338-NM24 US	B338-NM24-SR US	18.7	VG1845EP+906AGA	VG1845EP+906IGA	VG1845EP+906GGA
	29	B339-NM24 US	B339-NM24-SR US	29.2	VG1845ER+906AGA	VG1845ER+906IGA	VG1845ER+906GGA
	37	B340-NM24 US	B340-NM24-SR US	46.8	VG1845ES+906AGA	VG1845ES+906IGA	VG1845ES+906GGA
2	29	B348-NM24 US	B348-NM24-SR US	29.2	VG1845FR+909AGA	–	VG1845FR+909GGA
	46	B349-NM24 US	B349-NM24-SR US	46.8	VG1845FS+909AGA	–	VG1845FS+909GGA
	57	B350-NM24 US	B350-NM24-SR US	73.7	VG1845FT+909AGA	–	VG1845FT+909GGA
	with One Auxiliary Switch			with Two Auxiliary Switches			
1/2	0.8	B309-LR24-3-S US	–	–	–	–	–
	1.2	B310-LR24-3-S US	–	1.2	VG1845AD+906AGC	VG1845AD+906IGC	VG1845AD+906GGC
	1.9	B311-LR24-3-S US	–	1.9	VG1845AE+906AGC	VG1845AE+906IGC	VG1845AE+906GGC
	3.0	B312-LR24-3-S US	–	2.9	VG1845AF+906AGC	VG1845AF+906IGC	VG1845AF+906GGC
	4.7	B313-LR24-3-S US	–	4.7	VG1845AG+906AGC	VG1845AG+906IGC	VG1845AG+906GGC
	–	–	–	7.4	VG1845AL+906AGC	VG1845AL+906IGC	VG1845AL+906GGC
	10	B315-LR24-3-S US	–	11.7	VG1845AN+906AGC	VG1845AN+906IGC	VG1845AN+906GGC
3/4	4.7	B317-LR24-3-S US	–	4.7	VG1845BG+906AGC	VG1845BG+906IGC	VG1845BG+906GGC
	7.4	B318-LR24-3-S US	–	7.4	VG1845BL+906AGC	VG1845BL+906IGC	VG1845BL+906GGC
	–	–	–	11.7	VG1845BN+906AGC	VG1845BN+906IGC	VG1845BN+906GGC
	24	B320-LR24-3-S US	–	–	–	–	–
1	7.4	B322-LR24-3-S US	–	7.4	VG1845CL+906AGC	VG1845CL+906IGC	VG1845CL+906GGC
	10	B323-LR24-3-S US	–	11.7	VG1845CN+906AGC	VG1845CN+906IGC	VG1845CN+906GGC
	–	–	–	18.7	VG1845CP+906AGC	VG1845CP+906IGC	VG1845CP+906GGC
	30	B325-LR24-3-S US	–	–	–	–	–
1-1/4	10	B329-LR24-3-S US	–	11.7	VG1845DN+906AGC	VG1845DN+906IGC	VG1845DN+906GGC
	19	B330-LR24-3-S US	–	18.7	VG1845DP+906AGC	VG1845DP+906IGC	VG1845DP+906GGC
	–	–	–	29.2	VG1845DR+906AGC	VG1845DR+906IGC	VG1845DR+906GGC
1-1/2	–	–	–	18.7	VG1845EP+906AGC	VG1845EP+906IGC	VG1845EP+906GGC
	–	–	–	29.2	VG1845ER+906AGC	VG1845ER+906IGC	VG1845ER+906GGC
	–	–	–	46.8	VG1845ES+906AGC	VG1845ES+906IGC	VG1845ES+906GGC
2	–	–	–	29.2	VG1845FR+909AGC	–	VG1845FR+909GGC
	–	–	–	46.8	VG1845FS+909AGC	–	VG1845FS+909GGC
	–	–	–	73.7	VG1845FT+909AGC	–	VG1845FT+909GGC

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Spring Return

	Belimo			Johnson Controls		
	Two-Way Spring Return – Stainless Steel Ball and Stem					
	On/Off Control without Auxiliary Switches			On/Off Control without Auxiliary Switches		
Size (in.)	Cv	24 VAC	120 VAC	Cv	24 VAC	120 VAC
1/2	0.8	B209-LF24 US	B209-LF120 US	–	–	–
	1.2	B210-LF24 US	B210-LF120 US	1.2	VG1245AD+936BGA	VG1245AD+936BAA
	1.9	B211-LF24 US	B211-LF120 US	1.9	VG1245AE+936BGA	VG1245AE+936BAA
	3.0	B212-LF24 US	B212-LF120 US	2.9	VG1245AF+936BGA	VG1245AF+936BAA
	4.7	B213-LF24 US	B213-LF120 US	4.7	VG1245AG+936BGA	VG1245AG+936BAA
	7.4	B214-LF24 US	B214-LF120 US	7.4	VG1245AL+936BGA	VG1245AL+936BAA
	10	B215-LF24 US	B215-LF120 US	11.7	VG1245AN+936BGA	VG1245AN+936BAA
3/4	4.7	B217-LF24 US	B217-LF120 US	4.7	VG1245BG+936BGA	VG1245BG+936BAA
	7.4	B218-LF24 US	B218-LF120 US	7.4	VG1245BL+936BGA	VG1245BL+936BAA
	10	B219-LF24 US	B219-LF120 US	11.7	VG1245BN+936BGA	VG1245BN+936BAA
	24	B220-LF24 US	B220-LF120 US	–	–	–
1	7.4	B222-LF24 US	B222-LF120 US	7.4	VG1245CL+936BGA	VG1245CL+936BAA
	10	B223-LF24 US	B223-LF120 US	11.7	VG1245CN+936BGA	VG1245CN+936BAA
	19	B224-LF24 US	B224-LF120 US	18.7	VG1245CP+936BGA	VG1245CP+936BAA
	30	B225-LF24 US	B225-LF120 US	–	–	–
1-1/4	10	B229-LF24 US	B229-LF120 US	11.7	VG1245DN+936BGA	VG1245DN+936BAA
	19	B230-LF24 US	B230-LF120 US	18.7	VG1245DP+936BGA	VG1245DP+936BAA
	25	B231-NF24 US	B231-NF120 US	29.2	VG1245DR+936BGA	VG1245DR+936BAA
	37	B232-NF24 US	B232-NF120 US	–	–	–
1-1/2	19	B238-NF24 US	B238-NF120 US	18.7	VG1245EP+936BGA	VG1245EP+936BAA
	29	B239-NF24 US	B239-NF120 US	29.2	VG1245ER+936BGA	VG1245ER+936BAA
	37	B240-NF24 US	B240-NF120 US	46.8	VG1245ES+936BGA	VG1245ES+936BAA
2	29	B248-AF24 US	B248-AF120 US	29.2	VG1245FR+926BGA	VG1245FR+926BAA
	46	B249-AF24 US	B249-AF120 US	46.8	VG1245FS+926BGA	VG1245FS+926BAA
	57	B250-AF24 US	B250-AF120 US	73.7	VG1245FT+926BGA	VG1245FT+926BAA
	On/Off Control with One Auxiliary Switch			On/Off Control with One Auxiliary Switch		
1/2	0.8	B209-LF24-S US	B209-LF120-S US	–	–	–
	1.2	B210-LF24-S US	B210-LF120-S US	1.2	VG1245AD+936BGB	VG1245AD+936BAB
	1.9	B211-LF24-S US	B211-LF120-S US	1.9	VG1245AE+936BGB	VG1245AE+936BAB
	3.0	B212-LF24-S US	B212-LF120-S US	2.9	VG1245AF+936BGB	VG1245AF+936BAB
	4.7	B213-LF24-S US	B213-LF120-S US	4.7	VG1245AG+936BGB	VG1245AG+936BAB
	7.4	B214-LF24-S US	B214-LF120-S US	7.4	VG1245AL+936BGB	VG1245AL+936BAB
	10	B215-LF24-S US	B215-LF120-S US	11.7	VG1245AN+936BGB	VG1245AN+936BAB
3/4	4.7	B217-LF24-S US	B217-LF120-S US	4.7	VG1245BG+936BGB	VG1245BG+936BAB
	7.4	B218-LF24-S US	B218-LF120-S US	7.4	VG1245BL+936BGB	VG1245BL+936BAB
	10	B219-LF24-S US	B219-LF120-S US	11.7	VG1245BN+936BGB	VG1245BN+936BAB
	24	B220-LF24-S US	B220-LF120-S US	–	–	–
1	7.4	B222-LF24-S US	B222-LF120-S US	7.4	VG1245CL+936BGB	VG1245CL+936BAB
	10	B223-LF24-S US	B223-LF120-S US	11.7	VG1245CN+936BGB	VG1245CN+936BAB
	19	B224-LF24-S US	B224-LF120-S US	18.7	VG1245CP+936BGB	VG1245CP+936BAB
	30	B225-LF24-S US	B225-LF120-S US	–	–	–
1-1/4	10	B229-LF24-S US	B229-LF120-S US	11.7	VG1245DN+936BGB	VG1245DN+936BAB
	19	B230-LF24-S US	B230-LF120-S US	18.7	VG1245DP+936BGB	VG1245DP+936BAB
	25	B231-NF24-S US	B231-NF120-S US	29.2	VG1245DR+936BGB	VG1245DR+936BAB
	37	B232-NF24-S US	B232-NF120-S US	–	–	–
1-1/2	19	B238-NF24-S US	B238-NF120-S US	18.7	VG1245EP+936BGB	VG1245EP+936BAB
	29	B239-NF24-S US	B239-NF120-S US	29.2	VG1245ER+936BGB	VG1245ER+936BAB
	37	B240-NF24-S US	B240-NF120-S US	46.8	VG1245ES+936BGB	VG1245ES+936BAB
2	29	B248-AF24-S US*	B248-AF120-S US*	29.2	VG1245FR+926BGC	VG1245FR+926BAC
	46	B249-AF24-S US*	B249-AF120-S US*	46.8	VG1245FS+926BGC	VG1245FS+926BAC
	57	B250-AF24-S US*	B250-AF120-S US*	73.7	VG1245FT+926BGC	VG1245FT+926BAC

* AF Series Actuator have Two Single-Pole-Double-Throw Switches

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Spring Return

	Belimo			Johnson Controls		
	Two-Way Spring Return – Stainless Steel Ball and Stem					
	without Auxiliary Switches			without Auxiliary Switches		
Size (in.)	Cv	24 VAC Floating	0 to 10 VDC Proportional	Cv	24 VAC Floating	0 to 10 VDC Proportional
1/2	0.8	B209-LF24-3 US	B209-LF24-SR US	–	–	–
	1.2	B210-LF24-3 US	B210-LF24-SR US	1.2	VG1245AD+936AGA	VG1245AD+936GGA
	1.9	B211-LF24-3 US	B211-LF24-SR US	1.9	VG1245AE+936AGA	VG1245AE+936GGA
	3.0	B212-LF24-3 US	B212-LF24-SR US	2.9	VG1245AF+936AGA	VG1245AF+936GGA
	4.7	B213-LF24-3 US	B213-LF24-SR US	4.7	VG1245AG+936AGA	VG1245AG+936GGA
	7.4	B214-LF24-3 US	B214-LF24-SR US	7.4	VG1245AL+936AGA	VG1245AL+936GGA
	10	B215-LF24-3 US	B215-LF24-SR US	11.7	VG1245AN+936AGA	VG1245AN+936GGA
3/4	4.7	B217-LF24-3 US	B217-LF24-SR US	4.7	VG1245BG+936AGA	VG1245BG+936GGA
	7.4	B218-LF24-3 US	B218-LF24-SR US	7.4	VG1245BL+936AGA	VG1245BL+936GGA
	10	B219-LF24-3 US	B219-LF24-SR US	11.7	VG1245BN+936AGA	VG1245BN+936GGA
	24	B220-LF24-3 US	B220-LF24-SR US	28.7	VG1243BC+936AGA	VG1243BC+936GGA
1	7.4	B222-LF24-3 US	B222-LF24-SR US	7.4	VG1245CL+936AGA	VG1245CL+936GGA
	10	B223-LF24-3 US	B223-LF24-SR US	11.7	VG1245CN+936AGA	VG1245CN+936GGA
	19	B224-LF24-3 US	B224-LF24-SR US	18.7	VG1245CP+936AGA	VG1245CP+936GGA
	30	B225-LF24-3 US	B225-LF24-SR US	48.3	VG1243CC+926AGA	VG1243CC+916GGA
1-1/4	10	B229-LF24-3 US	B229-LF24-SR US	11.7	VG1245DN+936AGA	VG1245DN+936GGA
	19	B230-LF24-3 US	B230-LF24-SR US	18.7	VG1245DP+936AGA	VG1245DP+936GGA
	25	B231-AF24-3 US	B231-NF24-SR US	29.2	VG1245DR+936AGA	VG1245DR+936GGA
	37	B232-AF24-3 US	B232-NF24-SR US	82.6	VG1243DC+926AGA	VG1243DC+926GGA
1-1/2	19	B238-AF24-3 US	B238-NF24-SR US	18.7	VG1245EP+936AGA	VG1245EP+936GGA
	29	B239-AF24-3 US	B239-NF24-SR US	29.2	VG1245ER+936AGA	VG1245ER+936GGA
	37	B240-AF24-3 US	B240-NF24-SR US	46.8	VG1245ES+936AGA	VG1245ES+936GGA
2	29	B248-AF24-3 US	B248-AF24-SR US	29.2	VG1245FR+926AGA	VG1245FR+926GGA
	46	B249-AF24-3 US	B249-AF24-SR US	46.8	VG1245FS+926AGA	VG1245FS+926GGA
	57	B250-AF24-3 US	B250-AF24-SR US	73.7	VG1245FT+926AGA	VG1245FT+926GGA
	with One Auxiliary Switch			with Two Auxiliary Switches		
1/2	0.8	B209-LF24-3-S US	B209-LF24-SR-S US	–	–	–
	1.2	B210-LF24-3-S US	B210-LF24-SR-S US	1.2	VG1245AD+936AGC	VG1245AD+936GGC
	1.9	B211-LF24-3-S US	B211-LF24-SR-S US	1.9	VG1245AE+936AGC	VG1245AE+936GGC
	3.0	B212-LF24-3-S US	B212-LF24-SR-S US	2.9	VG1245AF+936AGC	VG1245AF+936GGC
	4.7	B213-LF24-3-S US	B213-LF24-SR-S US	4.7	VG1245AG+936AGC	VG1245AG+936GGC
	7.4	B214-LF24-3-S US	B214-LF24-SR-S US	7.4	VG1245AL+936AGC	VG1245AL+936GGC
	10	B215-LF24-3-S US	B215-LF24-SR-S US	11.7	VG1245AN+936AGC	VG1245AN+936GGC
3/4	4.7	B217-LF24-3-S US	B217-LF24-SR-S US	4.7	VG1245BG+936AGC	VG1245BG+936GGC
	7.4	B218-LF24-3-S US	B218-LF24-SR-S US	7.4	VG1245BL+936AGC	VG1245BL+936GGC
	10	B219-LF24-3-S US	B219-LF24-SR-S US	11.7	VG1245BN+936AGC	VG1245BN+936GGC
	24	B220-LF24-3-S US	B220-LF24-SR-S US	28.7	VG1243BC+906AGC	VG1243BC+906GGC
1	7.4	B222-LF24-3-S US	B222-LF24-SR-S US	7.4	VG1245CL+936AGC	VG1245CL+936GGC
	10	B223-LF24-3-S US	B223-LF24-SR-S US	11.7	VG1245CN+936AGC	VG1245CN+936GGC
	19	B224-LF24-3-S US	B224-LF24-SR-S US	18.7	VG1245CP+936AGC	VG1245CP+936GGC
	30	B225-LF24-3-S US	B225-LF24-SR-S US	48.3	VG1243CC+926AGC	VG1243CC+916GGC
1-1/4	10	B229-LF24-3-S US	B229-LF24-SR-S US	11.7	VG1245DN+936AGC	VG1245DN+936GGC
	19	B230-LF24-3-S US	B230-LF24-SR-S US	18.7	VG1245DP+936AGC	VG1245DP+936GGC
	25	B231-AF24-3-S US	B231-NF24-SR-S US	29.2	VG1245DR+936AGC	VG1245DR+936GGC
	37	B232-AF24-3-S US	B232-NF24-SR-S US	82.6	VG1243DC+926AGC	VG1243DC+926GGC
1-1/2	19	B238-AF24-3-S US	B238-NF24-SR-S US	18.7	VG1245EP+936AGC	VG1245EP+936GGC
	29	B239-AF24-3-S US	B239-NF24-SR-S US	29.2	VG1245ER+936AGC	VG1245ER+936GGC
	37	B240-AF24-3-S US	B240-NF24-SR-S US	46.8	VG1245ES+936AGC	VG1245ES+936GGC
2	29	B248-AF24-3-S US*	–	29.2	VG1245FR+926AGC	VG1245FR+926GGC
	46	B249-AF24-3-S US*	–	46.8	VG1245FS+926AGC	VG1245FS+926GGC
	57	B250-AF24-3-S US*	–	73.7	VG1245FT+926AGC	VG1245FT+926GGC

* AF Series Actuator have Two Single-Pole-Double-Throw Switches

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Spring Return

	Belimo			Johnson Controls		
	Three-Way Spring Return – Stainless Steel Ball and Stem					
	On/Off Control without Auxiliary Switches			On/Off Control without Auxiliary Switches		
Size (in.)	Cv	24 VAC	120 VAC	Cv	24 VAC	120 VAC
1/2	0.8	B309-LF24 US	B309-LF120 US	–	–	–
	1.2	B310-LF24 US	B310-LF120 US	1.2	VG1845AD+936BGA	VG1845AD+936BAA
	1.9	B311-LF24 US	B311-LF120 US	1.9	VG1845AE+936BGA	VG1845AE+936BAA
	3.0	B312-LF24 US	B312-LF120 US	2.9	VG1845AF+936BGA	VG1845AF+936BAA
	4.7	B313-LF24 US	B313-LF120 US	4.7	VG1845AG+936BGA	VG1845AG+936BAA
	–	–	–	7.4	VG1845AL+936BGA	VG1845AL+936BAA
	10	B315-LF24 US	B315-LF120 US	11.7	VG1845AN+936BGA	VG1845AN+936BAA
3/4	4.7	B317-LF24 US	B317-LF120 US	4.7	VG1845BG+936BGA	VG1845BG+936BAA
	7.4	B318-LF24 US	B318-LF120 US	7.4	VG1845BL+936BGA	VG1845BL+936BAA
	–	–	–	11.7	VG1845BN+936BGA	VG1845BN+936BAA
	24	B320-LF24 US	B320-LF120 US	–	–	–
1	7.4	B322-LF24 US	B322-LF120 US	7.4	VG1845CL+936BGA	VG1845CL+936BAA
	10	B323-LF24 US	B323-LF120 US	11.7	VG1845CN+936BGA	VG1845CN+936BAA
	–	–	–	18.7	VG1845CP+936BGA	VG1845CP+936BAA
	30	B325-LF24 US	B325-LF120 US	–	–	–
1-1/4	10	B329-LF24 US	B329-LF120 US	11.7	VG1845DN+936BGA	VG1845DN+936BAA
	19	B330-LF24 US	B330-LF120 US	18.7	VG1845DP+936BGA	VG1845DP+936BAA
	25	B331-NF24 US	B331-NF120 US	29.2	VG1845DR+936BGA	VG1845DR+936BAA
	37	B332-NF24 US	B332-NF120 US	–	–	–
1-1/2	19	B338-NF24 US	B338-NF120 US	18.7	VG1845EP+936BGA	VG1845EP+936BAA
	29	B339-NF24 US	B339-NF120 US	29.2	VG1845ER+936BGA	VG1845ER+936BAA
	37	B340-NF24 US	B340-NF120 US	46.8	VG1845ES+936BGA	VG1845ES+936BAA
2	29	B348-AF24 US	B348-AF120 US	29.2	VG1845FR+926BGA	VG1845FR+926BAA
	46	B349-AF24 US	B349-AF120 US	46.8	VG1845FS+926BGA	VG1845FS+926BAA
	57	B350-AF24 US	B350-AF120 US	73.7	VG1845FT+926BGA	VG1845FT+926BAA
	On/Off Control with One Auxiliary Switch			On/Off Control with One Auxiliary Switch		
1/2	0.8	B309-LF24-S US	B309-LF120-S US	–	–	–
	1.2	B310-LF24-S US	B310-LF120-S US	1.2	VG1845AD+936BGB	VG1845AD+936BAB
	1.9	B311-LF24-S US	B311-LF120-S US	1.9	VG1845AE+936BGB	VG1845AE+936BAB
	3.0	B312-LF24-S US	B312-LF120-S US	2.9	VG1845AF+936BGB	VG1845AF+936BAB
	4.7	B313-LF24-S US	B313-LF120-S US	4.7	VG1845AG+936BGB	VG1845AG+936BAB
	–	–	–	7.4	VG1845AL+936BGB	VG1845AL+936BAB
	10	B315-LF24-S US	B315-LF120-S US	11.7	VG1845AN+936BGB	VG1845AN+936BAB
3/4	4.7	B317-LF24-S US	B317-LF120-S US	4.7	VG1845BG+936BGB	VG1845BG+936BAB
	7.4	B318-LF24-S US	B318-LF120-S US	7.4	VG1845BL+936BGB	VG1845BL+936BAB
	–	–	–	11.7	VG1845BN+936BGB	VG1845BN+936BAB
	24	B320-LF24-S US	B320-LF120-S US	–	–	–
1	7.4	B322-LF24-S US	B322-LF120-S US	7.4	VG1845CL+936BGB	VG1845CL+936BAB
	10	B323-LF24-S US	B323-LF120-S US	11.7	VG1845CN+936BGB	VG1845CN+936BAB
	–	–	–	18.7	VG1845CP+936BGB	VG1845CP+936BAB
	30	B325-LF24-S US	B325-LF120-S US	–	–	–
1-1/4	10	B329-LF24-S US	B329-LF120-S US	11.7	VG1845DN+936BGB	VG1845DN+936BAB
	19	B330-LF24-S US	B330-LF120-S US	18.7	VG1845DP+936BGB	VG1845DP+936BAB
	25	B331-NF24-S US	B331-NF120-S US	29.2	VG1845DR+936BGB	VG1845DR+936BAB
	37	B332-NF24-S US	B332-NF120-S US	–	–	–
1-1/2	19	B338-NF24-S US	B338-NF120-S US	18.7	VG1845EP+936BGB	VG1845EP+936BAB
	29	B339-NF24-S US	B339-NF120-S US	29.2	VG1845ER+936BGB	VG1845ER+936BAB
	37	B340-NF24-S US	B340-NF120-S US	46.8	VG1845ES+936BGB	VG1845ES+936BAB
2	29	B348-AF24-S US*	B348-AF120-S US*	29.2	VG1845FR+926BGC	VG1845FR+926BAC
	46	B349-AF24-S US*	B349-AF120-S US*	46.8	VG1845FS+926BGC	VG1845FS+926BAC
	57	B350-AF24-S US*	B350-AF120-S US*	73.7	VG1845FT+926BGC	VG1845FT+926BAC

* AF Series Actuator have Two Single-Pole-Double-Throw Switches

CROSS-REFERENCE
BELIMO to JOHNSON CONTROLS

Spring Return

	Belimo			Johnson Controls		
	Three-Way Spring Return – Stainless Steel Ball and Stem					
	without Auxiliary Switches			without Auxiliary Switches		
Size (in.)	Cv	24 VAC Floating	0 to 10 VDC Proportional	Cv	24 VAC Floating	0 to 10 VDC Proportional
1/2	0.8	B309-LF24-3 US	B309-LF24-SR US	–	–	–
	1.2	B310-LF24-3 US	B310-LF24-SR US	1.2	VG1845AD+936AGA	VG1845AD+936GGA
	1.9	B311-LF24-3 US	B311-LF24-SR US	1.9	VG1845AE+936AGA	VG1845AE+936GGA
	3.0	B312-LF24-3 US	B312-LF24-SR US	2.9	VG1845AF+936AGA	VG1845AF+936GGA
	4.7	B313-LF24-3 US	B313-LF24-SR US	4.7	VG1845AG+936AGA	VG1845AG+936GGA
	–	–	–	7.4	VG1845AL+936AGA	VG1845AL+936GGA
	10	B315-LF24-3 US	B315-LF24-SR US	11.7	VG1845AN+936AGA	VG1845AN+936GGA
3/4	4.7	B317-LF24-3 US	B317-LF24-SR US	4.7	VG1845BG+936AGA	VG1845BG+936GGA
	7.4	B318-LF24-3 US	B318-LF24-SR US	7.4	VG1845BL+936AGA	VG1845BL+936GGA
	–	–	–	11.7	VG1845BN+936AGA	VG1845BN+936GGA
	24	B320-LF24-3 US	B320-LF24-SR US	–	–	–
1	7.4	B322-LF24-3 US	B322-LF24-SR US	7.4	VG1845CL+936AGA	VG1845CL+936GGA
	10	B323-LF24-3 US	B323-LF24-SR US	11.7	VG1845CN+936AGA	VG1845CN+936GGA
	–	–	–	18.7	VG1845CP+936AGA	VG1845CP+936GGA
	30	B325-LF24-3 US	B325-LF24-SR US	–	–	–
1-1/4	10	B329-LF24-3 US	B329-LF24-SR US	11.7	VG1845DN+936AGA	VG1845DN+936GGA
	19	B330-LF24-3 US	B330-LF24-SR US	18.7	VG1845DP+936AGA	VG1845DP+936GGA
	25	B331-AF24-3 US	B331-NF24-SR US	29.2	VG1845DR+936AGA	VG1845DR+936GGA
	37	B332-AF24-3 US	B332-NF24-SR US	–	–	–
1-1/2	19	B338-AF24-3 US	B338-NF24-SR US	18.7	VG1845EP+936AGA	VG1845EP+936GGA
	29	B339-AF24-3 US	B339-NF24-SR US	29.2	VG1845ER+936AGA	VG1845ER+936GGA
	37	B340-AF24-3 US	B340-NF24-SR US	46.8	VG1845ES+936AGA	VG1845ES+936GGA
2	29	B348-AF24-3 US	B348-AF24-SR US	29.2	VG1845FR+926AGA	VG1845FR+926GGA
	46	B349-AF24-3 US	B349-AF24-SR US	46.8	VG1845FS+926AGA	VG1845FS+926GGA
	57	B350-AF24-3 US	B350-AF24-SR US	73.7	VG1845FT+926AGA	VG1845FT+926GGA
	with One Auxiliary Switch			with Two Auxiliary Switches		
1/2	0.8	B309-LF24-3-S US	B309-LF24-SR-S US	–	–	–
	1.2	B310-LF24-3-S US	B310-LF24-SR-S US	1.2	VG1845AD+936AGC	VG1845AD+936GGC
	1.9	B311-LF24-3-S US	B311-LF24-SR-S US	1.9	VG1845AE+936AGC	VG1845AE+936GGC
	3.0	B312-LF24-3-S US	B312-LF24-SR-S US	2.9	VG1845AF+936AGC	VG1845AF+936GGC
	4.7	B313-LF24-3-S US	B313-LF24-SR-S US	4.7	VG1845AG+936AGC	VG1845AG+936GGC
	–	–	–	7.4	VG1845AL+936AGC	VG1845AL+936GGC
	10	B315-LF24-3-S US	B315-LF24-SR-S US	11.7	VG1845AN+936AGC	VG1845AN+936GGC
3/4	4.7	B317-LF24-3-S US	B317-LF24-SR-S US	4.7	VG1845BG+936AGC	VG1845BG+936GGC
	7.4	B318-LF24-3-S US	B318-LF24-SR-S US	7.4	VG1845BL+936AGC	VG1845BL+936GGC
	–	–	–	11.7	VG1845BN+936AGC	VG1845BN+936GGC
	24	B320-LF24-3-S US	B320-LF24-SR-S US	–	–	–
1	7.4	B322-LF24-3-S US	B322-LF24-SR-S US	7.4	VG1845CL+936AGC	VG1845CL+936GGC
	10	B323-LF24-3-S US	B323-LF24-SR-S US	11.7	VG1845CN+936AGC	VG1845CN+936GGC
	–	–	–	18.7	VG1845CP+936AGC	VG1845CP+936GGC
	30	B325-LF24-3-S US	B325-LF24-SR-S US	–	–	–
1-1/4	10	B329-LF24-3-S US	B329-LF24-SR-S US	11.7	VG1845DN+936AGC	VG1845DN+936GGC
	19	B330-LF24-3-S US	B330-LF24-SR-S US	18.7	VG1845DP+936AGC	VG1845DP+936GGC
	25	B331-NF24-3-S US	B331-NF24-SR-S US	29.2	VG1845DR+936AGC	VG1845DR+936GGC
	37	B332-NF24-3-S US	B332-NF24-SR-S US	–	–	–
1-1/2	19	B338-AF24-3-S US*	B338-NF24-SR-S US	18.7	VG1845EP+936AGC	VG1845EP+936GGC
	29	B339-AF24-3-S US*	B339-NF24-SR-S US	29.2	VG1845ER+936AGC	VG1845ER+936GGC
	37	B340-AF24-3-S US*	B340-NF24-SR-S US	46.8	VG1845ES+936AGC	VG1845ES+936GGC
2	29	B348-AF24-3-S US*	–	29.2	VG1845FR+926AGC	VG1845FR+926GGC
	46	B349-AF24-3-S US*	–	46.8	VG1845FS+926AGC	VG1845FS+926GGC
	57	B350-AF24-3-S US*	–	73.7	VG1845FT+926AGC	VG1845FT+926GGC

* AF Series Actuator have Two Single-Pole-Double-Throw Switches

CROSS-REFERENCE
HONEYWELL to JOHNSON CONTROLS

Non-Spring Return

	Honeywell		Johnson Controls				
Two-Way Non-Spring Return – Plated Brass Ball and Stem							
	Floating Control*		**Floating Control without Auxiliary Switches**			**Floating Control with Two Auxiliary Switches**	
Size (in.)	**Cv**	**Field Installable Switches Optional**	**Cv**	**without Timeout**	**with Timeout**	**without Timeout**	**with Timeout**
1/2	0.38	VB2AABA	–	–	–	–	–
	0.68	VB2ABBA	–	–	–	–	–
	1.3	VB2ACBA	1.2	VG1241AD+906AGA	VG1241AD+906IGA	VG1241AD+906AGC	VG1241AD+906IGC
	–	–	1.9	VG1241AE+906AGA	VG1241AE+906IGA	VG1241AE+906AGC	VG1241AE+906IGC
	2.6	VB2ADBA	2.9	VG1241AF+906AGA	VG1241AF+906IGA	VG1241AF+906AGC	VG1241AF+906IGC
	4.7	VB2AEBA	4.7	VG1241AG+906AGA	VG1241AG+906IGA	VG1241AG+906AGC	VG1241AG+906IGC
	8	VB2AFBA	7.4	VG1241AL+906AGA	VG1241AL+906IGA	VG1241AL+906AGC	VG1241AL+906IGC
	11.7	VB2AGBA	11.7	VG1241AN+906AGA	VG1241AN+906IGA	VG1241AN+906AGC	VG1241AN+906IGC
3/4	4.3	VB2BABA	4.7	VG1241BG+906AGA	VG1241BG+906IGA	VG1241BG+906AGC	VG1241BG+906IGC
	–	–	7.4	VG1241BL+906AGA	VG1241BL+906IGA	VG1241BL+906AGC	VG1241BL+906IGC
	10.1	VB2BBBA	11.7	VG1241BN+906AGA	VG1241BN+906IGA	VG1241BN+906AGC	VG1241BN+906IGC
	14.7	VB2BCBA	–	–	–	–	–
	28.6	VB2BDBA	28.7	VG1243BC+906AGA	–	VG1243BC+906AGC	–
1	–	–	7.4	VG1241CL+906AGA	VG1241CL+906IGA	VG1241CL+906AGC	VG1241CL+906IGC
	9	VB2CABA	11.7	VG1241CN+906AGA	VG1241CN+906IGA	VG1241CN+906AGC	VG1241CN+906IGC
	15	VB2CBBA	18.7	VG1241CP+906AGA	VG1241CP+906IGA	VG1241CP+906AGC	VG1241CP+906IGC
	26.1	VB2CCBA	–	–	–	–	–
	–	–	48.3	VG1243CC+916AGA	–	VG1243CC+916AGC	–
1-1/4	–	–	11.7	VG1241DN+906AGA	VG1241DN+906IGA	VG1241DN+906AGC	VG1241DN+906IGC
	14.9	VB2DABA	18.7	VG1241DP+906AGA	VG1241DP+906IGA	VG1241DP+906AGC	VG1241DP+906IGC
	–	–	29.2	VG1241DR+906AGA	VG1241DR+906IGA	VG1241DR+906AGC	VG1241DR+906IGC
	36.5	VB2DBBA	–	–	–	–	–
	–	–	82.6	VG1243DC+916AGA	–	VG1243DC+916AGC	–
1-1/2	–	–	18.7	VG1241EP+906AGA	VG1241EP+906IGA	VG1241EP+906AGC	VG1241EP+906IGC
	22.8	VB2EABA	29.2	VG1241ER+906AGA	VG1241ER+906IGA	VG1241ER+906AGC	VG1241ER+906IGC
	41.3	VB2EBBA	46.8	VG1241ES+906AGA	VG1241ES+906IGA	VG1241ES+906AGC	VG1241ES+906IGC
	–	–	143.4	VG1243EC+924AGA	–	VG1243EC+924AGC	–
2	–	–	29.2	VG1241FR+909AGA	–	VG1241FR+909AGC	–
	41.7	VB2FABA	46.8	VG1241FS+909AGA	–	VG1241FS+909AGC	–
	71.1	VB2FBBA	73.7	VG1241FT+909AGA	–	VG1241FT+909AGC	–
	Proportional Control		**Proportional Control**				
	Cv	**Field Installable Switches Optional**	**Cv**	**without Auxiliary Switches**	**with Auxiliary Switches**		
1/2	0.38	VB2AABB	–	–	–		
	0.68	VB2ABBB	–	–	–		
	1.3	VB2ACBB	1.2	VG1241AD+906GGA	VG1241AD+906GGC		
	–	–	1.9	VG1241AE+906GGA	VG1241AE+906GGC		
	2.6	VB2ADBB	2.9	VG1241AF+906GGA	VG1241AF+906GGC		
	4.7	VB2AEBB	4.7	VG1241AG+906GGA	VG1241AG+906GGC		
	8	VB2AFBB	7.4	VG1241AL+906GGA	VG1241AL+906GGC		
	11.7	VB2AGBB	11.7	VG1241AN+906GGA	VG1241AN+906GGC		
3/4	4.3	VB2BABB	4.7	VG1241BG+906GGA	VG1241BG+906GGC		
	–	–	7.4	VG1241BL+906GGA	VG1241BL+906GGC		
	10.1	VB2BBBB	11.7	VG1241BN+906GGA	VG1241BN+906GGC		
	14.7	VB2BCBB	–	–	–		
	28.6	VB2BDBB	28.7	VG1243BC+906GGA	VG1243BC+906GGC		
1	–	–	7.4	VG1241CL+906GGA	VG1241CL+906GGC		
	9	VB2CABB	11.7	VG1241CN+906GGA	VG1241CN+906GGC		
	15	VB2CBBB	18.7	VG1241CP+906GGA	VG1241CP+906GGC		
	26.1	VB2CCBB	–	–	–		
	–	–	48.3	VG1243CC+916GGA	VG1243CC+916GGC		
1-1/4	–	–	11.7	VG1241DN+906GGA	VG1241DN+906GGC		
	14.9	VB2DABB	18.7	VG1241DP+906GGA	VG1241DP+906GGC		
	–	–	29.2	VG1241DR+906GGA	VG1241DR+906GGC		
	36.5	VB2DBBB	–	–	–		
	–	–	82.6	VG1243DC+916GGA	VG1243DC+916GGC		
1-1/2	–	–	18.7	VG1241EP+906GGA	VG1241EP+906GGC		
	22.8	VB2EABB	29.2	VG1241ER+906GGA	VG1241ER+906GGC		
	41.3	VB2EBBB	46.8	VG1241ES+906GGA	VG1241ES+906GGC		
	–	–	143.4	VG1243EC+924GGA	VG1243EC+924GGC		
2	–	–	29.2	VG1241FR+909GGA	VG1241FR+909GGC		
	41.7	VB2FABB	46.8	VG1241FS+909GGA	VG1241FS+909GGC		
	71.1	VB2FBBB	73.7	VG1241FT+909GGA	VG1241FT+909GGC		

* Not recommended for two-position control

CROSS-REFERENCE
HONEYWELL to JOHNSON CONTROLS

Non-Spring Return

	Honeywell		Johnson Controls				
Three-Way Non-Spring Return – Plated Brass Ball and Stem							
	Floating Control*		**Floating Control without Auxiliary Switches**			**Floating Control with Two Auxiliary Switches**	
Size (in.)	**Cv**	**Field Installable Switches Optional**	**Cv**	**without Timeout**	**with Timeout**	**without Timeout**	**with Timeout**
1/2	1.0	VB3AABA	1.2	VG1841AD+906AGA	VG1841AD+906IGA	VG1841AD+906AGC	VG1841AD+906IGC
	–	–	1.9	VG1841AE+906AGA	VG1841AE+906IGA	VG1841AE+906AGC	VG1841AE+906IGC
	2.4	VB3ABBA	2.9	VG1841AF+906AGA	VG1841AF+906IGA	VG1841AF+906AGC	VG1841AF+906IGC
	4.3	VB3ACBA	4.7	VG1841AG+906AGA	VG1841AG+906IGA	VG1841AG+906AGC	VG1841AG+906IGC
	8	VB3ADBA	7.4	VG1841AL+906AGA	VG1841AL+906IGA	VG1841AL+906AGC	VG1841AL+906IGC
	–	–	11.7	VG1841AN+906AGA	VG1841AN+906IGA	VG1841AN+906AGC	VG1841AN+906IGC
3/4	2.4	VB3BABA	–	–	–	–	–
	3.8	VB3BBBA	4.7	VG1841BG+906AGA	VG1841BG+906IGA	VG1841BG+906AGC	VG1841BG+906IGC
	–	–	7.4	VG1841BL+906AGA	VG1841BL+906IGA	VG1841BL+906AGC	VG1841BL+906IGC
	12.6	VB3BCBA	11.7	VG1841BN+906AGA	VG1841BN+906IGA	VG1841BN+906AGC	VG1841BN+906IGC
1	8.6	VB3CABA	7.4	VG1841CL+906AGA	VG1841CL+906IGA	VG1841CL+906AGC	VG1841CL+906IGC
	10	VB3CBBA	11.7	VG1841CN+906AGA	VG1841CN+906IGA	VG1841CN+906AGC	VG1841CN+906IGC
	–	–	18.7	VG1841CP+906AGA	VG1841CP+906IGA	VG1841CP+906AGC	VG1841CP+906IGC
	22.3	VB3CCBA	–	–	–	–	–
	30.8	VB3CDBA	–	–	–	–	–
1-1/4	12.7	VB3DABA	11.7	VG1841DN+906AGA	VG1841DN+906IGA	VG1841DN+906AGC	VG1841DN+906IGC
	19.4	VB3DBBA	18.7	VG1841DP+906AGA	VG1841DP+906IGA	VG1841DP+906AGC	VG1841DP+906IGC
	–	–	29.2	VG1841DR+906AGA	VG1841DR+906IGA	VG1841DR+906AGC	VG1841DR+906IGC
	34.1	VB3DCBA	–	–	–	–	–
1-1/2	13.4	VB3EABA	18.7	VG1841EP+906AGA	VG1841EP+906IGA	VG1841EP+906AGC	VG1841EP+906IGC
	23.5	VB3EBBA	29.2	VG1841ER+906AGA	VG1841ER+906IGA	VG1841ER+906AGC	VG1841ER+906IGC
	32	VB3ECBA	46.8	VG1841ES+906AGA	VG1841ES+906IGA	VG1841ES+906AGC	VG1841ES+906IGC
2	23.9	VB3FABA	29.2	VG1841FR+909AGA	–	VG1841FR+909AGC	–
	38.2	VB3FBBA	46.8	VG1841FS+909AGA	–	VG1841FS+909AGC	–
	56.7	VB3FCBA	73.7	VG1841FT+909AGA	–	VG1841FT+909AGC	–
	Proportional Control		**Proportional Control**				
	Cv	**Field Installable Switches Optional**	**Cv**	**without Auxiliary Switches**	**with Auxiliary Switches**		
1/2	1.0	VB3AABB	1.2	VG1841AD+906GGA	VG1841AD+906GGC		
	–	–	1.9	VG1841AE+906GGA	VG1841AE+906GGC		
	2.4	VB3ABBB	2.9	VG1841AF+906GGA	VG1841AF+906GGC		
	4.3	VB3ACBB	4.7	VG1841AG+906GGA	VG1841AG+906GGC		
	8	VB3ADBB	7.4	VG1841AL+906GGA	VG1841AL+906GGC		
	–	–	11.7	VG1841AN+906GGA	VG1841AN+906GGC		
3/4	2.4	VB3BABB	–	–	–		
	3.8	VB3BBBB	4.7	VG1841BG+906GGA	VG1841BG+906GGC		
	–	–	7.4	VG1841BL+906GGA	VG1841BL+906GGC		
	12.6	VB3BCBB	11.7	VG1841BN+906GGA	VG1841BN+906GGC		
1	8.6	VB3CABB	7.4	VG1841CL+906GGA	VG1841CL+906GGC		
	10	VB3CBBB	11.7	VG1841CN+906GGA	VG1841CN+906GGC		
	–	–	18.7	VG1841CP+906GGA	VG1841CP+906GGC		
	22.3	VB3CCBB	–	–	–		
	30.8	VB3CDBB	–	–	–		
1-1/4	12.7	VB3DABB	11.7	VG1841DN+906GGA	VG1841DN+906GGC		
	19.4	VB3DBBB	18.7	VG1841DP+906GGA	VG1841DP+906GGC		
	–	–	29.2	VG1841DR+906GGA	VG1841DR+906GGC		
	34.1	VB3DCBB	–	–	–		
1-1/2	13.4	VB3EABB	18.7	VG1841EP+906GGA	VG1841EP+906GGC		
	23.5	VB3EBBB	29.2	VG1841ER+906GGA	VG1841ER+906GGC		
	32	VB3ECBB	46.8	VG1841ES+906GGA	VG1841ES+906GGC		
2	23.9	VB3FABB	29.2	VG1841FR+909GGA	VG1841FR+909GGC		
	38.2	VB3FBBB	46.8	VG1841FS+909GGA	VG1841FS+909GGC		
	56.7	VB3FCBB	73.7	VG1841FT+909GGA	VG1841FT+909GGC		

* Not recommended for two-position control

CROSS-REFERENCE
HONEYWELL to JOHNSON CONTROLS

Spring Return

	Honeywell			Johnson Controls		
Two-Way Spring Return – Plated Brass Ball and Stem						
		without Auxiliary Switches			without Auxiliary Switches	
Size (in.)	Cv	2 Position (On/Off)	Modulating Floating	Cv	24 VAC On/Off (Floating)	0 to 10 VDC Proportional
1/2	0.38	VB2AABC	VB2AABD	–	–	–
	0.68	VB2ABBC	VB2ABBD	–	–	–
	1.3	VB2ACBC	VB2ACBD	1.2	VG1241AD+936AGA	VG1241AD+936GGA
	–	–	–	1.9	VG1241AE+936AGA	VG1241AE+936GGA
	2.6	VB2ADBC	VB2ADBD	2.9	VG1241AF+936AGA	VG1241AF+936GGA
	4.7	VB2AEBC	VB2AEBD	4.7	VG1241AG+936AGA	VG1241AG+936GGA
	8	VB2AFBC	VB2AFBD	7.4	VG1241AL+936AGA	VG1241AL+936GGA
	11.7	VB2AGBC	VB2AGBD	11.7	VG1241AN+936AGA	VG1241AN+936GGA
3/4	4.3	VB2BABC	VB2BABD	4.7	VG1241BG+936AGA	VG1241BG+936GGA
	–	–	–	7.4	VG1241BL+936AGA	VG1241BL+936GGA
	10.1	VB2BBBC	VB2BBBD	11.7	VG1241BN+936AGA	VG1241BN+936GGA
	14.7	VB2BCBC	VB2BCBD	–	–	–
	28.6	VB2BDBC	VB2BDBD	28.7	VG1243BC+936AGA	VG1243BC+936GGA
1	–	–	–	7.4	VG1241CL+936AGA	VG1241CL+936GGA
	9	VB2CABC	VB2CABD	11.7	VG1241CN+936AGA	VG1241CN+936GGA
	15	VB2CBBC	VB2CBBD	18.7	VG1241CP+936AGA	VG1241CP+936GGA
	26.1	VB2CCBC	VB2CCBD	48.3	VG1243CC+926AGA	VG1243CC+916GGA
1-1/4	–	–	–	11.7	VG1241DN+936AGA	VG1241DN+936GGA
	14.9	VB2DABC	VB2DABD	18.7	VG1241DP+936AGA	VG1241DP+936GGA
	–	–	–	29.2	VG1241DR+936AGA	VG1241DR+936GGA
	36.5	VB2DBBC	VB2DBBD	–	–	–
	–	–	–	82.6	VG1243DC+926AGA	VG1243DC+926GGA
1-1/2	–	–	–	18.7	VG1241EP+936AGA	VG1241EP+936GGA
	22.8	VB2EABC	VB2EABD	29.2	VG1241ER+936AGA	VG1241ER+936GGA
	41.3	VB2EBBC	VB2EBBD	46.8	VG1241ES+936AGA	VG1241ES+936GGA
2	–	–	–	29.2	VG1241FR+926AGA	VG1241FR+926GGA
	41.7	VB2FABC	VB2FABD	46.8	VG1241FS+926AGA	VG1241FS+926GGA
	71.1	VB2FBBC	VB2FBBD	73.7	VG1241FT+926AGA	VG1241FT+926GGA
Three-Way Spring Return – Plated Brass Ball and Stem						
1/2	1.0	VB3AABC	VB3AABD	1.2	VG1845AD+936AGC	VG1845AD+936GGC
	–	–	–	1.9	VG1845AE+936AGC	VG1845AE+936GGC
	2.4	VB3ABBC	VB3ABBD	2.9	VG1845AF+936AGC	VG1845AF+936GGC
	4.3	VB3ACBC	VB3ACBD	4.7	VG1845AG+936AGC	VG1845AG+936GGC
	8	VB3ADBC	VB3ADBD	7.4	VG1845AL+936AGC	VG1845AL+936GGC
	–	–	–	11.7	VG1845AN+936AGC	VG1845AN+936GGC
3/4	2.4	VB3BABC	VB3BABD	–	–	–
	3.8	VB3BBBC	VB3BBBD	4.7	VG1845BG+936AGC	VG1845BG+936GGC
	–	–	–	7.4	VG1845BL+936AGC	VG1845BL+936GGC
	12.6	VB3BCBC	VB3BCBD	11.7	VG1845BN+936AGC	VG1845BN+936GGC
1	8.6	VB3CABC	VB3CABD	7.4	VG1845CL+936AGC	VG1845CL+936GGC
	10	VB3CBBC	VB3CBBD	11.7	VG1845CN+936AGC	VG1845CN+936GGC
	–	–	–	18.7	VG1845CP+936AGC	VG1845CP+936GGC
	22.3	VB3CCBC	VB3CCBD	–	–	–
	30.8	VB3CDBC	VB3CDBD	–	–	–
1-1/4	12.7	VB3DABC	VB3DABD	11.7	VG1845DN+936AGC	VG1845DN+936GGC
	19.4	VB3DBBC	VB3DBBD	18.7	VG1845DP+936AGC	VG1845DP+936GGC
	–	–	–	29.2	VG1845DR+936AGC	VG1845DR+936GGC
	34.1	VB3DCBC	VB3DCBD	–	–	–
1-1/2	13.4	VB3EABC	VB3EABD	18.7	VG1845EP+936AGC	VG1845EP+936GGC
	23.5	VB3EBBC	VB3EBBD	29.2	VG1845ER+936AGC	VG1845ER+936GGC
	32	VB3ECBC	VB3ECBD	46.8	VG1845ES+936AGC	VG1845ES+936GGC
2	23.9	VB3FABC	VB3FABD	29.2	VG1845FR+926AGC	VG1845FR+926GGC
	38.2	VB3FBBC	VB3FBBD	46.8	VG1845FS+926AGC	VG1845FS+926GGC
	56.7	VB3FCBC	VB3FCBD	73.7	VG1845FT+926AGC	VG1845FT+926GGC

CROSS-REFERENCE
HONEYWELL to JOHNSON CONTROLS

Non-Spring Return

	Honeywell		Johnson Controls				
Two-Way Non-Spring Return – Stainless Steel Ball and Stem							
	Floating Control*		Floating Control without Auxiliary Switches			Floating Control with Two Auxiliary Switches	
Size (in.)	CV	Field Installable Switches Optional	CV	without Timeout	with Timeout	without Timeout	with Timeout
1/2	0.38	VB2AASA	–	–	–	–	–
	0.68	VB2ABSA	–	–	–	–	–
	1.3	VB2ACSA	1.2	VG1245AD+906AGA	VG1245AD+906IGA	VG1245AD+906AGC	VG1245AD+906IGC
	–	–	1.9	VG1245AE+906AGA	VG1245AE+906IGA	VG1245AE+906AGC	VG1245AE+906IGC
	2.6	VB2ADSA	2.9	VG1245AF+906AGA	VG1245AF+906IGA	VG1245AF+906AGC	VG1245AF+906IGC
	4.7	VB2AESA	4.7	VG1245AG+906AGA	VG1245AG+906IGA	VG1245AG+906AGC	VG1245AG+906IGC
	8	VB2AFSA	7.4	VG1245AL+906AGA	VG1245AL+906IGA	VG1245AL+906AGC	VG1245AL+906IGC
	11.7	VB2AGSA	11.7	VG1245AN+906AGA	VG1245AN+906IGA	VG1245AN+906AGC	VG1245AN+906IGC
3/4	4.3	VB2BASA	4.7	VG1245BG+906AGA	VG1245BG+906IGA	VG1245BG+906AGC	VG1245BG+906IGC
	–	–	7.4	VG1245BL+906AGA	VG1245BL+906IGA	VG1245BL+906AGC	VG1245BL+906IGC
	10.1	VB2BBSA	11.7	VG1245BN+906AGA	VG1245BN+906IGA	VG1245BN+906AGC	VG1245BN+906IGC
	14.7	VB2BCSA	–	–	–	–	–
	28.6	VB2BDSA	28.7	VG1243BC+906AGA	–	VG1243BC+906AGC	–
1	–	–	7.4	VG1245CL+906AGA	VG1245CL+906IGA	VG1245CL+906AGC	VG1245CL+906IGC
	9	VB2CASA	11.7	VG1245CN+906AGA	VG1245CN+906IGA	VG1245CN+906AGC	VG1245CN+906IGC
	15	VB2CBSA	18.7	VG1245CP+906AGA	VG1245CP+906IGA	VG1245CP+906AGC	VG1245CP+906IGC
	26.1	VB2CCSA	48.3	VG1243CC+916AGA	–	VG1243CC+916AGC	–
1-1/4	–	–	11.7	VG1245DN+906AGA	VG1245DN+906IGA	VG1245DN+906AGC	VG1245DN+906IGC
	14.9	VB2DASA	18.7	VG1245DP+906AGA	VG1245DP+906IGA	VG1245DP+906AGC	VG1245DP+906IGC
	–	–	29.2	VG1245DR+906AGA	VG1245DR+906IGA	VG1245DR+906AGC	VG1245DR+906IGC
	36.5	VB2DBSA	82.6	VG1243DC+916AGA	–	VG1243DC+916AGC	–
1-1/2	–	–	18.7	VG1245EP+906AGA	VG1245EP+906IGA	VG1245EP+906AGC	VG1245EP+906IGC
	22.8	VB2EASA	29.2	VG1245ER+906AGA	VG1245ER+906IGA	VG1245ER+906AGC	VG1245ER+906IGC
	41.3	VB2EBSA	46.8	VG1245ES+906AGA	VG1245ES+906IGA	VG1245ES+906AGC	VG1245ES+906IGC
	–	–	143.4	VG1243EC+924AGA	–	VG1243EC+924AGC	–
2	–	–	29.2	VG1245FR+909AGA	–	VG1245FR+909AGC	–
	41.7	VB2FASA	46.8	VG1245FS+909AGA	–	VG1245FS+909AGC	–
	71.1	VB2FBSA	73.7	VG1245FT+909AGA	–	VG1245FT+909AGC	–
	Proportional Control			Proportional Control			
	CV	Field Installable Switches Optional	CV	without Auxiliary Switches	with Auxiliary Switches		
1/2	0.38	VB2AASB	–	–	–		
	0.68	VB2ABSB	–	–	–		
	1.3	VB2ACSB	1.2	VG1245AD+906GGA	VG1245AD+906GGC		
	–	–	1.9	VG1245AE+906GGA	VG1245AE+906GGC		
	2.6	VB2ADSB	2.9	VG1245AF+906GGA	VG1245AF+906GGC		
	4.7	VB2AESB	4.7	VG1245AG+906GGA	VG1245AG+906GGC		
	8	VB2AFSB	7.4	VG1245AL+906GGA	VG1245AL+906GGC		
	11.7	VB2AGSB	11.7	VG1245AN+906GGA	VG1245AN+906GGC		
3/4	4.3	VB2BASB	4.7	VG1245BG+906GGA	VG1245BG+906GGC		
	–	–	7.4	VG1245BL+906GGA	VG1245BL+906GGC		
	10.1	VB2BBSB	11.7	VG1245BN+906GGA	VG1245BN+906GGC		
	14.7	VB2BCSB	–	–	–		
	28.6	VB2BDSB	28.7	VG1243BC+906GGA	VG1243BC+906GGC		
1	–	–	7.4	VG1245CL+906GGA	VG1245CL+906GGC		
	9	VB2CASB	11.7	VG1245CN+906GGA	VG1245CN+906GGC		
	15	VB2CBSB	18.7	VG1245CP+906GGA	VG1245CP+906GGC		
	26.1	VB2CCSB	48.3	VG1243CC+916GGA	VG1243CC+916GGC		
1-1/4	–	–	11.7	VG1245DN+906GGA	VG1245DN+906GGC		
	14.9	VB2DASB	18.7	VG1245DP+906GGA	VG1245DP+906GGC		
	–	–	29.2	VG1245DR+906GGA	VG1245DR+906GGC		
	36.5	VB2DBSB	82.6	VG1243DC+916GGA	VG1243DC+916GGC		
1-1/2	–	–	18.7	VG1245EP+906GGA	VG1245EP+906GGC		
	22.8	VB2EASB	29.2	VG1245ER+906GGA	VG1245ER+906GGC		
	41.3	VB2EBSB	46.8	VG1245ES+906GGA	VG1245ES+906GGC		
	–	–	143.4	VG1243EC+924GGA	VG1243EC+924GGC		
2	–	–	29.2	VG1245FR+909GGA	VG1245FR+909GGC		
	41.7	VB2FASB	46.8	VG1245FS+909GGA	VG1245FS+909GGC		
	71.1	VB2FBSB	73.7	VG1245FT+909GGA	VG1245FT+909GGC		

* Not recommended for two-position control

CROSS-REFERENCE
HONEYWELL to JOHNSON CONTROLS

Spring Return

	Honeywell			Johnson Controls		
	Two-Way Spring Return – Stainless Steel Ball and Stem					
	without Auxiliary Switches			without Auxiliary Switches		
Size (in.)	Cv	2 Position (On/Off)	Modulating Floating	Cv	24 VAC On/Off (Floating)	0 to 10 VDC Proportional
1/2	0.38	VB2AASC	VB2AASD	–	–	–
	0.68	VB2ABSC	VB2ABSD	–	–	–
	1.3	VB2ACSC	VB2ACSD	1.2	VG1245AD+936AGA	VG1245AD+936GGA
	–	–	–	1.9	VG1245AE+936AGA	VG1245AE+936GGA
	2.6	VB2ADSC	VB2ADSD	2.9	VG1245AF+936AGA	VG1245AF+936GGA
	4.7	VB2AESC	VB2AESD	4.7	VG1245AG+936AGA	VG1245AG+936GGA
	8	VB2AFSC	VB2AFSD	7.4	VG1245AL+936AGA	VG1245AL+936GGA
	11.7	VB2AGSC	VB2AGSD	11.7	VG1245AN+936AGA	VG1245AN+936GGA
3/4	4.3	VB2BASC	VB2BASD	4.7	VG1245BG+936AGA	VG1245BG+936GGA
	–	–	–	7.4	VG1245BL+936AGA	VG1245BL+936GGA
	10.1	VB2BBSC	VB2BBSD	11.7	VG1245BN+936AGA	VG1245BN+936GGA
	14.7	VB2BCSC	VB2BCSD	–	–	–
	28.6	VB2BDSC	VB2BDSD	28.7	VG1243BC+936AGA	VG1243BC+936GGA
1	–	–	–	7.4	VG1245CL+936AGA	VG1245CL+936GGA
	9	VB2CASC	VB2CASD	11.7	VG1245CN+936AGA	VG1245CN+936GGA
	15	VB2CBSC	VB2CBSD	18.7	VG1245CP+936AGA	VG1245CP+936GGA
	26.1	VB2CCSC	VB2CCSD	48.3	VG1243CC+926AGA	VG1243CC+916GGA
1-1/4	–	–	–	11.7	VG1245DN+936AGA	VG1245DN+936GGA
	14.9	VB2DASC	VB2DASD	18.7	VG1245DP+936AGA	VG1245DP+936GGA
	–	–	–	29.2	VG1245DR+936AGA	VG1245DR+936GGA
	36.5	VB2DBSC	VB2DBSD	82.6	VG1243DC+926AGA	VG1243DC+926GGA
1-1/2	–	–	–	18.7	VG1245EP+936AGA	VG1245EP+936GGA
	22.8	VB2EASC	VB2EASD	29.2	VG1245ER+936AGA	VG1245ER+936GGA
	41.3	VB2EBSC	VB2EBSD	46.8	VG1245ES+936AGA	VG1245ES+936GGA
2	–	–	–	29.2	VG1245FR+926AGA	VG1245FR+926GGA
	41.7	VB2FASC	VB2FASD	46.8	VG1245FS+926AGA	VG1245FS+926GGA
	71.1	VB2FBSC	VB2FBSD	73.7	VG1245FT+926AGA	VG1245FT+926GGA

CROSS-REFERENCE
GRISWOLD CONTROLS, DELTA CONTROL PRODUCTS, and BRAY INTERNATIONAL to JOHNSON CONTROLS
Two-Way, Plated Brass Trim

Size (in.)	Cv	Griswold Controls	Delta Control Products	Bray Controls	Cv	Johnson Controls
	Two-Way Plated Brass Trim, Internal NPT End Connections, less actuators					
1/2	0.38	3URA1FB	ST 05-2-004	VCB2101N1	–	–
	0.68	3URA2FB	ST 05-2-007	VCB2102N1	–	–
	1.3	3URA3FB	ST 05-2-01	VCB2103N1	1.2	VG1241AD
	–	–	–	–	1.9	VG1241AE
	2.6	3URA4FB	ST 05-2-03	VCB2104N1	2.9	VG1241AF
	4.7	3URA5FB	ST 05-2-05	VCB2105N1	4.7	VG1241AG
	8.0	3URA7FB	ST 05-2-08	–	7.4	VG1241AL
	11.7	3URA6FB	ST 05-2-12	VCB2106N1	11.7	VG1241AN
3/4	0.31	3URB6FB	ST 75-2-003	–	–	–
	0.63	3URB7FB	ST 75-2-006	–	–	–
	1.2	3URB8FB	ST 75-2-01	–	–	–
	2.5	3URB1FB	ST 75-2-03	VCB2207N1	–	–
	4.3	3URB2FB	ST 75-2-04	VCB2208N1	4.7	VG1241BG
	–	–	–	–	7.4	VG1241BL
	10.1	3URB4FB	ST 75-2-10	VCB2210N1	11.7	VG1241BN
	14.7	3URB3FB	ST 75-2-15	VCB2209N1	–	–
	28.6	3URB5FB	ST 75-2-29	–	–	–
1	4.4	3URC7FB	ST 1-2-04	–	7.4	VG1241CL
	9.0	3URC1FB	ST 1-2-09	VCB2311N1	11.7	VG1241CN
	15.3	3URC3FB	ST 1-2-15	VCB2313N1	18.7	VG1241CP
	26.1	3URC5FB	ST 1-2-26	–	–	–
	28.4	3URC2FB	ST 1-2-28	VCB2312N1	–	–
	43.9	3URC6FB	ST 1-2-44	–	–	–
	54.2	3URC4FB	ST 1-2-54	–	–	–
1-1/4	4.4	3URD5FB	ST 125-2-04	–	–	–
	8.3	3URD6FB	ST 125-2-08	–	11.7	VG1241DN
	14.9	3URD1FB	ST 125-2-15	VCB2414N1	18.7	VG1241DP
	–	–	–	–	29.2	VG1241DR
	36.5	3URD3FB	ST 125-2-37	VCB2416N1	–	–
	41.1	3URD2FB	ST 125-2-41	VCB2415N1	82.6	
	102.3	3URD4FB	ST 125-2-102		–	–
1-1/2	–	–	–	–	18.7	VG1241EP
	22.8	3URE1FB	ST 150-2-23	VCB2517N1	29.2	VG1241ER
	41.3	3URE3FB	ST 150-2-41	VCB2519N1	46.8	VG1241ES
	73.9	3URE2FB	ST 150-2-74	VCB2518N1	–	–
	171.7	3URE4FB	ST 150-2-171	–	–	–
2	–	–	–	–	29.2	VG1241FR
	41.7	3URF1FB	ST 2-2-42	VCB2620N1	46.8	VG1241FS
	57.0	3URF5FB	ST 2-2-57	–	–	–
	71.1	3URF3FB	ST 2-2-71	VCB2622N1	73.7	VG1241FT
	100	3URF6FB	ST 2-2-100	–	–	–
	108	3URF2FB	ST 2-2-108	VCB2621N1	–	–
	210	3URF7FB	ST 2-2-210	–	–	–
	266	3URF4FB	ST 2-2-266	–	–	–

CROSS-REFERENCE
GRISWOLD CONTROLS, DELTA CONTROL PRODUCTS, and BRAY INTERNATIONAL to JOHNSON CONTROLS
Two-Way, Stainless Steel Trim

Size (in.)	Cv	Griswold Controls	Delta Control Products	Bray Controls	Cv	Johnson Controls
Two-Way Plated Brass Trim, Internal NPT End Connections, less actuators						
1/2	0.38	3URA1FS	ST 05-2-004 SSBS	VCB2101N2	–	–
	0.68	3URA2FS	ST 05-2-007 SSBS	VCB2102N2	–	–
	1.3	3URA3FS	ST 05-2-01 SSBS	VCB2103N2	1.2	VG1245AD
	–	–	–	–	1.9	VG1245AE
	2.6	3URA4FS	ST 05-2-03 SSBS	VCB2104N2	2.9	VG1245AF
	4.7	3URA5FS	ST 05-2-05 SSBS	VCB2105N2	4.7	VG1245AG
	8.0	3URA7FS	ST 05-2-08 SSBS	–	7.4	VG1245AL
	11.7	3URA6FS	ST 05-2-12 SSBS	VCB2106N2	11.7	VG1245AN
3/4	0.31	3URB6FS	ST 75-2-003 SSBS	–	–	–
	0.63	3URB7FS	ST 75-2-006 SSBS	–	–	–
	1.2	3URB8FS	ST 75-2-01 SSBS	–	–	–
	2.5	3URB1FS	ST 75-2-03 SSBS	VCB2207N2	–	–
	4.3	3URB2FS	ST 75-2-04 SSBS	VCB2208N2	4.7	VG1245BG
	–	–	–	–	7.4	VG1245BL
	10.1	3URB4FS	ST 75-2-10 SSBS	VCB2210N2	11.7	VG1245BN
	14.7	3URB3FS	ST 75-2-15 SSBS	VCB2209N2	–	–
	28.6	3URB5FS	ST 75-2-29 SSBS	–	28.7	VG1243BC
1	4.4	3URC7FS	ST 1-2-04 SSBS	–	7.4	VG1245CL
	9.0	3URC1FS	ST 1-2-09 SSBS	VCB2311N2	11.7	VG1245CN
	15.3	3URC3FS	ST 1-2-15 SSBS	VCB2313N2	18.7	VG1245CP
	26.1	3URC5FS	ST 1-2-26 SSBS	–	–	–
	28.4	3URC2FS	ST 1-2-28 SSBS	VCB2312N2	–	–
	43.9	3URC6FS	ST 1-2-44 SSBS	–	48.3	VG1243CC
	54.2	3URC4FS	ST 1-2-54 SSBS	–	–	–
1-1/4	4.4	3URD5FS	ST 125-2-04 SSBS	–	–	–
	8.3	3URD6FS	ST 125-2-08 SSBS	–	11.7	VG1245DN
	14.9	3URD1FS	ST 125-2-15 SSBS	VCB2414N2	18.7	VG1245DP
	–	–	–	–	29.2	VG1245DR
	36.5	3URD3FS	ST 125-2-37 SSBS	VCB2416N2	–	–
	41.1	3URD2FS	ST 125-2-41 SSBS	VCB2415N2	82.6	VG1243DC
	102.3	3URD4FS	ST 125-2-102 SSBS	–	–	–
1-1/2	–	–	–	–	18.7	VG1245EP
	22.8	3URE1FS	ST 150-2-23 SSBS	VCB2517N2	29.2	VG1245ER
	41.3	3URE3FS	ST 150-2-41 SSBS	VCB2519N2	46.8	VG1245ES
	73.9	3URE2FS	ST 150-2-74 SSBS	VCB2518N2	–	–
	–	–	–	–	143	VG1243EC
	171.7	3URE4FS	ST 150-2-171 SSBS	–	–	–
2	–	–	–	–	29.2	VG1245FR
	41.7	3URF1FS	ST 2-2-42 SSBS	VCB2620N2	46.8	VG1245FS
	57.0	3URF5FS	ST 2-2-57 SSBS	–	–	–
	71.1	3URF3FS	ST 2-2-71 SSBS	VCB2622N2	73.7	VG1245FT
	100	3URF6FS	ST 2-2-100 SSBS	–	–	–
	108	3URF2FS	ST 2-2-108 SSBS	VCB2621N2	–	–
	210	3URF7FS	ST 2-2-210 SSBS	–	–	–
	266	3URF4FS	ST 2-2-266 SSBS	–	–	–

CROSS-REFERENCE
GRISWOLD CONTROLS, DELTA CONTROL PRODUCTS, and BRAY INTERNATIONAL to JOHNSON CONTROLS
Three-Way Mixing Ball Valves

		Griswold Controls	Delta Control Products	Bray Controls	Johnson Controls		
Three-Way Mixing Ball Valves, Internal NPT End Connections, less actuators							
Size (in.)	In-Line Port Cv	Brass	Brass	Brass	In-Line Port Cv	Brass	Stainless Steel
1/2	0.33	3WRAA	ST 05-3-003	–	–	–	–
	0.59	3WRAB	ST 05-3-006	VCB3101NM	–	–	–
	1.0	3WRAC	ST 05-3-01	VCB3102NM	1.2	VG1841AD	VG1845AD
	–	–	–	–	1.9	VG1841AE	VG1845AE
	2.4	3WRAD	ST 05-3-02	VCB3103NM	2.9	VG1841AF	VG1845AF
	4.3	3WRAE	ST 05-3-04	VCB3104NM	4.7	VG1841AG	VG1845AG
	8.0	3WRAF	ST 05-3-08	VCB3105NM	7.4	VG1841AL	VG1845AL
	–	–	–	–	11.7	VG1841AN	VG1845AN
3/4	0.40	3WRBA	ST 75-3-007	–	–	–	–
	0.66	3WRBB	ST 75-3-007	–	–	–	–
	1.3	3WRBC	ST 75-3-01	–	–	–	–
	2.4	3WRBC	ST 75-3-02	VCB3207NM	–	–	–
	3.8	3WRBE	ST 75-3-04	VCB3208NM	4.7	VG1841BG	VG1845BG
	–	–	–	–	7.4	VG1841BL	VG1845BL
	12.6	3WRBF	ST 75-3-13	VCB3209NM	11.7	VG1841BN	VG1845BN
1	0.40	3WRCA	ST 1-3-004	–	–	–	–
	0.65	3WRCB	ST 1-3-007	–	–	–	–
	1.3	3WRCC	ST 1-3-01	–	–	–	–
	2.3	3WRCD	ST 1-3-02	–	–	–	–
	3.5	3WRCE	ST 1-3-04	–	–	–	–
	4.5	3WRCK	ST 1-3-05	–	–	–	–
	8.6	3WRCG	ST 1-3-09	VCB3311NM	7.4	VG1841CL	VG1845CL
	10.0	3WRCF	ST 1-3-10	–	11.7	VG1841CN	VG1845CN
	14.9	3WRCJ	ST 1-3-15	–	18.7	VG1841CP	VG1845CP
	22.3	3WRCH	ST 1-3-22	VCB3312NM	–	–	–
	30.8	3WRCM	ST 1-3-31	–	–	–	–
1-1/4	4.1	3WRDD	ST 125-3-04	–	–	–	–
	7.7	3WRDA	ST 125-3-08	–	–	–	–
	8.7	3WRDE	ST 125-3-09	–	–	–	–
	12.7	3WRDC	ST 125-3-13	VCB3414NM	11.7	VG1841DN	VG1845DN
	19.4	3WRDB	ST 125-3-19	–	18.7	VG1841DP	VG1845DP
	–	–	–	–	29.2	VG1841DR	VG1845DR
	34.1	3WRDF	ST 125-3-34	VCB3415NM	–	–	–
1-1/2	4.0	3WREB	ST 150-3-04	–	–	–	–
	8.3	3WREC	ST 150-3-08	–	–	–	–
	13.4	3WREA	ST 150-3-13	–	18.7	VG1841EP	VG1845EP
	23.5	3WREE	ST 150-3-24	VCB3517NM	29.2	VG1841ER	VG1845ER
	32.0	3WRED	ST 150-3-32	–	46.8	VG1841ES	VG1845ES
	61.1	3WREF	ST 150-3-61	VCB3518NM	–	–	–
2	23.9	3WRFA	ST 2-3-24	–	29.2	VG1841FR	VG1845FR
	38.2	3WRFC	ST 2-3-38	VCB3620NM	46.8	VG1841FS	VG1845FS
	56.7	3WRFB	ST 2-3-57	–	73.7	VG1841FT	VG1845FT
	108.5	3WRFD	ST 2-3-109	VCB3621NM	–	–	–

CROSS-REFERENCE
DODGE ENGINEERING AND CONTROLS to JOHNSON CONTROLS
Two-Way

	Dodge Engineering & Controls			Johnson Controls		
	Two-Way Ball Valves, less actuators					
Size (in.)	Cv	Brass	Stainless Steel	Cv	Brass	Stainless Steel
1/2	0.5	2-050-.5	2-050-.5-SBS	–	–	–
	1	2-050-1	2-050-1-SBS	1.2	VG1241AD	VG1245AD
	2	2-050-2	2-050-2-SBS	1.9	VG1241AE	VG1245AE
	3	2-050-3	2-050-3-SBS	2.9	VG1241AF	VG1245AF
	4	2-050-4	2-050-4-SBS	–	–	–
	5	2-050-5	2-050-5-SBS	4.7	VG1241AG	VG1245AG
	6	2-050-6	2-050-6-SBS	–	–	–
	7	2-050-7	2-050-7-SBS	7.4	VG1241AL	VG1245AL
	8	2-050-8	2-050-8-SBS	–	–	–
	9	2-050-9	2-050-9-SBS	–	–	–
	9.8	2-050-9.8	2-050-9.8-SBS	11.7	VG1241AN	VG1245AN
3/4	–	–	–	4.7	VG1241BG	VG1245BG
	–	–	–	7.4	VG1241BL	VG1245BL
	–	–	–	11.7	VG1241BN	VG1245BN
	25	2-075-025	2-075-025-SBS	28.7	–	VG1243BC
	33	2-075-033	2-075-033-SBS	–	–	–
1	–	–	–	7.4	VG1241CL	VG1245CL
	–	–	–	11.7	VG1241CN	VG1245CN
	–	–	–	18.7	VG1241CP	VG1245CP
	35	2-100-035	2-100-035-SBS	–	–	–
	47	2-100-047	2-100-047-SBS	48.3	–	VG1243CC
1-1/4	–	–	–	11.7	VG1241DN	VG1245DN
	–	–	–	18.7	VG1241DP	VG1245DP
	–	–	–	29.2	VG1241DR	VG1245DR
	47	2-125-047	2-125-047-SBS	–	–	–
	81	2-125-081	2-125-081-SBS	82.6	–	VG1243DC
1-1/2	–	–	–	18.7	VG1241EP	VG1245EP
	–	–	–	29.2	VG1241ER	VG1245ER
	–	–	–	46.8	VG1241ES	VG1245ES
	81	2-150-081	2-150-081-SBS	–	–	–
	105	2-150-105	2-150-105-SBS	143.4	–	VG1243EC
2	–	–	–	29.2	VG1241FR	VG1245FR
	–	–	–	46.8	VG1241FS	VG1245FS
	–	–	–	73.7	VG1241FT	VG1245FT
	105	2-200-105	2-200-105-SBS	–	–	–
	360	2-200-360	2-200-360-SBS	–	–	–

CROSS-REFERENCE
DODGE ENGINEERING AND CONTROLS to JOHNSON CONTROLS
Three-Way

	Dodge Engineering & Controls			Johnson Controls		
	Three-Way Ball Valves, less actuators					
Size (in.)	Cv	Brass	Stainless Steel	Cv	Brass	Stainless Steel
1/2	0.5	3-050-.5	3-050-.5-SBS	–	–	–
	1	3-050-1	3-050-1-SBS	1.2	VG1841AD	VG1845AD
	2	3-050-2	3-050-2-SBS	1.9	VG1841AE	VG1845AE
	3	3-050-3	3-050-3-SBS	2.9	VG1841AF	VG1845AF
	4	3-050-4	3-050-4-SBS	–	–	–
	5	3-050-5	3-050-5-SBS	4.7	VG1841AG	VG1845AG
	6	3-050-7	3-050-6-SBS	7.4	VG1841AL	VG1845AL
	–	–	–	11.7	VG1841AN	VG1845AN
3/4	–	–	–	4.7	VG1841BG	VG1845BG
	–	–	–	7.4	VG1841BL	VG1845BL
	12	3-075-012	3-075-012-SBS	11.7	VG1841BN	VG1845BN
1	–	–	–	7.4	VG1841CL	VG1845CL
	–	–	–	11.7	VG1841CN	VG1845CN
	14	3-100-014	3-100-014-SBS	18.7	VG1841CP	VG1845CP
1-1/4	–	–	–	11.7	VG1841DN	VG1845DN
	–	–	–	18.7	VG1841DP	VG1845DP
	–	–	–	29.2	VG1841DR	VG1845DR
	47	2-125-047	2-125-047-SBS	–	–	–
	81	2-125-081	2-125-081-SBS	–	–	–
1-1/2	–	–	–	18.7	VG1841EP	VG1845EP
	–	–	–	29.2	VG1841ER	VG1845ER
	–	–	–	46.8	VG1841ES	VG1845ES
	81	2-150-081	2-150-081-SBS	–	–	–
	105	2-150-105	2-150-105-SBS	–	–	–
2	–	–	–	29.2	VG1841FR	VG1845FR
	–	–	–	46.8	VG1841FS	VG1845FS
	–	–	–	73.7	VG1841FT	VG1845FT
	105	2-200-105	2-200-105-SBS	–	–	–
	360	2-200-360	2-200-360-SBS	–	–	–

SIZING WATER VALVES

TWO-POSITION APPLICATIONS The valve is normally sized the same as the pipe size using the largest Cv available.

MODULATING APPLICATIONS The valve should be sized to produce the required Cv with a pressure drop of one to two times the pressure drop across the coil at rated flow.

EXAMPLE Coil requires 14 gpm at 5 psi pressure drop. The valve should be selected to provide 14 gpm with a pressure drop across the valve between 5 and 10 psi (one to two times the pressure drop across the coil at the required flow.

SOLUTION From the table below a 1/2 in., 4.7 Cv valve will provide 14.1 gpm flow at a pressure drop across the valve of 9 psi. This valve should be selected as the valve will provide the needed flow with a pressure drop between one and two times the pressure drop across the coil at the required flow.

Cv	1.2	1.9	2.9	4.7	7.4	11.7	18.7	28.7	29.2	46.8	48.3	73.7	82.6	143.4
Pressure Drop (psi)	Flow Rate in gpm (Gallons Per Minute)													
1	1.2	1.9	2.9	4.7	7.4	11.7	18.7	28.7	29.2	46.8	48.3	73.7	82.6	143.4
2	1.7	2.7	4.1	6.6	10.5	16.5	26.4	40.6	41.3	66.2	68.3	104.2	116.8	202.8
3	2.1	3.3	5.0	8.1	12.8	20.3	32.4	49.7	50.6	81.1	83.7	127.7	143.1	248.4
4	2.4	3.8	5.8	9.4	14.8	23.4	37.4	57.4	58.4	93.6	96.6	147.4	165.2	286.8
5	2.7	4.2	6.5	10.5	16.5	26.2	41.8	64.2	65.3	104.6	108.0	164.8	184.7	320.7
6	2.9	4.7	7.1	11.5	18.1	28.7	45.8	70.3	71.5	114.6	118.3	180.5	202.3	351.3
7	3.2	5.0	7.7	12.4	19.6	31.0	49.5	75.9	77.3	123.8	127.8	195.0	218.5	379.4
8	3.4	5.4	8.2	13.3	20.9	33.1	52.9	81.2	82.6	132.4	136.6	208.5	233.6	405.6
9	3.6	5.7	8.7	14.1	22.2	35.1	56.1	86.1	87.6	140.4	144.9	221.1	247.8	430.2
10	3.8	6.0	9.2	14.9	23.4	37.0	59.1	90.8	92.3	148.0	152.7	233.1	261.2	453.5
11	4.0	6.3	9.6	15.6	24.5	38.8	62.0	95.2	96.8	155.2	160.2	244.4	274.0	475.6
12	4.2	6.6	10.0	16.3	25.6	40.5	64.8	99.4	101.2	162.1	167.3	255.3	286.1	496.8
13	4.3	6.9	10.5	16.9	26.7	42.2	67.4	103.5	105.3	168.7	174.1	265.7	297.8	517.0
14	4.5	7.1	10.9	17.6	27.7	43.8	70.0	107.4	109.3	175.1	180.7	275.8	309.1	536.6
15	4.6	7.4	11.2	18.2	28.7	45.3	72.4	111.2	113.1	181.3	187.1	285.4	319.9	555.4
16	4.8	7.6	11.6	18.8	29.6	46.8	74.8	114.8	116.8	187.2	193.2	294.8	330.4	573.6
17	4.9	7.8	12.0	19.4	30.5	48.2	77.1	118.3	120.4	193.0	199.1	303.9	340.6	591.3
18	5.1	8.1	12.3	19.9	31.4	49.6	79.3	121.8	123.9	198.6	204.9	312.7	350.4	608.4
19	5.2	8.3	12.6	20.5	32.3	51.0	81.5	125.1	127.3	204.0	210.5	321.3	360.0	625.1
20	5.4	8.5	13.0	21.0	33.1	52.3	83.6	128.4	130.6	209.3	216.0	329.6	369.4	641.3
21	5.5	8.7	13.3	21.5	33.9	53.6	85.7	131.5	133.8	214.5	221.3	337.7	378.5	657.1
22	5.6	8.9	13.6	22.0	34.7	54.9	87.7	134.6	137.0	219.5	226.5	345.7	387.4	672.6
23	5.8	9.1	13.9	22.5	35.5	56.1	89.7	137.6	140.0	224.4	231.6	353.5	396.1	687.7
24	5.9	9.3	14.2	23.0	36.3	57.3	91.6	140.6	143.1	229.3	236.6	361.1	404.7	702.5
25	6.0	9.5	14.5	23.5	37.0	58.5	93.5	143.5	146.0	234.0	241.5	368.5	413.0	717.0
26	6.1	9.7	14.8	24.0	37.7	59.7	95.4	146.3	148.9	238.6	246.3	375.8	421.2	731.2
27	6.2	9.9	15.1	24.4	38.5	60.8	97.2	149.1	151.7	243.2	251.0	383.0	429.2	745.1
28	6.3	10.1	15.3	24.9	39.2	61.9	99.0	151.9	154.5	247.6	255.6	390.0	437.1	758.8
29	6.5	10.2	15.6	25.3	39.9	63.0	100.7	154.6	157.2	252.0	260.1	396.9	444.8	772.2
30	6.6	10.4	15.9	25.7	40.5	64.1	102.4	157.2	159.9	256.3	264.5	403.7	452.4	785.4

SIZING STEAM VALVES

TWO-POSITION APPLICATIONS

The valve is normally sized to be the same as the pipe using the largest Cv available for a given pipe size.

MODULATING APPLICATIONS

Select the valve to meet the BtuH requirements of the coil.

ASSUMPTIONS

1. The table assumes an atmospheric return.
2. Minimum coil BtuH calculated assuming a pressure drop across the valve of 50% of supply pressure.
3. Maximum coil BtuH calculated assuming a pressure drop across the valve of 80% of supply pressure.

Available Pipe Size NPT	1/2"		1/2"		1/2"		1/2" 3/4"		1/2" 3/4" 1"		3/4" 1"		1" 1-1/4" 1-1/2"	
Cv	1.2		1.9		2.9		4.7		7.4		11.7		18.7	
Saturated Steam	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH
Supply Pressure														
1	10,700	13,600	17,000	21,500	25,900	32,800	42,000	53,200	66,200	83,700	104,700	132,400	167,300	211,600
2	15,600	19,800	24,700	31,300	37,800	47,800	61,200	77,400	96,400	121,900	152,400	192,700	243,500	308,000
3	19,600	24,800	31,100	39,300	47,500	60,000	76,900	97,300	121,100	153,200	191,500	242,300	306,100	387,200
4	23,300	29,500	36,900	46,700	56,300	71,200	91,200	115,400	143,700	181,700	227,100	287,300	363,000	459,200
5	26,700	33,700	42,200	53,400	64,400	81,500	104,400	132,100	164,400	208,000	260,000	328,900	415,600	525,700
6	29,900	37,900	47,400	59,900	72,300	91,500	117,200	148,300	184,600	233,400	291,800	369,100	466,400	589,900
7	33,000	41,800	52,300	66,100	79,800	100,900	129,300	163,600	203,600	257,600	322,000	407,300	514,600	650,900
8	36,100	45,600	57,100	72,200	87,200	110,300	141,300	178,700	222,400	281,400	351,700	444,900	562,100	711,000
9	39,000	49,400	61,800	78,200	94,300	119,300	152,900	193,300	240,700	304,400	380,500	481,300	608,200	769,300
10	42,000	53,100	66,400	84,000	101,400	128,300	164,300	207,900	258,700	327,300	409,100	517,500	653,800	827,000
11	44,800	56,700	71,000	89,800	108,300	137,000	175,600	222,100	276,400	349,600	437,000	552,800	698,500	883,500
12	47,600	60,300	75,400	95,400	115,100	145,600	186,600	236,000	293,800	371,600	464,500	587,500	742,400	939,000
15	56,000	70,900	88,700	112,200	135,400	171,300	219,500	277,600	345,600	437,100	546,400	691,100	873,200	1,104,600

SIZING STEAM VALVES

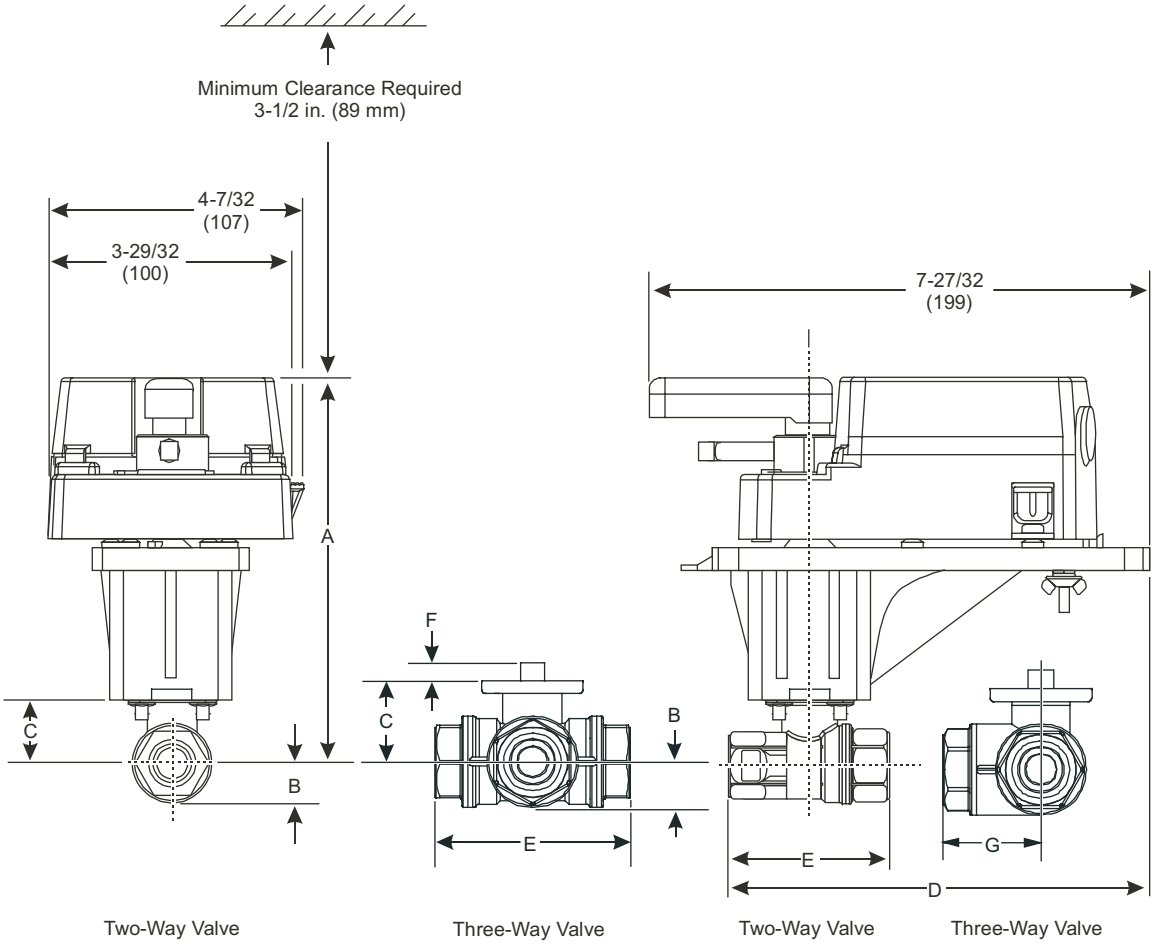
EXAMPLE A steam coil is rated to produce 1,100,000 BtuH. The steam supply pressure is 10 psig.

SOLUTION From the table below a 3/4", 28.7 Cv valve will provide between 1,003,500 and 1,269,300 BtuH with an inlet pressure of 10 psig. This valve should be selected, as the requirements of the coil fall within the capabilities of the valve. If an exact match is not available, it is often possible to adjust the steam supply pressure by adjusting the pressure control on the boiler or adding a steam pressure regulator to reduce the pressure.

Available Pipe Size NPT	3/4"		1-1/4" 1-1/2" 2"		1-1/2" 2"		1"		2"		1-1/4"		1-1/2"	
Cv	28.7		29.2		46.8		48.3		73.7		82.6		143.4	
Saturated Steam	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH	Min. Coil BtuH	Max. Coil BtuH
Supply Pressure														
1	256,700	324,700	261,200	330,400	416,800	527,200	432,000	546,500	659,200	833,800	738,800	934,500	1,282,600	1,622,400
2	373,800	472,800	380,300	481,000	606,900	767,600	629,000	795,600	959,800	1,214,100	1,075,700	1,360,700	1,867,500	2,362,200
3	469,800	594,300	478,000	604,600	762,800	964,900	790,600	1,000,100	1,206,400	1,526,000	1,352,100	1,710,300	2,347,400	2,969,200
4	557,100	704,700	566,800	717,000	904,600	1,144,300	937,600	1,186,000	1,430,700	1,809,700	1,603,500	2,028,300	2,783,800	3,521,200
5	637,800	806,800	648,900	820,800	1,035,600	1,309,900	1,073,400	1,357,700	1,637,800	2,071,700	1,835,600	2,321,900	3,186,700	4,030,900
6	715,800	905,400	728,200	921,200	1,162,200	1,470,100	1,204,600	1,523,700	1,838,100	2,325,000	2,060,000	2,605,800	3,576,400	4,523,800
7	789,800	999,000	803,500	1,016,400	1,282,400	1,622,100	1,329,100	1,681,300	2,028,100	2,565,400	2,273,000	2,875,200	3,946,200	4,991,500
8	862,700	1,091,200	877,700	1,110,200	1,400,800	1,771,800	1,451,900	1,836,500	2,215,400	2,802,200	2,482,900	3,140,600	4,310,500	5,452,400
9	933,400	1,180,600	949,600	1,201,200	1,515,500	1,917,000	1,570,800	1,986,900	2,396,800	3,031,800	2,686,300	3,397,900	4,663,600	5,899,000
10	1,003,500	1,269,300	1,021,000	1,291,400	1,629,300	2,061,000	1,688,800	2,136,200	2,576,900	3,259,500	2,888,100	3,653,100	5,013,900	6,342,100
11	1,072,000	1,356,000	1,090,700	1,379,600	1,740,600	2,201,700	1,804,100	2,282,000	2,752,800	3,482,100	3,085,200	3,902,600	5,356,200	6,775,100
12	1,139,400	1,441,200	1,159,200	1,466,300	1,850,000	2,340,100	1,917,500	2,425,400	2,925,900	3,700,900	3,279,200	4,147,900	5,692,900	7,201,000
15	1,340,200	1,695,300	1,363,600	1,724,800	2,176,100	2,752,600	2,255,500	2,853,000	3,441,600	4,353,300	3,857,200	4,879,000	6,696,400	8,470,400

DIMENSIONS – NON-SPRING RETURN

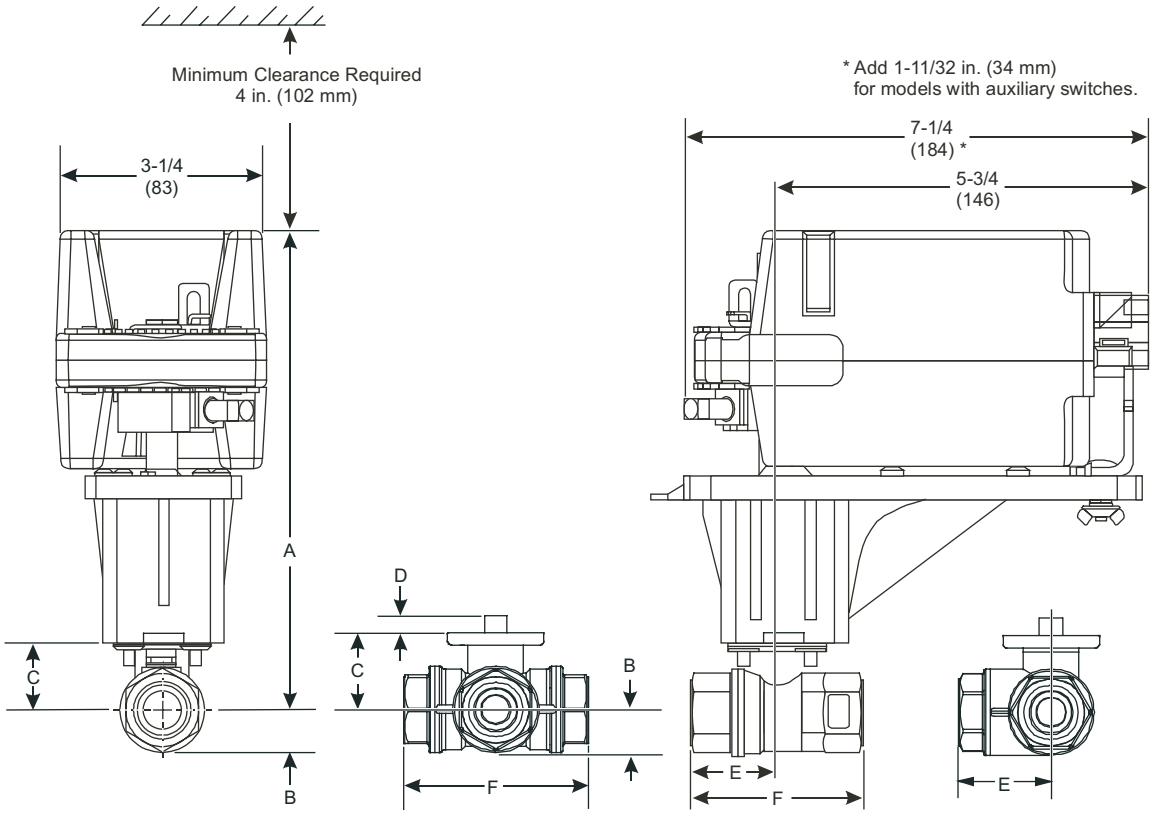
M9106 or M9109 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve with M9000-520 Linkage Dimensions, in. (mm)



Valve Size, in. (DN)	A	B	C	D	E	F	G
1/2 (DN15)	6-19/64 (160)	21/32 (17)	1-7/32 (31)	6-49/64 (172)	2-33/64 (64)	11/32 (9)	1-1/4 (32)
3/4 (DN20)	6-19/64 (160)	21/32 (17)	1-7/32 (31)	6-29/32 (175)	2-51/64 (71)	11/32 (9)	1-13/32 (36)
1 (DN25)	6-3/8 (162)	3/4 (19)	1-19/64 (33)	7-13/64 (183)	3-13/32 (87)	11/32 (9)	1-11/16 (43)
1-1/4 (DN32)	6-13/16 (173)	1-1/32 (26)	1-23/32 (44)	7-15/32 (190)	3-15/16 (100)	11/32 (9)	2 (51)
1-1/2 (DN40)	6-31/32 (177)	1-9/64 (29)	1-57/64 (48)	7-43/64 (195)	4-21/64 (110)	11/32 (9)	2-1/8 (54)
2 (DN50)	7-11/64 (182)	1-15/32 (37)	2-1/16 (53)	7-59/64 (201)	4-27/32 (123)	11/32 (9)	2-9/16 (65)

DIMENSIONS – SPRING RETURN

M9206 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve with M9000-520 Linkage Dimensions, in. (mm)



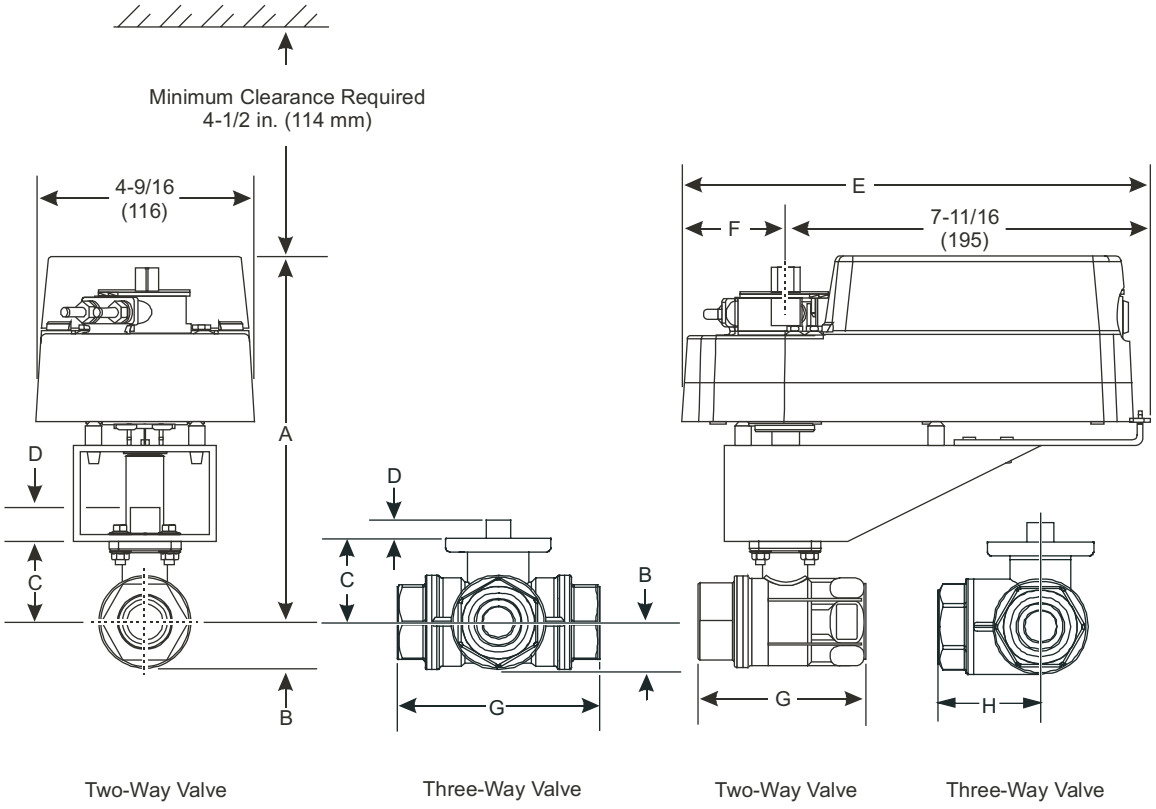
Two-Way Valve | Three-Way Valve | Two-Way Valve | Three-Way Valve

Valve Size, in. (DN)	A*	B	C	D	E	F
1/2 (DN15)	7-13/64 (183)	21/32 (17)	1-7/32 (31)	11/32 (9)	1-1/4 (32)	2-33/64 (64)
3/4 (DN20)	7-13/64 (183)	21/32 (17)	1-7/32 (31)	11/32 (9)	1-13/32 (36)	2-51/64 (71)
1 (DN25)	7-9/32 (185)	3/4 (19)	1-19/64 (33)	11/32 (9)	1-45/64 (43)	3-13/32 (87)
1-1/4 (DN32)	7-11/16 (195)	1-1/32 (26)	1-23/32 (44)	11/32 (9)	1-31/32 (50)	3-15/16 (100)
1-1/2 (DN40)	7-7/8 (200)	1-9/64 (29)	1-57/64 (48)	11/32 (9)	2-11/64 (55)	4-21/64 (110)

* For valve assemblies with M9206-Bxx-2S Series actuators, subtract 19/32 (15 mm) from dimension A (column A).

DIMENSIONS – SPRING RETURN

M9216 Actuated VG1241, VG1245, VG1841, and VG1845 Series Ball Valve with M9000-510 Linkage Dimensions, in. (mm)

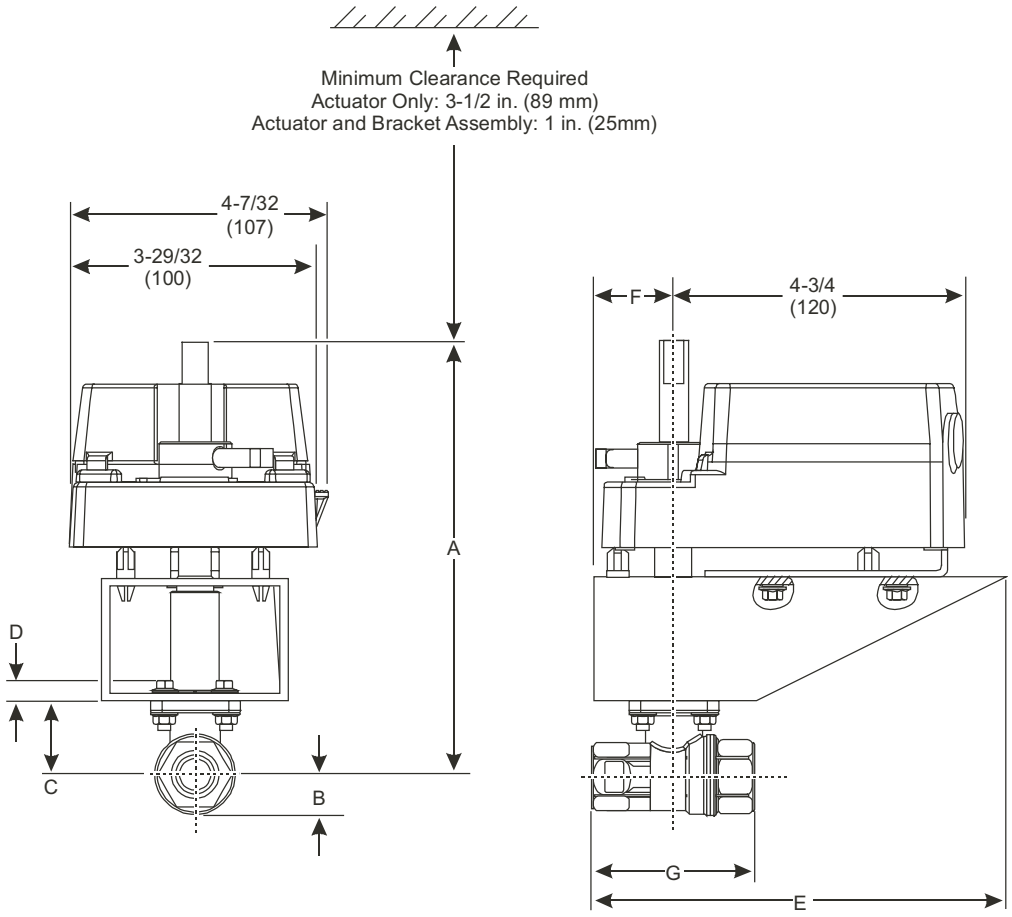


Valve Size, in. (DN)	A	B	C	D	E*	F	G	H
2 (DN50)	8-1/32 (204)	1-15/32 (37)	2-1/8 (54)	11/32 (9)	9-13/16 (249)	2-5/32 (55)	4-27/32 (123)	2-27/64 (62)

* For valve assemblies with On/Off M9216-BAA-2 Series actuators, add 3 in. (76.2 mm) to dimension E (column E).

DIMENSIONS – HIGH CAPACITY FULL PORT VALVE NON-SPRING RETURN

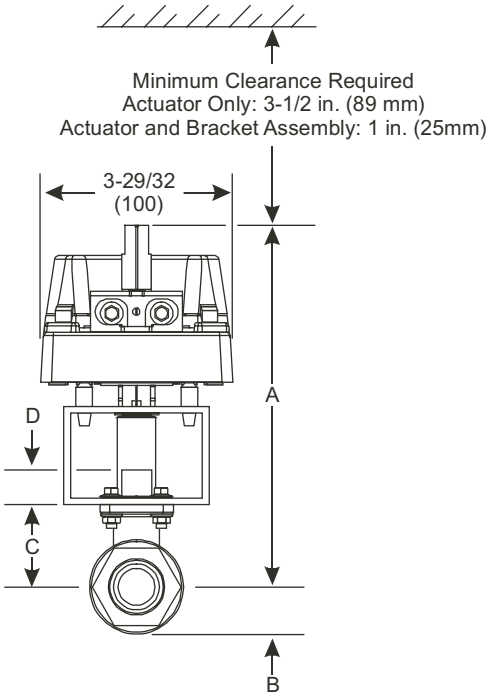
M9106 Actuated VG1243 Series Ball Valve with M9000-512 Linkage Dimensions, in. (mm)



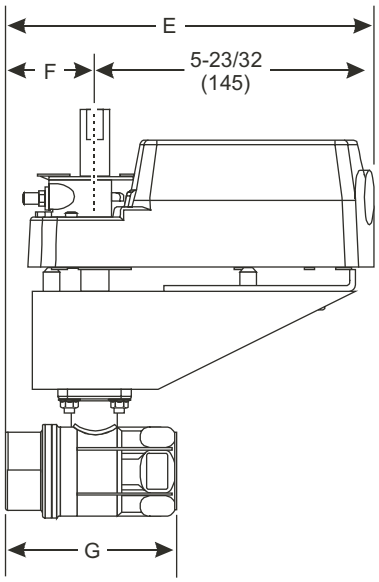
Valve Size, in. (DN)	A	B	C	D	E	F	G
3/4 (DN20)	7 (176)	25/32 (20)	1-9/32 (33)	9/32 (7)	7-1/32 (179)	1-11/32 (34)	3 (76)

DIMENSIONS – HIGH CAPACITY FULL PORT VALVE NON-SPRING RETURN

M9100 Actuated VG1243 Series Ball Valve with M9000-51x Linkage Dimensions, in. (mm)



Two-Way Valve

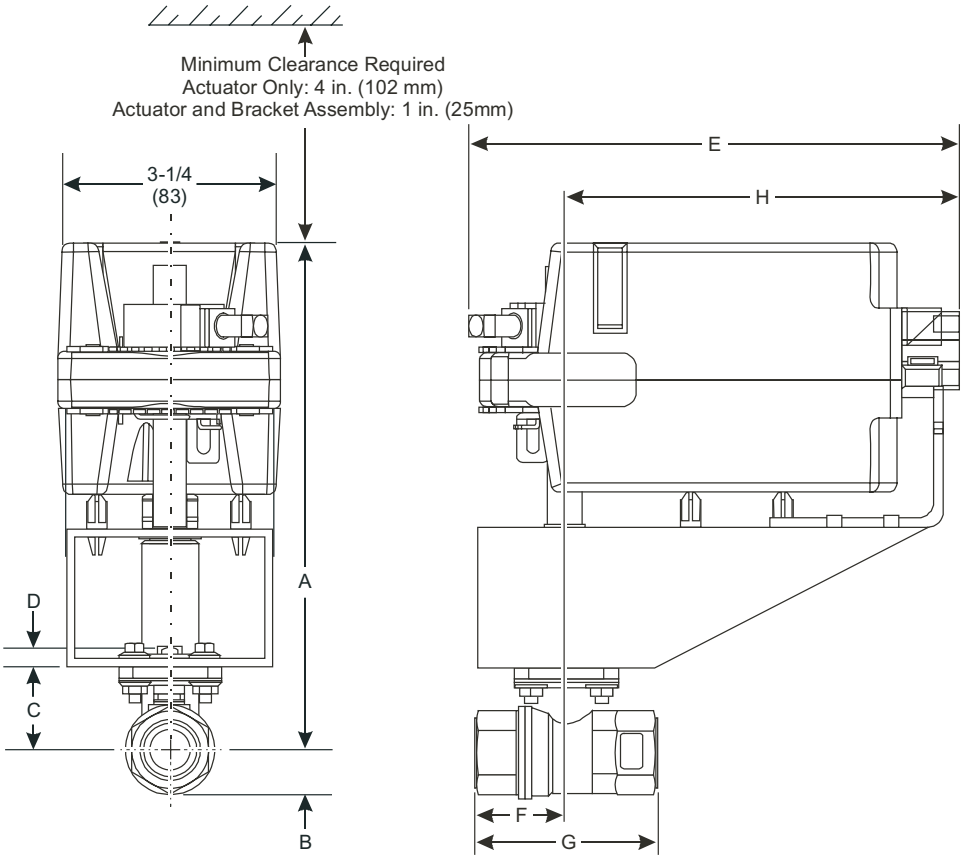


Two-Way Valve

Valve Size, in. (DN)	A	B	C	D	E	F	G
1 (DN25)	7-17/32 (191)	31/32 (25)	1-13/16 (46)	11/32 (9)	7-7/32 (183)	1-1/2 (38)	3-11/32 (85)
1-1/4 (DN32)	7-11/16 (195)	1-5/32 (29)	1-15/16 (49)	11/32 (9)	7-9/16 (192)	1-13/16 (46)	3-21/32 (93)
1-1/2 (DN40)	8-5/16 (211)	1-13/32 (36)	2-19/32 (66)	7/16 (11)	7-25/32 (198)	2-3/32 (53)	4-1/8 (105)

DIMENSIONS – HIGH CAPACITY FULL PORT VALVE SPRING RETURN

M9206 Actuated VG1243 Series Ball Valve with M9000-513 Linkage Dimensions, in. (mm)



Two-Way Valve

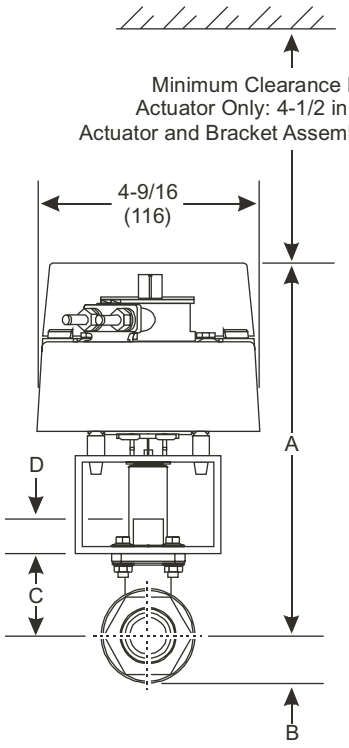
Two-Way Valve

Valve Size, in. (DN)	A	B	C	D	E*	F	G	H
3/4 (DN20)	7-7/16 (189)	25/32 (20)	1-9/32 (33)	9/32 (7)	7-1/4 (184)	1-1/2 (38)	3 (76)	5-3/4 (146)

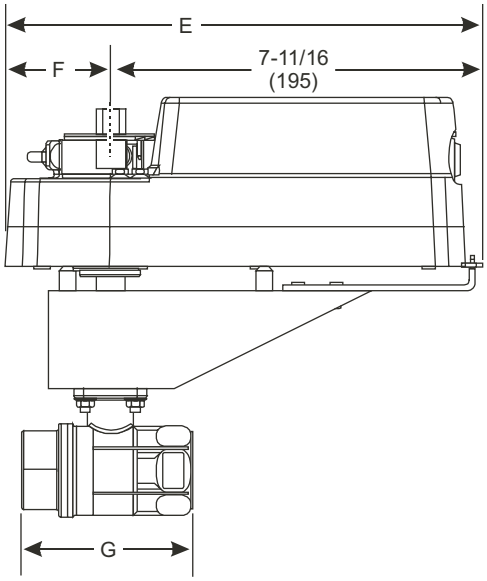
* For models with auxiliary switches, add 1-11/32 in. (34 mm) to dimension E (column E).

DIMENSIONS – HIGH CAPACITY FULL PORT VALVE SPRING RETURN

M9216 Actuated VG1243 Series Ball Valve with M9000-51x Linkage Dimensions, in. (mm)



Two-Way Valve



Two-Way Valve

Valve Size, in. (DN)	A	B	C	D	E	F	G
1 (DN25)	8-5/32 (207)	31/32 (25)	1-13/16 (46)	11/32 (9)	9-13/16 (249)	2-5/32 (55)	3-11/32 (85)
1-1/4 (DN32)	8-9/32 (210)	1-5/32 (29)	1-15/16 (49)	11/32 (9)	9-13/16 (249)	2-5/32 (55)	3-21/32 (93)

TECHNICAL SPECIFICATIONS

Product	VG1000 Series Forged Brass Ball Valves	
Service*	Hot Water, Chilled Water, 50/50 Glycol Solutions, and 15 psig (103 kPa) Saturated Steam for HVAC Systems	
Fluid Temperature Limits	**Water**	**VG1241 and VG1841 Series:** 23 to 203ºF (-5 to 95ºC) **VG1245 and VG1845 Series:** 23 to 250ºF (-5 to 121ºC) **VG1243 Series:** 35 to 250ºF (2 to 121°C)
	Steam	**VG1245 and VG1243 Series:** 15 psig (103 kPa) at 250°F (121°C) **VG1241 Series:** Not Rated for Steam Service
Valve Body Pressure/	**Water**	**580 psig (3,996 kPa) (PN40)**
Temperature Rating	**Steam**	**15 psig (103 kPa) Saturated Steam**
Maximum Closeoff Pressure	**VG1241 and VG1245 Series:** 200 psig (1,378 kPa) **VG1243 Series:** 150 psig (1,034 kPa)	
Maximum Recommended Operating Pressure Drop	**50 psi Maximum Differential Pressure for Valves with Characterized Flow Control Disk** **30 psi Maximum for Quiet Service Ball Valves**	
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**	Greater than 500:1	
Minimum Ambient Operating Temperature	-4°F (-20°C) M9106 and M9109 Series Non-Spring Return Actuators -25°F (-32°C) M9206 Series Spring Return Actuators -22°F (-30°C) M9216-GGx-2 Series Spring Return Actuators -4°F (-20°C) M9216-Agx-2 and M9216-Bxx-2 Series Spring Return Actuators	
Maximum Ambient Operating Temperature* (Limited by the Actuator and Linkage)**	**M9000-520 Linkage**	125°F (52°C) M9106 and M9109 Series Non-Spring Return Actuators 140°F (60°C) M9206 Series Spring Return Actuators
	M9000-51x Series Linkage	For Fluid Temperature Below 212°F (100°C) 125°F (52°C) M9106 Series Non-Spring Return Actuators 122°F (50°C) M9100 Series Non-Spring Return Actuators 140°F (60°C) M9206 Series Spring Return Actuators 122°F (50°C) M9216 Series Spring Return Actuators
		For Fluid Temperature Between 212 and 250°F (100 and 121°C) 100°F (38°C) For All Actuators
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)	
Materials	**Body**	Forged Brass
	Ball	**VG1241 and VG1841 Series:** Chrome-Plated Brass
		VG1x45 and VG1243 Series: 300 Series Stainless Steel
	Blowout-Proof Stem	**VG1241 and VG1841 Series:** Nickel-Plated Brass
		VG1x45 and VG1243 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

* Proper water treatment is recommended; refer to VDI 2035 Standard.

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

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

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

Our Guarantee to You

Certified to ISO 9001 quality processes and backed by a **three-year warranty.**

Shipping

Our VG1000 Series Ball Valves are built-to-order with a **standard lead time of three business days. Next day, fast track service** is available.

Ordering Information

Contact your local Johnson Controls representative or contact Customer Service:

1-800-ASK-JNSN (1-800-275-5676)

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Printed in USA PUBL-3776