

VG1000 Flanged

Plant Valves Series - DN65 to DN150, PN16

Product Bulletin

VG1000 Flanged Plant Valves Series are designed to regulate the flow of hot or chilled water and low pressure steam in response to the demand of a controller in HVAC systems.

They are operated by remote mounted Spring Return and Non Spring Return actuators.

Johnson Controls® offers valve, linkage, and actuator assemblies for factory or field mounting with either spring return or non-spring return actuators.



Features and Benefits

- **Close-off Pressure Rating:**
 - 690 kPa for 2-way valves
 - 345 kPa for 3-way valves
 Provides tight shutoff.
- **Stainless Steel Ball and Stem Assembly**
Applies to systems with high temperature water -20 to 140°C or 172 kPa saturated steam.
- **500:1 Rangeability**
Provides accurate control under all load conditions.
- **Amodel® Flow Characterizing Disk**
Provides equal percentage flow characteristics for best temperature control; available in a wide array of Cv ranges to cover a broad variety of applications.
- **Ethylene Propylene Diene Monomer (EPDM) Double O-Ring Stem Seal**
Offers tested leak-free operation for 200,000 cycles in iron-oxide contaminated water.
- **Graphite-Reinforced Polytetrafluoroethylene (PTFE) Seats**
Include 15% graphite-reinforced ball seals that last twice as long in iron-oxide contaminated water when compared to virgin Teflon® ball seats.
- **Seats Backed with EPDM O-Rings**
Maintain a constant seating force that compensates for expansion, contraction, and seat wear without increasing operating torque.
- **Maintenance-Free Design**
Performs without failure in excess of 200,000 full stroke cycles in iron-oxide contaminated water.
- **Available with Factory-Mounted M9000 Series Electric Actuators**
Reduces field installation time and cost.

Product Details

Available in sizes DN65 to DN150, VG1000 Flanged Plant Valves Series are specifically designed for automated commercial HVAC service.

These valves feature a stainless steel ball and stem for high temperature water to 140°C and saturated steam to 172 kPa.

The stem and mounting flange, combined with an innovative double O-ring stem seal, provide quick and easy electric actuator field mounting while ensuring long life and leak-free valve performance.

The specially engineered, graphite-reinforced PTFE seat with flexible PTFE seat design (backed with EPDM O-rings) significantly reduces the operating torque, allowing the smallest possible electric actuator available to provide the force required for each specific application. Two way valve assemblies provide 690 kPa, and three way assemblies provide (345 kPa closeoff pressure while ensuring operation after long idle periods.

VG1000 Flanged Plant Valves Series are designed for factory or field mounting to Johnson Controls® M9124 Electric Actuators Series, which are ideally suited for on/off, floating, or proportional HVAC service. To field-couple an actuator to a valve, use an M9000-518 Linkage kit for M9124 actuators and a M9000-519 Linkage Kit for M9220 actuators. The cost-effective, reliable design makes the VG1000 Flanged Plant Valves Series maintenance-free.

IMPORTANT: The VG1000 Flanged Plant Valves Series are intended to control saturated steam, hot water, and chilled water flow under normal equipment operating conditions. Where failure or malfunction of the valve could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the valve.

Repair Information

If the VG1000 Flanged Plant Valves Series fails to operate within its specifications, replace the unit. For a replacement valve, contact the nearest Johnson Controls representative.

Electric Actuator Control Signal Action

Two way VG1000 Flanged Plant Valves Series are fully open when the electric actuator is fully counterclockwise (CCW) and fully closed when the electric actuator is fully clockwise (CW). For three way valves, Coil Port A and Common Port AB are fully open when the electric actuator is fully CCW, as shown in Figure 1. Bypass Port B and Common Port AB are fully open when the actuator is fully CW, as shown in Figure 2.

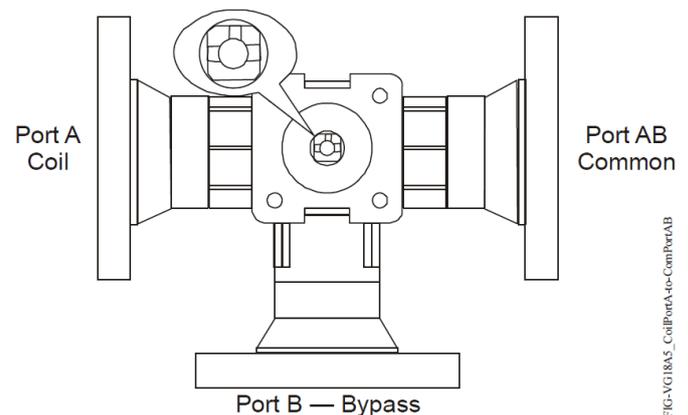


FIG-VG18A5_CoilPortA-to-ComPortAB

Figure 1
VG18A5 Series Three Way Ball Valve
(Coil Port A Open to Common Port AB)

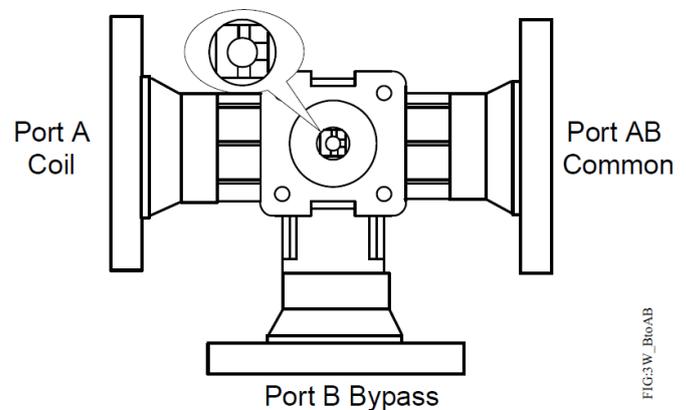


FIG:3W_BroAB

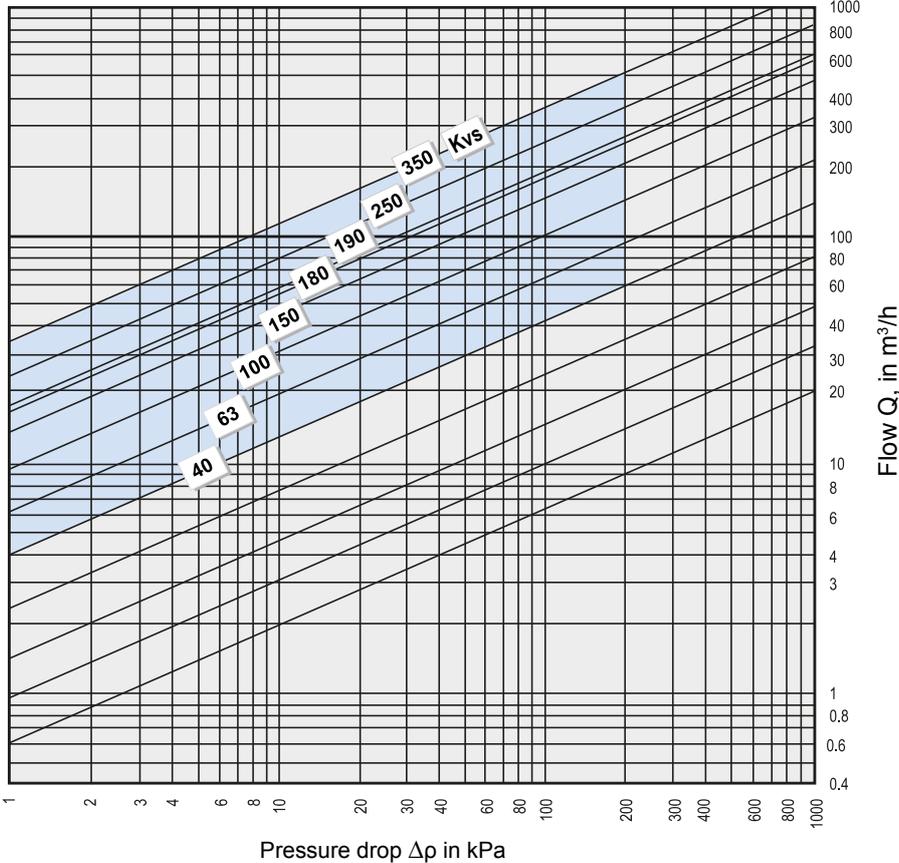
Figure 2
VG18A5 Series Three Way Ball Valve
(Bypass Port B Open to Common Port AB)

For non-spring return and spring-to-open proportional control models in the direct-acting mode, a minimum control signal drives the electric actuator to the fully CCW position, while a maximum control signal drives the electric actuator to the fully CW position.

For spring-to-close proportional control models in the direct-acting mode, a minimum control signal drives the electric actuator to the fully CW position, whereas a maximum control signal drives the electric actuator to the fully CCW position.

Valve Selection

K_V Selection Diagram



Valve / Actuator Combinations

Assemblies with Proportional Actuators

Spring Return Function	---		●	
Supply Voltage	24 VAC/DC			
Torque	24 Nm		20 Nm	
Running Time	125 s		150 s	
Spring Return Time Power Off	---		26 s	
Control Signal	0 - 10 / 2 - 10 VDC 0 - 20 / 4 - 20 mA			
Switches	---	2 x SPDT	---	2 x SPDT
Feedback	0 - 10 / 2 - 10 VDC			
Actuator Codes	M9124-GGA-1N	M9124-GGC-1N	M9220-HGA-1	M9220-HGC-1
Linkage Codes	M9000-518		M9000-519	
Ordering Codes Suffix for Assemblies	+ 524GGA	+ 524GGC	+ 530HGA (Spring Opens)	+ 530HGC (Spring Opens)
			+ 550HGA (Spring Closes)	+ 550HGC (Spring Closes)

Valve Codes	Body Size	K _{vs} (Control Port)	K _{vs} (Bypass Port)	Close-off Pressures in kPa			
2-way Models							
VG12E5GT	DN65	63	---	690	690	690	690
VG12E5GU		100	---	690	690	690	690
VG12E5HU	DN80	100	---	690	690	690	690
VG12E5HW		180	---	690	690	690	690
VG12E5JV	DN100	150	---	690	690	690	690
VG12E5NY	DN125	250	---	690	690	690	690
VG12E5PZ	DN150	350	---	690	690	690	690
3-way Models							
VG18E5GT	DN65	63	40	345	345	345	345
VG18E5GU		100	63	345	345	345	345
VG18E5HU	DN80	100	63	345	345	345	345
VG18E5HW		180	75	345	345	345	345
VG18E5JV	DN100	150	75	345	345	345	345
VG18E5NY	DN125	250	160	345	345	345	345
VG18E5PZ	DN150	350	160	345	345	345	345

Valve / Actuator Combinations

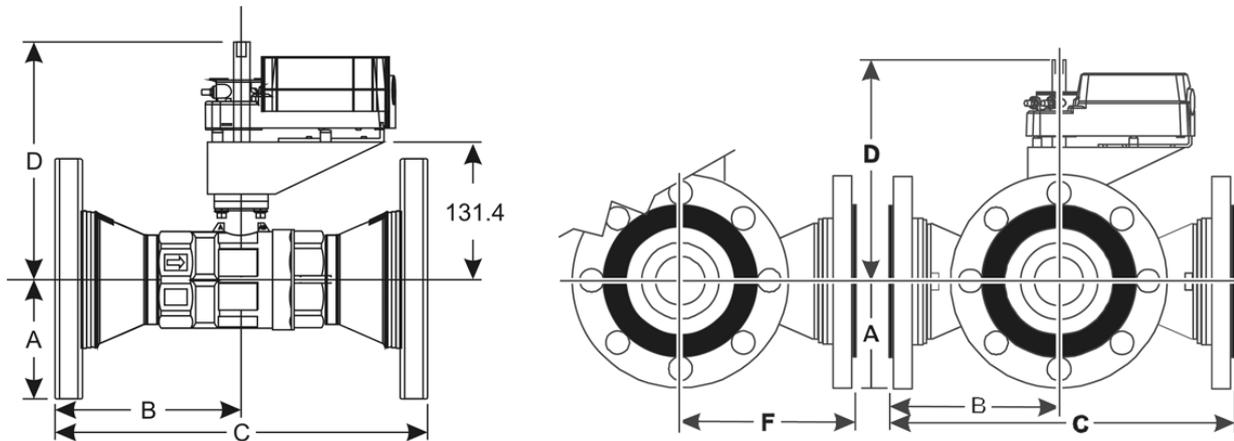
Assemblies with Floating and On/Off Actuators

Spring Return Function	---				●					
Supply Voltage	24 VAC / DC		230 VAC		24 VAC / DC				230 VAC	
Torque	24 Nm				20 Nm					
Running Time	125 s				150 s				24 - 57 s	
Spring Return Time Power Off	---				20 s				11...50 s	
Control signal	Floating and ON/OFF						ON/OFF			
Switches	---	2 x SPDT	---	2 x SPDT	---	2 x SPDT	---	2 x SPDT	---	2 x SPDT
Feedback	---									
Actuator Codes	M9124-AGA-1N	M9124-AGC-1N	M9124-ADA-1N	M9124-ADC-1N	M9220-AGA-1	M9220-AGC-1	M9220-BGA-1	M9220-BGC-1	M9220-BDA-1	M9220-BDC-1
Linkage Codes	M9000-518				M9000-519					
Ordering Codes Suffix for Assemblies	+524AGA	+524AGC	+524ADA	+524ADC	+530AGA (Spring Opens)	+530AGC (Spring Opens)	+530BGA (Spring Opens)	+530BGC (Spring Opens)	+530BDA (Spring Opens)	+530BDC (Spring Opens)
					+550AGA (Spring Closes)	+550AGC (Spring Closes)	+550BGA (Spring Closes)	+550BGC (Spring Closes)	+550BDA (Spring Closes)	+550BDC (Spring Closes)

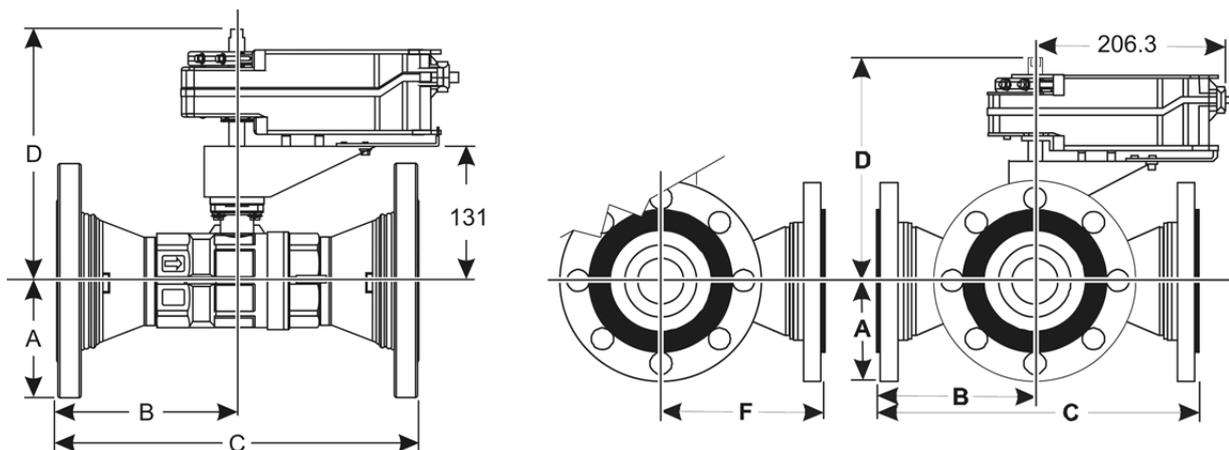
Valve Codes	Body Size	K _{vs} (Control Port)	K _{vs} (Bypass Port)	Close-off Pressures in kPa									
2-way Models													
VG12E5GT	DN65	63	---	690	690	690	690	690	690	690	690	690	690
VG12E5GU		100	---	690	690	690	690	690	690	690	690	690	690
VG12E5HU	DN80	100	---	690	690	690	690	690	690	690	690	690	690
VG12E5HW		180	---	690	690	690	690	690	690	690	690	690	690
VG12E5JV	DN100	150	---	690	690	690	690	690	690	690	690	690	690
VG12E5NY	DN125	250	---	690	690	690	690	690	690	690	690	690	690
VG12E5PZ	DN150	350	---	690	690	690	690	690	690	690	690	690	690
3-way Models													
VG18E5GT	DN65	63	40	345	345	345	345	345	345	345	345	345	345
VG18E5GU		100	63	345	345	345	345	345	345	345	345	345	345
VG18E5HU	DN80	100	63	345	345	345	345	345	345	345	345	345	345
VG18E5HW		180	75	345	345	345	345	345	345	345	345	345	345
VG18E5JV	DN100	150	75	345	345	345	345	345	345	345	345	345	345
VG18E5NY	DN125	250	160	345	345	345	345	345	345	345	345	345	345
VG18E5PZ	DN150	350	160	345	345	345	345	345	345	345	345	345	345

Dimensions (in mm)

Valves with Non-Spring Return M9124 Actuator



Valves with Spring Return M9220 Actuator



Codes	Valve Size	A	B	C	D *		F **	Holes for Flange	Holes Diameters	Bolt
					M9124	M9220				
VG1xE5Gx	DN65	92.5	145	290	226	245	149	4	19	M16x60
VG1xE5Hx	DN80	100	155	310	230	260	159	8	19	M16x65
VG1xE5Jx	DN100	110	175	350	230	260	179	8	19	M16x70
VG1xE5NY	DN125	125	200	400	256	286	255	8	19	M16x75
VG1xE5PZ	DN150	142.5	240	480	256	286	290	8	23	M20x80

Note

* Allow a minimum of 100 mm clearance above the shaft to remove the actuator

** For 3-way valves only

Technical Specifications (1/2 part)

Valve Type	2-way and 3-way mixing
Body Rating	PN16
Service *	Hot water, chilled water, 50/50 glycol solutions, and 172 kPa Saturated Steam for HVAC Systems
Valve Fluid Temperature Limits	-20 to 140°C
Valve Body Pressure / Temperature Rating	
Water	
Steam	max 172 kPa saturated steam for HVAC applications
Maximum Closeoff Pressure	
	2-way 690 kPa
	3-way 345 kPa
Maximum Recommended Operating Pressure Drop	200 kPa
Flow Characteristics	
	2-way Equal Percentage (according EN60534-2-4)
	3-way Equal Percentage (according EN60534-2-4) Flow Characteristics of Inline Port (Coil) and Linear Percentage Flow Characteristics of Angle Port (Bypass)
Rangeability **	Greater than 500:1
Leakage	
	2-way and 3-way 0.01% of Maximum Flow, Control port, ANSI/FCI 70-2, Class 4
	3-way 1% of Maximum Flow, Bypass Port
Storage and Transport Temperature	-20°C to 65°C, dry and free of dirty
End Connections	Flanged, DIN EN 1092, Type 16, Form B sealing strip
Minimum Ambient Operating Temperature	
	-20°C M9124 Series Non-Spring Return Actuator
	-40°C M9220 Series Spring Return Actuator
Maximum Ambient Operating Temperature ***	
	50°C M9124 Series Non-Spring Return Actuator
	55°C M9220 Series Spring Return Actuator
Materials	
	Body Forged brass EN 12165
	Ball and Blowout-Proof Stem Stainless Steel x5CrNi1810 EN10088-3
	Flanges and Adapters EN-JL 1040 (cast iron)
	Seat, Stem Seals EPDM O-Ring
	Stem Bush PTFE
	Characterizing Disk Amodel® AS-1145HS
	Ball Seat PTFE graphite filled

...Continued...

Technical Specifications (2/2 part)

Weight

VG12E5Gx	DN65	2-way	kg 15.4	VG18E5Gx	DN65	3-way	kg 18.5
VG12E5Hx	DN80		kg 16.3	VG18E5Hx	DN80		kg 22.2
VG12E5Jx	DN100		kg 20	VG18E5Jx	DN100		kg 28.1
VG12E5NY	DN125		kg 27.8	VG18E5NY	DN125		kg 39.9
VG12E5PZ	DN150		kg 31.2	VG18E5PZ	DN150		kg 43.7

CE Compliance

Johnson Controls declares that these products are in compliance with the essential requirements and other relevant provisions of the PED (Pressure Equipment Directive) 2014/68/EU

Notes

- * Refer to VDI 2035 Standard for proper water treatment.
- ** 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 shall not be liable for damages resulting from misapplication or misuse of its products.