

# Cast Iron Flanged Globe Valves

## Description

VG2000 Series Cast Iron Flanged Globe Valves are designed primarily to regulate the flow of water and steam in response to the demand of a controller in Heating, Ventilating, and Air Conditioning (HVAC) systems. Available in sizes 2-1/2 through 6 in., these ANSI Class 125 valves are available in Normally Open (N.O.), Normally Closed (N.C.), and three-way mixing configurations. Both electric and pneumatic actuators are available for factory or field mounting.

Refer to the *VG2000 Series Cast Iron Flanged Globe Valves Product Bulletin (LIT-977133)* for important product application information.

## Features

- complete family of 2-1/2 through 6 in. cast iron flanged globe valves, brass trim, with several styles of electric and pneumatic actuators offers a broad selection from which to choose
- flexible features and options ordering matrix allow engineering to suit your specific application from thousands of easy-to-select, factory-assembled combinations
- standard Johnson Controls® Ring Pack Packings provide industry-leading reliability and operating life
- every valve tested for leakage — provides energy conservation and ensures occupant comfort



VG2000 Series Cast Iron Flanged Globe Valves

## Selection Chart

VG2x31 Valves with M91xx-xGx-2 Actuators – Non-Spring Return						
Size	Cv	Closeoff psig	On/Off Floating without switches M9116-AGA-2 M9124-AGA-2	Proportional without switches M9116-GGA-2 M9124-GGA-2	On/Off Floating with two switches M9116-AGC-2 M9124-AGC-2	Proportional with two switches M9116-GGC-2 M9124-GGC-2
<b>Two-Way, Push-Down-to-Close</b>						
2-1/2	51	62	VG2231TM+916AGA	VG2231TM+916GGA	VG2231TM+916AGC	VG2231TM+916GGC
2-1/2	51	101	VG2231TM+924AGA	VG2231TM+924GGA	VG2231TM+924AGC	VG2231TM+924GGC
3	83	27	VG2231UM+916AGA	VG2231UM+916GGA	VG2231UM+916AGC	VG2231UM+916GGC
3	83	43	VG2231UM+924AGA	VG2231UM+924GGA	VG2231UM+924AGC	VG2231UM+924GGC
3	83	88	VG2231UM2924AGA <sup>1</sup>	VG2231UM2924GGA <sup>1</sup>	VG2231UM2924AGC <sup>1</sup>	VG2231UM2924GGC <sup>1</sup>
4	150	24	VG2231VM+924AGA	VG2231VM+924GGA	VG2231VM+924AGC	VG2231VM+924GGC
4	150	49	VG2231VM2924AGA <sup>1</sup>	VG2231VM2924GGA <sup>1</sup>	VG2231VM2924AGC <sup>1</sup>	VG2231VM2924GGC <sup>1</sup>
5	240	26	VG2231WN2924AGA <sup>1</sup>	VG2231WN2924GGA <sup>1</sup>	VG2231WN2924AGC <sup>1</sup>	VG2231WN2924GGC <sup>1</sup>
6	350	16	VG2231YN2924AGA <sup>1</sup>	VG2231YN2924GGA <sup>1</sup>	VG2231YN2924AGC <sup>1</sup>	VG2231YN2924GGC <sup>1</sup>
<b>Three-Way, Mixing</b>						
2-1/2	54	37	VG2831TM+916AGA	VG2831TM+916GGA	VG2831TM+916AGC	VG2831TM+916GGC
2-1/2	54	60	VG2831TM+924AGA	VG2831TM+924GGA	VG2831TM+924AGC	VG2831TM+924GGC
3	80	16	VG2831UM+916AGA	VG2831UM+916GGA	VG2831UM+916AGC	VG2831UM+916GGC
3	80	26	VG2831UM+924AGA	VG2831UM+924GGA	VG2831UM+924AGC	VG2831UM+924GGC
3	80	53	VG2831UM2924AGA <sup>1</sup>	VG2831UM2924GGA <sup>1</sup>	VG2831UM2924AGC <sup>1</sup>	VG2831UM2924GGC <sup>1</sup>
4	157	9	VG2831VM+916AGA	VG2831VM+916GGA	VG2831VM+916AGC	VG2831VM+916GGC
4	157	14	VG2831VM+924AGA	VG2831VM+924GGA	VG2831VM+924AGC	VG2831VM+924GGC
4	157	30	VG2831VM2924AGA <sup>1</sup>	VG2831VM2924GGA <sup>1</sup>	VG2831VM2924AGC <sup>1</sup>	VG2831VM2924GGC <sup>1</sup>
5	238	7	VG2831WN+924AGA	VG2831WN+924GGA	VG2831WN+924AGC	VG2831WN+924GGC
5	238	15	VG2831WN2924AGA <sup>1</sup>	VG2831WN2924GGA <sup>1</sup>	VG2831WN2924AGC <sup>1</sup>	VG2831WN2924GGC <sup>1</sup>
6	347	4	VG2831YN+924AGA	VG2831YN+924GGA	VG2831YN+924AGC	VG2831YN+924GGC
6	347	9	VG2831YN2924AGA <sup>1</sup>	VG2831YN2924GGA <sup>1</sup>	VG2831YN2924AGC <sup>1</sup>	VG2831YN2924GGC <sup>1</sup>

1. Valve assemblies have two actuators mounted in tandem. On tandem actuator assemblies with switches, only one actuator is provided with auxiliary switches. M9116-AGx-2 actuators are not designed for tandem operation.

VG2000 Series Cast Iron Flanged Globe Valves (Continued)



VG2x31 Valves with M9220 Series Non-Spring Return Electric Valve Actuators

Selection Chart

VG2x31 Valves with M9220-xGx-3 Actuators – Spring Return – Floating and On/Off						
Size in.	Cv	Closeoff psig	Floating		On/Off	
			Without Switches	With Two Switches	Without Switches	With Two Switches
			M9220-AGA-3	M9220-AGC-3	M9220-BGA-3	M9220-BGC-3
<b>Two-Way – Spring Return Normally Open – Valve Stem Up</b>						
2-1/2	51	76	VG2231TM+92NAGA	VG2231TM+92NAGC	VG2231TM+92NBGA	VG2231TM+92NBGC
3	83	33	VG2231UM+92NAGA	VG2231UM+92NAGC	VG2231UM+92NBGA	VG2231UM+92NBGC
3	83	66	VG2231UM292NAGA <sup>1</sup>	VG2231UM292NAGC <sup>1</sup>	VG2231UM292NBGA <sup>1</sup>	VG2231UM292NBGC <sup>1</sup>
4	150	37	VG2231VM292NAGA <sup>1</sup>	VG2231VM292NAGC <sup>1</sup>	VG2231VM292NBGA <sup>1</sup>	VG2231VM292NBGC <sup>1</sup>
5	240	20	VG2231WM292NAGA <sup>1</sup>	VG2231WM292NAGC <sup>1</sup>	VG2231WM292NBGA <sup>1</sup>	VG2231WM292NBGC <sup>1</sup>
<b>Two-Way – Spring Return Normally Closed – Valve Stem Down</b>						
2-1/2	51	76	VG2231TM+94NAGA	VG2231TM+94NAGC	VG2231TM+94NBGA	VG2231TM+94NBGC
3	83	33	VG2231UM+94NAGA	VG2231UM+94NAGC	VG2231UM+94NBGA	VG2231UM+94NBGC
3	83	66	VG2231UM294NAGA <sup>1</sup>	VG2231UM294NAGC <sup>1</sup>	VG2231UM294NBGA <sup>1</sup>	VG2231UM294NBGC <sup>1</sup>
4	150	37	VG2231VM294NAGA <sup>1</sup>	VG2231VM294NAGC <sup>1</sup>	VG2231VM294NBGA <sup>1</sup>	VG2231VM294NBGC <sup>1</sup>
5	240	20	VG2231WM294NAGA <sup>1</sup>	VG2231WM294NAGC <sup>1</sup>	VG2231WM294NBGA <sup>1</sup>	VG2231WM294NBGC <sup>1</sup>
<b>Three-Way Mixing – Spring Return – Valve Stem Up – Side Inlet Port Closed</b>						
2-1/2	54	45	VG2831TM+92NAGA	VG2831TM+92NAGC	VG2831TM+92NBGA	VG2831TM+92NBGC
3	80	20	VG2831UM+92NAGA	VG2831UM+92NAGC	VG2831UM+92NBGA	VG2831UM+92NBGC
3	80	40	VG2831UM292NAGA <sup>1</sup>	VG2831UM292NAGC <sup>1</sup>	VG2831UM292NBGA <sup>1</sup>	VG2831UM292NBGC <sup>1</sup>
4	157	11	VG2831VM+92NAGA	VG2831VM+92NAGC	VG2831VM+92NBGA	VG2831VM+92NBGC
4	157	22	VG2831VM292NAGA <sup>1</sup>	VG2831VM292NAGC <sup>1</sup>	VG2831VM292NBGA <sup>1</sup>	VG2831VM292NBGC <sup>1</sup>
5	238	12	VG2831WN292NAGA <sup>1</sup>	VG2831WN292NAGC <sup>1</sup>	VG2831WN292NBGA <sup>1</sup>	VG2831WN292NBGC <sup>1</sup>
6	347	7	VG2831YN292NAGA <sup>1</sup>	VG2831YN292NAGC <sup>1</sup>	VG2831YN292NBGA <sup>1</sup>	VG2831YN292NBGC <sup>1</sup>
<b>Three-Way Mixing – Spring Return – Valve Stem Down – Side Inlet Port Open</b>						
2-1/2	54	45	VG2831TM+94NAGA	VG2831TM+94NAGC	VG2831TM+94NBGA	VG2831TM+94NBGC
3	80	20	VG2831UM+94NAGA	VG2831UM+94NAGC	VG2831UM+94NBGA	VG2831UM+94NBGC
3	80	40	VG2831UM294NAGA <sup>1</sup>	VG2831UM294NAGC <sup>1</sup>	VG2831UM294NBGA <sup>1</sup>	VG2831UM294NBGC <sup>1</sup>
4	157	11	VG2831VM+94NAGA	VG2831VM+94NAGC	VG2831VM+94NBGA	VG2831VM+94NBGC
4	157	22	VG2831VM294NAGA <sup>1</sup>	VG2831VM294NAGC <sup>1</sup>	VG2831VM294NBGA <sup>1</sup>	VG2831VM294NBGC <sup>1</sup>
5	238	12	VG2831WN294NAGA <sup>1</sup>	VG2831WN294NAGC <sup>1</sup>	VG2831WN294NBGA <sup>1</sup>	VG2831WN294NBGC <sup>1</sup>
6	347	7	VG2831YN294NAGA <sup>1</sup>	VG2831YN294NAGC <sup>1</sup>	VG2831YN294NBGA <sup>1</sup>	VG2831YN294NBGC <sup>1</sup>

1. Valve assemblies have two actuators mounted in tandem. On tandem actuator assemblies with switches, only one actuator is provided with auxiliary switches.

**VG2000 Series Cast Iron Flanged Globe Valves (Continued)**
**Selection Chart**

VG2x31 Valves with M9220-xGx-3 Actuators – Proportional				
Size in.	Cv	Closeoff psig	Proportional	
			Without Switches M9220-GGA-3	With Two Switches M9220-GGC-3
<b>Two-Way – Spring Return Normally Open – Valve Stem Up</b>				
2-1/2	51	76	VG2231TM+92NGGA	VG2231TM+92NGGC
3	83	33	VG2231UM+92NGGA	VG2231UM+92NGGC
3	83	66	VG2231UM292NGGA <sup>1</sup>	VG2231UM292NGGC <sup>1</sup>
4	150	37	VG2231VM292NGGA <sup>1</sup>	VG2231VM292NGGC <sup>1</sup>
5	240	20	VG2231WM292NGGA <sup>1</sup>	VG2231WM292NGGC <sup>1</sup>
<b>Two-Way – Spring Return Normally Closed – Valve Stem Down</b>				
2-1/2	51	76	VG2231TM+94NGGA	VG2231TM+94NGGC
3	83	33	VG2231UM+94NGGA	VG2231UM+94NGGC
3	83	66	VG2231UM294NGGA <sup>1</sup>	VG2231UM294NGGC <sup>1</sup>
4	150	37	VG2231VM294NGGA <sup>1</sup>	VG2231VM294NGGC <sup>1</sup>
5	240	20	VG2231WM294NGGA <sup>1</sup>	VG2231WM294NGGC <sup>1</sup>
<b>Three-Way Mixing – Spring Return – Valve Stem Up – Side Inlet Port Closed</b>				
2-1/2	54	45	VG2831TM+92NGGA	VG2831TM+92NGGC
3	80	20	VG2831UM+92NGGA	VG2831UM+92NGGC
3	80	40	VG2831UM292NGGA <sup>1</sup>	VG2831UM292NGGC <sup>1</sup>
4	157	11	VG2831VM+92NGGA	VG2831VM+92NGGC
4	157	22	VG2831VM292NGGA <sup>1</sup>	VG2831VM292NGGC <sup>1</sup>
5	238	12	VG2831WN292NGGA <sup>1</sup>	VG2831WN292NGGC <sup>1</sup>
6	347	7	VG2831YN292NGGA <sup>1</sup>	VG2831YN292NGGC <sup>1</sup>
<b>Three-Way Mixing – Spring Return – Valve Stem Down – Side Inlet Port Open</b>				
2-1/2	54	45	VG2831TM+94NGGA	VG2831TM+94NGGC
3	80	20	VG2831UM+94NGGA	VG2831UM+94NGGC
3	80	40	VG2831UM294NGGA <sup>1</sup>	VG2831UM294NGGC <sup>1</sup>
4	157	11	VG2831VM+94NGGA	VG2831VM+94NGGC
4	157	22	VG2831VM294NGGA <sup>1</sup>	VG2831VM294NGGC <sup>1</sup>
5	238	12	VG2831WN294NGGA <sup>1</sup>	VG2831WN294NGGC <sup>1</sup>
6	347	7	VG2831YN294NGGA <sup>1</sup>	VG2831YN294NGGC <sup>1</sup>

1. Valve assemblies have two actuators mounted in tandem. On tandem actuator assemblies with switches, only one actuator is provided with auxiliary switches.

## VG2000 Series Cast Iron Flanged Globe Valves (Continued)



VG2x31 Valves with VA-3100 Series Non-Spring Return Electric Valve Actuators

VG2x31 Valves with VA-6100 Series Non-Spring Return Electric Valve Actuators

### Selection Chart

VG2x31 Valves with VA-3100-xGx Series Non-Spring Return Actuators					
Size	Cv	Closeoff psig	Floating without	Floating with	0 to 10 VDC Proportional with
			Switches	Feedback and Two Switches	Two Switches
			VA-3100-AGA	VA-3100-AGC	VA-3100-HGC
<b>Two-Way Push-Down-to-Close</b>					
2-1/2	51	115	VG2231TM+300AGA	VG2231TM+300AGC	VG2231TM+300HGC
3	83	79	VG2231UM+301AGA	VG2231UM+301AGC	VG2231UM+301HGC
4	150	45	VG2231VM+301AGA	VG2231VM+301AGC	VG2231VM+301HGC
5	240	29	VG2231WN+302AGA	VG2231WN+302AGC	VG2231WN+302HGC
6	350	20	VG2231YN+302AGA	VG2231YN+302AGC	VG2231YN+302HGC
<b>Three-Way Mixing</b>					
2-1/2	54	69	VG2831TM+300AGA	VG2831TM+300AGC	VG2831TM+300HGC
3	80	48	VG2831UM+301AGA	VG2831UM+301AGC	VG2831UM+301HGC
4	157	27	VG2831VM+301AGA	VG2831VM+301AGC	VG2831VM+301HGC
5	238	17	VG2831WN+302AGA	VG2831WN+302AGC	VG2831WN+302HGC
6	347	12	VG2831YN+302AGA	VG2831YN+302AGC	VG2831YN+302HGC

### Selection Chart

VG2x31 Valves with VA-6100-xGx Series Non-Spring Return Actuators					
Size	Cv	Closeoff psig	Floating with Two Switches	0 to 10 VDC Proportional with Two Switches	
			VA-6100-AGC	VA-6100-HGC	
<b>Two-Way Push-Down-to-Close</b>					
4	150	89	VG2231VN+602AGC	VG2231VN+602HGC	
5	240	57	VG2231WN+602AGC	VG2231WN+602HGC	
6	350	40	VG2231YN+602AGC	VG2231YN+602HGC	
<b>Three-Way Mixing</b>					
4	157	54	VG2831VN+602AGC	VG2831VN+602HGC	
5	238	34	VG2831WN+602AGC	VG2831WN+602HGC	
6	347	24	VG2831YN+602AGC	VG2831YN+602HGC	

**VG2000 Series Cast Iron Flanged Globe Valves (Continued)**
**Technical Specifications**

VG2000 Series Cast Iron Flanged Globe Valves		
<b>Service<sup>1</sup></b>		Hot Water, Chilled Water, 50% Glycol Solutions or Steam for HVAC Systems
<b>Valve Stroke</b>	2-1/2 and 3 in. Valves	3/4 in. (19 mm)
	3 and 4 in. Valves	1-1/8 in. (29 mm)
	5 in. Valves	1-3/8 in. (35 mm)
	6 in. Valves	1-1/2 in. (38 mm)
<b>Valve Body Rating</b>		Meets Requirements of ASME B16.1, Class 125
<b>Valve Assembly Maximum Allowable Pressure/Temperature</b>	Steam	35 psig (241 kPa) at 281°F (138°C)
	Water	175 psig (1,206 kPa) up to 150°F (66°C), Decreasing to 125 psig (861 kPa) at 281°F (138°C)
<b>Leakage</b>		0.1% of Maximum Flow
<b>Inherent Flow Characteristics</b>		Modified Linear
<b>Rangeability<sup>2</sup></b>	2-1/2 in. Valves	6.5:1
	3 in. Valves	7.7:1
	4 in. Valves	9.3:1
	5 in. Valves	10.7:1
	6 in. Valves	10.4:1
<b>Spring Ranges (MP8000 Series Actuators)</b>		3 to 7, 4 to 8, and 9 to 13 psig (21 to 48, 28 to 55, and 62 to 90 kPa)
<b>Maximum Recommended Operating Pressure Drop</b>		35 psig (241 kPa) for All Valve Sizes
<b>Maximum Actuator Supply Pressure (Pneumatically Actuated Valves Only)</b>		25 psig (172 kPa) Maximum
<b>Materials</b>	Body	Cast Iron with Black Lacquer Finish
	Stem	316 Stainless Steel
	Plug	Brass
	Packing	Ethylene Propylene Terpolymer (EPT) Ring Packs
<b>Valve Fluid Operating Temperature Limits</b>		35 to 281°F (2 to 138°C), 35 psig (241 kPa) Saturated Steam
<b>Actuator Ambient Operating Temperature Limits</b>		Refer to the appropriate actuator product bulletin.

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

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