

Description

Figure 1: VG2000 Series Electric Cast Iron Flanged Globe Valve



VG2000 Series Electric 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 HVAC systems. These ANSI Class 125 valves are available in 2 1/2 in. through 6 in. sizes and 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.

Repair information

If the VG2000 Series Globe Valve fails to operate within its specifications, replace the valve body, actuator, or entire assembly. For replacement parts, contact the nearest Johnson Controls® representative.

Features

- Complete family of 2 1/2 in. 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.

Selection charts

Table 1: VG2000 Series Valves with M91xx-xGx-2 Actuators — non-spring return

Valve code number	Size, in.	Cv (Kvs)	Closeoff psig	Non-spring return actuator code number			
				On / off floating without switches	Proportional without switches	On / off floating with two switches	Proportional with two switches
				M9116-AGA-2 M9124-AGA-2	M9116-GGA-2 M9124-GGA-2	M9116-AGC-2 M9124-AGC-2	M9116-GGC-2 M9124-GGC-2
Two-way, push-down-to-close							
VG2231TM	2 1/2	45 (38.6)	62	VG2231TM+916AGA	VG2231TM+916GGA	VG2231TM+916AGC	VG2231TM+916GGC
			101	VG2231TM+924AGA	VG2231TM+924GGA	VG2231TM+924AGC	VG2231TM+924GGC
VG2231UM	3	59 (50.6)	27	VG2231UM+916AGA	VG2231UM+916GGA	VG2231UM+916AGC	VG2231UM+916GGC
			43	VG2231UM+924AGA	VG2231UM+924GGA	VG2231UM+924AGC	VG2231UM+924GGC
			88	VG2231UM2924AGA	VG2231UM2924GGA	VG2231UM2924AGC	VG2231UM2924GGC
VG2231VM	4	105 (90.0)	24	VG2231VM+924AGA	VG2231VM+924GGA	VG2231VM+924AGC	VG2231VM+924GGC
			49	VG2231VM2924AGA	VG2231VM2924GGA	VG2231VM2924AGC	VG2231VM2924GGC
VG2231WN	5	147 (126.0)	26	VG2231WN2924AGA	VG2231WN2924GGA	VG2231WN2924AGC	VG2231WN2924GGC
VG2231YN	6	226 (193.7)	16	VG2231YN2924AGA	VG2231YN2924GGA	VG2231YN2924AGC	VG2231YN2924GGC
Three-way, mixing							
VG2831TM	2 1/2	49 (42.0)	37	VG2831TM+916AGA	VG2831TM+916GGA	VG2831TM+916AGC	VG2831TM+916GGC
			60	VG2831TM+924AGA	VG2831TM+924GGA	VG2831TM+924AGC	VG2831TM+924GGC
VG2831UM	3	74 (63.4)	16	VG2831UM+916AGA	VG2831UM+916GGA	VG2831UM+916AGC	VG2831UM+916GGC
			26	VG2831UM+924AGA	VG2831UM+924GGA	VG2831UM+924AGC	VG2831UM+924GGC
			53	VG2831UM2924AGA	VG2831UM2924GGA	VG2831UM2924AGC	VG2831UM2924GGC
VG2831VM	4	131 (112.3)	9	VG2831VM+916AGA	VG2831VM+916GGA	VG2831VM+916AGC	VG2831VM+916GGC
			14	VG2831VM+924AGA	VG2831VM+924GGA	VG2831VM+924AGC	VG2831VM+924GGC
			30	VG2831VM2924AGA	VG2831VM2924GGA	VG2831VM2924AGC	VG2831VM2924GGC
VG2831WN	5	197 (168.9)	7	VG2831WN+924AGA	VG2831WN+924GGA	VG2831WN+924AGC	VG2831WN+924GGC
			15	VG2831WN2924AGA	VG2831WN2924GGA	VG2831WN2924AGC	VG2831WN2924GGC
VG2831YN	6	284 (243.4)	4	VG2831YN+924AGA	VG2831YN+924GGA	VG2831YN+924AGC	VG2831YN+924GGC
			9	VG2831YN2924AGA	VG2831YN2924GGA	VG2831YN2924AGC	VG2831YN2924GGC

① **Note:** Some 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.

① **Note:** Product codes that use a 2 instead of a + refer to valve assemblies that have two actuators mounted in tandem.

Example: VG2231UM+924AGA refers to a single actuator assembly. VG2231UM2924AGA refers to a tandem actuator assembly.

Table 2: VG2000 Series Valves with M9220-xGx-3 Actuators — spring return — floating and on / off

Valve code number	Size, in.	Cv (Kvs)	Closeoff psig	Spring return actuator code number			
				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
Two-way — spring return N.O. — valve stem up							
VG2231TM	2 1/2	45 (38.6)	76	VG2231TM+92NAGA	VG2231TM+92NAGC	VG2231TM+92NBGA	VG2231TM+92NBGC
VG2231UM	3	59 (50.6)	33	VG2231UM+92NAGA	VG2231UM+92NAGC	VG2231UM+92NBGA	VG2231UM+92NBGC
			66	VG2231UM292NAGA	VG2231UM292NAGC	VG2231UM292NBGA	VG2231UM292NBGC
VG2231VM	4	105 (90.0)	37	VG2231VM292NAGA	VG2231VM292NAGC	VG2231VM292NBGA	VG2231VM292NBGC
VG2231WN	5	147 (126.0)	20	VG2231WN292NAGA	VG2231WN292NAGC	VG2231WN292NBGA	VG2231WN292NBGC
Two-way — spring return N.C. — valve stem down							
VG2231TM	2 1/2	45 (38.6)	76	VG2231TM+94NAGA	VG2231TM+94NAGC	VG2231TM+94NBGA	VG2231TM+94NBGC
VG2231UM	3	59 (50.6)	33	VG2231UM+94NAGA	VG2231UM+94NAGC	VG2231UM+94NBGA	VG2231UM+94NBGC
			66	VG2231UM294NAGA	VG2231UM294NAGC	VG2231UM294NBGA	VG2231UM294NBGC
VG2231VM	4	105 (90.0)	37	VG2231VM294NAGA	VG2231VM294NAGC	VG2231VM294NBGA	VG2231VM294NBGC
VG2231WN	5	147 (126.0)	20	VG2231WN294NAGA	VG2231WN294NAGC	VG2231WN294NBGA	VG2231WN294NBGC
Three-way mixing — spring return — valve stem up — side inlet port closed							
VG2831TM	2 1/2	49 (42.0)	45	VG2831TM+92NAGA	VG2831TM+92NAGC	VG2831TM+92NBGA	VG2831TM+92NBGC
VG2831UM	3	74 (63.4)	20	VG2831UM+92NAGA	VG2831UM+92NAGC	VG2831UM+92NBGA	VG2831UM+92NBGC
			40	VG2831UM292NAGA	VG2831UM292NAGC	VG2831UM292NBGA	VG2831UM292NBGC
VG2831VM	4	131 (112.3)	11	VG2831VM+92NAGA	VG2831VM+92NAGC	VG2831VM+92NBGA	VG2831VM+92NBGC
			22	VG2831VM292NAGA	VG2831VM292NAGC	VG2831VM292NBGA	VG2831VM292NBGC
VG2831WN	5	197 (168.9)	12	VG2831WN292NAGA	VG2831WN292NAGC	VG2831WN292NBGA	VG2831WN292NBGC
VG2831YN	6	284 (243.4)	7	VG2831YN292NAGA	VG2831YN292NAGC	VG2831YN292NBGA	VG2831YN292NBGC
Three-way mixing — spring return — valve stem down — side inlet port open							
VG2831TM	2 1/2	49 (42.0)	45	VG2831TM+94NAGA	VG2831TM+94NAGC	VG2831TM+94NBGA	VG2831TM+94NBGC
VG2831UM	3	74 (63.4)	20	VG2831UM+94NAGA	VG2831UM+94NAGC	VG2831UM+94NBGA	VG2831UM+94NBGC
			40	VG2831UM294NAGA	VG2831UM294NAGC	VG2831UM294NBGA	VG2831UM294NBGC
VG2831VM	4	131 (112.3)	11	VG2831VM+94NAGA	VG2831VM+94NAGC	VG2831VM+94NBGA	VG2831VM+94NBGC
			22	VG2831VM294NAGA	VG2831VM294NAGC	VG2831VM294NBGA	VG2831VM294NBGC
VG2831WN	5	197 (168.9)	12	VG2831WN294NAGA	VG2831WN294NAGC	VG2831WN294NBGA	VG2831WN294NBGC
VG2831YN	6	284 (243.4)	7	VG2831YN294NAGA	VG2831YN294NAGC	VG2831YN294NBGA	VG2831YN294NBGC

ⓘ **Note:** Some valve assemblies have two actuators mounted in tandem. On tandem actuator assemblies with switches, only one actuator is provided with auxiliary switches.

ⓘ **Note:** Product codes that use a 2 instead of a + refer to valve assemblies that have two actuators mounted in tandem.

Example: VG2231UM+92NAGA refers to a single actuator assembly. VG2231UM292NAGA refers to a tandem actuator assembly.

Table 3: VG2000 Series Valves with M9220-xGx-3 Actuators — proportional

Valve code number	Size, in.	Cv (Kvs)	Closeoff psig	Proportional actuator code number	
				Without switches	With two switches
				M9220-GGA-3	M9220-GGC-3
Two-way — spring return N.O. — valve stem up					
VG2231TM	2 1/2	45 (38.6)	76	VG2231TM+92NGGA	VG2231TM+92NGGC
VG2231UM	3	59 (50.6)	33	VG2231UM+92NGGA	VG2231UM+92NGGC
			66	VG2231UM292NGGA	VG2231UM292NGGC
VG2231VM	4	105 (90.0)	37	VG2231VM292NGGA	VG2231VM292NGGC
VG2231WN	5	147 (126.0)	20	VG2231WN292NGGA	VG2231WN292NGGC
Two-way — spring return N.C. — valve stem down					
VG2231TM	2 1/2	45 (38.6)	76	VG2231TM+94NGGA	VG2231TM+94NGGC
VG2231UM	3	59 (50.6)	33	VG2231UM+94NGGA	VG2231UM+94NGGC
			66	VG2231UM294NGGA	VG2231UM294NGGC
VG2231VM	4	105 (90.0)	37	VG2231VM294NGGA	VG2231VM294NGGC
VG2231WN	5	147 (126.0)	20	VG2231WN294NGGA	VG2231WN294NGGC
Three-way mixing — spring return — valve stem up — side inlet port closed					
VG2831TM	2 1/2	49 (42.0)	45	VG2831TM+92NGGA	VG2831TM+92NGGC
VG2831UM	3	74 (63.4)	20	VG2831UM+92NGGA	VG2831UM+92NGGC
			40	VG2831UM292NGGA	VG2831UM292NGGC
VG2831VM	4	131 (112.3)	11	VG2831VM+92NGGA	VG2831VM+92NGGC
			22	VG2831VM292NGGA	VG2831VM292NGGC
VG2831WN	5	197 (168.9)	12	VG2831WN292NGGA	VG2831WN292NGGC
VG2831YN	6	284 (243.4)	7	VG2831YN292NGGA	VG2831YN292NGGC
Three-way mixing — spring return — valve stem down — side inlet port open					
VG2831TM	2 1/2	49 (42.0)	45	VG2831TM+94NGGA	VG2831TM+94NGGC
VG2831UM	3	74 (63.4)	20	VG2831UM+94NGGA	VG2831UM+94NGGC
			40	VG2831UM294NGGA	VG2831UM294NGGC
VG2831VM	4	131 (112.3)	11	VG2831VM+94NGGA	VG2831VM+94NGGC
			22	VG2831VM294NGGA	VG2831VM294NGGC
VG2831WN	5	197 (168.9)	12	VG2831WN294NGGA	VG2831WN294NGGC
VG2831YN	6	284 (243.4)	7	VG2831YN294NGGA	VG2831YN294NGGC

- ① **Note:** Some valve assemblies have two actuators mounted in tandem. On tandem actuator assemblies with switches, only one actuator is provided with auxiliary switches.
- ① **Note:** Product codes that use a 2 instead of a + refer to valve assemblies that have two actuators mounted in tandem.

Example: VG2231UM+92NGGA refers to a single actuator assembly. VG2231UM292NGGA refers to a tandem actuator assembly.

Table 4: VG2000 Series Valves with VA-3100-xGx Series Non-Spring Return Actuators

Valve code number	Size, in.	Cv (Kvs)	Closeoff psig	Floating without switches	Floating with feedback and two switches	0 VDC to 10 VDC proportional with two switches
				VA-3100-AGA	VA-3100-AGC	VA-3100-HGC
Two-way, push-down-to-close						
VG2231TM	2 1/2	45 (38.6)	115	VG2231TM+300AGA	VG2231TM+300AGC	VG2231TM+300HGC
VG2231UM	3	59 (50.6)	79	VG2231UM+301AGA	VG2231UM+301AGC	VG2231UM+301HGC
VG2231VM	4	105 (90.0)	45	VG2231VM+301AGA	VG2231VM+301AGC	VG2231VM+301HGC
VG2231WN	5	147 (126.0)	29	VG2231WN+302AGA	VG2231WN+302AGC	VG2231WN+302HGC
VG2231YN	6	226 (193.7)	20	VG2231YN+302AGA	VG2231YN+302AGC	VG2231YN+302HGC
Three-way mixing						
VG2831TM	2 1/2	49 (42.0)	69	VG2831TM+300AGA	VG2831TM+300AGC	VG2831TM+300HGC
VG2831UM	3	74 (63.4)	48	VG2831UM+301AGA	VG2831UM+301AGC	VG2831UM+301HGC
VG2831VM	4	131 (112.3)	27	VG2831VM+301AGA	VG2831VM+301AGC	VG2831VM+301HGC
VG2831WN	5	197 (168.9)	17	VG2831WN+302AGA	VG2831WN+302AGC	VG2831WN+302HGC
VG2831YN	6	284 (243.4)	12	VG2831YN+302AGA	VG2831YN+302AGC	VG2831YN+302HGC

Table 5: VG2000 Series Valves with VA-6100-xGx Series Non-Spring-Return Actuators

Valve code number	Size, in.	Cv (Kvs)	Closeoff psig	Floating with two switches	0 VDC to 10 VDC proportional with two switches
				VA-6100-AGC	VA-6100-HGC
Two-way push-down-to-close					
VG2231VM	4	105 (90.0)	89	VG2231VN+602AGC	VG2231VN+602HGC
VG2231WN	5	147 (126.0)	57	VG2231WN+602AGC	VG2231WN+602HGC
VG2231YN	6	226 (193.7)	40	VG2231YN+602AGC	VG2231YN+602HGC
Three-way mixing					
VG2831VM	4	131 (112.3)	54	VG2831VN+602AGC	VG2831VN+602HGC
VG2831WN	5	197 (168.9)	34	VG2831WN+602AGC	VG2831WN+602HGC
VG2831YN	6	284 (243.4)	24	VG2831YN+602AGC	VG2831YN+602HGC

Technical specifications

Table 6: VG2000 Series Electric Cast Iron Flanged Globe Valves

Specification		Description
Service		Hot water, chilled water, 50% glycol solutions, and steam for HVAC systems
Valve stroke	2 1/2 in. and 3 in. valves	3/4 in. (19 mm)
	3 in. 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)
Valve body rating		Meets requirements of ASME B16.1, Class 125
Valve assembly maximum allowable pressure / temperature	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)
Leakage		0.1% of maximum flow
Inherent flow characteristics		Modified linear
Rangeability	3 in. valves	7.7:1
	4 in. valves	9.3:1
	5 in. valves	10.7:1
	6 in. valves	10.4:1
Spring ranges (MP8000 Series Actuators)		3 psig to 7 psig (21 kPa to 48 kPa), 4 psig to 8 psig (28 kPa to 55 kPa), and 9 psig to 13 psig (62 kPa to 90 kPa)
Maximum recommended operating pressure drop		35 psig (241 kPa) for all valve sizes
Maximum actuator supply pressure (pneumatically actuated valves only)		25 psig (172 kPa) maximum
Materials	Body	Cast iron with black lacquer finish
	Stem	316 stainless steel
	Plug	Brass
	Packing	Ethylene Propylene Terpolymer (EPT) ring packs
Valve fluid operating temperature limits		35°F to 281°F (2°C to 138°C), 35 psig (241 kPa) saturated steam
Actuator ambient operating temperature limits		Refer to the appropriate actuator product bulletin.
Compliance	Canada	CRN: 0C22368.5

① **Note:** Refer to the VDI 2035 Guideline for correct water treatment specifications.

① **Note:** Rangeability is the ratio of maximum controllable flow to minimum controllable flow.

Product warranty

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

Single point of contact

APAC	EU	UK	NA/SA
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