

## VG7000 Series

# Bronze Globe Valves for Assembly in the Field

## Description

The VG7000 Series Bronze Valves accurately regulate the flow of water or steam in response to the demand of a controller in heating, ventilating, and air conditioning systems. These valves are available in normally open, normally closed, and three-way mixing configurations. Both electric and pneumatic actuators are available.

Refer to the *VG7000 Series Bronze Control Valves Product Bulletin (LIT-977140)* for important product application information.

## Features

- size ranges of 1/2 in. through 2 in. with several styles of electric and pneumatic actuators offers a broad selection from which to choose

- American National Standards Institute (ANSI) Class 250 (pressure/temperature) standard compliant
- tight shutoff testing ensures occupant comfort and energy conservation
- standard Johnson Controls® Ring Pack Packings provide industry-leading reliability and operating life
- complete actuator interchangeability allows easy field retrofit or mounting using standardized mounting kits
- all valve sizes available with brass trim or stainless steel trim for use in saturated steam applications up to 100 psig



**VG7000 Series Bronze Control Valve**

## Repair Information

If the VG7000 Valve fails to operate within its specifications, refer to the *VG7000 Series Bronze Control Valves Product Bulletin (LIT-977140)* for repair information.

## Selection Charts

### VG7000 Series Valve Bodies (Part 1 of 2)

Valve Size, in.	Cv	End Connections <sup>1</sup>						
		National Pipe Thread (NPT)	Union Sweat	Union Sweat (3/8 in. Copper Tubing)	Union Sweat (3/4 in. Copper Tubing)	Union Globe	Union Angle	NPT
Two-Way Push-Down-to-Close								
		Brass Trim						Stainless Steel Trim
1/2	0.73	VG7241CT	VG7281CT	VG7271CT	VG7291CT	VG7251CT	VG7551CT	VG7243CT
1/2	1.8	VG7241ET	VG7281ET	VG7271ET	VG7291ET	VG7251ET	VG7551ET	VG7243ET
1/2	4.6	VG7241GT	VG7281GT	VG7271GT	VG7291GT	VG7251GT	VG7551GT	VG7243GT
3/4	7.3	VG7241LT	VG7281LT	---	---	VG7251LT	VG7551LT	VG7243LT
1	11.6	VG7241NT	VG7281NT	---	---	VG7251NT	VG7551NT	VG7243NT
1-1/4	18.5	VG7241PT	VG7281PT	---	---	VG7251PT	VG7551PT	VG7243PT
1-1/2	28.9	VG7241RT	VG7281RT	---	---	VG7251RT	VG7551RT	VG7243RT
2	46.2	VG7241ST	VG7281ST	---	---	---	---	VG7243ST
1-1/2	28.9	3/8 in. <b>M</b> Stem Only Available in 1-1/2 and 2 in. NPT Stainless Steel Trim						VG7243RM
2	46.2							VG7243SM
Two-Way Push-Down-to-Open								
		Brass Trim						Stainless Steel Trim
1/2	0.73	VG7441CT	VG7481CT	VG7471CT	VG7491CT	VG7451CT	---	VG7443CT
1/2	1.8	VG7441ET	VG7481ET	VG7471ET	VG7491ET	VG7451ET	---	VG7443ET
1/2	4.6	VG7441GT	VG7481GT	VG7471GT	VG7491GT	VG7451GT	---	VG7443GT
3/4	7.3	VG7441LT	VG7481LT	---	---	---	---	VG7443LT
1	11.6	VG7441NT	VG7481NT	---	---	---	---	VG7443NT
1-1/4	18.5	VG7441PT	VG7481PT	---	---	---	---	VG7443PT
1-1/2	28.9	VG7441RT	VG7481RT	---	---	---	---	VG7443RT
2	46.2	VG7441ST	VG7481ST	---	---	---	---	VG7443ST
1-1/2	28.9	3/8 in. <b>M</b> Stem Only Available in 1-1/2 and 2 in. NPT Stainless Steel Trim						VG7443RM
2	46.2							VG7443SM

## Bronze Globe Valves for Assembly in the Field (Continued)

### VG7000 Series Valve Bodies (Part 2 of 2)

Valve Size, in.	Cv	End Connections <sup>1</sup>						
		National Pipe Thread (NPT)	Union Sweat	Union Sweat (3/8 in. Copper Tubing)	Union Sweat (3/4 in. Copper Tubing)	Union Globe	Union Angle	NPT
Three-Way Mixing								
		Brass Trim						Stainless Steel Trim
1/2	0.73	VG7842CT	VG7882CT	VG7872CT	VG7892CT	---	---	VG7844CT
1/2	1.8	VG7842ET	VG7882ET	VG7872ET	VG7892ET	---	---	VG7844ET
1/2	4.6	VG7842GT	VG7882GT	VG7872GT	VG7892GT	---	---	VG7844GT
3/4	7.3	VG7842LT	VG7882LT	---	---	---	---	VG7844LT
1	11.6	VG7842NT	VG7882NT	---	---	---	---	VG7844NT
1-1/4	18.5	VG7842PT	VG7882PT	---	---	---	---	VG7844PT
1-1/2	28.9	VG7842RT	VG7882RT	---	---	---	---	VG7844RT
2	46.2	VG7842ST	VG7882ST	---	---	---	---	VG7844ST
1-1/2	28.9	3/8 in. M Stem Only Available in 1-1/2 and 2 in. NPT Stainless Steel Trim						VG7844RM
2	46.2							VG7844SM

1. All actuators except MP84 Series use the 1/4 in. T stem. The MP84 Series pneumatic actuators require the 3/8 in. M stem.

### Pneumatic Actuators for VG7000 Series Brass Trim Valve Bodies (Part 1 of 2)

Actuator Code Number		V-3801-8001			V-3000-8011 Exposed Spring  V-3000-8003 Enclosed Spring <sup>1</sup>			MP822C00 (3 to 7) MP822D00 (4 to 8) MP822E00 (9 to 13)		1 and 1-1/4 in.
								MP823C00 (3 to 7) MP823D00 (4 to 8) MP823E00 (9 to 13)		1-1/2 and 2 in.
Temperature Range		35 to 248°F (2 to 120°C), 15 psig Saturated Steam			35 to 284°F (2 to 140°C), 38 psig Saturated Steam			35 to 284°F (2 to 140°C), 38 psig Saturated Steam		
Spring Range		3 to 6	4 to 8	9 to 13	3 to 6	4 to 8	9 to 13	3 to 7	4 to 8	9 to 13
Valve Size		Mounting Kit								
1/2 and 3/4 in.		VG7000-1010	VG7000-1011	VG7000-1012	VG7000-1001	VG7000-1002	VG7000-1003	---	---	---
1 and 1-1/4 in.		---	---	---	VG7000-1004	VG7000-1005	VG7000-1006	MP8000-6702		
1-1/2 and 2 in.		---	---	---	VG7000-1007	VG7000-1008	VG7000-1009			
Positioner		Not Available			V-9502-90 (V-3000-8011 Only)			V-9502-95		
Size, in.	Cv	Closeoff Pressure								
Two-Way Normally Open										
1/2	0.73	186	157	84	365	339	191	---	---	---
1/2	1.8	186	157	84	365	339	191	---	---	---
1/2	4.6	105	89	48	225	192	108	---	---	---
3/4	7.3	67	56	30	144	122	69	---	---	---
1	11.6	---	---	---	90	76	42	279	257	148
1-1/4	18.5	---	---	---	55	47	26	170	157	90
1-1/2	28.9	---	---	---	35	30	16	109	100	58
2	46.2	---	---	---	22	19	11	70	64	37

## Bronze Globe Valves for Assembly in the Field (Continued)

### Pneumatic Actuators for VG7000 Series Brass Trim Valve Bodies (Part 2 of 2)

Pneumatic Actuators for VG7000 Series Brass Trim Valve Bodies (Part 2 of 2)											
Actuator Code Number	V-3801-8001			V-3000-8011 Exposed Spring			MP822C00 (3 to 7) MP822D00 (4 to 8) MP822E00 (9 to 13)		1 and 1-1/4 in.		
				V-3000-8003 Enclosed Spring <sup>1</sup>			MP823C00 (3 to 7) MP823D00 (4 to 8) MP823E00 (9 to 13)		1-1/2 and 2 in.		
Temperature Range	35 to 248°F (2 to 120°C), 15 psig Saturated Steam			35 to 284°F (2 to 140°C), 38 psig Saturated Steam			35 to 284°F (2 to 140°C), 38 psig Saturated Steam				
Spring Range	3 to 6		4 to 8	9 to 13	3 to 6		4 to 8	9 to 13	3 to 7	4 to 8	9 to 13
Valve Size	Mounting Kit										
1/2 and 3/4 in.	VG7000-1010	VG7000-1011	VG7000-1012	VG7000-1001	VG7000-1002	VG7000-1003	---	---	---		
1 and 1-1/4 in.	---	---	---	VG7000-1004	VG7000-1005	VG7000-1006	MP8000-6702				
1-1/2 and 2 in.	---	---	---	VG7000-1007	VG7000-1008	VG7000-1009					
Positioner	Not Available			V-9502-90 (V-3000-8011 Only)			V-9502-95				
Size, in.	Cv	Closeoff Pressure									
Two-Way Normally Closed											
1/2	0.73	37	57	158	100	142	348	---	---	---	
1/2	1.8	37	57	158	100	142	348	---	---	---	
1/2	4.6	18	28	76	49	68	168	---	---	---	
3/4	7.3	11	16	45	29	41	100	---	---	---	
1	11.6	---	---	---	17	25	65	70	96	223	
1-1/4	18.5	---	---	---	10	14	37	40	55	128	
1-1/2	28.9	---	---	---	6	9	23	25	34	79	
2	46.2	---	---	---	4	6	14	16	21	50	
Three-Way Mixing											
1/2	0.73	186 / 37	157 / 57	84 / 158	365 / 100	339 / 142	191 / 348	---	---	---	
1/2	1.8	186 / 37	157 / 57	84 / 158	365 / 100	339 / 142	191 / 348	---	---	---	
1/2	4.6	105 / 18	89 / 28	48 / 76	225 / 49	192 / 68	108 / 168	---	---	---	
3/4	7.3	67 / 11	56 / 16	30 / 45	144 / 29	122 / 41	69 / 100	---	---	---	
1	11.6	---	---	---	90 / 17	76 / 25	42 / 65	279 / 70	257 / 96	148 / 223	
1-1/4	18.5	---	---	---	55 / 10	47 / 14	26 / 37	170 / 40	157 / 55	90 / 128	
1-1/2	28.9	---	---	---	35 / 6	30 / 9	16 / 23	109 / 25	100 / 34	58 / 79	
2	46.2	---	---	---	22 / 4	19 / 6	11 / 14	70 / 16	64 / 21	37 / 50	

1. To prevent finger injury, V-3000-8003 Actuators with enclosed springs are used in applications where the valve is exposed to the public. Typical applications include control of hot water or steam radiators.

## Bronze Globe Valves for Assembly in the Field (Continued)

### Pneumatic Actuators for VG7000 Series Stainless Steel Trim Valve Bodies

Actuator Code Number		V-3000-8011 Exposed Spring			MP821C00 (3 to 7) MP821D00 (4 to 8) MP821E00 (9 to 13)		1/2 and 3/4 in.	MP843C00 (3 to 7) MP843D00 (4 to 8) MP843E00 (9 to 13)		1-1/2 and 2 in.
		V-3000-8003 Enclosed Spring <sup>1</sup>			MP822C00 (3 to 7) MP822D00 (4 to 8) MP822E00 (9 to 13)		1 and 1-1/4 in.			
					MP823C00 (3 to 7) MP823D00 (4 to 8) MP823E00 (9 to 13)		1-1/2 and 2 in.			
Temperature Range		35 to 338°F (2 to 170°C), 100 psig Saturated Steam			35 to 338°F (2 to 170°C), 100 psig Saturated Steam			35 to 338°F (2 to 170°C), 100 psig Saturated Steam		
Spring Range		3 to 6	4 to 8	9 to 13	3 to 6	4 to 8	9 to 13	3 to 7	4 to 8	9 to 13
Valve Size		Mounting Kit								
1/2 and 3/4 in.		VG7000-1001	VG7000-1002	VG7000-1003	MP8000-6701			Not Recommended		
1 and 1-1/4 in.		VG7000-1004	VG7000-1005	VG7000-1006	MP8000-6702					
1-1/2 and 2 in.		VG7000-1007	VG7000-1008	VG7000-1009						
Positioner		V-9502-90 (V-3000-8011 Only)			V-9502-95			V-9502-95		
Size, in.	Cv	Closeoff Pressure								
Two-Way Normally Open										
1/2	0.73	299	255	143	308	308	308	---	---	---
1/2	1.8	299	255	143	308	308	308	---	---	---
1/2	4.6	169	144	81	308	308	275	---	---	---
3/4	7.3	108	92	52	304	304	175	---	---	---
1	11.6	67	57	32	209	193	111	---	---	---
1-1/4	18.5	41	35	19	128	118	68	---	---	---
1-1/2	28.9	---	---	---	82	75	43	165	152	88
2	46.2	---	---	---	52	48	28	106	97	56
Two-Way Normally Closed										
1/2	0.73	75	106	261	280	308	308	---	---	---
1/2	1.8	75	106	261	280	308	308	---	---	---
1/2	4.6	36	51	126	135	183	308	---	---	---
3/4	7.3	22	31	75	81	109	252	---	---	---
1	11.6	13	19	49	53	72	168	---	---	---
1-1/4	18.5	7	11	28	30	41	96	---	---	---
1-1/2	28.9	---	---	---	19	25	59	39	53	121
2	46.2	---	---	---	12	16	37	24	33	76
Three-Way Mixing										
1/2	0.73	299 / 75	255 / 106	143 / 261	308 / 280	308 / 308	308 / 308	---	---	---
1/2	1.8	299 / 75	255 / 106	143 / 261	308 / 280	308 / 308	308 / 308	---	---	---
1/2	4.6	169 / 36	144 / 51	81 / 126	308 / 135	308 / 183	275 / 308	---	---	---
3/4	7.3	108 / 22	92 / 31	52 / 75	304 / 81	304 / 109	175 / 252	---	---	---
1	11.6	67 / 13	57 / 19	32 / 49	209 / 53	193 / 72	111 / 168	---	---	---
1-1/4	18.5	41 / 7	35 / 11	19 / 28	128 / 30	118 / 41	68 / 96	---	---	---
1-1/2	28.9	---	---	---	82 / 19	75 / 25	43 / 59	165 / 39	152 / 53	88 / 121
2	46.2	---	---	---	52 / 12	48 / 16	28 / 37	106 / 24	97 / 33	56 / 76

1. To prevent finger injury, V-3000-8003 Actuators with enclosed springs are used in applications where the valve is exposed to the public. Typical applications include control of hot water or steam radiators.

## Bronze Globe Valves for Assembly in the Field (Continued)

### Non-Spring Return Electric Actuators for VG7000 Series Valve Bodies

Actuator Code Number		VA-7150-1001 On/Off (Floating)		VA-7200-1001 On/Off (Floating)		VA7810-AGA-2 On/Off (Floating Control) VA7810-AGC-2 On/Off (Floating Control) with Two Switches	
		VA-7152-1001 0 to 10 VDC Proportional		VA-7202-1001 0 to 10 VDC Proportional		VA7810-HGA-2 0 to 10 VDC Proportional Control VA7810-HGC-2 0 to 10 VDC Proportional Control with Two Switches	
		VA-7153-1001 On/Off (Floating) with Feedback		VA-7203-1001 On/Off (Floating) with Feedback			
Temperature Range		Brass Trim: 35 to 284°F (2 to 140°C), 38 psig Saturated Steam					
		Stainless Steel: 35 to 338°F (2 to 170°C), 100 psig Saturated Steam					
Linkage		None					
Stem Type		Requires T Stem					
Size, in.	Cv	Closeoff Pressure					
		Brass Trim	Stainless Steel Trim	Brass Trim	Stainless Steel Trim	Brass Trim	Stainless Steel Trim
Two-Way Normally Open							
1/2	0.73	345	239	---	308	345	308
1/2	1.8	345	239	---	308	345	308
1/2	4.6	216	135	---	278	345	283
3/4	7.3	138	86	---	177	289	180
1	11.6	86	54	179	112	182	114
1-1/4	18.5	52	33	109	68	111	70
1-1/2	28.9	34	21	70	44	71	45
2	46.2	21	13	45	28	46	28
Two-Way Normally Closed							
1/2	0.73	345	308	---	308	345	308
1/2	1.8	345	308	---	308	345	308
1/2	4.6	257	161	---	308	345	308
3/4	7.3	153	96	---	197	321	201
1	11.6	100	63	209	131	213	133
1-1/4	18.5	57	36	120	75	122	76
1-1/2	28.9	36	22	74	46	76	47
2	46.2	22	14	46	29	47	30
Three-Way Mixing							
1/2	0.73	345 / 345	239 / 308	---	308 / 308	345 / 345	308 / 308
1/2	1.8	345 / 345	239 / 308	---	308 / 308	345 / 345	308 / 308
1/2	4.6	216 / 257	135 / 161	---	278 / 308	345 / 345	283 / 308
3/4	7.3	138 / 153	86 / 96	---	177 / 197	289 / 321	180 / 201
1	11.6	86 / 100	54 / 63	179 / 209	112 / 131	182 / 213	114 / 133
1-1/4	18.5	52 / 57	33 / 36	109 / 120	68 / 75	111 / 122	70 / 76
1-1/2	28.9	34 / 36	21 / 22	70 / 74	44 / 46	71 / 76	45 / 47
2	46.2	21 / 22	13 / 14	45 / 46	28 / 29	46 / 47	28 / 30

## Bronze Globe Valves for Assembly in the Field (Continued)

### Spring Return Electric Actuators for VG7000 Series Valve Bodies

Spring Return Electric Actuators for V8700 Series Valve Bodies							
Actuator Code Number		VA-4233-AGA-2 Floating Control VA-4233-AGC-2 Floating Control with Two Switches		VA7820-HGA-2 <sup>1</sup> 0 to 10 VDC Proportional Control VA7820-HGC-2 <sup>1</sup> 0 to 10 VDC Proportional Control with Two Switches		VA7830-HGA-2 <sup>1</sup> 0 to 10 VDC Proportional Control VA7830-HGC-2 <sup>1</sup> 0 to 10 VDC Proportional Control with Two Switches	
		VA-4233-BGA-2 On/Off Control VA-4233-BGC-2 On/Off Control with Two Switches					
		VA-4233-GGA-2 0 to 10 VDC Proportional Control VA-4233-GGC-2 0 to 10 VDC Proportional Control with Two Switches					
		Spring Return Valve Stem Up					
Temperature Range		Brass Trim: 35 to 284°F (2 to 140°C), 38 psig Saturated Steam					
		Stainless Steel: 35 to 338°F (2 to 170°C), 100 psig Saturated Steam					
Linkage		None					
Stem Type		Requires T Stem					
Size, in.	Cv	Closeoff Pressure					
		Brass Trim	Stainless Steel Trim	Brass Trim	Stainless Steel Trim	Brass Trim	Stainless Steel Trim
Two-Way Normally Open							
1/2	0.73	345	230	345	308	345	308
1/2	1.8	345	230	345	308	345	308
1/2	4.6	208	130	345	283	345	283
3/4	7.3	132	82	289	180	289	180
1	11.6	63	39	182	114	182	114
1-1/4	18.5	38	24	111	70	111	70
1-1/2	28.9	---	---	71	45	71	45
2	46.2	---	---	46	28	46	28
Two-Way Normally Closed							
1/2	0.73	345	224	345	308	345	308
1/2	1.8	345	224	345	308	345	308
1/2	4.6	173	108	345	308	345	308
3/4	7.3	103	64	321	201	321	201
1	11.6	66	41	213	133	213	133
1-1/4	18.5	38	24	122	76	122	76
1-1/2	28.9	---	---	76	47	76	47
2	46.2	---	---	47	30	47	30
Three-Way Mixing							
1/2	0.73	345 / 345	230 / 224	345 / 345	308 / 308	345 / 345	308 / 308
1/2	1.8	345 / 345	230 / 224	345 / 345	308 / 308	345 / 345	308 / 308
1/2	4.6	208 / 173	130 / 108	345 / 345	283 / 308	345 / 345	283 / 308
3/4	7.3	132 / 103	82 / 64	289 / 321	180 / 201	289 / 321	180 / 201
1	11.6	63 / 66	39 / 41	182 / 213	114 / 133	182 / 213	114 / 133
1-1/4	18.5	38 / 38	24 / 24	111 / 122	70 / 76	111 / 122	70 / 76
1-1/2	28.9	---	---	71 / 76	45 / 47	71 / 76	45 / 47
2	46.2	---	---	46 / 47	28 / 30	46 / 47	28 / 30

1. VA7820 and VA7830 Spring Return Actuators ship from the factory already set for 0-10 VDC Proportional Control. These actuators have field-selectable switches that allow the actuators to be used for On/Off Control or Three-Wire Floating Control.

## Bronze Globe Valves for Assembly in the Field (Continued)

### Technical Specifications

VG7000 Series Valve Bodies, Two-Way and Three-Way				
Service		Steam, Hot Water, and Chilled Water with up to 50% Glycol Solution (Proper water treatment is recommended for long service life; refer to standard VDI 2035.)		
		<b>Cv</b>	<b>Kv</b>	
Valve Body Sizes Available	1/2 in. (DN15)	0.73, 1.8, 4.6	0.63, 1.6, 4	
	3/4 in. (DN20)	7.3	6.3	
	1 in. (DN25)	11.6	10	
	1-1/4 in. (DN32)	18.5	16	
	1-1/2 in. (DN40)	28.9	25	
	2 in. (DN50)	46.2	40	
Stem Travel		1/2 and 3/4 in. Valves	1 and 1-1/4 in. Valve	1-1/2 and 2 in. Valves
	Two-Way and Three-Way	5/16 in.	1/2 in.	3/4 in.
		Brass Trim		Stainless Steel Trim
End Connections		NPT, Union Sweat, Globe & Angle		NPT
Materials	Body	Cast Bronze – C84400		Cast Bronze – C83600
	Stem	Stainless Steel		Stainless Steel
	Plug	Brass		Stainless Steel
	Seat	3/4 through 2 in.: Machined from Body 1/2 in.: Brass Seat		Stainless Steel Replaceable Seat
	Disk	Ethylene Propylene Diene Monomer (EPDM)		Stainless Steel
	Packing	Self-Adjusting Ethylene Propylene Terpolymer (EPT) U-Cups		Spring-Loaded Polytetrafluoroethylene (PTFE)
Flow Characteristic	Two-Way	Equal Percentage		Equal Percentage
	Three-Way	Linear		Linear
Ratings	Body	ANSI Class 250 <sup>1</sup>		ANSI Class 250 <sup>2</sup>
	Leakage (Percent of Maximum Flow)	0.01%		0.05%
	Fluid Temperature, Body Only <sup>3</sup>	35 to 284°F (2 to 140°C)		35 to 338°F (2 to 170°C)
	Maximum Steam Pressure, Saturated Steam	38 psig (262 kPa)		100 psig (690 kPa)
	Maximum Pressure Drop, Valve Open	35 psig (1/2 through 1-1/4 in.) 30 psig (1-1/2 and 2 in. valves)		35 psig (1/2 through 1-1/4 in.) 30 psig (1-1/2 and 2 in. valves)

1. 400 psig (2,758 kPa) for fluid temperatures between 35 and 150°F (2 and 66°C); decreasing to 365 psig (2,515 kPa) at 248°F (120°C).

2. 400 psig (2,758 kPa) for fluid temperatures between 35 and 150°F (2 and 66°C); decreasing to 308 psig (2,122 kPa) at 338°F (170°C).

3. Refer to appropriate actuator literature for ambient limitations due to the actuator.