VG1000 Series

LIT-1924515

Forged Brass Ball Valves for Assembly in the Field

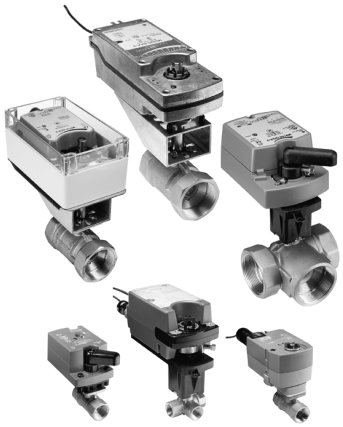
Description

VG1000 Series Ball Valves are designed to regulate the flow of hot or chilled water and for some models low-pressure steam in response to the demand of a controller in Heating, Ventilating, and Air Conditioning (HVAC) systems. Available in sizes 1/2 through 2 in. (DN15 through DN50), this family of two-way and three-way forged brass valves is factory or field mounted to Johnson Controls® VA9104, M9104, M9106, M9109, and M9100 Series Non-Spring Return and VA2202, M2202, M9206 and M9210 Series Spring Return Electric Actuators for on/off, floating, or proportional control.

Refer to the *VG1000 Series Forged Brass Ball Valves Product Bulletin (LIT-977132)* for important product application information.

Features

- NPT, sweat ,and press end connections provide the right valve for a broad range of applications — reducing installation time and the need for adapters while increasing system reliability
- 300 Series stainless steel ball and stem assembly tolerates high temperature water or 15 psi saturated steam with fluid temperatures of -22 to 284°F (-30 to 140°C) or where a higher degree of corrosion protection is desired
- Ethylene Propylene Diene Monomer (EPDM) double O-ring steam seal provides a leak-free seal— the packing has been tested and is leak-free after 200,000 cycles in iron-oxide contaminated water
- graphite reinforced Polytetrafluoroethylene (PTFE) seats include 15% graphite-reinforced ball seals, providing better wear resistance
- 200 psi closeoff pressure rating provides tight shutoff
- 500:1 rangeability provides accurate control under all load conditions
- chrome-plated brass ball and stem assembly handles both chilled water and hot water applications with a fluid temperature range of 23 to 203°F (-5 to 95°C)
- blowout-proof stem protects the user from the risk of injury



VG1000 Series Ball Valves Shown with Field Mounted VA9104 and M9000 Series Actuators

Selection Charts

Series Actuators: Valid Ball Valve, Electric Actuator and Linkage Combinations (for Field Assembly)

Valve Size, in. (mm)	Valve Code Number	Actuator Base Code Number[1]	Linkage Kit Code Number	Weathershield Code Number
1/2 (DN15) 3/4 (DN20)	**VG1241A, VG1241B, VG1245A, VG1245B, VG1271A, VG1271B, VG1275A, VG1275B VG1291A, VG1291B, VG1295A, VG1295B VG1841A, VG1841B VG1845A, VG1845B**	**VA9104**	None Required	N/A
		M9104	**M9000-550**	
		M9106	**M9000-520**	
		VA2202	None Required	
		M2202	**M2000-500**	
		M9206	**M9000-520**	
		M9108	**M9000-516**	**M9000-330**
		M9210	**M9000-517**	**M9000-340**
1 (DN25)	**VG1241C, VG1245C, VG1271C, VG1275C VG1291C, VG1295C VG1841C, VG1845C**	**VA9104**	None Required	N/A
		M9104	**M9000-550**	
		M9106 M9206	**M9000-520**	
		VA2202	None Required	
		M2202	**M2000-500**	
		M9108	**M9000-516**	**M9000-330**
		M9210	**M9000-517**	**M9000-340**
1-1/4 (DN32) 1-1/2 (DN40)	**VG1241D, VG1241E VG1245D, VG1245E VG1841D, VG1841E VG1845D, VG1845E**	**M9106 M9206**	**M9000-520**	N/A
		M9108	**M9000-516**	**M9000-330**
		M9210	**M9000-517**	**M9000-340**
2 (DN50)	**VG1241F VG1245F VG1841F VG1845F**	**M9109**	**M9000-520**	N/A
		M9116	**M9000-516**	**M9000-330**
		M9210	**M9000-517**	**M9000-340**

1. VA9104, M9104, M9106, M9109 and M9100 Series Actuators are non-spring return, and VA2202, M2202, M9206 and M9210 Series Actuators are spring return. Note: VA9104, M9104, VA2202, and M2202 have a maximum fluid temperature limit of 212°F (100°C).

Repair Information

Repair Parts

Replacement Part Code Number	Linkage	Replacement Description
—	M9000-51x	Unit replacement
M9000-600	M9000-520	Anti-rotation slider, includes carriage screw, washers, and wing nut
M9000-601		M5 Mounting Screws and Nuts
M9000-602		Drive Shaft
M9000-603		Manual Handle and Mounting Screw
—	M9000-550	Unit Replacement
—	M2000-500	Unit Replacement

VG1000 Series Forged Brass Ball Valves for Assembly in the Field (Continued)

Available Ball Valves for Field Assembly[1]

Size, in. (mm)	Closeoff (psig)	Control Disc	Control Port Cv (kv)	Bypass Port Cv (kv) *(Three-Way Only)*	Plated Brass Ball and Stem (23 to 203°F Fluid Temperature)		Stainless Steel Ball and Stem (-22 to 284°F Fluid Temperature, 15 psi saturated steam)	
					Two-Way	Three-Way	Two-Way	Three-Way
NPT Threaded End Connection Valves								
1/2 (DN15)	200	Yes	1.2 (1.0)	0.7 (0.6)	**VG1241AD**	**VG1841AD**	**VG1245AD**	**VG1845AD**
			1.9 (1.6)	1.2 (1.0)	**VG1241AE**	**VG1841AE**	**VG1245AE**	**VG1845AE**
			2.9 (2.5)	1.9 (1.6)	**VG1241AF**	**VG1841AF**	**VG1245AF**	**VG1845AF**
			4.7 (4.0)	2.9 (2.5)	**VG1241AG**	**VG1841AG**	**VG1245AG**	**VG1845AG**
			7.4 (6.3)	4.7 (4.0)	**VG1241AL**	**VG1841AL**	**VG1245AL**	**VG1845AL**
		No	11.7 (10.0)	5.8 (5.0)	**VG1241AN**	**VG1841AN**	**VG1245AN**	**VG1845AN**
3/4 (DN20)	200	Yes	4.7 (4.0)	2.9 (2.5)	**VG1241BG**	**VG1841BG**	**VG1245BG**	**VG1845BG**
			7.4 (6.3)	4.7 (4.0)	**VG1241BL**	**VG1841BL**	**VG1245BL**	**VG1845BL**
		No	11.7 (10.0)	5.8 (5.0)	**VG1241BN**	**VG1841BN**	**VG1245BN**	**VG1845BN**
1 (DN25)	200	Yes	7.4 (6.3)	4.7 (4.0)	**VG1241CL**	**VG1841CL**	**VG1245CL**	**VG1845CL**
			11.7 (10.0)	5.8 (5.0)	**VG1241CN**	**VG1841CN**	**VG1245CN**	**VG1845CN**
		No	18.7 (16.0)	9.4 (8.0)	**VG1241CP**	**VG1841CP**	**VG1245CP**	**VG1845CP**
1-1/4 (DN32)	200	Yes	11.7 (10.0)	5.8 (5.0)	**VG1241DN**	**VG1841DN**	**VG1245DN**	**VG1845DN**
			18.7 (16.0)	9.4 (8.0)	**VG1241DP**	**VG1841DP**	**VG1245DP**	**VG1845DP**
		No	29.2 (25.0)	14.6 (12.5)	**VG1241DR**	**VG1841DR**	**VG1245DR**	**VG1845DR**
1-1/2 (DN40)	200	Yes	18.7 (16.0)	9.4 (8.0)	**VG1241EP**	**VG1841EP**	**VG1245EP**	**VG1845EP**
			29.2 (25.0)	14.6 (12.5)	**VG1241ER**	**VG1841ER**	**VG1245ER**	**VG1845ER**
		No	46.8 (40.0)	23.4 (20.0)	**VG1241ES**	**VG1841ES**	**VG1245ES**	**VG1845ES**
2 (DN50)	200	Yes	29.2 (25.0)	14.6 (12.5)	**VG1241FR**	**VG1841FR**	**VG1245FR**	**VG1845FR**
			46.8 (40.0)	23.4 (20.0)	**VG1241FS**	**VG1841FS**	**VG1245FS**	**VG1845FS**
		No	73.7 (63.0)	36.8 (31.5)	**VG1241FT**	**VG1841FT**	**VG1245FT**	**VG1845FT**
Sweat End Connection Valves								
1/2 (DN15)	200	Yes	1.2 (1.0)	0.7 (0.6)	**VG1271AD**	—	**VG1275AD**	—
			1.9 (1.6)	1.2 (1.0)	**VG1271AE**		**VG1275AE**	
			2.9 (2.5)	1.9 (1.6)	**VG1271AF**		**VG1275AF**	
			4.7 (4.0)	2.9 (2.5)	**VG1271AG**		**VG1275AG**	
			7.4 (6.3)	4.7 (4.0)	**VG1271AL**		**VG1275AL**	
		No	11.7 (10.0)	5.8 (5.0)	**VG1271AN**		**VG1275AN**	
3/4 (DN20)	200	Yes	4.7 (4.0)	2.9 (2.5)	**VG1271BG**		**VG1275BG**	
			7.4 (6.3)	4.7 (4.0)	**VG1271BL**		**VG1275BL**	
		No	11.7 (10.0)	5.8 (5.0)	**VG1271BN**		**VG1275BN**	
1 (DN25)	200	Yes	7.4 (6.3)	4.7 (4.0)	**VG1271CL**		**VG1275CL**	
			11.7 (10.0)	5.8 (5.0)	**VG1271CN**		**VG1275CN**	
		No	18.7 (16.0)	9.4 (8.0)	**VG1271CP**		**VG1275CP**	
Press End Connection Valves								
1/2 (DN15)	200	Yes	1.2 (1.0)	0.7 (0.6)	**VG1291AD**	—	**VG1295AD**	—
			1.9 (1.6)	1.2 (1.0)	**VG1291AE**		**VG1295AE**	
			2.9 (2.5)	1.9 (1.6)	**VG1291AF**		**VG1295AF**	
			4.7 (4.0)	2.9 (2.5)	**VG1291AG**		**VG1295AG**	
			7.4 (6.3)	4.7 (4.0)	**VG1291AL**		**VG1295AL**	
		No	11.7 (10.0)	5.8 (5.0)	**VG1291AN**		**VG1295AN**	
3/4 (DN20)	200	Yes	4.7 (4.0)	2.9 (2.5)	**VG1291BG**		**VG1295BG**	
			7.4 (6.3)	4.7 (4.0)	**VG1291BL**		**VG1295BL**	
		No	11.7 (10.0)	5.8 (5.0)	**VG1291BN**		**VG1295BN**	
1 (DN25)	200	Yes	7.4 (6.3)	4.7 (4.0)	**VG1291CL**		**VG1295CL**	
			11.7 (10.0)	5.8 (5.0)	**VG1291CN**		**VG1295CN**	
		No	18.7 (16.0)	9.4 (8.0)	**VG1291CP**		**VG1295CP**	

1. Before retrofitting older valves with VA9104, M9104, VA2202, or M2202 actuators, be sure that the valves have a tapped hole in the center of the valve stem and no threads in the flange holes. These direct mount actuators do not fit with older valves designed without a tapped center stem hole or with threaded flange mounting holes.

VG1000 Series Forged Brass Ball Valves for Assembly in the Field (Continued)

Technical Specifications

VG1000 Series Forged Brass Ball Valves for Assembly in the Field		
Service[1]		Hot Water, Chilled Water, 50/50 Glycol Solutions, and 1 5 psig (103 kPa) Saturated Steam[2] for HVAC Systems
Valve Fluid Temperature Limits	**Water**	VG1241, VG1271, VG1291, and VG1841 Series: 23 to 203×F (-5 to 95×C)
		VG1245, VG1275, VG1295, and VG1845 Series: -22 to 284×F (-30 to 140×C)
		VG1243 Series: 35 to 250°F (2 to 121°C)
	Steam[2]	VG1245 and VG1243 Series: 15 psig (103 kPa) at 250°F (121°C)
		VG1241 Series: Not Rated for Steam Service
Maximum Actuator Fluid Temperature Limits	**212°F (100°C)**	VA2202, VA9104, M2202 with M2000-500 Linkage, and M9104 with M9000-550 Linkage
	284°F (140°C)	M9106, M9109, or M9206 with M9000-550 Linkage, and M9210 with M9000-517 Linkage
Valve Body Pressure/ Temperature Rating	**Water**	VG1241, VG1245, VG1841, and VG1845: 580 psig (3,996 kPa) (PN40) VG1271, VG1275, VG1291, and VG1295: 300 psig (2,067 kPa)
	Steam[2]	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		Maximum Differential Pressure: 50 psi: Valves with Characterized Flow Control Disk 30 psi: 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[3]		Greater than 500:1
Minimum Ambient Operating Temperature	**-25°F (-32°C)**	M9206 Series Spring Return Actuators
	-22°F (-30°C)	VA2202 and M2202 Series Spring Return Actuators
	-4°F (-20°C)	VA9104, M9104, M9106, and M9109 Series Non-Spring Return Actuators
	-40°F (-40°C)	M9210 Series Spring Return Actuators
Maximum Ambient Operating Temperature[2] **(Limited by the Actuator and Linkage)**	**Direct Mount**	125°F (52°C): VA9104 Series Non-Spring Return Actuators 122°F (50°C): VA2202 Series Spring Return Actuators
	M9000-550 Linkage	125°F (52°C): M9104 Series Non-Spring Return Actuators
	M9000-520 Linkage	125°F (52°C): M9106 and M9109 Series Non-Spring Return Actuat 140°F (60°C): M9206 Series Spring Return Actuators
	M2000-500 Linkage	122°F (50°C): M2202 Series Spring Return Actuators
	M9000-51x Series Linkage	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 131°F (55°C): M9210 Series Spring Return Actuators
Valve Body Size/Cv (kv)		See *Selection Charts*.
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), 1/2 through 2 in. (DN 15 through DN50) Sweat, 1/2 through 1 in. (DN15 through DN25) Press *(ProPress® compatible),* 1/2 through 1 in. (DN15 through DN25) (The Press End Connections are designed to work with RIDGID® pressing tools.)[4]
Materials	**Body**	Forged Brass
	Ball	VG12x1 and VG18x1 Series: Chrome Plated Brass
		VG12x5 and VG18x5 Series: 300 Series Stainless Steel
	Blowout-Proof Stem	VG12x1 and VG18x1 Series: Nickel Plated Brass
		VG12x5 and VG18x5 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

1. Refer to VDI 2035 Standard for recommended proper water treatment.
2. In steam applications, install the valve with the stem horizontal to the piping, and wrap the valve and piping with insulation.
3. Rangeability is defined as the ratio of maximum controllable flow to minimum controllable flow.
4. ProPress®is a registered Trademark of Viega.
   RIDGID® is a registered Trademark of the Ridge Tool Company.
   Press Tool™ is a Trademark of the Ridge Tool Company