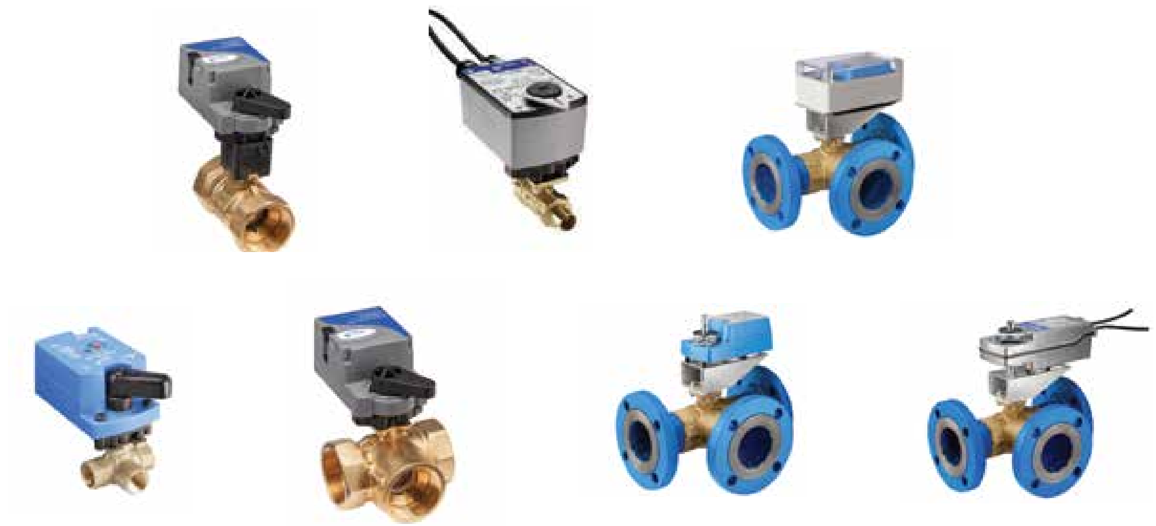
HVAC CONTROL PRODUCTS NORTH AMERICA

VG1000 Series Ball Valve Selection Guide

Johnson Controls

Creating a more comfortable, safe and sustainable world.



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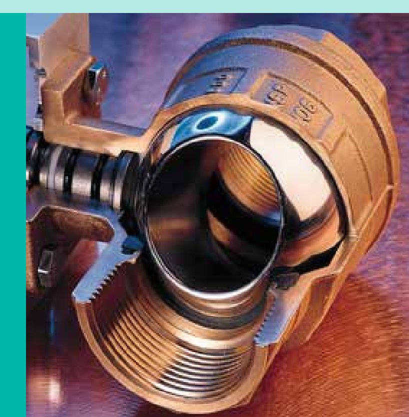
How to build factory assembly codes using this guide

- ASME Class 150 Flange Connections
- High Fluid Temperature Range
- Stainless Steel Trim
- Close Off Pressure
  - 2-Way = 100 PSID
  - 3-Way = 50 PSID
- Fluid Temperature Limits:
  - -22 to 284°F (-30 to 140°C)

					Actuator Type	Non-Spring Return				Spring Return Port A Open[2]								Spring	
						M9124				M9220									
					Control Input	On / Off and Floating Point		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point		120V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point	
Actuator Options	Auxiliary Switches:	1 SPDT, 5.0(2.9) A @ 240 V																	
		2 SPDT, 5.0(2.9) A @ 240 V									■		■		■		■		■
		2 SPDT, 3.0(1.5) A @ 24 VAC					■		■										
Inch	DN (mm)	Cv	Face to Face	2-Way ANSI Flange	3-Way ANSI Flange														
2 1/2	DN 65	47 (29)	narrow large	VG12A5KS VG12A5GS	VG18A5KS VG18A5GS	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		74 (47)	narrow large	VG12A5KT VG12A5GT	VG18A5KT VG18A5GT	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		117 (74)	narrow large	VG12A5KU VG12A5GU	VG18A5KU VG18A5GU	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3	DN 80	74 (47)	narrow large	VG12A5LT VG12A5HT	VG18A5LT VG18A5HT	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		117 (74)	narrow large	VG12A5LU VG12A5HU	VG18A5LU VG18A5HU	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		176 (88)	narrow large	VG12A5LV VG12A5HV	VG18A5LV VG18A5HV	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		211 (105)	narrow large	VG12A5LW VG12A5HW	VG18A5LW VG18A5HW	■	■	■	■	■	■	■	■	■	■	■	■	■	■
4	DN 100	117 (74)	large	VG12A5JU	VG18A5JU	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		176 (88)	large	VG12A5JV	VG18A5JV	■	■	■	■	■	■	■	■	■	■	■	■	■	■
		185 (175)	narrow	VG12A5MW	VG18A5MW														
5 in	DN 125	290 (182)	narrow	VG12A5NY	VG18A5NY														
6 in	DN 150	348 (170)	narrow	VG12A5PZ	VG18A5PZ														
MOTORIZED VALVE ASSEMBLY CODE	=	VALVE CODE	+	FACTORY ASSEMBLY CODE		+924AGA	+924AGC	+924GGA	+924GGC	+92NAGA	+92NAGC	+92NBAA	+92NBAC	+92NBGA	+92NBGC	+92NGGA	+92NGGC	+94NAGA	+94NAGC

Example: VG18A5HU+92NGGA

Note: Full chart not represented here



Superior Wear Resistance

Low Operating Torque

Double Protection Against Stem Leaks

PTFE Stem Centering Bushing

15 to 20 Year Life

Tested > 200,000 Cycles in Iron Oxide Contaminated Water

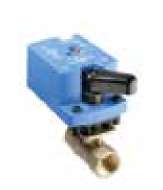
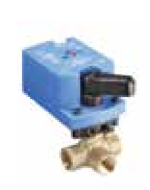
WHY SELECT JOHNSON CONTROLS VG1000 SERIES BALL VALVES?

- Most Complete Ball Valve Product Line in the HVAC Industry
- High pressure ratings
- Rangeability > 500 to 1
- Equal Percentage Flow Characteristics
- Simplified Actuator Selection
- 15% Graphite Filled PTFE Ball Seats, Dual EPDM Stem Seals
- Compact Size – Direct Mounted Actuators
- Lower Cost than Globe Valve Solutions
- Six-Sigma Quality Program – Industry Leading Test Programs
- Backed by Johnson Controls – Industry Leading 5 yr. Warranty

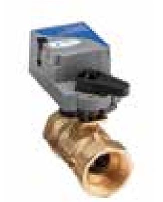
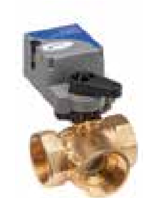
Factory Assembled Motorized Valve Assemblies

- Standard Fluid Temperature Range
- NPT Threaded

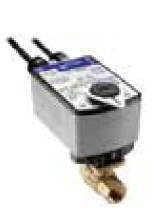
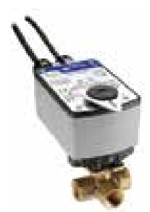
- NPT Threaded
- Standard Fluid Temperature Range
- Stainless Steel Trim
- 200 PSID Close Off Pressure
- Fluid Temperature Limits:
  -22 to 212°F (-30 to 100°C)

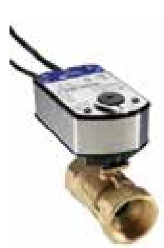
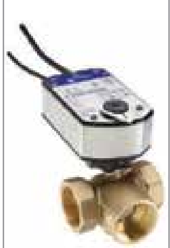
Ball Valves with VA9104 Series Actuators

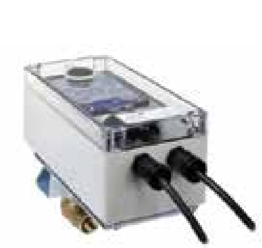
Ball Valves with VA9300 Series Actuators

Ball Valves with VA9203 Series Actuators

Ball Valves with VA9208 Series Actuators



Motorized Ball Valve Assembly with Weather Shield (field assembly)

MOTORIZED VALVE ASSEMBLY CODE[3] = VALVE CODE + FACTORY ASSEMBLY CODE

Example: VG1241AD+9T4AGA

Valve Type

Inch	DN (mm)	Cv[2]	2-Way	3-Way
1/2	15	1.2 (0.7)	VG1245AD	VG1845AD
		1.9 (1.2)	VG1245AE	VG1845AE
		2.9 (1.9)	VG1245AF	VG1845AF
		4.7 (2.9)	VG1245AG	VG1845AG
		7.4 (4.7)	VG1245AL	VG1845AL
		11.7 (5.8)	VG1245AN	VG1845AN
3/4	20	4.7 (2.9)	VG1245BG	VG1845BG
		7.4 (4.7)	VG1245BL	VG1845BL
		11.7 (5.8)	VG1245BN	VG1845BN
1	25	7.4 (4.7)	VG1245CL	VG1845CL
		11.7 (7.4)	VG1245CN	VG1845CN
		18.7 (9.4)	VG1245CP	VG1845CP
1 1/4	32	11.7 (7.4)	VG1245DN	VG1845DN
		18.7 (11.7)	VG1245DP	VG1845DP
		29.2 (14.6)	VG1245DR	VG1845DR
1 1/2	40	18.7 (11.7)	VG1245EP	VG1845EP
		29.2 (18.7)	VG1245ER	VG1845ER
		46.8 (23.4)	VG1245ES	VG1845ES
2	50	29.2 (18.7)	VG1245FR	VG1845FR
		46.8 (29.2)	VG1245FS	VG1845FS
		73.7 (36.8)	VG1245FT	VG1845FT

Actuator Type[1] — Non-Spring Return

	VA9104						VA9300									
Control Input	Floating Point without Timeout		On / Off and Floating Point		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		24V Floating Point		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point High Speed		On / Off and 85 to 264V Floating Point	
Factory Assembly Code	+9T4AGA	+9A4AGA	+9T4IGA	+9A4IGA	+9T4GGA	+9A4GGA	+910HGA	+910HGC	+910HGA	+910HGC	+910HGA	+910HGC	Special Order	Special Order	Special Order	Special Order
Actuator Options — Auxiliary Switches: 1 SPDT, 5.0(2.9) A @ 240 V																
Auxiliary Switches: 2 SPDT, 5.0(2.9) A @ 240 V																
Auxiliary Switches: 2 SPDT, 3.0(1.5) A @ 24 VAC								■		■		■		■		■
Electrical Connections: Screw Terminals	■		■		■											
Electrical Connections: 120 in. Plenum Cable		■		■		■										
VG1245AD / VG1845AD	■	■	■	■	■	■		■		■		■		■		■
VG1245AE / VG1845AE	■	■	■	■	■	■		■		■		■		■		■
VG1245AF / VG1845AF	■	■	■	■	■	■		■		■		■		■		■
VG1245AG / VG1845AG	■	■	■	■	■	■		■		■		■		■		■
VG1245AL / VG1845AL	■	■	■	■	■	■		■		■		■		■		■
VG1245AN / VG1845AN	■	■	■	■	■	■		■		■		■		■		■
VG1245BG / VG1845BG	■	■	■	■	■	■		■		■		■		■		■
VG1245BL / VG1845BL	■	■	■	■	■	■		■		■		■		■		■
VG1245BN / VG1845BN	■	■	■	■	■	■		■		■		■		■		■
VG1245CL / VG1845CL	■	■	■	■	■	■		■		■		■		■		■
VG1245CN / VG1845CN	■	■	■	■	■	■		■		■		■		■		■
VG1245CP / VG1845CP	■	■	■	■	■	■		■		■		■		■		■
VG1245DN / VG1845DN							■	■	■	■	■	■	■	■	■	■
VG1245DP / VG1845DP							■	■	■	■	■	■	■	■	■	■
VG1245DR / VG1845DR							■	■	■	■	■	■	■	■	■	■
VG1245EP / VG1845EP							■	■	■	■	■	■	■	■	■	■
VG1245ER / VG1845ER							■	■	■	■	■	■	■	■	■	■
VG1245ES / VG1845ES							■	■	■	■	■	■	■	■	■	■
VG1245FR / VG1845FR							■	■	■	■	■	■	■	■	■	■
VG1245FS / VG1845FS							■	■	■	■	■	■	■	■	■	■
VG1245FT / VG1845FT							■	■	■	■	■	■	■	■	■	■
Position Feedback: 0(2) to 10 VDC Position Feedback						■					■	■				
Power Requirements: 24 VAC +25%/-20%, Class 2, SELV	■	■	■	■	■	■										
24 VAC +25%/-15%, Class 2, SELV																
24 VAC +/- 20%, VDC +/- 10%							■	■	■	■	■	■	■	■		
24 VAC +/- 25%, VDC +/- 10%																
120 VAC +10%/-15% at 60 Hz																
85 to 264 VAC at 50/60 Hz															■	■
Electrical Connections: 120 in. (3.05 m) 19 AWG Plenum Cable							■	■	■	■	■	■	■	■		
1/4 in. Spade Terminals																
48 in. (1.2 m) 18 AWG Appliance Cable															■	■
Weather Shield Options (For Field Assembly Only): M9000-342	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
optional switch kit 2XSPDT								■		■		■		■		■

Actuator Type[1] — Spring Return Port A Open

	VA9203								VA9208							
Control Input	On / Off and Floating Point		85 to 264V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point		120V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)	
Factory Assembly Code	+923AGA	+923AGB	+923BUA	+923BUB	+923BGA	+923BGB	+923GGA	+923GGB	+928AGA	+938AGC	+938BAA	+938BAC	+938BGA	+938BGC	+928GGA	+938GGC
Actuator Options — Auxiliary Switches: 1 SPDT, 5.0(2.9) A @ 240 V		■		■		■		■								
Auxiliary Switches: 2 SPDT, 5.0(2.9) A @ 240 V										■		■		■		■
Auxiliary Switches: 2 SPDT, 3.0(1.5) A @ 24 VAC																
VG1245AD / VG1845AD	■	■	■	■	■	■	■	■								
VG1245AE / VG1845AE	■	■	■	■	■	■	■	■								
VG1245AF / VG1845AF	■	■	■	■	■	■	■	■								
VG1245AG / VG1845AG	■	■	■	■	■	■	■	■								
VG1245AL / VG1845AL	■	■	■	■	■	■	■	■								
VG1245AN / VG1845AN	■	■	■	■	■	■	■	■								
VG1245BG / VG1845BG	■	■	■	■	■	■	■	■								
VG1245BL / VG1845BL	■	■	■	■	■	■	■	■								
VG1245BN / VG1845BN	■	■	■	■	■	■	■	■								
VG1245CL / VG1845CL	■	■	■	■	■	■	■	■								
VG1245CN / VG1845CN	■	■	■	■	■	■	■	■								
VG1245CP / VG1845CP	■	■	■	■	■	■	■	■								
VG1245DN / VG1845DN									■	■	■	■	■	■	■	■
VG1245DP / VG1845DP									■	■	■	■	■	■	■	■
VG1245DR / VG1845DR									■	■	■	■	■	■	■	■
VG1245EP / VG1845EP									■	■	■	■	■	■	■	■
VG1245ER / VG1845ER									■	■	■	■	■	■	■	■
VG1245ES / VG1845ES									■	■	■	■	■	■	■	■
VG1245FR / VG1845FR									■	■	■	■	■	■	■	■
VG1245FS / VG1845FS									■	■	■	■	■	■	■	■
VG1245FT / VG1845FT									■	■	■	■	■	■	■	■
Position Feedback: 0(2) to 10 VDC Position Feedback							■	■							■	■
Power Requirements: 24 VAC +25%/-20%, Class 2, SELV																
24 VAC +25%/-15%, Class 2, SELV																
24 VAC +/- 20%, VDC +/- 10%	■	■			■	■	■	■	■	■					■	■
24 VAC +/- 25%, VDC +/- 10%													■	■		
120 VAC +10%/-15% at 60 Hz											■	■				
85 to 264 VAC at 50/60 Hz			■	■												
Electrical Connections: 120 in. (3.05 m) 19 AWG Plenum Cable	■						■		■						■	
1/4 in. Spade Terminals																
48 in. (1.2 m) 18 AWG Appliance Cable		■	■	■	■	■		■		■	■	■	■	■		■
Weather Shield Options (For Field Assembly Only): M9000-342	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
optional switch kit 2XSPDT																

Actuator Type[1] — Spring Return Port A Closed

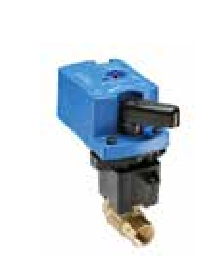
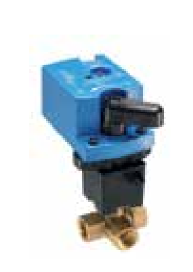
	VA9203								VA9208							
Control Input	On / Off and Floating Point		85 to 264V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point		120V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)	
Factory Assembly Code	+943AGA	+943AGB	+943BUA	+943BUB	+943BGA	+943BGB	+943GGA	+943GGB	+948AGA	+958AGC	+958BAA	+958BAC	+958BGA	+958BGC	+948GGA	+958GGC
Actuator Options — Auxiliary Switches: 1 SPDT, 5.0(2.9) A @ 240 V	■		■		■		■									
Auxiliary Switches: 2 SPDT, 5.0(2.9) A @ 240 V										■		■		■		■
Auxiliary Switches: 2 SPDT, 3.0(1.5) A @ 24 VAC																
VG1245AD / VG1845AD	■	■	■	■	■	■	■	■								
VG1245AE / VG1845AE	■	■	■	■	■	■	■	■								
VG1245AF / VG1845AF	■	■	■	■	■	■	■	■								
VG1245AG / VG1845AG	■	■	■	■	■	■	■	■								
VG1245AL / VG1845AL	■	■	■	■	■	■	■	■								
VG1245AN / VG1845AN	■	■	■	■	■	■	■	■								
VG1245BG / VG1845BG	■	■	■	■	■	■	■	■								
VG1245BL / VG1845BL	■	■	■	■	■	■	■	■								
VG1245BN / VG1845BN	■	■	■	■	■	■	■	■								
VG1245CL / VG1845CL	■	■	■	■	■	■	■	■								
VG1245CN / VG1845CN	■	■	■	■	■	■	■	■								
VG1245CP / VG1845CP	■	■	■	■	■	■	■	■								
VG1245DN / VG1845DN									■	■	■	■	■	■	■	■
VG1245DP / VG1845DP									■	■	■	■	■	■	■	■
VG1245DR / VG1845DR									■	■	■	■	■	■	■	■
VG1245EP / VG1845EP									■	■	■	■	■	■	■	■
VG1245ER / VG1845ER									■	■	■	■	■	■	■	■
VG1245ES / VG1845ES									■	■	■	■	■	■	■	■
VG1245FR / VG1845FR									■	■	■	■	■	■	■	■
VG1245FS / VG1845FS									■	■	■	■	■	■	■	■
VG1245FT / VG1845FT									■	■	■	■	■	■	■	■
Position Feedback: 0(2) to 10 VDC Position Feedback							■	■							■	■
Power Requirements: 24 VAC +25%/-20%, Class 2, SELV																
24 VAC +25%/-15%, Class 2, SELV																
24 VAC +/- 20%, VDC +/- 10%	■	■			■	■	■	■	■	■					■	■
24 VAC +/- 25%, VDC +/- 10%													■	■		
120 VAC +10%/-15% at 60 Hz											■	■				
85 to 264 VAC at 50/60 Hz			■	■												
Electrical Connections: 120 in. (3.05 m) 19 AWG Plenum Cable	■						■		■						■	
1/4 in. Spade Terminals																
48 in. (1.2 m) 18 AWG Appliance Cable		■	■	■	■	■		■		■	■	■	■	■		■
Weather Shield Options (For Field Assembly Only): M9000-342	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
optional switch kit 2XSPDT																

1 For 3-Way valves, the first Cv listed is for Port A (Coil). The second Cv listed in parenthesis is for Port B (Bypass).
2 For ball valve and actuator factory assemblies combine valve code number and actuator valve assembly code.
Example: VG1241AD+9T4AGA is 1/2 inch two-way ball valve, 1.2 Cv, NPT end connections, plated brass trim with VA9104 Series non-spring return electric actuator with 24 VAC floating point control without time out with screw terminal electrical connections.

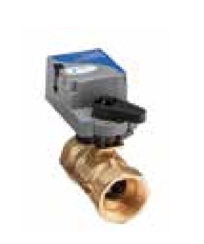
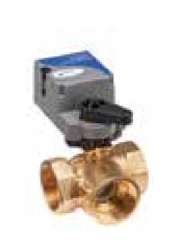
NPT THREADED, HIGH FLUID TEMPERATURE RANGE

Factory Assembled Motorized Valve Assemblies

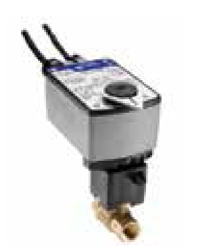
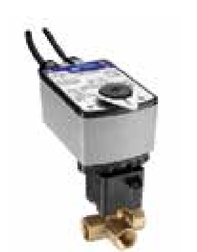
- High Fluid Temperature Range
- NPT Threaded

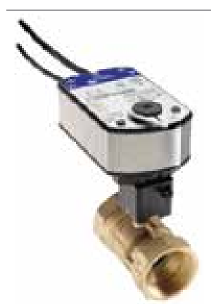
Ball Valves with VA9104 Series Actuators

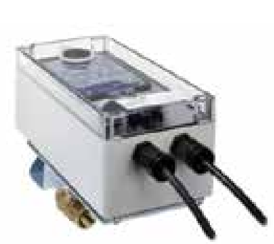
Ball Valves with VA9300 Series Actuators

Ball Valves with VA9203 Series Actuators




Ball Valves with VA9208 Series Actuators



Motorized Ball Valve Assembly with Weather Shield (field assembly)

- NPT Threaded
- High Fluid Temperature Range
- Stainless Steel Trim
- 200 PSID Close Off Pressure
- Fluid Temperature Limits: -22 to 284°F (-30 to 140°C)

Actuator Type[1]

MOTORIZED VALVE ASSEMBLY CODE[2] = VALVE CODE + FACTORY ASSEMBLY CODE

Example: VG1245ADH9T4AGA

Actuator Type: Non-Spring Return

					Non-Spring Return															
					VA9104						VA9300									
				Control Input	Floating Point without Timeout		On / Off and Floating Point		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		24V Floating Point		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point High Speed		On / Off and 85 to 264V Floating Point	
Actuator Options																				
Auxiliary Switches:			1 SPDT, 5.0(2.9) A @ 240 V																	
			2 SPDT, 5.0(2.9) A @ 240 V																	
			2 SPDT, 3.0(1.5) A @ 24 VAC									■		■		■		■		■
Electrical Connections:			Screw Terminals		■		■		■											
			120 in. Plenum Cable			■		■		■										
Valve Type			Stainless Steel Trim																	
Inch	DN (mm)	Cv[2]	2-Way	3-Way																
1/2	15	1.2 (0.7)	VG1245AD	VG1845AD	■	■	■	■	■	■		■		■		■		■		■
		1.9 (1.2)	VG1245AE	VG1845AE	■	■	■	■	■	■		■		■		■		■		■
		2.9 (1.9)	VG1245AF	VG1845AF	■	■	■	■	■	■		■		■		■		■		■
		4.7 (2.9)	VG1245AG	VG1845AG	■	■	■	■	■	■		■		■		■		■		■
		7.4 (4.7)	VG1245AL	VG1845AL	■	■	■	■	■	■		■		■		■		■		■
		11.7 (5.8)	VG1245AN	VG1845AN	■	■	■	■	■	■		■		■		■		■		■
3/4	20	4.7 (2.9)	VG1245BG	VG1845BG	■	■	■	■	■	■		■		■		■		■		■
		7.4 (4.7)	VG1245BL	VG1845BL	■	■	■	■	■	■		■		■		■		■		■
		11.7 (5.8)	VG1245BN	VG1845BN	■	■	■	■	■	■		■		■		■		■		■
1	25	7.4 (4.7)	VG1245CL	VG1845CL	■	■	■	■	■	■		■		■		■		■		■
		11.7 (7.4)	VG1245CN	VG1845CN	■	■	■	■	■	■		■		■		■		■		■
		18.7 (9.4)	VG1245CP	VG1845CP	■	■	■	■	■	■		■		■		■		■		■
1 1/4	32	11.7 (7.4)	VG1245DN	VG1845DN							■	■	■	■	■	■	■	■	■	■
		18.7 (11.7)	VG1245DP	VG1845DP							■	■	■	■	■	■	■	■	■	■
		29.2 (14.6)	VG1245DR	VG1845DR							■	■	■	■	■	■	■	■	■	■
1 1/2	40	18.7 (11.7)	VG1245EP	VG1845EP							■	■	■	■	■	■	■	■	■	■
		29.2 (18.7)	VG1245ER	VG1845ER							■	■	■	■	■	■	■	■	■	■
		46.8 (23.4)	VG1245ES	VG1845ES							■	■	■	■	■	■	■	■	■	■
2	50	29.2 (18.7)	VG1245FR	VG1845FR							■	■	■	■	■	■	■	■	■	■
		46.8 (29.2)	VG1245FS	VG1845FS							■	■	■	■	■	■	■	■	■	■
		73.7 (36.8)	VG1245FT	VG1845FT							■	■	■	■	■	■	■	■	■	■
Factory Assembly Code					H9T4AGA	H9A4AGA	H9T4IGA	H9A4IGA	H9T4GGA	H9A4GGA	H910HGA	H910HGC	H910HGA	H910HGC	H910HGA	H910HGC	Special Order	Special Order	Special Order	Special Order
Additional Actuator and Accessory Reference Information																				
Position Feedback:																				
			0(2) to 10 VDC Position Feedback							■					■	■				
Power Requirements:																				
			24 VAC +25%/-20%, Class 2, SELV		■	■	■	■	■	■										
			24 VAC +25%/-15%, Class 2, SELV																	
			24 VAC +/- 20%, VDC +/- 10%								■	■	■	■	■	■	■	■		
			24 VAC +/- 25%, VDC +/- 10%																	
			120 VAC +10%/-15% at 60 Hz																	
			85 to 264 VAC at 50/60 Hz																■	■
Electrical Connections:																				
			120 in. (3.05 m) 19 AWG Plenum Cable								■	■	■	■	■	■	■	■		
			1/4 in. Spade Terminals																	
			48 in. (1.2 m) 18 AWG Appliance Cable																■	■
Weather Shield Options (For Field Assembly Only)																				
			M9000-342		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			optional switch kit 2XSPDT									■		■		■		■		■

Actuator Type: Spring Return Port A Open

					Spring Return Port A Open															
					VA9203								VA9208							
				Control Input	On / Off and Floating Point		85 to 264V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point		120V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)	
Actuator Options																				
Auxiliary Switches:			1 SPDT, 5.0(2.9) A @ 240 V			■		■		■		■								
			2 SPDT, 5.0(2.9) A @ 240 V											■		■		■		■
			2 SPDT, 3.0(1.5) A @ 24 VAC																	
Electrical Connections:			Screw Terminals																	
			120 in. Plenum Cable																	
Valve Type			Stainless Steel Trim																	
Inch	DN (mm)	Cv[2]	2-Way	3-Way																
1/2	15	1.2 (0.7)	VG1245AD	VG1845AD	■	■	■	■	■	■	■	■								
		1.9 (1.2)	VG1245AE	VG1845AE	■	■	■	■	■	■	■	■								
		2.9 (1.9)	VG1245AF	VG1845AF	■	■	■	■	■	■	■	■								
		4.7 (2.9)	VG1245AG	VG1845AG	■	■	■	■	■	■	■	■								
		7.4 (4.7)	VG1245AL	VG1845AL	■	■	■	■	■	■	■	■								
		11.7 (5.8)	VG1245AN	VG1845AN	■	■	■	■	■	■	■	■								
3/4	20	4.7 (2.9)	VG1245BG	VG1845BG	■	■	■	■	■	■	■	■								
		7.4 (4.7)	VG1245BL	VG1845BL	■	■	■	■	■	■	■	■								
		11.7 (5.8)	VG1245BN	VG1845BN	■	■	■	■	■	■	■	■								
1	25	7.4 (4.7)	VG1245CL	VG1845CL	■	■	■	■	■	■	■	■								
		11.7 (7.4)	VG1245CN	VG1845CN	■	■	■	■	■	■	■	■								
		18.7 (9.4)	VG1245CP	VG1845CP	■	■	■	■	■	■	■	■								
1 1/4	32	11.7 (7.4)	VG1245DN	VG1845DN									■	■	■	■	■	■	■	■
		18.7 (11.7)	VG1245DP	VG1845DP									■	■	■	■	■	■	■	■
		29.2 (14.6)	VG1245DR	VG1845DR									■	■	■	■	■	■	■	■
1 1/2	40	18.7 (11.7)	VG1245EP	VG1845EP									■	■	■	■	■	■	■	■
		29.2 (18.7)	VG1245ER	VG1845ER									■	■	■	■	■	■	■	■
		46.8 (23.4)	VG1245ES	VG1845ES									■	■	■	■	■	■	■	■
2	50	29.2 (18.7)	VG1245FR	VG1845FR									■	■	■	■	■	■	■	■
		46.8 (29.2)	VG1245FS	VG1845FS									■	■	■	■	■	■	■	■
		73.7 (36.8)	VG1245FT	VG1845FT									■	■	■	■	■	■	■	■
Factory Assembly Code					H923AGA	H923AGB	H923BUA	H923BUB	H923BGA	H923BGB	H923GGA	H923GGB	H928AGA	H938AGC	H938BAA	H938BAC	H938BGA	H938BGC	H928GGA	H938GGC
Additional Actuator and Accessory Reference Information																				
Position Feedback:																				
			0(2) to 10 VDC Position Feedback								■	■							■	■
Power Requirements:																				
			24 VAC +25%/-20%, Class 2, SELV																	
			24 VAC +25%/-15%, Class 2, SELV																	
			24 VAC +/- 20%, VDC +/- 10%		■	■			■	■	■	■	■	■					■	■
			24 VAC +/- 25%, VDC +/- 10%														■	■		
			120 VAC +10%/-15% at 60 Hz												■	■				
			85 to 264 VAC at 50/60 Hz				■	■												
Electrical Connections:																				
			120 in. (3.05 m) 19 AWG Plenum Cable		■						■		■						■	
			1/4 in. Spade Terminals																	
			48 in. (1.2 m) 18 AWG Appliance Cable			■	■	■	■	■		■		■	■	■	■	■		■
Weather Shield Options (For Field Assembly Only)																				
			M9000-342		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			optional switch kit 2XSPDT																	

Actuator Type: Spring Return Port A Closed

					Spring Return Port A Closed															
					VA9203								VA9208							
				Control Input	On / Off and Floating Point		85 to 264V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point		120V On / Off		24V On / Off		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)	
Actuator Options																				
Auxiliary Switches:			1 SPDT, 5.0(2.9) A @ 240 V			■		■		■		■								
			2 SPDT, 5.0(2.9) A @ 240 V											■		■		■		■
			2 SPDT, 3.0(1.5) A @ 24 VAC																	
Electrical Connections:			Screw Terminals																	
			120 in. Plenum Cable																	
Valve Type			Stainless Steel Trim																	
Inch	DN (mm)	Cv[2]	2-Way	3-Way																
1/2	15	1.2 (0.7)	VG1245AD	VG1845AD	■	■	■	■	■	■	■	■								
		1.9 (1.2)	VG1245AE	VG1845AE	■	■	■	■	■	■	■	■								
		2.9 (1.9)	VG1245AF	VG1845AF	■	■	■	■	■	■	■	■								
		4.7 (2.9)	VG1245AG	VG1845AG	■	■	■	■	■	■	■	■								
		7.4 (4.7)	VG1245AL	VG1845AL	■	■	■	■	■	■	■	■								
		11.7 (5.8)	VG1245AN	VG1845AN	■	■	■	■	■	■	■	■								
3/4	20	4.7 (2.9)	VG1245BG	VG1845BG	■	■	■	■	■	■	■	■								
		7.4 (4.7)	VG1245BL	VG1845BL	■	■	■	■	■	■	■	■								
		11.7 (5.8)	VG1245BN	VG1845BN	■	■	■	■	■	■	■	■								
1	25	7.4 (4.7)	VG1245CL	VG1845CL	■	■	■	■	■	■	■	■								
		11.7 (7.4)	VG1245CN	VG1845CN	■	■	■	■	■	■	■	■								
		18.7 (9.4)	VG1245CP	VG1845CP	■	■	■	■	■	■	■	■								
1 1/4	32	11.7 (7.4)	VG1245DN	VG1845DN									■	■	■	■	■	■	■	■
		18.7 (11.7)	VG1245DP	VG1845DP									■	■	■	■	■	■	■	■
		29.2 (14.6)	VG1245DR	VG1845DR									■	■	■	■	■	■	■	■
1 1/2	40	18.7 (11.7)	VG1245EP	VG1845EP									■	■	■	■	■	■	■	■
		29.2 (18.7)	VG1245ER	VG1845ER									■	■	■	■	■	■	■	■
		46.8 (23.4)	VG1245ES	VG1845ES									■	■	■	■	■	■	■	■
2	50	29.2 (18.7)	VG1245FR	VG1845FR									■	■	■	■	■	■	■	■
		46.8 (29.2)	VG1245FS	VG1845FS									■	■	■	■	■	■	■	■
		73.7 (36.8)	VG1245FT	VG1845FT									■	■	■	■	■	■	■	■
Factory Assembly Code					H943AGA	H943AGB	H943BUA	H943BUB	H943BGA	H943BGB	H943GGA	H943GGB	H948AGA	H958AGC	H958BAA	H958BAC	H958BGA	H958BGC	H948GGA	H958GGC
Additional Actuator and Accessory Reference Information																				
Position Feedback:																				
			0(2) to 10 VDC Position Feedback								■	■							■	■
Power Requirements:																				
			24 VAC +25%/-20%, Class 2, SELV																	
			24 VAC +25%/-15%, Class 2, SELV																	
			24 VAC +/- 20%, VDC +/- 10%		■	■			■	■	■	■	■	■					■	■
			24 VAC +/- 25%, VDC +/- 10%														■	■		
			120 VAC +10%/-15% at 60 Hz												■	■				
			85 to 264 VAC at 50/60 Hz				■	■												
Electrical Connections:																				
			120 in. (3.05 m) 19 AWG Plenum Cable		■						■		■						■	
			1/4 in. Spade Terminals																	
			48 in. (1.2 m) 18 AWG Appliance Cable			■	■	■	■	■		■		■	■	■	■	■		■
Weather Shield Options (For Field Assembly Only)																				
			M9000-342		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			optional switch kit 2XSPDT																	

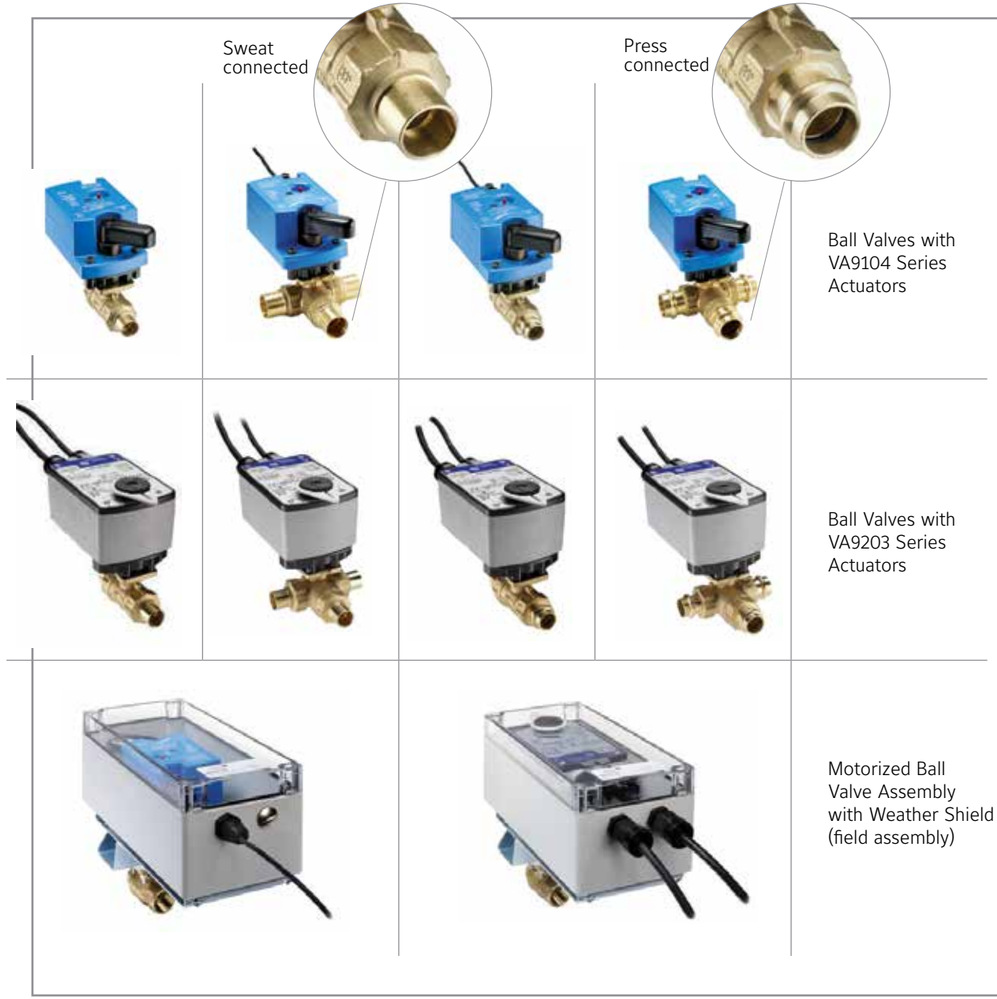
1 For 3-Way valves, the first Cv listed is for Port A (Coil). The second Cv listed in parenthesis is for Port B (Bypass)

2 For Ball valve and actuator factory assemblies combine valve code number and actuator valve assembly code.

Example: VG1245ADH9T4AGA is 1/2 inch two-way ball valve, 1.2 Cv, NPT end connections, Stainless Steel trim with VA9104 Series non-spring return electric actuator with 24 VAC floating point control without time out with screw terminal electrical connections.

Factory Assembled Motorized Valve Assemblies

- Standard Fluid Temperature Range
- Sweat and Press Connected



- Sweat and Press Connected
- Standard Fluid Temperature Range
- Stainless Steel Trim
- 200 PSID Close Off Pressure
- Fluid Temperature Limits:
  -22 to 212°F (-30 to 100°C)

						Actuator Type[1]													
						Non-Spring Return						Spring Return Port A Open				Spring Return Port A Closed			
						VA9104						VA9203				VA9203			
					Control Input	Floating Point without Timeout		On / Off and Floating Point		0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point	120V On / Off	24V On / Off	0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)	On / Off and Floating Point	120V On / Off	24V On / Off	0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)
Actuator Options			1 SPDT, 5.0(2.9) A @ 240 V																
		Auxiliary Switches:	2 SPDT, 5.0(2.9) A @ 240 V																
			2 SPDT, 3.0(1.5) A @ 24 VAC																
		Electrical	Screw Terminals			■		■		■									
		Connections:	120 in. Plenum Cable				■		■		■								
	Inch	DN (mm)	Cv[2]	Sweat Connections 2-Way	Sweat Connections 3-Way	Press Connections 2-Way	Press Connections 3-Way												
Valve Type	1/2	15	1.2 (0.7)	VG1275AD	VG1875AD	VG1295AD	VG1895AD	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			1.9 (1.2)	VG1275AE	VG1875AE	VG1295AE	VG1895AE	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			2.9 (1.9)	VG1275AF	VG1875AF	VG1295AF	VG1895AF	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			4.7 (2.9)	VG1275AG	VG1875AG	VG1295AG	VG1895AG	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			7.4 (4.7)	VG1275AL	VG1875AL	VG1295AL	VG1895AL	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			11.7 (5.8)	VG1275AN	VG1875AN	VG1295AN	VG1895AN	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	3/4	20	4.7 (2.9)	VG1275BG	VG1875BG	VG1295BG	VG1895BG	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			7.4 (4.7)	VG1275BL	VG1875BL	VG1295BL	VG1895BL	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			11.7 (5.8)	VG1275BN	VG1875BN	VG1295BN	VG1895BN	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	1	25	7.4 (4.7)	VG1275CL	VG1875CL	VG1295CL	VG1895CL	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			11.7 (7.4)	VG1275CN	VG1875CN	VG1295CN	VG1895CN	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			18.7 (9.4)	VG1275CP	VG1875CP	VG1295CP	VG1895CP	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	MOTORIZED VALVE ASSEMBLY CODE[3] = VALVE CODE + FACTORY ASSEMBLY CODE Example: VG1895AD+9T4AGA					+9T4AGA	+9A4AGA	+9T4IGA	+9A4IGA	+9T4GGA	+9A4GGA	+923AGA	+923BUA	+923BGA	+923GGA	+943AGA	+943BUA	+943BGA	+943GGA
Additional Actuator and Accessory Reference Information			Position Feedback:																
			0(2) to 10 VDC Position Feedback									■							
			Power Requirements:																
			24 VAC +25%/-20%, Class 2, SELV					■	■	■	■	■	■								
			24 VAC +25%/-15%, Class 2, SELV																		
			24 VAC +/- 20%, VDC +/- 10%											■	■	■		■	■		
			24 VAC +/- 25%, VDC +/- 10%																		
			120 VAC +10%/-15% at 60 Hz																		
			85 to 264 VAC at 50/60 Hz										■				■				
			Electrical Connections:																		
			120 in. (3.05 m) 19 AWG Plenum Cable									■			■	■				■	
			1/4 in. Spade Terminals																		
			48 in. (1.2 m) 18 AWG Appliance Cable										■	■			■	■			
			Weather Shield Options (For Field Assembly Only)																		
			M9000-342					■	■	■	■	■	■	■	■	■	■	■	■	■	■

1 For 3-Way valves, the first Cv listed is for Port A (Coil). The second Cv listed in parenthesis is for Port B (Bypass)
2 For ball valve and actuator factory assemblies combine valve code number and actuator valve assembly code.
Example: VG1895AD+9T4AGA is 1/2 inch three-way ball valve, 1.2 Cv, Press end connections, stainless steel trim with non-spring return electric actuator with 24 VAC floating point control without time out with screw terminal electrical connections.

Factory Assembled Motorized Valve Assemblies

- High Fluid Temperature Range
- ASME Class 150 Flange Connected

M9124 Actuator Installed on 2 1/2 thru 6 inch. ASME Flanged Ball Valves using M9000-518 Linkage

M9220 Actuator Installed on 2 1/2 thru 6 inch. ASME Flanged Ball Valves using M9000-519 Linkage

Field Assembled M9124 Actuator, M9000-518 Linkage and M9000-330 Weather Shield on ASME Flanged Ball Valve

Field Assembled M9220 Actuator, M9000-519 Linkage and M9000-340 Weather Shield on Flanged Ball Valve (field assembly)

- ASME Class 150 Flange Connections
- High Fluid Temperature Range
- Stainless Steel Trim
- Close Off Pressure
  - 2-Way = 100 PSID
  - 3-Way = 50 PSID
- Fluid Temperature Limits:
  - -22 to 284°F (-30 to 140°C)

Actuator Type

						Non-Spring Return			Spring Return Port A Open[2]				Spring Return Port A Closed[2]			
						M9124			M9220				M9220			
					Control Input	On / Off and Floating Point	0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)		On / Off and Floating Point	120V On / Off	24V On / Off	0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)	On / Off and Floating Point	120V On / Off	24V On / Off	0 (2) to 10 VDC 0 (4) to 20 mA (w/500 ohm resistor)
Actuator Options					1 SPDT, 5.0(2.9) A @ 240 V											
					Auxiliary Switches: 2 SPDT, 5.0(2.9) A @ 240 V				■	■	■	■	■	■	■	■
					2 SPDT, 3.0(1.5) A @ 24 VAC		■	■								
Valve Type	Inch	DN (mm)	Cv	Face to Face	2-Way ANSI Flange	3-Way ANSI Flange										
	2 1/2	DN 65	47 (29)	narrow	VG12A5KS	VG18A5KS	■	■	■	■	■	■	■	■	■	■	■	■	■	■
				large	VG12A5GS	VG18A5GS	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			74 (47)	narrow	VG12A5KT	VG18A5KT	■	■	■	■	■	■	■	■	■	■	■	■	■	■
				large	VG12A5GT	VG18A5GT	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			117 (74)	narrow	VG12A5KU	VG18A5KU	■	■	■	■	■	■	■	■	■	■	■	■	■	■
				large	VG12A5GU	VG18A5GU	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	3	DN 80	74 (47)	narrow	VG12A5LT	VG18A5LT	■	■	■	■	■	■	■	■	■	■	■	■	■	■
				large	VG12A5HT	VG18A5HT	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			117 (74)	narrow	VG12A5LU	VG18A5LU	■	■	■	■	■	■	■	■	■	■	■	■	■	■
				large	VG12A5HU	VG18A5HU	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			176 (88)	narrow	VG12A5LV	VG18A5LV	■	■	■	■	■	■	■	■	■	■	■	■	■	■
				large	VG12A5HV	VG18A5HV	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			211 (105)	narrow	VG12A5LW	VG18A5LW	■	■	■	■	■	■	■	■	■	■	■	■	■	■
				large	VG12A5HW	VG18A5HW	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	4	DN 100	117 (74)	large	VG12A5JU	VG18A5JU	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			176 (88)	large	VG12A5JV	VG18A5JV	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			185 (175)	narrow	VG12A5MW	VG18A5MW	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	5 in	DN 125	290 (182)	narrow	VG12A5NY	VG18A5NY	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	6 in	DN 150	348 (170)	narrow	VG12A5PZ	VG18A5PZ	■	■	■	■	■	■	■	■	■	■	■	■	■	■

MOTORIZED VALVE ASSEMBLY CODE = VALVE CODE + FACTORY ASSEMBLY CODE

Example: VG18A5HU+92NGGA

Additional Actuator and Accessory Reference Information	+924AGA	+924AGC	+924GGA	+924GGC	+92NAGA	+92NAGC	+92NBAA	+92NBAC	+92NBGA	+92NBGC	+92NGGA	+92NGGC	+94NAGA	+94NAGC	+94NBAA	+94NBAC	+94NBGA	+94NBGC	+94NGGA	+94NGGC
Position Feedback:																				
0(2) to 10 VDC Position Feedback			■	■							■	■							■	■
Power Requirements:																				
24 VAC +25%/-20%, Class 2, SELV																				
24 VAC +25%/-15%, VDC +/- 10%	■	■	■	■																
24 VAC +/- 20%, VDC +/- 10%					■	■			■	■	■	■	■	■			■	■	■	■
24 VAC +/- 25%, VDC +/- 10%																				
120 VAC +10%/-15% at 60 Hz							■	■							■	■				
85 to 264 VAC at 50/60 Hz																				
Electrical Connections:																				
Screw Terminals			■	■																
48 in. (1.2 m) 19 AWG Plenum Cable																				
120 in. (3.05 m) 19 AWG Plenum Cable																				
1/4 in. Spade Terminals	■	■																		
48 in. (1.2 m) 18 AWG Appliance Cable					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Weather Shield Options (For Field Assembly Only)																				
M9000-330 Weather Shield	■	■	■	■																
M9000-340 Weather Shield					■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

1 The M9124 assemblies include the M9000-518 Linkage
2 The M9220 assemblies include the M9000-519 Linkage
3 For 3-Way valves, the first Cv listed is for Port A (Coil). The second Cv listed in parenthesis is for Port B (Bypass)
4 For Ball Valve and actuator factory assemblies combine valve code number and actuator valve assembly code.
Example: VG18A5HU+92NGGA is a 3 inch, 3-Way ball valve, 117 Cv thru Port A and 74 Cv thru Port B, ASME Class 150 flanged end connections, stainless steel trim with M9220 spring return actuator, with 0(2) to 10 VDC or 0(4) to 20ma proportional control with 48 in. (1.2m) 18 AWG Appliance Cable, assembled for spring return port "A" open.

Key to the Factory Assembly Codes to Actuator and Accessory Mounting Kits

Actuator and Accessories being Mounted	Factory Assembly Code
M9124 AGA-2 with M9000-518 linkage	+924AGA
M9124 AGC-2 with M9000-518 linkage	+924AGC
M9124 GGA-2 with M9000-518 linkage	+924GGA
M9124 GGC-2 with M9000-518 linkage	+924GGC
M9220-AGA-3 with M9000-519 linkage	+92NAGA or +94NAGA
M9220-AGC-3 with M9000-519 linkage	+92NAGC or +94NAGC
M9220-BAA-3 with M9000-519 linkage	+92NBAA or +94NBAA
M9220-BAC-3 with M9000-519 linkage	+92NBAC or +94NBAC
M9220-BGA-3 with M9000-519 linkage	+92NBGA or +94NBGA
M9220-BGC-3 with M9000-519 linkage	+92NBGC or +94NBGC
M9220-GGA-3 with M9000-519 linkage	+92NGGA or +94NGGA
M9220-GGC-3 with M9000-519 linkage	+92NGGC or +94NGGC
VA9104-AGA-2S	+9A4AGA
VA9104-AGA-2S with M9000-561 thermal barrier	H9A4AGA
VA9104-AGA-3S	+9T4AGA
VA9104-AGA-3S with M9000-561 thermal barrier	H9T4AGA
VA9104-GGA-2S	+9A4GGA
VA9104-GGA-2S with M9000-561 thermal barrier	H9A4GGA
VA9104-GGA-3S	+9T4GGA
VA9104-GGA-3S with M9000-561 thermal barrier	H9T4GGA
VA9104-IGA-2S	+9A4IGA
VA9104-IGA-2S with M9000-561 thermal barrier	H9A4IGA
VA9104-IGA-3S	+9T4IGA
VA9104-IGA-3S with M9000-561 thermal barrier	H9T4IGA
VA9203-AGA-2Z	+923AGA or +943AGA
VA9203-AGA-2Z with M9000-561 thermal barrier	H923AGA or H943AGA
VA9203-AGB-2Z	+923AGB or +943AGB
VA9203-AGB-2Z with M9000-561 thermal barrier	H923AGB or H943AGB
VA9203-BGA-2	+923BGA or +943BGA
VA9203-BGA-2 with M9000-561 thermal barrier	H923BGA or H943BGA
VA9203-BGB-2	+923BGB or +943BGB
VA9203-BGB-2 with M9000-561 thermal barrier	H923BGB or H943BGB

Actuator and Accessories being Mounted	Factory Assembly Code
VA9203-BUA-2	+923BUA or +943BUA
VA9203-BUA-2 with M9000-561 thermal barrier	H923BUA or H943BUA
VA9203-BUB-2	+923BUB or +943BUB
VA9203-BUB-2 with M9000-561 thermal barrier	H923BUB or H943BUB
VA9203-GGA-2Z	+923GGA or +943GGA
VA9203-GGA-2Z with M9000-561 thermal barrier	H923GGA or H943GGA
VA9203-GGB-2Z	+923GGB or +943GGB
VA9203-GGB-2Z with M9000-561 thermal barrier	H923GGB or H943GGB
VA9208-AGA-2	+928AGA or +948AGA
VA9208-AGA-2 with M9000-561 thermal barrier	H928AGA or H948AGA
VA9208-AGC-3	+938AGC or +958AGC
VA9208-AGC-3 with M9000-561 thermal barrier	H938AGC or H958AGC
VA9208-BAA-3	+938BAA or +958BAA
VA9208-BAA-3 with M9000-561 thermal barrier	H938BAA or H958BAA
VA9208-BAC-3	+938BAC or +958BAC
VA9208-BAC-3 with M9000-561 thermal barrier	H938BAC or H958BAC
VA9208-BGA-3	+938BGA or +958BGA
VA9208-BGA-3 with M9000-561 thermal barrier	H938BGA or H958BGA
VA9208-BGC-3	+938BGC or +958BGC
VA9208-BGC-3 with M9000-561 thermal barrier	H938BGC or H958BGC
VA9208-GGA-2	+928GGA or +948GGA
VA9208-GGA-2 with M9000-561 thermal barrier	H928GGA or H948GGA
VA9208-GGC-3	+938GGC or +958GGC
VA9208-GGC-3 with M9000-561 thermal barrier	H938GGC or H958GGC
VA9310-HGA-2	+910HGA
VA9310-HGA-2 with M9000-2 switch kit	+910HGC
VA9310-HGA-2 with M9000-561 thermal barrier	H910HGA
VA9310-HGA-2 with M9000-561 thermal barrier and with M9300-2 switch kit	H910HGC

Valid Field Assembly Combinations

VG1000 Series Ball Valves, M(VA)9000 Series Actuators, Linkage Kits, Weather Shields

Valve Size in. (DN)	Valve Code Number			Actuator Base Code Number[1]	Linkage Kit Code Number		Weather Shield
	NPT End Connection	Sweat End Connection	Press End Connection		Fluid Temperatures (<212°F [100°C])	Fluid Temperatures (≥212°F [100°C])	
1/2 (DN15)	VG1245Ax VG1845Ax	VG1275Ax VG1875Ax	VG1295Ax VG1895Ax	VA9104[2]	None Required	M9000-561	M9000-342
				M9104[2]	M9000-551		
				VA9300	None Required		
				M9300	M9310-500		
				VA9203	None Required		
				M9203	M9000-560		
3/4 (DN20)	VG1245Bx VG1845Bx	VG1275Bx VG1875Bx	VG1295Bx VG1895Bx	VA9104[2]	None Required	M9000-561	M9000-342
				M9104[2]	M9000-551		
				VA9300	None Required		
				M9300	M9310-500		
				VA9203	None Required		
				M9203	M9000-560		
1 (DN25)	VG1245Cx VG1845Cx	VG1275Cx VG1875Cx	VG1295Cx VG1895Cx	VA9104[2]	None Required	M9000-561	M9000-342
				M9104[2]	M9000-551		
				VA9300	None Required		
				M9300	M9310-500		
				VA9203	None Required		
				M9203	M9000-560		
1 1/4 (DN32)	VG1245Dx VG1845Dx			VA9300	None Required	M9000-561	M9000-342
				M9300	M9310-500		
				VA9208	None Required		
				M9208	M9000-550		
1 1/2 (DN40)	VG1245Ex VG1845Ex			VA9300	None Required	M9000-561	M9000-342
				M9300	M9310-500		
				VA9208	None Required		
				M9208	M9000-550		
2 (DN50)	VG1245Fx VG1845Fx			VA9300	None Required	M9000-561	M9000-342
				M9300	M9310-500		
				VA9208	None Required		
				M9208	M9000-550		

Valid Ball Valve, Electric Actuator, Linkage, and Weathershield Combinations (for Field Assembly)

Valve Size in. (DN)	Valve Code Number	Actuator Base Number	Link Kit Code Number	Optional Weathershield Code Number
2-1/2 (DN65)	VG12A5Gx, VG18A5Gx VG12A5Kx, VG18A5Kx	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340
3 (DN80)	VG12A5Hx, VG18A5Hx VG12A5Lx, VG18A5Lx	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340
4 (DN100)	VG12A5Jx, VG18A5Jx VG12A5MZ, VG18A5MZ	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340
5 (DN125)	VG12A5NY, VG18A5NY	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340
6 (DN150)	VG12A5PZ, VG18A5PZ	M9124	M9000-518	M9000-330
		M9220	M9000-519	M9000-340

1 VA9104, M9104, VA9300, and M9300 Series Actuators are non-spring return, and VA9203, M9203, VA9208, and M9208 Series Actuators are spring return.
Note: VA9104, M9104, VA9300, M9300, VA9203, M9203, VA9208, and M9208 have a maximum fluid temperature limit of 212°F (100°C) unless used with the M9000-561 Thermal Barrier.

2 To avoid excessive wear or drive time on the motor for VA9104 and M9104 use a controller and/or software that provides a timeout function to remove the signal at the end of rotation (stall). The IGx and GGx models have an automatic shutoff to avoid excessive wear or drive time on the motor.

VG1000 Series Ball Valve Accessories

	Code Number	Description	Qty
Ball Valve Linkages			
	M9000-518	Ball Valve Linkage for Non-Spring Return, 2 1/2 to 6 in. VG1000 flanged valves with 11 mm square stem	1
	M9000-519	Ball Valve Linkage for Spring Return, 2 1/2 to 6 in. VG1000 flanged Valves with 11 mm square stem	1
	M9000-551	VG1000 Ball Valve linkage (for use with M9104 Series actuators only)	1
	M9000-560	Ball Valve Linkage Kit for applying M9203, and M9208 Series Electric Actuators to VG1000 Series Valves	1
	M9000-561	Thermal Barrier Kit for M9000-560 Ball Valve Linkage. Extends M(VA)9104, M(VA)9300, M(VA)9203, and M(VA)9208 Series Electric Spring Return Actuators applications to include low pressure steam	1
	M9310-500	Ball Valve Linkage Kit for applying M9310 Series Electric Actuators to VG1000 Series Valves	1

VG1000 Series Ball Valve Accessories

	Code Number	Description	Qty
Weather Shields for Ball Valves			
	M9000-330	NEMA 3R Weather Shield for VG1000 Series Non-Spring Return Ball Valves with M9000-518 Linkage	1
	M9000-340	NEMA 3R Weather Shield for VG1000 Series Spring Ball Valves with M9000-519 Linkage	1
	M9000-342	Weather Shield Kit for VG1000 Series Ball Valve application of M(VA)9104, M9310, M(VA)9203, and M(VA)9208 Series Electric Spring Return Actuators	1
Miscellaneous			
	M9000-607	Position Indicator for VG1000 Series Ball Valve Applications (For use with VA9300, VA9203, VA9208 and VA9310 Series Actuators)	5
	M9200-100	Threaded Conduit Adapters for 1/2 in. electrician's fittings (For use with M(VA)9208, and M9220 Series Actuators)	5

Sizing Water Valves

Two-Position Applications: The valve is normally sized with the largest Cv available.

Modulating Applications: The valve should be sized to produce the required Cv with a pressure drop of one to two times the pressure drop across the coil at rated flow.

Example: Coil requires 14 gpm at 5 psi pressure drop. The valve should be selected to provide 14 gpm with a pressure drop across the valve between 5 and 10 psi (one to two times the pressure drop across the coil at the required flow).

Solution: From the table below a 1/2 in., 4.7 Cv valve will provide 14.1 gpm flow at a pressure drop across the valve of 9 psi. This valve should be selected as the valve will provide the needed flow with a pressure drop between one and two times the pressure drop across the coil at the required flow.

VG1000 Ball Valves 1/2 through 2 inch

FLOW RATE IN GPM (GALLONS PER MINUTE)										
Cv	1.2	1.9	2.9	4.7	7.4	11.7	18.7	29.2	46.8	73.7
Pressure Drop (PSI)										
1	1.2	1.9	2.9	4.7	7.4	11.7	18.7	29.2	46.8	73.7
2	1.7	2.7	4.1	6.6	10.5	16.5	26.4	41.3	66.2	104.2
3	2.1	3.3	5.0	8.1	12.8	20.3	32.4	50.6	81.1	127.7
4	2.4	3.8	5.8	9.4	14.8	23.4	37.4	58.4	93.6	147.4
5	2.7	4.2	6.5	10.5	16.5	26.2	41.8	65.3	104.6	164.8
6	2.9	4.7	7.1	11.5	18.1	28.7	45.8	71.5	114.6	180.5
7	3.2	5.0	7.7	12.4	19.6	31.0	49.5	77.3	123.8	195.0
8	3.4	5.4	8.2	13.3	20.9	33.1	52.9	82.6	132.4	208.5
9	3.6	5.7	8.7	14.1	22.2	35.1	56.1	87.6	140.4	221.1
10	3.8	6.0	9.2	14.9	23.4	37.0	59.1	92.3	148.0	233.1
11	4.0	6.3	9.6	15.6	24.5	38.8	62.0	96.8	155.2	244.4
12	4.2	6.6	10.0	16.3	25.6	40.5	64.8	101.2	162.1	255.3
13	4.3	6.9	10.5	16.9	26.7	42.2	67.4	105.3	168.7	265.7
14	4.5	7.1	10.9	17.6	27.7	43.8	70.0	109.3	175.1	275.8
15	4.6	7.4	11.2	18.2	28.7	45.3	72.4	113.1	181.3	285.4
16	4.8	7.6	11.6	18.8	29.6	46.8	74.8	116.8	187.2	294.8
17	4.9	7.8	12.0	19.4	30.5	48.2	77.1	120.4	193.0	303.9
18	5.1	8.1	12.3	19.9	31.4	49.6	79.3	123.9	198.6	312.7
19	5.2	8.3	12.6	20.5	32.3	51.0	81.5	127.3	204.0	321.3
20	5.4	8.5	13.0	21.0	33.1	52.3	83.6	130.6	209.3	329.6
21	5.5	8.7	13.3	21.5	33.9	53.6	85.7	133.8	214.5	337.7
22	5.6	8.9	13.6	22.0	34.7	54.9	87.7	137.0	219.5	345.7
23	5.8	9.1	13.9	22.5	35.5	56.1	89.7	140.0	224.4	353.5
24	5.9	9.3	14.2	23.0	36.3	57.3	91.6	143.1	229.3	361.1
25	6.0	9.5	14.5	23.5	37.0	58.5	93.5	146.0	234.0	368.5
26	6.1	9.7	14.8	24.0	37.7	59.7	95.4	148.9	238.6	375.8
27	6.2	9.9	15.1	24.4	38.5	60.8	97.2	151.7	243.2	383.0
28	6.3	10.1	15.3	24.9	39.2	61.9	99.0	154.5	247.6	390.0
29	6.5	10.2	15.6	25.3	39.9	63.0	100.7	157.2	252.0	396.9
30	6.6	10.4	15.9	25.7	40.5	64.1	102.4	159.9	256.3	403.7

Sizing Water Valves

Two-Position Applications: The valve is normally sized with the largest Cv available.

Modulating Applications: The valve should be sized to produce the required Cv with a pressure drop of one to two times the pressure drop across the coil at rated flow.

Example: Coil requires 180 gpm at 4 psi pressure drop. The valve should be selected to provide 180 gpm with a pressure drop across the valve between 4 and 8 psi (one to two times the pressure drop across the coil at the required flow).

Solution: From the table below a 74 Cv valve will provide 181 gpm flow at a pressure drop across the valve of 6 psi. This valve should be selected as the valve will provide the needed flow with a pressure drop between one and two times the pressure drop across the coil at the required flow.

VG1000 Flanged Ball Valves 2-1/2 through 6 inch

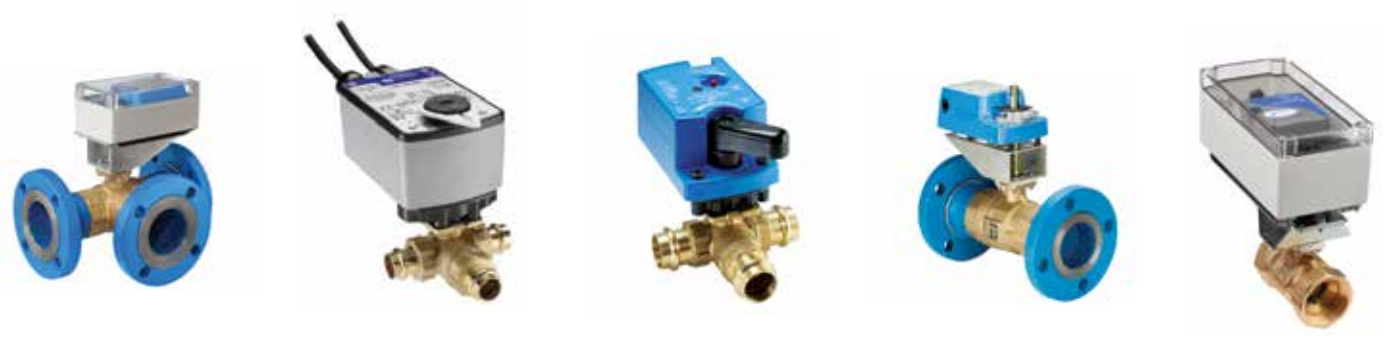
FLOW RATE IN GPM (GALLONS PER MINUTE)							
Cv	47	74	117	176	211	290	406
Pressure Drop (PSI)							
1	47	74	117	176	211	290	348
2	66	105	165	249	298	410	492
3	81	128	203	305	365	502	603
4	94	148	234	352	422	580	696
5	105	165	262	394	472	648	778
6	115	181	287	431	517	710	852
7	124	196	310	466	558	767	921
8	133	209	331	498	597	820	984
9	141	222	351	528	633	870	1,044
10	149	234	370	557	667	917	1,100
11	156	245	388	584	700	962	1,154
12	163	256	405	610	731	1,005	1,206
13	169	267	422	635	761	1,046	1,255
14	176	277	438	659	789	1,085	1,302
15	182	287	453	682	817	1,123	1,348
16	188	296	468	704	844	1,160	1,392
17	194	305	482	726	870	1,196	1,435
18	199	314	496	747	895	1,230	1,476
19	205	323	510	767	920	1,264	1,517
20	210	331	523	787	944	1,297	1,556
21	215	339	536	807	967	1,329	1,595
22	220	347	549	826	990	1,360	1,632
23	225	355	561	844	1012	1,391	1,669
24	230	363	573	862	1034	1,421	1,705
25	235	370	585	880	1055	1,450	1,740
26	240	377	597	897	1076	1,479	1,774
27	244	385	608	915	1096	1,507	1,808
28	249	392	619	931	1117	1,535	1,841
29	253	399	630	948	1136	1,562	1,874
30	257	405	641	964	1156	1,588	1,906

NOTES

Notes

Notes

Better performance starts with a better valve.



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