VG4000 Series

VG4000 Electric Zone Valves

Johnson Controls

VG4000 Electric Zone Valves

VG4000 Series High-Capacity/High-Closeoff Electric Zone Valves are designed to regulate the flow of water in response to the demand of a controller in zone and Variable Air Volume (VAV) reheats coil applications. The high-capacity/high-closeoff capability of the VG4400xx-C and VG4800xx-C also makes this family of valves an ideal choice for fan coil and baseboard radiation applications. Normally Closed (N.C.) VG4000 series valve is designed for use with VA-7010 Series on/off control actuators and VA-7450 Series floating or proportional control actuators. These electric actuators can be order separately for field installation.

Refer to the VA-7010 Series Electric On/Off Actuator Product/Technical Bulletin or the VA-7450 Electronic Valve Actuator Product/Technical Bulletin for specific information regarding either actuator series.

Figure 1: VG4000 Series High-Capacity/High-Closeoff Electric Zone Valves

Features and Benefits

Forged Brass Body and Stainless Steel Stem and Spring	Ensures long life
Ideal for Zone, VAV Reheat Coil, Fan Coil, and Baseboard Radiation Applications	Offers a broad range of applications
EPT Rubber Plug for Bubble-Tight Shutoff	Maximizes energy savings
Easy, Field-Replaceable Packing	Shortens repairing time
Actuator can be Field Installed After Piping	Simplifies installation in confined locations
Built-In Return Spring for VA-7010 Series Electric Actuators	Allows the valve to return to normal position when the actuator is de-energized

Table 1: Ordering Code for VG4000 Series Zone Valve with Threaded (Internal BSP) End Connections

Valve Code Number	Size (in.)	Kv	Close-off Pressure* (PSIG)	On/Off	On/Off	On/Off	Floating	0 ~ 10VDC Proportional
				24VAC 50/60Hz	120VAC 50/60Hz	230VAC 50/60Hz	24VAC 50/60Hz	24VAC 50/60Hz
				VA-7010-8001**	VA-7010-8502-C	VA-7010-8503-C	VA-7450-1001**	VA-7452-1001**
Two-Way N.C. (Push-Down-to-Open, PDTO)								
VG4400FC-C	1/2	2.1 ~ 2.2	50 (345kPa)	Yes	Yes	Yes	Yes	Yes
VG4400GC-C	3/4	2.5 ~ 2.6	50 (345kPa)	Yes	Yes	Yes	Yes	Yes
VG4400HC-C	1	3.0 ~ 3.1	50 (345kPa)	Yes	Yes	Yes	Yes	Yes
Three-Way N.C. (Push-Down-to-Open, PDTO)								
VG4800FC-C	1/2	2.1 ~ 2.2	50 (345kPa)	Yes	Yes	Yes	Yes	Yes
VG4800GC-C	3/4	2.5 ~ 2.6	50 (345kPa)	Yes	Yes	Yes	Yes	Yes

* The close-off pressure for three-way mixing valves is 50 psig(345kPa) on the normally closed port and 25 psig(172kPa) on the normally open port.

** Imported types

Table 2: Drop (PSI) vs. Flow Rate in Gallons per Minute (GPM)

Pipe Size (Sweat or Threaded End Connections	1/2 in.	3/4 in.	1 in.
Kv	2.1 ~ 2.2	2.5 ~ 2.6	3.0 ~ 3.1
Pressure Drop (PSI)	Flow Rate (GPM)		
1	2.6	3.0	3.6
2	3.6	4.3	5.1
3	4.5	5.3	6.3
4	5.1	6.1	7.3
5	5.8	6.8	8.1
6	6.3	7.5	8.9
7	6.8	8.0	9.6
8	7.3	8.6	10.3
9	7.7	9.1	10.9
10	8.1	9.6	11.5
11	8.5	10.1	12.0
12	8.9	10.5	12.6
13	9.3	11.0	13.1
14	9.6	11.4	13.6
15	10.0	11.8	14.0
16	10.3	12.2	14.5
17	10.6	12.5	15.0
18	10.9	12.9	15.4
19	11.2	13.3	15.8
20	11.5	13.6	16.2
21	11.8	13.9	16.6
22	12.1	14.3	17.0
23	12.3	14.6	17.4
24	12.6	14.9	17.8
25	12.9	15.2	18.1
26	13.1	15.5	18.5
27	13.4	15.8	18.8
28	13.6	16.1	19.2
29	13.9	16.4	19.5
30	14.1	16.7	19.9

Actuator Assemblies

VG4400/4800 Series High-Capacity/High-Close-off Electric Zone Valves are specifically designed for use with VA-7010 Series on/off control actuators and VA-7450 Series floating or proportional control actuators.

Note: For soldering reasons, factory-ordered assemblies featuring sweat end connections are shipped with the actuator separated from the valve body.

Operation

IMPORTANT:
It is recommended that the VG4000 Series Valve be mounted within 90 degrees of the upright position.

VA-7010 Series (On/Off Control)

When power is applied to the actuator, the motor drives the gear assembly, pushing the valve stem down against the force of the return spring. When power is removed, the actuator retracts, allowing the return spring to move the valve stem up in the direction of its normal position. Figure 2 illustrates the effect that valve stem movement has on flow.

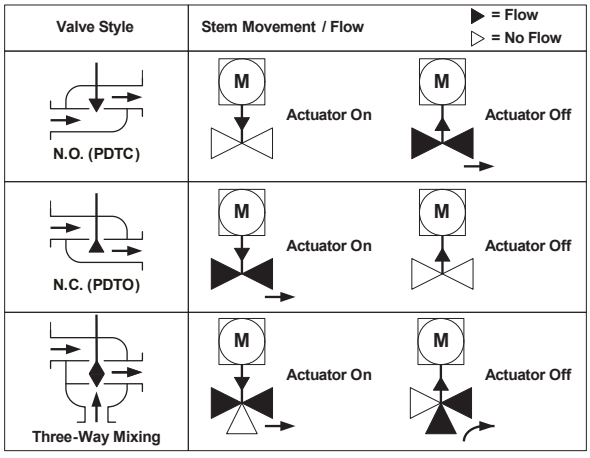

Figure 2: Effect of Valve Stem Movement on Flow

VA-7450-1001 (Floating Control)

When power is applied to the Common (blue) and Down (red) wires, the motor drives the gear assembly, pushing the valve stem down against the force of the return spring. When power is applied to the Common (blue) and Up (white) wires, the actuator retracts, allowing the return spring to move the valve stem up to its normal position. When power is removed, the actuator will hold its position.

If power remains applied to either the red or white wire, the actuator will time out and shut the motor off after approximately 80 seconds, holding its current position. Figure 2 illustrates the effect that valve stem movement has on flow.

VA-7452-1001 (Proportional Control)

When the control signal increases, the actuator motor drives the gear assembly, pushing the valve stem down against the force of the return spring.
When the control signal decreases, the actuator retracts, allowing the return spring to move the valve stem up in the direction of its normal position.

Upon loss of power, the actuator will hold its position. Figure 2 illustrates the effect that valve stem movement has on flow.

Dimensions

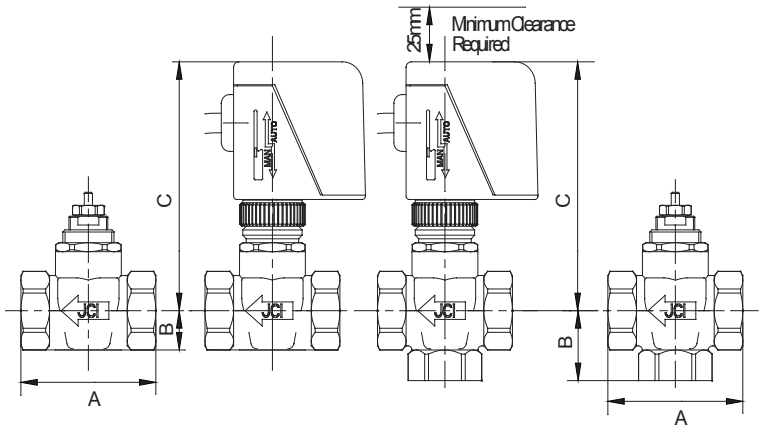

Figure 3: VA-7010 Actuated VG4000 Series Valve Dimensions, in. (mm) (Refer to Table 3)

Table 3: Dimensions for VA-7010 Actuated VG4400/4800 Series Assemblies with Threaded (Internal BSP) End Connections, mm

Dimension*	Two or Three-Way Valve Assemblies				
	Two-way 1/2 in. (DN15)	Two-way 3/4 in. (DN20)	Two-way 1 in. (DN25)	Three-way 1/2 in. (DN15)	Three-way 3/4 in. (DN20)
A	66	66	90	66	66
B	18	18	24	32	32
C	109	109	109	109	109

*For actuator-only dimensions, refer to the VA-7010 Series Electric On/Off Actuator Product/Technical Bulletin

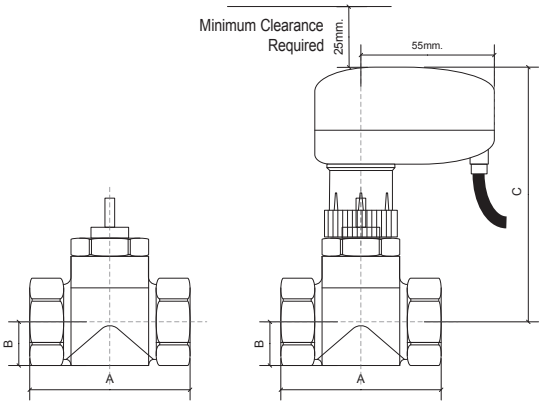

Figure 4: VA-7450 Actuated VG4000 Series Valve Dimensions, in. (mm) (Refer to Table 4)

Table 4: Dimensions for VA-7450 Actuated VG4000 Series Assemblies with Threaded (Internal BSP) End Connections, mm

Dimension*	Two or Three-Way Valve Assemblies				
	Two-way 1/2 in. (DN15)	Two-way 3/4 in. (DN20)	Two-way 1 in. (DN25)	Three-way 1/2 in. (DN15)	Three-way 3/4 in. (DN20)
A	66	66	90	66	66
B	18	18	24	32	32
C	105	105	105	105	105

* For actuator-only dimensions, refer to the VA-7450 Electronic Valve Actuator Product/Technical Bulletin

Technical Data

Product	VG4000 Series High-Capacity/High-Closeoff Electric Zone Valves				
Models	VG4400FC-C	VG4400GC-C	VG4400HC-C	VG4800FC-C	VG4800GC-C
Body Rating	PN16 Maximum Pressure: 300 PSIG (2,067 kPa)				
Service*	Hot and Cold Water for HVAC Systems				
Valve Sizes	1/2 in. (DN15)	3/4 in. (DN20)	1 in. (DN25)	1/2 in. (DN15)	3/4 in. (DN20)
Maximum Close-off Pressure	50 PSIG				
Leakage	0.01% of Maximum Flow; 100% Protection Tested				
End Connections	Threaded (Internal BSP)				
Stroke	3mm				
Body Type	Two-Way PDTO(NC)	Two-Way PDTO(NC)	Two-Way PDTO(NC)	Three-Way Mixing	Three-Way Mixing
Material					
Valve Body	Forged Brass				
Packing Nut and Cage	Brass				
Stem	ANSI 300 Stainless Steel				
Spring	Stainless Steel				
Plug	EPT Rubber				
Packing	Two EPT Rubber O-Rings				
Fluid Temperature Limits	2 ~ 95℃ (35 ~ 203℉)				
Ambient Temperature Limits	2 ~ 50℃ (35 ~ 122℉)				
Flow Characteristics	On/Off with VA-7010 Series Actuator; Two-Way Valves with VA-7450 Series Actuator Approximately Equal Percentage; Three-Way Valves with VA-7450 Series Actuator Approximately Linear for Service Port				
Valve Body Shipping Weight, lb (kg):	1/2 in. (DN15 Two-Way) 1.03 (0.47)	3/4 in. (DN20 Two-Way) 0.86 (0.39)	1 in. (DN25 Two-Way) 1.52 (0.69)	1/2 in. (DN15 Three-Way) 1.14 (0.52)	3/4 in. (DN20 Three-Way) 0.95 (0.43)
Actuator Shipping Weight, lb (kg)	VA-7010 Series: 1.10 (0.50) VA-7450 Series: 0.33 (0.15)				

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

Johnson Controls is a global diversified technology and industrial leader serving customers in more than 150 countries. Our 142,000 employees create quality products, services and solutions to optimize energy and operational efficiencies of buildings; lead-acid automotive batteries and advanced batteries for hybrid and electric vehicles; and interior systems for automobiles. Our commitment to sustainability dates back to our roots in 1885, with the invention of the first electric room thermostat. Through our growth strategies and by increasing market share we are committed to delivering value to shareholders and making our customers successful.

Johnson Controls Building Efficiency delivers products, services and solutions that increase energy efficiency and lower operating costs in buildings for more than one million customers. Operating from 500 branch offices in more than 150 countries, we are a leading provider of equipment, controls and services for heating, ventilating, air-conditioning, refrigeration and security systems. We have been involved in more than 500 renewable energy projects including solar, wind and geothermal technologies. Our solutions have reduced carbon dioxide emissions by 13.6 million metric tons and generated savings of $7.5 billion since 2000. Many of the world's largest companies rely on us to manage 1.5 billion square feet of their commercial real estate.

Australia
Tel : +61 (2) 9805 8300
Fax: +61 (2) 9889 3016

China (Shanghai)
Tel : +86 (21) 6276 6509
Fax: +86 (21) 6277 3543

Hong Kong
Tel : +852 2590 0012
Fax: +852 2516 5648

India
Tel : +91 (22) 3082 2200
Fax: +91 (22) 3088 1592

Indonesia
Tel : +62 (21) 5366 8500
Fax: +62 (21) 5366 8300

Japan
Tel : +81 (3) 5738 6100
Fax: +81 (3) 5738 6298

Korea
Tel : +82 (2) 554 5935
Fax: +82 (2) 554 5739

Macau
Tel : +853 2875 1820
Fax: +853 2875 1825

Malaysia
Tel : +60 (3) 7628 4393
Fax: +60 (3) 7620 0538

New Zealand
Tel : +64 (9) 444 6434
Fax: +64 (9) 444 2092

Singapore
Tel : +65 6748 0202
Fax: +65 6284 3017

Taiwan
Tel : +886 (2) 2657 5568
Fax: +886 (2) 2657 6388

Thailand
Tel : +66 (2) 717 1260-80
Fax: +66 (2) 717 0861

Asia Engineering Centre: Wuxi, China
Asia Parts & Product Hub: Shanghai, China
Asia Centre of Engineering & Technology (CET): Hong Kong
Asia Centre of Excellence in Engineering (CoEE): Beijing, China · Mumbai & Pune, India
Manufacturing/Assembly: Guangzhou & Wuxi, China · Pune, India

Johnson Controls

© 2011 Johnson Controls, Inc.

www.johnsoncontrols.com

Printed on recycled paper