

VG5000 Series Electric Zone Valves

VG5000 Series Electric Zone Valves are primarily designed to regulate the flow of water in response to the demand of a controller in zone, fan coil, and Variable Air Volume (VAV) reheat coil applications. The valves can be used in combination with VA-7010 electric on/off actuators and VA-7450 floating or proportional actuators. VG5000 Series Valves are available in Normally Open (N.O.), Normally Closed (N.C.), or three-way mixing configurations.

Refer to either the VA-7010 Series Electric On/Off Actuator Product/Technical Bulletin or the VA-7450 Electronic Valve Actuator Product/Technical Bulletin (FAN 977 or FAN 1628.3) for specific information.



Figure 1: VG5000 Series Electric Zone Valves

Features and Benefits	
<input type="checkbox"/> Forged Brass Body and Stainless Steel Stem and Spring	Ensures long life
<input type="checkbox"/> Rubber Compound Plug for Bubble-Tight Shutoff	Maximizes energy savings
<input type="checkbox"/> Field-Adjustable Cv for Select Body Styles	Reduces stock and offers flexibility
<input type="checkbox"/> Easy, Field-Replaceable Packing	Shortens service time
<input type="checkbox"/> Actuator Can Be Field Installed After Piping	Simplifies installation in confined locations
<input type="checkbox"/> Built-In Return Spring for VA-7010 Actuators	Allows the valve to return to normal position when the actuator is de-energized

Table 2: Field-Adjustable Cv for VG5000 Series Electric Zone Valves

Valve Body Size (in.)	Valve Body Code Number	Cv Adjustment Indexes		
		1*	2*	3*
1/2	VG5240CC	1.90	1.17	0.74
	VG5240DC			
	VG5240EC			
	VG5440CC			
	VG5440DC			
	VG5440EC			
	VG5270BC	1.17	0.74	0.46
	VG5270CC			
	VG5270DC			
	VG5470CC	1.70	1.17	0.74
	VG5470DC			
VG5470EC				
3/4	VG5440HC	4.10	3.00	1.90
	VG5440JC			
	VG5440KC			
	VG5470HC	3.70	3.00	1.90
	VG5470JC			
	VG5470KC			
1	VG5440FC	6.40	4.70	3.00
	VG5440LC			
	VG5440MC			
	VG5470FC	5.80	4.70	3.00
	VG5470LC			
	VG5470MC			

* Refer to Figure 2 for the location of the Cv selection marks.

Note: Two-Way N.O. (PDTC) valves in sizes 3/4 and 1 in. and all three-way valves do not feature an adjustable Cv. (For Kv equivalent, multiply the Cv value by 0.857.)

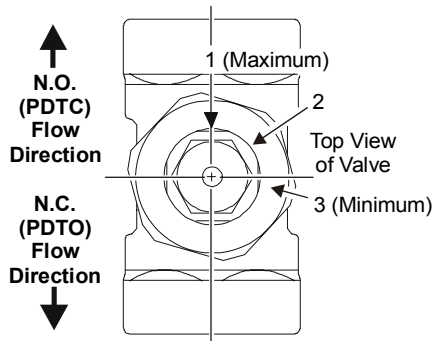


Figure 2: Location of the Cv Selection Marks

Table 3: Accessories (Ordered Separately)

Product Code Number	Description
VG5000-1	Packing Nut with Integral O-Ring
VA-7450-8900	Manual Override Ring Accessory (Opens N.C. valves or the N.C. port of three-way valves for VA-7450 and VA-7452 actuated assemblies.)

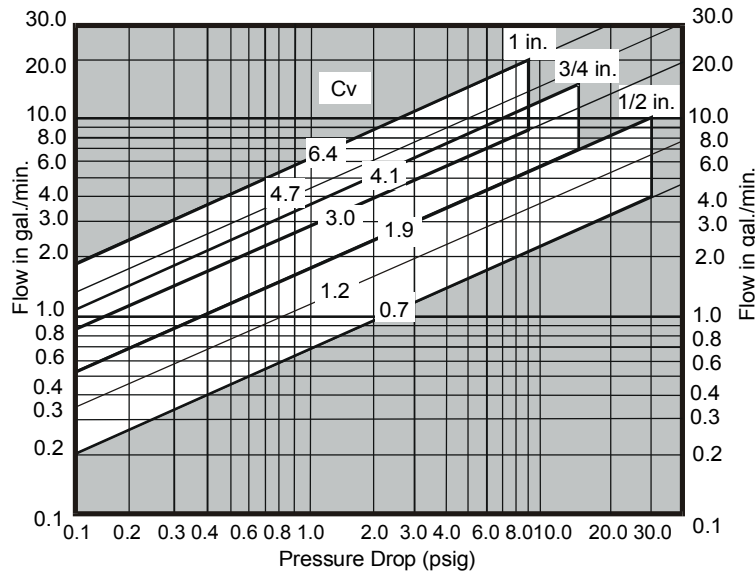


Figure 3: Pressure Drop vs. Flow

Table 4: Closeoff Pressures, psig (kPa)

Valve Size	Threaded (NPT) Ends			Sweat Ends		
	N.O. (PDTC)	N.C. (PDTO)	Three-Way Mixing	N.O. (PDTC)	N.C. (PDTO)	Three-Way Mixing
1/2 in. = BC	----	----	----	45 (310)	----	----
CC	30 (207)	30 (207)	30 (207)	45 (310)	30 (207)	----
DC	30 (207)	30 (207)	30 (207)	45 (310)	30 (207)	----
EC	30 (207)	30 (207)	30 (207)	30 (207)	30 (207)	30 (207)
3/4 in. = HC	----	14.5 (100)	----	----	14.5 (100)	----
JC	20 (138)	14.5 (100)	14.5 (100)	20 (138)	14.5 (100)	----
KC	14.5 (100)	14.5 (100)	14.5 (100)	14.5 (100)	14.5 (100)	14.5 (100)
1 in. = FC	----	9 (62)	----	----	9 (62)	----
LC	----	9 (62)	----	12 (83)	9 (62)	----
MC	9 (62)	9 (62)	9 (62)	9 (62)	9 (62)	9 (62)

Note: Closeoff pressures are the same for both VA-7010 and VA-745x actuators.

Actuator Assemblies

VG5000 Series Valves are specifically designed for use with VA-7010 Series Electric On/Off and VA-745x Series Electronic 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 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 4 illustrates the effect that valve stem movement has on flow.

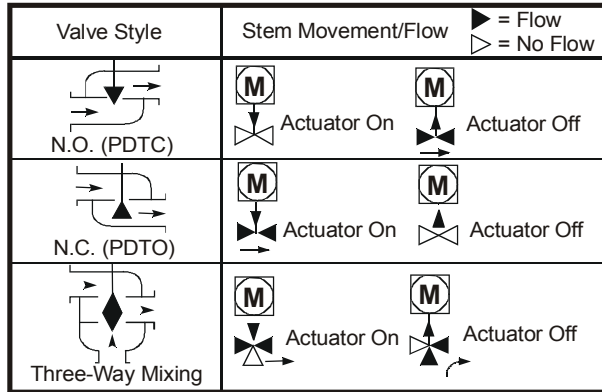


Figure 4: Flow Diagram

VA-7450-10011 (On/Off or 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 off the motor after approximately 80 seconds, holding its current position. Figure 4 illustrates the effect that valve stem movement has on flow.

VA-7452-90011 (Proportional Control)

When the signal increases in Direct Action (DA) configuration or decreases in Reverse Action (RA) configuration, the actuator motor drives the gear assembly, pushing the valve stem down against the force of the valve return spring.

When the signal decreases in DA configuration or increases in RA configuration, the actuator retracts and allows the valve return spring to move the valve stem up, in the direction of its normal position.

Upon loss of the supply voltage, the actuator will hold its position. Figure 4 illustrates the effect that valve stem movement has on flow.

Dimensions

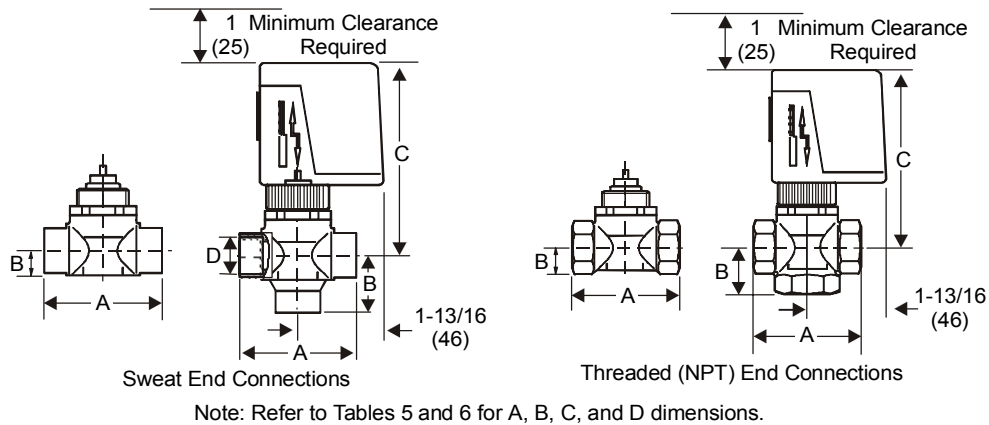


Figure 5: VG5000 Series Valve/VA-7010 Series Actuator Dimensions, in. (mm)

**Table 5: VG5000 Series Valve/VA-7010 Series Actuator Dimensions, in. (mm)
(Sweat End Connections)**

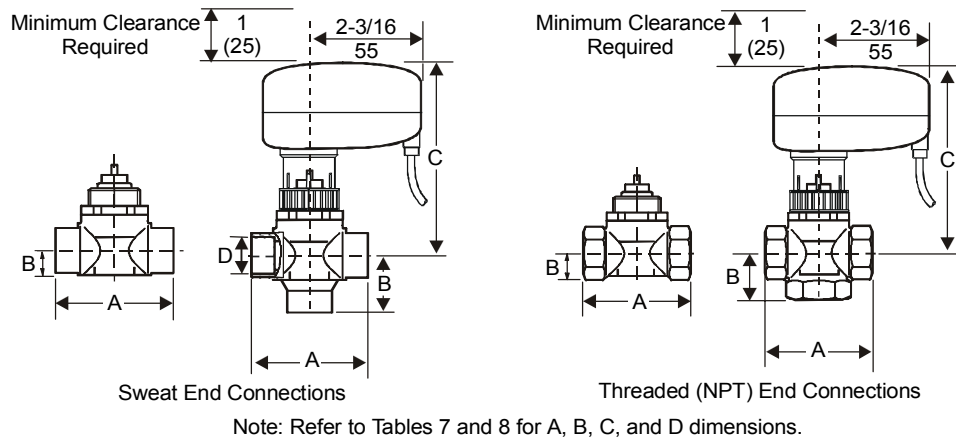
Dimension	Two-Way			Three-Way Mixing		
	1/2 in. (DN15)	3/4 in. (DN20)	1 in. (DN25)	1/2 in. (DN15)	3/4 in. (DN20)	1 in. (DN25)
A	2-13/32 (61)	3-1/16 (78)	3-3/4 (95)	2-13/32 (61)	3-1/16 (78)	3-3/4 (95)
B	1/2 (13)	21/32 (17)	21/32 (17)	1-7/32 (31)	1-17/32 (39)	1-29/32(48)
C*	3-15/16 (100)	4-1/16 (103)	4-3/16 (106)	3-15/16 (100)	4-3/32 (104)	4-1/4 (108)
D	5/8 (16)	7/8 (22)	1-1/8 (29)	5/8 (16)	7/8 (22)	1-1/8 (29)

* For actuator-only dimensions, refer to the *VA-7010 Series Electronic On/Off Actuator Product/Technical Bulletin (LIT-977360)*.

**Table 6: VG5000 Series Valve/VA-7010 Series Actuator Dimensions, in. (mm)
(Threaded End Connections)**

Dimension	Two-Way			Three-Way Mixing		
	(1/2 in.) DN15	3/4 in. (DN20)	1 in. (DN25)	1/2 in. (DN15)	3/4 in. (DN20)	1 in. (DN25)
A	2-5/32 (55)	2-19/32 (66)	3-17/32 (90)	2-5/32 (55)	2-19/32 (66)	3-17/32 (90)
B	19/32 (15)	3/4 (19)	15/16 (24)	1-5/32 (29)	1-5/16 (33)	1-15/32 (37)
C*	3-27/32 (98)	4-1/32 (102)	4-5/32 (106)	3-27/32 (98)	4-1/32 (102)	4-5/32 (106)

* For actuator-only dimensions, refer to the *VA-7010 Series Electronic On/Off Actuator Product/Technical Bulletin (LIT-977360)*.



Note: Refer to Tables 7 and 8 for A, B, C, and D dimensions.

Figure 6: VG5000 Series Valve/VA-745x Series Actuator Dimensions, in. (mm)

**Table 7: VG5000 Series Valve/VA-745x Series Actuator Dimensions, in. (mm)
(Sweat End Connections)**

Dimension	Two-Way			Three-Way Mixing		
	1/2 in. (DN15)	3/4 in. (DN20)	1 in. (DN25)	1/2 in. (DN15)	3/4 in. (DN20)	1 in. (DN25)
A	2-13/32 (61)	3-1/16 (78)	3-3/4 (95)	2-13/32 (61)	3-1/16 (78)	3-3/4 (95)
B	1/2 (13)	21/32 (17)	21/32 (17)	1-7/32 (31)	1-17/32 (39)	1-29/32(48)
C*	3-23/32 (94)	3-27/32 (98)	3-31/32 (100)	3-23/32 (94)	3-7/8 (98)	4-1/32 (102)
D	5/8 (16)	7/8 (22)	1-1/8 (29)	5/8 (16)	7/8 (22)	1-1/8 (29)

* For actuator-only dimensions, refer to the VA-7450 Series Electronic Valve Actuator Product/Technical Bulletin (LIT-977324).

**Table 8: VG5000 Series Valve/VA-745x Series Actuator Dimensions, in. (mm)
(Threaded End Connections)**

Dimension	Two-Way			Three-Way Mixing		
	(1/2 in.) DN15	3/4 in. (DN20)	1 in. (DN25)	1/2 in. (DN15)	3/4 in. (DN20)	1 in. (DN25)
A	2-5/32 (55)	2-19/32 (66)	3-17/32 (90)	2-5/32 (55)	2-19/32 (66)	3-17/32 (90)
B	19/32 (15)	3/4 (19)	15/16 (24)	1-5/32 (29)	1-5/16 (33)	1-15/32 (37)
C*	3-5/8 (92)	3-13/16 (96)	3-15/16 (100)	3-5/8 (92)	3-13/16 (97)	3-15/16 (100)

* For actuator-only dimensions, refer to the VA-7450 Series Electronic Valve Actuator Product/Technical Bulletin (LIT-977324).

Specifications

Product	VG5000 Series Electric Zone Valves		
Models	Refer to Table 1.		
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)
Maximum Closeoff Pressure	Refer to Table 4.		
Leakage	0.01% of Maximum Flow; 100% Production Tested		
End Connections	Threaded (NPT): ANSI B1.20.1 Sweat: ANSI B16.18		
Stroke	0.12 in. (3 mm)		
Materials:			
Valve, Packing Nut, Cage	Brass		
Stem	ANSI 300 Stainless Steel		
Spring	Stainless Steel		
Plug	Rubber EPT		
Packing	Two Rubber EPT O-Rings		
Fluid Temperature Limits	35 to 203°F (2 to 95°C)		
Ambient Temperature Limits	35 to 122°F (2 to 50°C)		
Flow Characteristics	On/Off with VA-7010 Actuator; Two-Way Models with VA-7450 Series Actuators Approximately Equal Percentage; Three-Way Models with VA-7450 Series Actuator Approximately Linear for Service Port		
Valve Body Shipping Weight, lb (kg):	1/2 in. (DN15)	3/4 in. (DN20)	1 in. (DN25)
N.O. (PDTC)	0.57 (0.26)	0.86 (0.39)	1.52 (0.69)
N.C. (PDTO)	0.68 (0.31)	0.93 (0.42)	1.48 (0.67)
Three-Way Mixing	0.73 (0.33)	1.06 (0.48)	1.74 (0.79)
Actuator Shipping Weight, lb (kg)	VA-7010: 1.10 (0.50) VA-745x: 0.40 (0.18)		

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

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.



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Printed in U.S.A.
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