

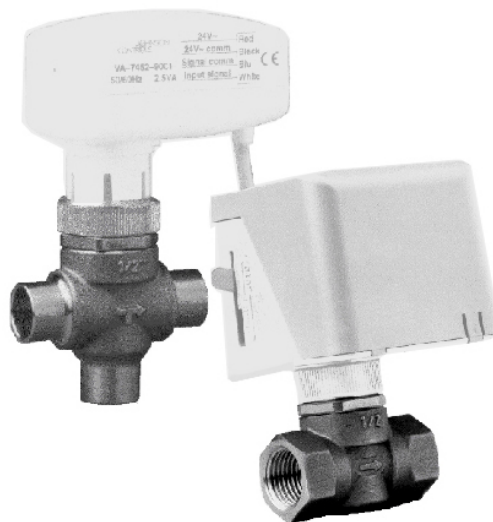
VG5000 Forged Brass Valves

Introduction

The VG5000 forged brass valve series is primarily designed to regulate the flow of water in response to the demand of a controller, in zone and terminal unit applications.

They can be used in combination with VA-7010 electric ON/OFF actuator, VA-7040 thermal actuator and or VA-7450 floating or proportional actuator.

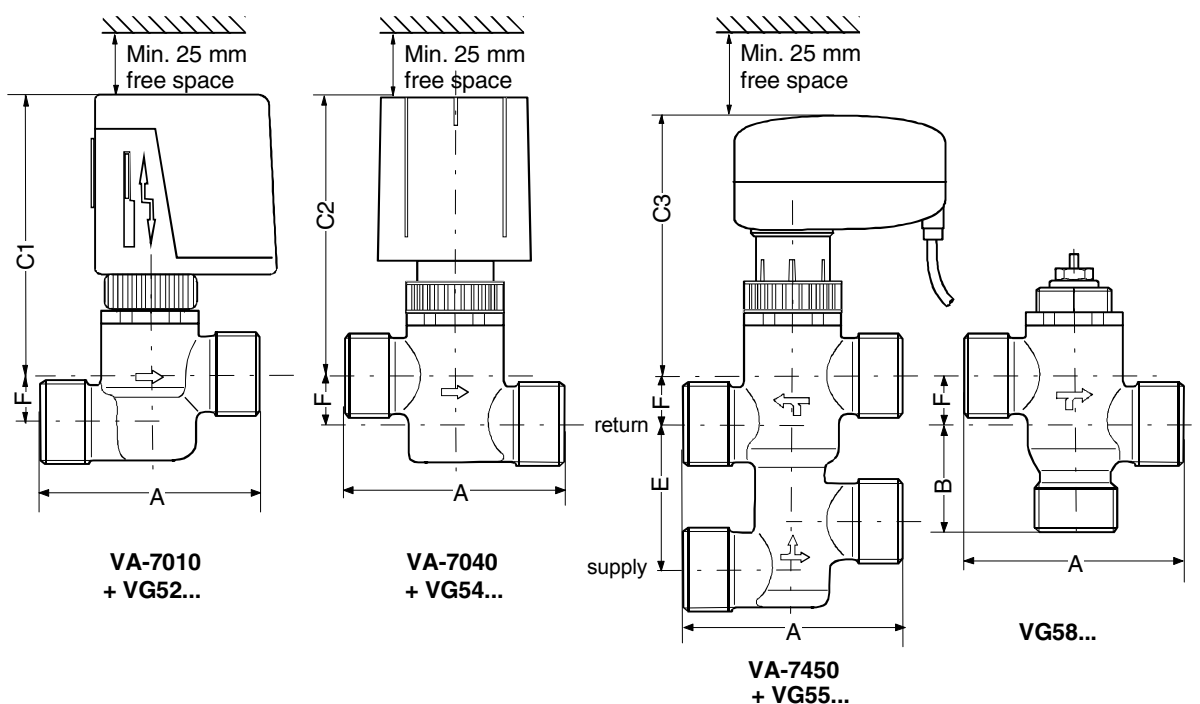
The valves are available in 2-way PDTC (Normally Open), 2-way PDTO (Normally Closed), 3-way mixing and 3-way mixing with built-in Normally Open bypass configurations.



VG5000 3-way mixing with VA-7450 (left)
VG5000 2-way valve with VA-7010 (right)

Features and Benefits	
☐ 2-way PDTO (NC), PDTC (NO) and 3-way configurations	Flexible applications
☐ 3-way with built-in bypass configuration	Reduces piping installation time and cost
☐ Selectable flow characteristic in combination with VA-7452 actuator series	Provides desired controllability
☐ Forged brass body, stainless steel stem and spring	Ensure long life and it is compact
☐ Rubber compound plug for bubble-tight shut-off	Maximises energy saving
☐ Field adjustable Kvs for select body styles	Reduce stock and offers flexibility
☐ Actuator can be field installed after piping	Simplifies installation in confined location
☐ Built-in return spring	Allows the valve to return to normal position when actuator is not mounted or when VA-7010 / VA-7040 actuator is de-energised

Ordering data



Threaded Male Connection

Body Type	Ordering code	Connection Size	Factory Set Kvs and alternative adjustable Kvs			Close-Off Pressure (kPa)	Dimensions (mm)						
							A	B	C1 (VA-7010)	C2 (VA-7040)	C3 (VA-7450)	E	F
			z =1 z =9	z =1 z =9									
2-way PDTC (NO)	VG52z0AC	½"	0.4	<u>0.25</u>	-	200	68	-	96	95	90	-	11
	VG52z0BC	½"	<u>0.4</u>	0.25	-	200	68	-	96	95	90	-	11
	VG52z0CC	½"	1	<u>0.63</u>	-	200	68	-	96	95	90	-	11
	VG52z0DC	½"	<u>1</u>	0.63	-	200	68	-	96	95	90	-	11
	VG52z0EC	½"	<u>1.6</u>	-	-	100	72	-	98	97	92	-	13.5
	VG52z0JC	¾"	<u>2.5</u>	-	-	140	74		98	97	92	-	15
	VG52z0KC	¾"	<u>3.5</u>	-	-	100	74		98	97	92	-	15
2-way PDTO (NC)	VG54z0AC	½"	0.4	<u>0.25</u>	-	200	68	-	96	95	90	-	11
	VG54z0BC	½"	<u>0.4</u>	0.25	-	200	68	-	96	95	90	-	11
	VG54z0CC	½"	1	<u>0.63</u>	-	200	68	-	96	95	90	-	11
	VG54z0DC	½"	<u>1</u>	0.63	-	200	68	-	96	95	90	-	11
	VG54z0EC	½"	<u>1.6</u>	1	0.63	100	72	-	98	97	92	-	13.5
	VG54z0JC	¾"	3.5	<u>2.5</u>	1.6	100	74		98	97	92	-	15
	VG54z0KC	¾"	<u>3.5</u>	2.5	1.6	100	74		98	97	92	-	15
3-way Mixing	VG58z0AC	½"	<u>0.25</u>			200	68	26.5	96	95	90	-	11
	VG58z0BC	½"	<u>0.4</u>			200	68	26.5	96	95	90	-	11
	VG58z0CC	½"	<u>0.63</u>			200	68	26.5	96	95	90	-	11
	VG58z0DC	½"	<u>1</u>			200	68	26.5	96	95	90	-	11
	VG58z0EC	½"	<u>1.6</u>			100	72	34.5	98	97	92	-	13.5
	VG58z0JC	¾"	<u>2.5</u>			100	74	36	98	97	92	-	15
	VG58z0KC	¾"	<u>3.5</u>			100	74	36	98	97	92	-	15

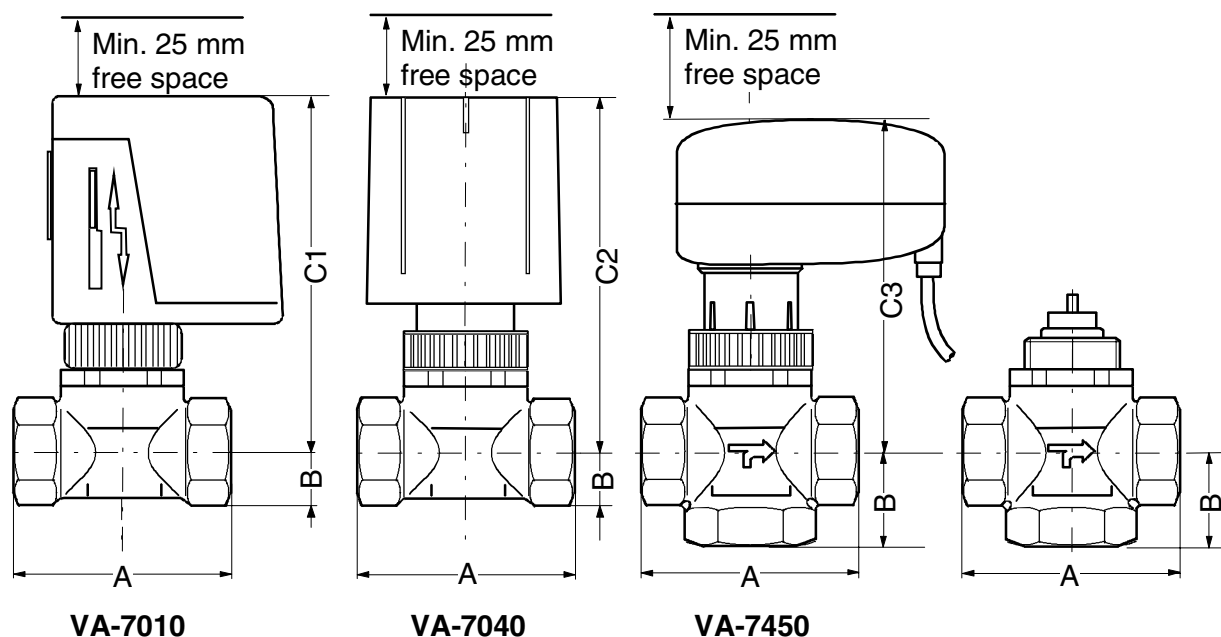
Threaded Male Connection (continued...)

Body Type	Ordering code	Connection size	Factory Set Kvs (Kv on Bypass port of 3-Way mixing + built-in bypass valves)	Close -Off Pressure (kPa)	Dimensions (mm)						
					A	B	C1 (VA-7010)	C2 (VA-7040)	C3 (VA-7450)	E	F
3-way + built-in NO bypass	VG55z0AC	½"	0.25 (0.25)	200	68	-	96	95	90	40	11
	VG55z0PC	½"	0.4 (0.25)	200	68	-	96	95	90	40	11
	VG55z0BC	½"	0.4 (0.4)	200	68	-	96	95	90	40	11
	VG55z0QC	½"	0.63 (0.4)	200	68	-	96	95	90	40	11
	VG55z0CC	½"	0.63 (0.63)	200	68	-	96	95	90	40	11
	VG55z0RC	½"	1 (0.63)	200	68	-	96	95	90	40	11
	VG55z0DC	½"	1.0 (1.0)	200	68	-	96	95	90	40	11
	VG55z0SC	½"	1.6 (1.0)	100	72	-	96	95	90	40	13.5
	VG55z0EC	½"	1.6 (1.6)	100	72	-	96	95	90	40	13.5
	VG55z0TC	¾"	2.5 (1.6)	100	74	-	98	97	92	40	15
	VG55z0JC	¾"	2.5 (2.5)	100	74	-	98	97	92	40	15
	VG55z0UC	¾"	3.0 (2.5)	100	74	-	98	97	92	40	15
	VG55z0KC	¾"	3.0 (3.0)	100	74	-	98	97	92	40	15

Threads

Z=1 BSP parallel**Z=9** Compression fitting (only for Bodies with connection size ½")

BSP taper and SAE Flare connections are also available, on request only.



Threaded Female Connection

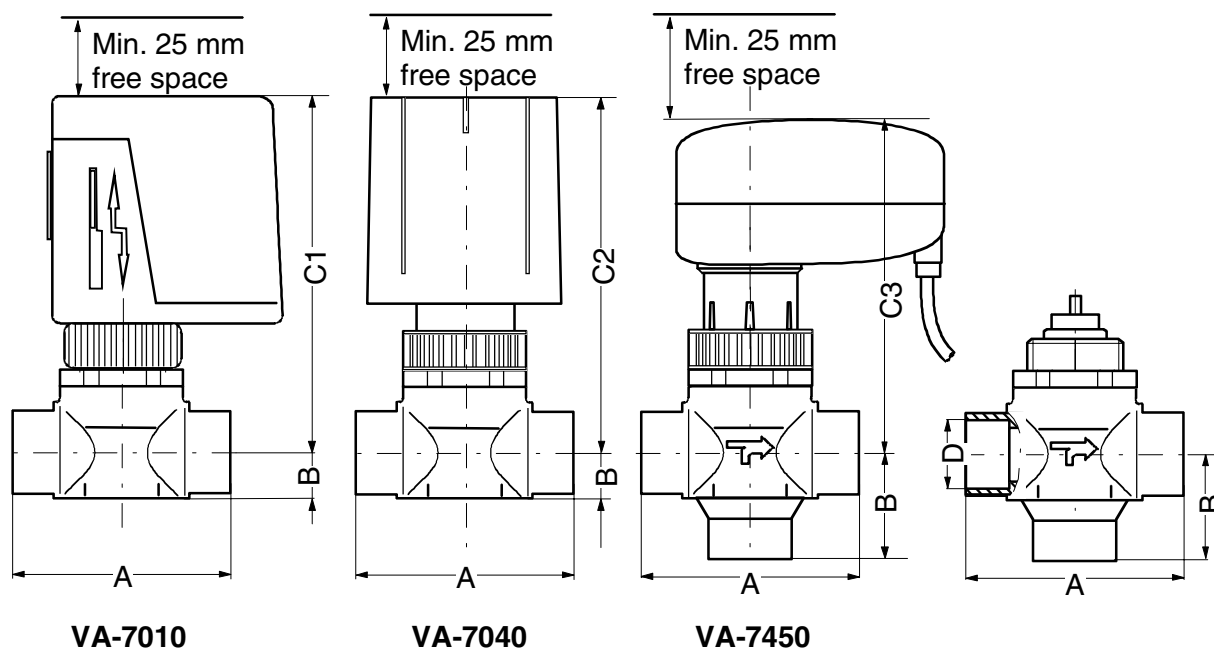
Body Type	Ordering code	Connection Size	Factory Set Kvs and alternative adjustable Kvs			Close-Off Pressure (kPa)	Dimensions (mm)				
			1	2	3		A	B	C1 (VA-7010)	C2 (VA-7040)	C3 (VA-7450)
2-way PDTC (NO)	VG52y0CC	1/2"	1.6	1	<u>0.63</u>	200	55	15	100	99	94
	VG52y0DC	1/2"	1.6	<u>1</u>	0.63	200	55	15	100	99	94
	VG52y0EC	1/2"	<u>1.6</u>	1	0.63	200	55	15	100	99	94
	VG52y0JC	3/4"	<u>2.5</u>	-	-	140	66	19	103	102	97
	VG52y0KC	3/4"	<u>3.5</u>	-	-	100	66	19	103	102	97
	VG52y0MC	1"	<u>5.5</u>	-	-	62	90	24	106	105	100
2-way PDTO (NC)	VG54y0CC	1/2"	1.6	1	<u>0.63</u>	200	55	15	100	99	94
	VG54y0DC	1/2"	1.6	<u>1</u>	0.63	200	55	15	100	99	94
	VG54y0EC	1/2"	<u>1.6</u>	1	0.63	200	55	15	100	99	94
	VG54y0JC	3/4"	3.5	<u>2.5</u>	1.6	100	66	19	103	102	97
	VG54y0KC	3/4"	<u>3.5</u>	2.5	1.6	100	66	19	103	102	97
	VG54y0MC	1"	<u>5.5</u>	4	2.5	62	90	24	106	105	100
3-way Mixing	VG58y0CC	1/2"	<u>0.63</u>			200	55	29	100	99	94
	VG58y0DC	1/2"	<u>1</u>			200	55	29	100	99	94
	VG58y0EC	1/2"	<u>1.6</u>			200	55	29	100	99	94
	VG58y0JC	3/4"	<u>2.5</u>			100	66	33.5	103	102	97
	VG58y0KC	3/4"	<u>3.5</u>			100	66	33.5	103	102	97
	VG58y0MC	1"	<u>5.5</u>			62	90	37.5	106	105	100

Threads

y = 0: BSP parallel

y = 2: BSP taper

y = 4: NPT



Sweat Connection

Body Type	Ordering code	Connection Size	Factory Set Kvs and alternative adjustable Kvs			Close-Off Pressure (kPa)	Dimensions (mm)					
			1	2	3		A	B	C1 (VA-7010)	C2 (VA-7040)	C3 (VA-7450)	D
2-way PDTC (NO)	VG5270CC	½"	1	<u>0.63</u>	0.4	300	61	13	100	99	94	15.98
	VG5270DC	½"	<u>1</u>	0.63	0.4	300	61	13	100	99	94	15.98
	VG5270EC	½"	<u>1.6</u>	1	0.63	200	61	13	100	99	94	15.98
	VG5270JC	¾"	<u>2.5</u>	-	-	140	78	16.5	103	102	97	22.3
	VG5270KC	¾"	<u>3.5</u>	-	-	100	78	16.5	103	102	97	22.3
	VG5270LC	1"	<u>4</u>	-	-	85	95	17	106	105	100	28.7
	VG5270MC	1"	<u>5.5</u>	-	-	62	95	17	106	105	100	28.7
2-way PDTO (NC)	VG5470CC	½"	1.45	1	<u>0.63</u>	200	61	13	100	99	94	15.98
	VG5470DC	½"	1.45	<u>1</u>	0.63	200	61	13	100	99	94	15.98
	VG5470EC	½"	<u>1.45</u>	1	0.63	200	61	13	100	99	94	15.98
	VG5470JC	¾"	3.2	<u>2.5</u>	1.6	100	78	16.5	103	102	97	22.3
	VG5470KC	¾"	<u>3.2</u>	2.5	1.6	100	78	16.5	103	102	97	22.3
	VG5470MC	1"	<u>5</u>	4	2.5	62	95	17	106	105	100	28.7
3-way Mixing	VG5870EC	½"	<u>1.45</u>			200	61	30.5	100	99	94	15.98
	VG5870KC	¾"	<u>3.2</u>			100	78	39	103	102	98	22.3
	VG5870MC	1"	<u>5</u>			62	95	47.5	106	105	100	28.7

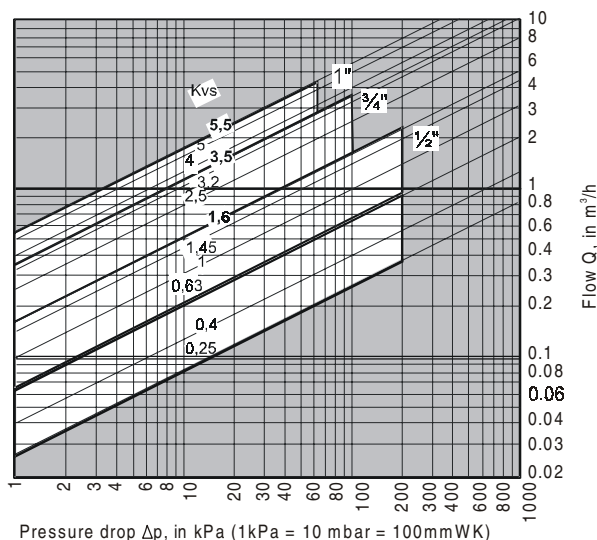
Spare parts

VG5000-1 Packing kit, incl. nut and "O"-ring

The Packing can be replaced without removing water from the piping system.

Valve selection

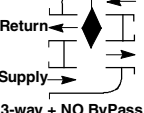
The valve size for water applications can be defined using the diagrams below, where the intersection of the pressure drop over the completely open valve and the flow has to stay within the white area.



Kvs selection diagram in SI units, full seat

Operation

When the stem of the valve is moved down by the actuator against the return spring, it opens the N.C. port or closes the N.O. port of a valve.

Valve Type	Stem movement / flow  = flow  = no flow	
 2-way NO, PDTC *)	 Actuator spindle down	 Actuator spindle up
 2-way NC, PDTO *)	 Actuator spindle down	 Actuator spindle up
 3-way + NO ByPass	 Actuator spindle down	 Actuator spindle up
 3-way, mixing	 Actuator spindle down	 Actuator spindle up

*) PDTC = Push down to close
PDTO = Push down to open

Valve - Actuators combinations

The VG5000 valve series is designed to be used with the VA-7010 series electric on/off, VA-7040 thermal and VA-7450 electronic modulating actuators. The ordering data for these actuators are as follows:

• VA-7010 Series Electric Actuator

VA-7010-810 

Supply voltage

- | | |
|---|---------|
| 1 | 24 VAC |
| 3 | 230 VAC |

• VA-7040 Series Thermal Actuator

VA-7040- 2 

Supply voltage

- | | |
|---|------------------|
| 1 | 24 VAC or 24 VDC |
| 3 | 230 VAC |

• VA-7450 Series Electronic Actuator

VA-7450-1001

3-point actuator, 24 VAC power supply

VA-7452-1001

0..10 VDC input actuator

fixed settings: linear characteristic, direct action, 2-way PDTO (NC) or 3-way NC port

VA-7452-9001

Configurable actuator with voltage input 0..10, 0..5 or 5..10 VDC

See "VA-7450" bulletin for more information.

Mounting instructions

When mounting the VG5000 series valves, please follow the instructions below:

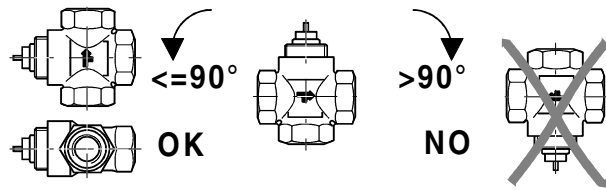
- The valve must be piped for flow in the direction indicated by the arrow on the body, so that the plug will seat against the flow.



WARNING

The water quality should meet VDI 2035 or similar requirements for HVAC applications. Use of the valve with fluids other than specified must be approved by Johnson Controls.

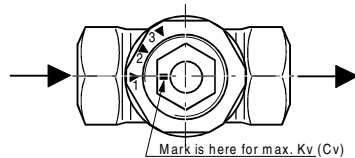
- The valve should be piped using the proper tools.
- The valve with actuator should be mounted within 90° of the vertical position, free of dripping water and easy accessible for the electric connections.



- The actuator should never be used as a lever to move the valve.
- The actuator should always be free of thermal insulation material and there should be left at least 25 mm space above the actuator for mounting and removal purposes as indicated under **Dimensions**.

Adjustments

The Kvs value can be adjusted on some models (see “**Ordering Data**” table) by setting the screw on top of the valve in any of five selection marks.



The Kvs values of the five positions for the different valve sizes are stated in the “**Ordering Data**” table.

Specifications

Models:	VG52xx	VG54xx	VG55xx	VG58xx
Body type:	2-way PDTCT (NO)	2-way PDTCT (NC)	3-way with built-in NO bypass	3-way mixing
Body rating:	PN 16 Nominal, 20 bar (300 psi) maximum rated pressure			
Flow characteristic:	On/Off in combination with VA-7010 actuator series On/Off in combination with VA-7040 actuator series Linear or equal percentage with VA-7450 actuator series			
Medium:	Hot and cold water for HVAC systems meets Quality Standards VDI 2035 or equivalent			
Connection size:	½"	¾"	1"	
Max. pressure drop Δp:	200 kPa	100 kPa	62 kPa	
Kvs and max. closeoff pressure:	See "Ordering Data" table			
Body Connections:	Gas BSP Parallel (ISO 228/1, BS 2779, DIN 259) Compression fittings (EN 1254-2) NPT American Standard Pipe Thread (ANSI B1.20.1) Gas BSP Taper (ISO R7/1, BS 21, DIN 2999) Sweat Female (ANSI B16.18)			
Nominal Stroke:	3 mm			
Connection to actuator:	M28 x 1.5			
Materials:				
body, packing nut, cage	Brass			
stem	AISI 303 Stainless steel			
spring	Stainless steel			
plug	Rubber EPT			
packing	(2) "O" Ring EPT			
Leakage:	max 0,01% of Kvs			
Fluid Temperature Limits	2...95 °C			
Ambient Temperature Limits:	2...50 °C			
Max. weight in g excl. packaging:	½"	¾"	1"	
2-way NO:	280	390	690	
2-way NC:	330	420	670	
3-way mixing:	370	480	790	
3-way + built-in bypass:	500	550	-	

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. are not liable for damages resulting from misapplication or misuse of its products.

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