Product Bulletin VG5000
Issue Date 11 2009

VG5000 Globe Valves Series for Terminal Units

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.

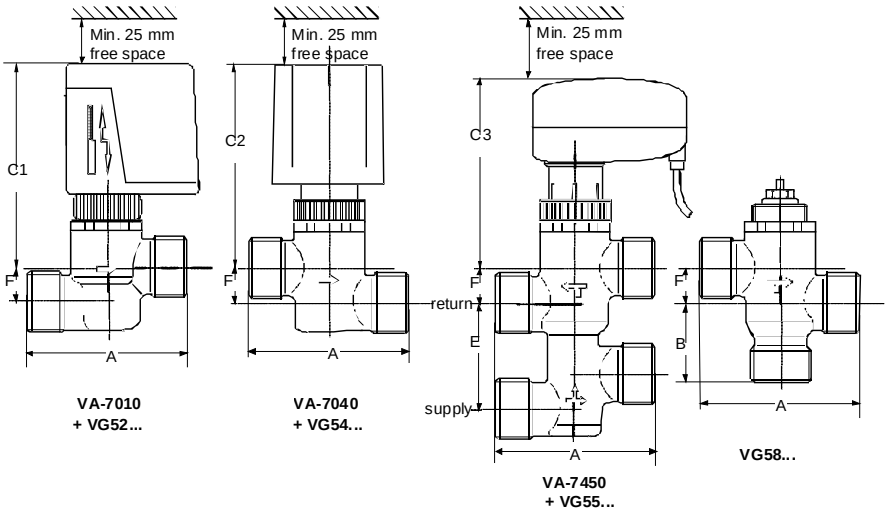
They can be used in combination with VA-7010 Electric ON/OFF Actuator, VA-7040 Thermal Actuators, VA-7450 Floating or Proportional Actuator.

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 with bypass with VA-7450 (left)
VG5000 3-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**	Improves 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 Kv_s 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 Codes



Threaded Male Connection

Ordering Code	Body Type	Body Size	Factory Set Kv_s and alternative adjustable Kv_s			Close-Off Pressure (kPa)	Dimensions *(mm)*						
							A	B	C1 (VA-7010)	C2 (VA-7040)	C3 (VA-745x)	E	F
			1	2	3		z = 1 z = 9	z = 1 z = 9					
VG52z0AC	2-way PDTC (NO)	DN15	0.4	**0.25**	-	200	68	-	96	95	90	-	11
VG52z0BC		DN15	**0.4**	0.25	-	200	68	-	96	95	90	-	11
VG52z0CC		DN15	1	**0.63**	-	200	68	-	96	95	90	-	11
VG52z0DC		DN15	**1**	0.63	-	200	68	-	96	95	90	-	11
VG52z0EC		DN15	**1.6**	-	-	100	72	-	98	97	92	-	13.5
VG52z0JC		DN20	**2.5**	-	-	140	74		98	97	92	-	15
VG52z0KC		DN20	**3.5**	-	-	100	74		98	97	92	-	15
VG54z0AC	2-way PDTO (NC)	DN15	0.4	**0.25**	-	200	68	-	96	95	90	-	11
VG54z0BC		DN15	**0.4**	0.25	-	200	68	-	96	95	90	-	11
VG54z0CC		DN15	1	**0.63**	-	200	68	-	96	95	90	-	11
VG54z0DC		DN15	**1**	0.63	-	200	68	-	96	95	90	-	11
VG54z0EC		DN15	**1.6**	1	0.63	100	72	-	98	97	92	-	13.5
VG5410JC		DN20	3.5	**2.5**	1.6	100	74		98	97	92	-	15
VG5410KC		DN20	**3.5**	2.5	1.6	100	74		98	97	92	-	15
VG58z0AC	3-way Mixing	DN15	**0.25**			200	68	26.5	96	95	90	-	11
VG58z0BC		DN15	**0.4**			200	68	26.5	96	95	90	-	11
VG58z0CC		DN15	**0.63**			200	68	26.5	96	95	90	-	11
VG58z0DC		DN15	**1**			200	68	26.5	96	95	90	-	11
VG58z0EC		DN15	**1.6**			100	72	34.5	98	97	92	-	13.5
VG5810JC		DN20	**2.5**			100	74	36	98	97	92	-	15
VG5810KC		DN20	**3.5**			100	74	36	98	97	92	-	15

Threads

z = 1 BSP parallel

z = 9 Compression fitting (only for Bodies with connection size ½")

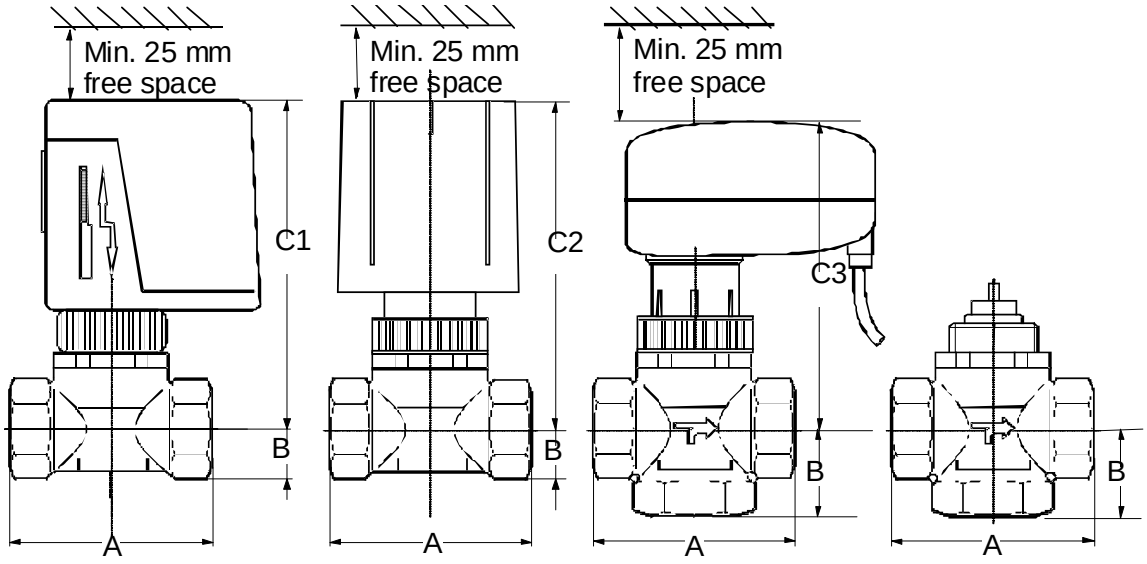
Threaded Male Connection *(continued…)*

Ordering Code	Body Type	Body Size	**Factory Set Kv_s** and alternative adjustable Kv_s	Close-Off Pressure (kPa)	Dimensions *(mm)*						
					A	B	C1 (VA-7010)	C2 (VA-7040)	C3 (VA-745x)	E	F
					z = 1 z = 9	z = 1 z = 9					
VG55z0AC	3-way + built-in NO bypass	DN15	**0.25** (0.25)	200	68	-	96	95	90	40	11
VG55z0PC		DN15	**0.4** (0.25)	200	68	-	96	95	90	40	11
VG55z0BC		DN15	**0.4** (0.4)	200	68	-	96	95	90	40	11
VG55z0QC		DN15	**0.63** (0.4)	200	68	-	96	95	90	40	11
VG55z0CC		DN15	**0.63** (0.63)	200	68	-	96	95	90	40	11
VG55z0RC		DN15	**1** (0.63)	200	68	-	95	95	90	40	11
VG55z0DC		DN15	**1.0** (1.0)	200	68	-	95	95	90	40	11
VG55z0SC		DN15	**1.6** (1.0)	100	72	-	95	95	90	40	13.5
VG55z0EC		DN15	**1.6** (1.6)	100	72	-	95	95	90	40	13.5
VG5510TC		DN20	**2.5** (1.6)	100	74	-	97	97	92	40	15
VG5510JC		DN20	**2.5** (2.5)	100	74	-	97	97	92	40	15
VG5510UC		DN20	**3.0** (2.5)	100	74	-	97	97	92	40	15
VG5510KC		DN20	**3.0** (3.0)	100	74	-	97	97	92	40	15

Threads

z = 1 BSP parallel

z = 9 Compression fitting (only for Bodies with connection size ½")



VA-7010 **VA-7040** **VA-7450**

Threaded Female Connection

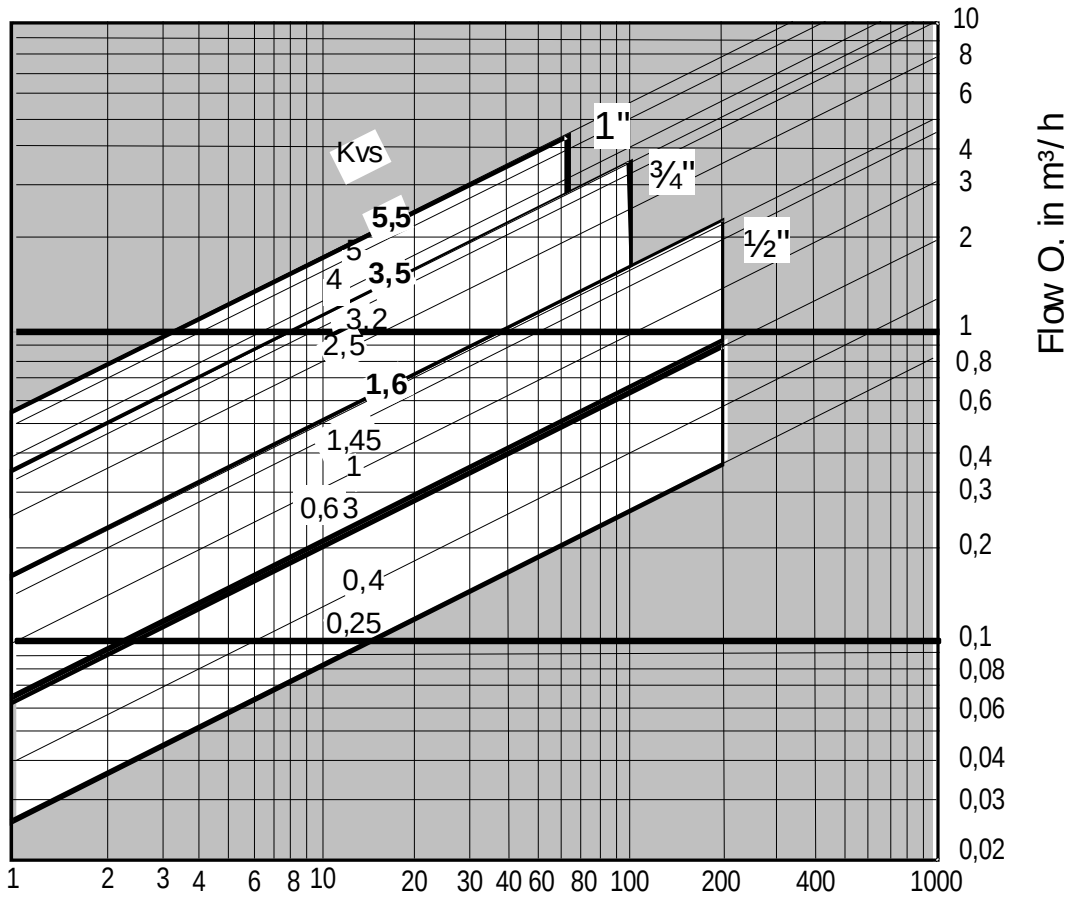
Ordering Code	Body Type	Body Size	Factory Set Kv_s and alternative adjustable Kv_s			Close-Off Pressure (kPa)	Dimensions *(mm)*				
			1	2	3		A	B	C1 (VA-7010)	C2 (VA-7040)	C3 (VA-745x)
VG5200AC	2-way PDTC (NO)	DN15	**0.25**	0.4		200	55	15	100	99	94
VG5200BC		DN15	0.25	**0.4**		200	55	15	100	99	94
VG5200CC		DN15	1.6	1	**0.63**	200	55	15	100	99	94
VG5200DC		DN15	1.6	**1**	0.63	200	55	15	100	99	94
VG5200EC		DN15	**1.6**	1	0.63	200	55	15	100	99	94
VG5200JC		DN20	**2.5**	-	-	140	66	19	103	102	97
VG5200KC		DN20	**3.5**	-	-	100	66	19	103	102	97
VG5200MC		DN25	**5.5**	-	-	62	90	24	106	105	100
VG5400AC	2-way PDTO (NC)	DN15	**0.25**	0.4		200	55	15	100	99	94
VG5400BC		DN15	0.25	**0.4**		200	55	15	100	99	94
VG5400CC		DN15	1.6	1	**0.63**	200	55	15	100	99	94
VG5400DC		DN15	1.6	**1**	0.63	200	55	15	100	99	94
VG5400EC		DN15	**1.6**	1	0.63	200	55	15	100	99	94
VG5400JC		DN20	3.5	**2.5**	1.6	100	66	19	103	102	97
VG5400KC		DN20	**3.5**	2.5	1.6	100	66	19	103	102	97
VG5400MC		DN25	**5.5**	4	2.5	62	90	24	106	105	100
VG5800CC	3-way Mixing	DN15	**0.63**			200	55	29	100	99	94
VG5800DC		DN15	**1**			200	55	29	100	99	94
VG5800EC		DN15	**1.6**			200	55	29	100	99	94
VG5800JC		DN20	**2.5**			100	66	33.5	103	102	97
VG5800KC		DN20	**3.5**			100	66	33.5	103	102	97
VG5800MC		DN25	**5.5**			62	90	37.5	106	105	100

Maintenance and Service

Description	Code Number
Packing Nut with integral o-ring	**VG5000-1**

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.



Kv_s selection diagram in SI units, full seat

Valve - Actuators Combinations

The VG5000 series valves are designed to be used with following actuators:

VA-7010 Series ON/OFF Actuator

Item Code	Supply Voltage
VA-7010-8101	24 VAC
VA-7010-8103	230 VAC

See "VA-7010" Product Bulletin for more information.

VA-7040 Series Thermal Actuator

Item Code	Supply voltage	Action
VA-7040-21	24 VAC or 24 VDC	ON/OFF
VA-7040-23	230 VAC	ON/OFF
VA-7060-21	24 VAC	Proportional

See "VA-704x" and "VA-706x" Product Bulletin for more information.

VA-7450 Series Modulating Actuator

Item Code	Features
VA-7450-1001	• Floating control
VA-7452-1001	• Proportional control • Self-calibrating • 0 to 10 VDC input signal • Direct Acting
VA-7452-9001	• Proportional control • Self-calibrating • Selectable input signals for range splitting (0 to 10, 0 to 5, 5 to 10 VDC). • Selectable action: direct, reverse. • Selectable combined flow characteristic in combination with VG5 series terminal unit valves • Selectable Anti-sticking cycle

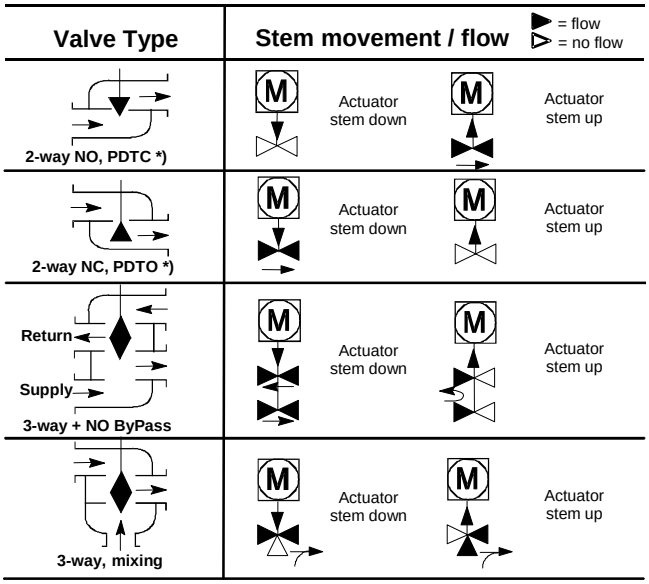
See "VA-7450" Product Bulletin for more information.

Operation

These valves are used for hot or cold water and for water glycol mixtures up to 30%.

Note: These valves are intended to control equipment under normal operating conditions. Where failure or malfunction of the valves could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory systems) intended to warn of or protect against failure or malfunction of the valves must be incorporated into and maintained as part of the control system.

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.



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

Mounting Instructions

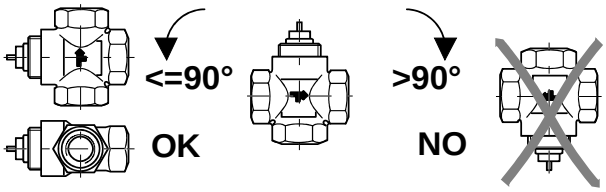
General Guidelines

In addition to general installation instructions, please observe the following points:

- Ensure that valve body and piping are free of impurities.
- Pay attention to position of the valve relative to the flow direction.
- Note arrows on valve body.
- Ensure that threaded connections of valve and piping are tighten.
- Ensure installation without tension and torque.
- Do not use the valve as a step or fixation point. Only piping supports it.
- Protect valve from dust or dirt on construction sites.
- Provide strainer or filter upstream of valve.
- Use compensators to balance thermal expansion of piping.
- Ensure that stem thread and shaft are kept free of paint.

Installation Site Information

The valve installation site should be easily accessible and provide sufficient room for service and removal of actuators. Manual shut-off valves should be located up and downstream of the control valve, to facilitate service and repairs without drainage of the piping system. The control valve should preferably be installed in vertical or horizontal position.



Piping should be insulated to protect actuators against high temperatures. Insulation should leave sufficient room for service of stem packing. To ensure trouble free function of the control valves the pipe immediately upstream of the valve should be straight far the length of at least. 2x DN and the pipe immediately downstream straight far the length at least 6x DN.

Commissioning

Prior to commissioning check information on material, pressure, temperature and flow direction in conjunction with the installation piping system plan. Impurities in the piping system and valves, such as dirt, welding beads etc. will cause the system to leak. Prior to commissioning a new installation or re-commissioning after repairs or service, ensure that:

- Correct installation- and assembly work has been completed.
- Only qualified personnel carry out commissioning.
- Correct functional position of the valve is ascertained.
- Maintenance of existing protective facilities is carried out.
- Using the valve against the flow directions is not recommended because it can lead to noise formation and damage of the valve. If back flushing is indispensable the maximum differential pressure across the valve must not exceed half of the max rated pressure drop *(see "Technical Specifications", page 8).*

Valve Removal

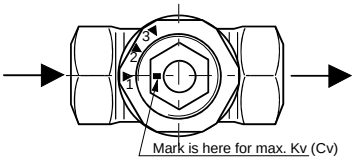
In addition to general guidelines the following points should be observed:

- Pressure free piping system
- Cooled fluid
- Drained piping system
- With corrosive or aggressive fluids, the piping system should be vented.

Work to be performed by qualified personnel only.

Adjustments

The Kv_S value can be adjusted on some models *(see "Ordering Codes" on page 2)* by setting the screw on top of the valve in any of five selection marks.



Technical Specifications

Product	VG5000			
Models	**VG52xx**	**VG54xx**	**VG55xx**	**VG58xx**
Body Type	2-way PDTC (NO)	2-way PDTO (NC)	3-way with built-in NO by-pass	3-way mixing
Body Rating	PN 16 Nominal, maximum rated pressure			
Flow Characteristic	Inherent: Quick Opening with VA-7452-9001 actuators: improved combined flow characteristic for modulating control			
Service	Water, glycol solutions (max 30%) for HVAC applications. Fluid Group 1 according 67/548/EEC. (proper water treatment is recommended, refer to VDI 2035)			

Body Size	**DN15**	**DN20**	**DN25**
Max. Pressure drop Δp	200 kPa	100 kPa	62 kPa

Kv_s and max. close-off pressure	*See "Ordering Code" on page 2*
Body Connections	Gas BSP Parallel (ISO 228/1, BS 2779, DIN 259) Compression fittings (EN 1254-2)
Nominal Stroke	3 mm
Connection to Actuator	M28 x 1.5

Materials	**Body:**		EN12165 CW617 CuZn40Pb2
	Trim:	Centrepiece:	EN12164 CW614 CuZn39Pb3
		Locknut:	EN12164 CW614 CuZn39Pb3
		Packing nut:	EN12164 CW614 CuZn39Pb3
		Packing:	(2) EPT 851 O-ring (Ethylene Propylene Terpolymer)
		Stem:	AISI 303 stainless steel (X10CrNiS1809)
		Spring:	AISI 302 stainless steel (X10CrNi1809)
		Plug:	EPT 7010 Rubber (Ethylene Propylene Terpolymer)

Leakage	Max 0,01% of K_{VS}, Class IV for ANSI FCI 70-2 and EN60534-4 modif. 1
Fluid Temperature Limits	2...95 °C
Ambient Temperature Limits	2...50 °C

Max. weight packaging excluded	**DN15**	**DN20**	**DN25**
2-way NO	280 g	390 g	690 g
2-way NC	330 g	420 g	670 g
3-way mixing	370 g	480 g	790 g
3-way + built-in bypass	500 g	550 g	-

Compliance	PED (Pressure Equipment Directive) 23/97/CE (Paragraph 3, comma 3) CE marking is not applicable.

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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