VG3000

Globe Valves Series for Terminal Units

Product Bulletin

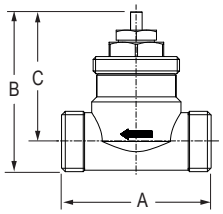
The VG3000 brass valve series is primarily designed to regulate the flow of water in response to the demand of a controller in zone and terminal unit applications and can be used in combination with VA-708x Thermal ON/OFF Actuators, VA-709x Thermal 0...10 V Actuators and VA-748x Electric Terminal Unit Valve Actuators.

The valves are available in 2-way, 3-way mixing and 3-way mixing with built-in bypass configurations.

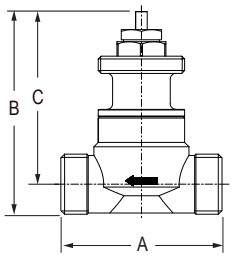
- **2-way PDTC (NO) with 6 bar close off pressure**
  Allow valve operating when high pump head is available
- **Extend range of K_{VS}**
  Wide range of application
- **Forged brass body, stainless steel stem and spring**
  Ensure long life and it is compact
- **Actuator can be field installed after piping**
  Simplifies installation in confined location
- **Commissioning Cap available as accessory**
  Easy commissioning and manual operation without actuator

Johnson Controls

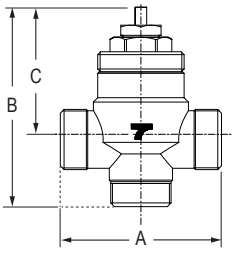
Ordering Codes and Dimensions *(in mm)*



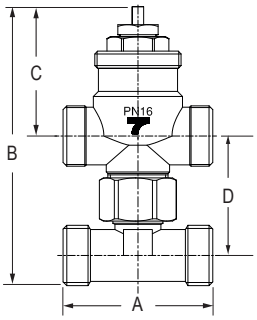
VG3210xx



VG3211xx



VG3310xx

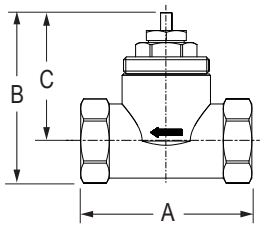


VG3410xx

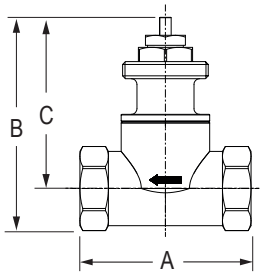
Threaded Male Connection

Ordering Codes	Body Type	Body Size	Connections	K_V Control Port (Cv Control Port)	K_V Bypass Port (Cv Bypass Port)	Close-Off Pressure (kPa)	Dimensions (mm)			
							A	B	C	D
VG3210BS	2-way PDTC (NO)	DN10	G 1/2"	0.4 (0.43)	---	250	52	55	45	---
VG3210CS				0.63 (0.70)						
VG3210DS				1.0 (1.12)						
VG3210ES				1.6 (1.9)						
VG3210FS				2.5 (2.9)			56			
VG3210JS		DN15	G 3/4"	2.5 (2.9)		200		58		
VG3210KS				4.0 (4.7)			66			
VG3210LS		DN20	G 1"	6.3 (7.4)		100	80	61.5	45.5	
VG3211BS	2-way PDTC (NO)	DN10	G 1/2"	0.4 (0.43)	---	600	52	70	60	---
VG3211CS				0.63 (0.70)						
VG3211DS				1.0 (1.12)						
VG3211ES				1.6 (1.9)						
VG3211FS				2.5 (2.9)			56			
VG3211JS		DN15	G 3/4"	2.5 (2.9)				73		
VG3211KS				4.0 (4.7)			66			
VG3211LS		DN20	G 1"	6.3 (7.4)			80	74		
VG3310BS	3-way Mixing	DN10	G 1/2"	0.4 (0.43)	0.25 (0.29)	250	52	66	45	---
VG3310CS				0.63 (0.70)	0.4 (0.43)					
VG3310DS				1.0 (1.12)	0.63 (0.70)					
VG3310ES				1.6 (1.9)	1.0 (1.12)					
VG3310FS				2.5 (2.9)	1.6 (1.9)		56	67	46	
VG3310JS		DN15	G 3/4"	2.5 (2.9)	1.6 (1.9)	200		73		
VG3310KS				4.0 (4.7)	2.5 (2.9)		66	80		
VG3310LS		DN20	G 1"	6.3 (7.4)	4.0 (4.7)	100	80	85		
VG3410BS	3-way with built-in by-pass Mixing	DN10	G 1/2"	0.4 (0.43)	0.25 (0.29)	250	52	95.5	45	40
VG3410CS				0.63 (0.70)	0.4 (0.43)					
VG3410DS				1.0 (1.12)	0.63 (0.70)					
VG3410ES				1.6 (1.9)	1.0 (1.12)					
VG3410FS				2.5 (2.9)	1.6 (1.9)		56	96.5	46	
VG3410JS		DN15	G 3/4"	2.5 (2.9)	1.6 (1.9)	200		98.2		
VG3410KS				4.0 (4.7)	2.5 (2.9)		66	99.2		
VG3410LS		DN20	G 1"	6.3 (7.4)	4.0 (4.7)	100	80	125		72

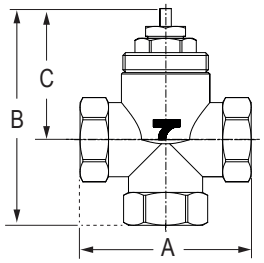
Ordering Codes and Dimensions *(in mm)*



VG3200xx - VG3240xx



VG3201xx - VG3241xx



VG3300xx - VG3340xx

Threaded Female Connection

Ordering Codes	Body Type	Body Size	Connections	K_V Control Port (Cv Control Port)	K_V Bypass Port (Cv Bypass Port)	Close-Off Pressure (kPa)	Dimensions (mm)		
							A	B	C
VG3200FS	2-way PDTC (NO)	DN15	G 1/2"	2.5 (2.9)	---	250	60	58	45
VG3200KS		DN20	G 3/4"	4.0 (4.7)	---	200	65	60	45
VG3200LS		DN25	G 1"	6.3 (7.4)	---	100	80	64	45.5
VG3201FS	2-way PDTC (NO)	DN15	G 1/2"	2.5 (2.9)	---	600	60	73	60
VG3201KS		DN20	G 3/4"	4.0 (4.7)	---	600	65	75	60
VG3201LS		DN25	G 1"	6.3 (7.4)	---	600	80	77	58
VG3300FS	3-way Mixing	DN15	G 1/2"	2.5 (2.9)	1.6 (1.9)	250	60	76	46
VG3300KS		DN20	G 3/4"	4.0 (4.7)	2.5 (2.9)	200	65	80	46
VG3300LS		DN25	G 1"	6.3 (7.4)	4.0 (4.7)	150	80	85.5	46
VG3240FS	2-way PDTC (NO)	DN15	NPT 1/2"	2.5 (2.9)	---	250	60	58	45
VG3240KS		DN20	NPT 3/4"	4.0 (4.7)	---	200	65	60	45
VG3240LS		DN25	NPT 1"	6.3 (7.4)	---	100	80	64	45.5
VG3241FS	2-way PDTC (NO)	DN15	NPT 1/2"	2.5 (2.9)	---	600	60	73	60
VG3241KS		DN20	NPT 3/4"	4.0 (4.7)	---	600	65	75	60
VG3241LS		DN25	NPT 1"	6.3 (7.4)	---	600	80	77	58
VG3340FS	3-way Mixing	DN15	NPT 1/2"	2.5 (2.9)	1.6 (1.9)	250	60	76	46
VG3340KS		DN20	NPT 3/4"	4.0 (4.7)	2.5 (2.9)	200	65	80	46
VG3340LS		DN25	NPT 1"	6.3 (7.4)	4.0 (4.7)	100	80	85.5	46

Accessory *(order separately)*

Accessory Code	Description
VG3000-CAP	Plastic commitioning cap

Valve - Actuators Combinations

The VG3000 series valves are designed to be used with following actuators:

VA-708x Thermal ON/OFF Actuators

Item Codes	Action	Supply voltage
VA-7087-21	**Direct Acting** (stem extends when actuator is energized)	24 VAC
VA-7088-21	**Reverse Acting** (stem retracts when actuator is energized)	
VA-7087-23	**Direct Acting** (stem extends when actuator is energized)	230 VAC
VA-7088-23	**Reverse Acting** (stem retracts when actuator is energized)	

VA-709x Thermal 0...10 V Actuators

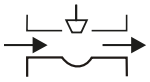
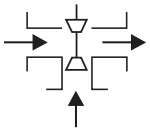
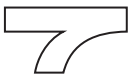
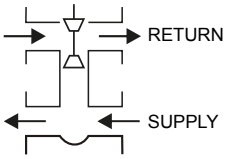
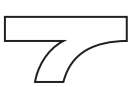
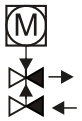
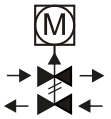
Item Codes	Action	Supply voltage
VA-7097-21	**Normally Open** (stem extends when actuator is energized)	24 VAC
VA-7098-21	**Normally Close** (stem retracts when actuator is energized)	

VA-748x Electric Actuators

Item Codes	Control Type	Supply voltage
VA-7480-0001	**Floating**	24 VAC
VA-7481-0001		
VA-7480-0003		230 VAC
VA-7481-0003		
VA-7482-2001	**Proportional Direct Acting** (stem extends when increased input signal)	24 VAC / DC
VA-7482-8xxx	**Autostroke Proportional Direct Acting** (stem extends when increased input signal)	24 VAC / DC

See "VA-708x Thermal ON/OFF Actuators", "VA-709x Thermal 0...10 V Actuators" and "VA-748x Electric Terminal Unit Valve Actuator" Product Bulletins for more information.

Operation

Valve Type	Stem Movement / Flow ▶ = flow ▷ = no flow	
	Actuator Stem down	Actuator Stem up
 2-Way PDTC (NO)		
 3-Way MIXING 		
 3-Way + bypass 		

Operation

These valves are used for hot or cold water and for water glycol mixtures up to 50%.

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.

Mounting Instructions

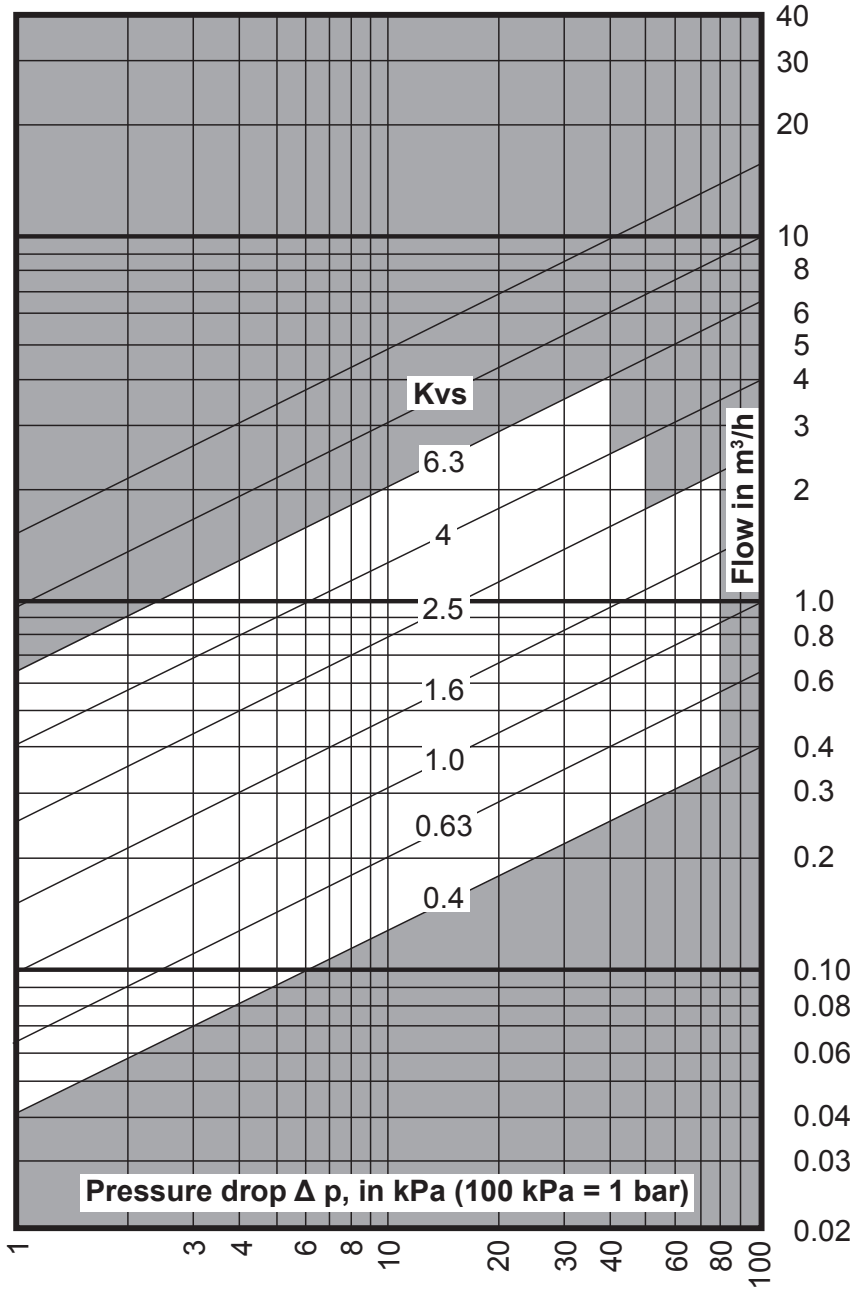
General Guidelines

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 flow symbols 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.

Valve Selection

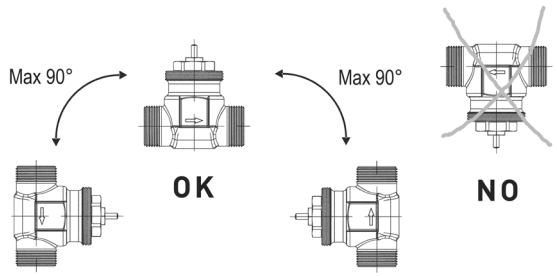
The valve size for water applications can be defined using the diagram below, where the intersection of the pressure drop across the valve and the flow must be within the white area.



K_{VS} selection diagram

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.

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.

Technical Specifications VG3000

Threaded Male Connection

Models	VG3210xx	VG3211xx	VG3310xx	VG3410xx
Body Type	2-way PDTC (NO)	2-way PDTC (NO)	3-way mixing	3-way mixing with built-in by-pass
Body Rating	PN16 Nominal, maximum rated pressure			
Inherent Flow Characteristic	Linear			
Service	Water, glycol solutions (max 50%) for HVAC applications. Fluid Group 1 according 67/548/EEC. (proper water treatment is recommended, refer to VDI 2035)			
Body Size	DN10 DN15 DN20			
Max Pressure drop Δp				
DN10	70 kPa	80 kPa	70 kPa	70 kPa
DN15	50 kPa	60 kPa	50 kPa	50 kPa
DN20	40 kPa	50 kPa	40 kPa	40 kPa
Kv_s and max. close-off pressure	*See "Ordering Code and Dimensions" on page 2*			
Body Connection	Gas (ISO 228/1)			
Nominal Stroke	4.0 mm			
Connection to Actuator	M30 x 1.5			
Materials				
Body:	EN12165 CW617 Brass CuZn40Pb2			
Trim:	Stem: AISI 303 stainless steel (X10CrNiS1809) Spring: AISI 302 stainless steel (X10CrNi1809) Plug: EPDM			
Leakage	Max 0,01% of K_{VS}, Class IV for ANSI FCI 70-2 and EN60534-4 modif. 1			
Fluid Temperature Limits	2...110 °C			
Ambient Temperature Limits	2...50 °C			
Max weight packaging excluded	**2-way NO**	**2-way NO**	**3-way mixing**	**3 way mixing + built-in bypass**
DN10	200 g	215 g	200 g	350 g
DN15	200 g	215 g	250 g	400 g
DN20	500 g	515 g	550 g	800 g
Compliance	Johnson Controls, Inc., declares that these products are in compliance with the essential requirements and other relevant provisions of the PED (Pressure Equipment Directive) 2014/68/UE (Paragraph 4, comma 3). CE marking is not applicable. ROHS (95/2002/CE)			

Technical Specifications VG3000

Threaded Female Connection

Models	**VG3200xx** **VG3240xx**	**VG3201xx** **VG3241xx**	**VG3300xx** **VG3340xx**
Body Type	2-way PDTC (NO)	2-way PDTC (NO)	3-way mixing
Body Rating	PN16 Nominal, maximum rated pressure		
Inherent Flow Characteristic	Linear		
Service	Water, glycol solutions (max 50%) 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			
DN15	70 kPa	80 kPa	70 kPa
DN20	50 kPa	60 kPa	50 kPa
DN25	40 kPa	50 kPa	40 kPa
Kv_s and max. close-off pressure	*See "Ordering Code and Dimensions" on page 3*		
Body Connection	Gas (ISO 228/1) and NPT		
Nominal Stroke	4.0 mm		
Connection to Actuator	M30 x 1.5		
Materials			
Body	EN12165 CW617 Brass CuZn40Pb2		
Trim	Stem: AISI 303 stainless steel (X10CrNiS1809) Spring: AISI 302 stainless steel (X10CrNi1809) Plug: EPDM		
Leakage	Max 0,01% of K_{VS}, Class IV for ANSI FCI 70-2 and EN60534-4 modif. 1		
Fluid Temperature Limits	2...110 °C		
Ambient Temperature Limits	2...50 °C		
Max weight packaging excluded	**2-way NO**	**2-way NO**	**3-way mixing**
DN15	279 g	318 g	273 g
DN20	383 g	428 g	383 g
DN25	509 g	539 g	509 g
Compliance	Johnson Controls plc declares that these products are in compliance with the essential requirements and other relevant provisions of the PED (Pressure Equipment Directive) 2014/68/UE (Paragraph 4, comma 3). CE marking is not applicable. ROHS (95/2002/CE)		