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VG7000 Female Threaded Bronze Valve Series with Pneumatic Actuators

Product Bulletin

PB_VG7000 Pneumatic
Issue Date 09 2008

The VG7000 Series pneumatically operated cast bronze valves with female threaded fittings are designed primarily to regulate the flow of water and steam in response to the demand of a controller, in heating, ventilating and air conditioning systems. These valves are available in two-way PDTC, two-way PDTO and three-way mixing configurations.

For electrically operated valves see Product Bulletin "VG7000 Female Threaded Bronze Valve Series with Electric Actuators".



VG7000 three-way valve with V-3801 (left), V-400 (with positioner) & V-3000 (with positioner) pneumatic actuators

Features and Benefits

Features	Benefits
DN 15 through DN 50 bronze valves, in two-way PDTC, PDTO and three-way mixing configurations	Covers all common HVAC applications
Wide range of electric actuators available for all valves	Allows choice of best suited and most cost-effective actuator
Every valve tested for tight shutoff	Provides maximum energy efficiency and ensures occupant comfort
Uses Standard Johnson Controls U-cup Packing	Provides reliability and durability
Flexible features-and-options ordering template	Easy to select the right valve combination for your specific application
Standard Bonnet and stem design	Allows on-site installation and servicing, and interchange-ability of actuators

Ordering Data

Ordering codes for valve bodies

VG7



Stem Type

T	Standard threaded stem
S	Slotted stem and small bonnet (for VA-7310 actuators only)

Size/kvs

A	DN 15 / 0.25	N	DN 25 / 10
B	DN 15 / 0.4	P	DN 32/16
C	DN 15 / 0.63	R	DN 40/25
D	DN 15 / 1.0	S	DN 50/40
E	DN 15 / 1.6		
F	DN 15 / 2.5		
G	DN 15 / 4.0		
L	DN 20 / 6.3		

Model

1	2-way, brass trim, Equal %
2	3-way mixing, brass trim, linear in both ports
3	2-way, stainless steel trim, Equal %
4	3-way mixing, stainless steel trim, linear in both ports

End Connection

0	BSP Parallel Threaded
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Body Type

2	2-way PDTC (Normally Open)
4	2-way PDT0 (Normally Closed)
8	Mixing

Ordering factory fitted pneumatic actuator

VG7xxxxx+



Option

P	Factory fitted positioner (not available on V-3801 actuators)
-	None

Spring range

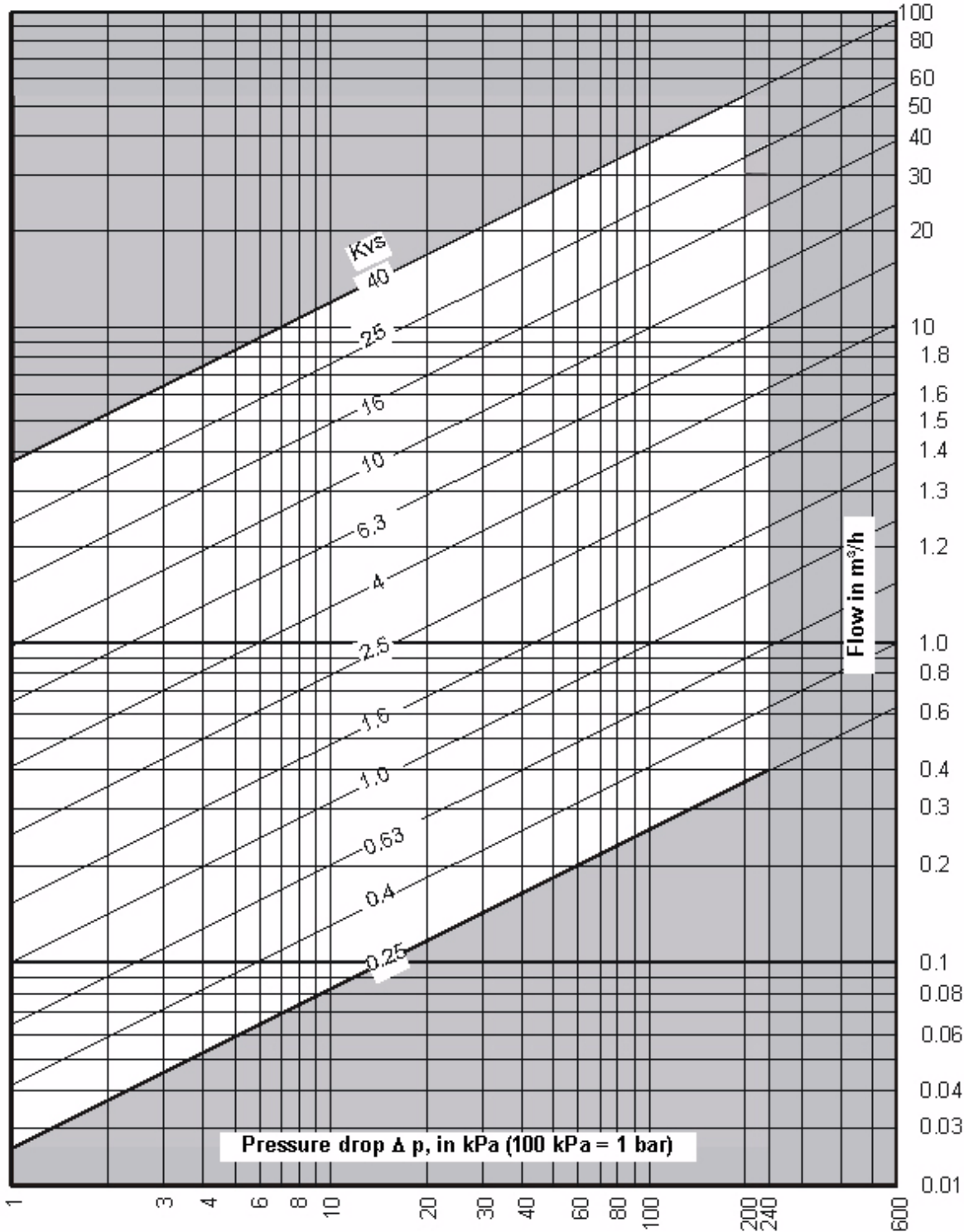
B	21 - 42 KPa recommended for PDTC (N.O.) valves
E	63 - 91 Kpa recommended for PDT0 (N:C.) valves

Actuator Type

3801	V-3801-8001 series requires stem type "S"
3008	V-3000-8001 series requires stem type "T"
V400	V-400-80nn series requires stem type "T"

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.



Kvs selection diagram for DN 15...50 valves

Operation

Valve function	Stem Position	
2-way PDTC 	Actuator extends stem 	Actuator retracts stem
2-way PDTO 	Actuator extends stem 	Actuator retracts stem
3-way mixing Inlet 1 Inlet 2 Outlet 	Actuator extends stem 	Actuator retracts stem

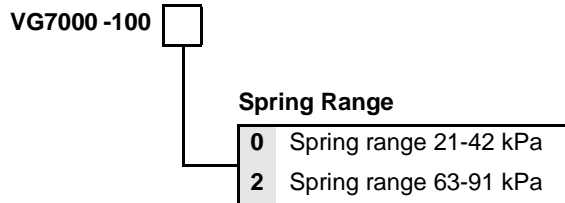
L = Linear **E** = Equal percent
▶ = Open **◀** = Closed

Valve actuator combinations

V-3801 Direct acting actuator

For on-site installation the actuator must be ordered with the mounting kit.

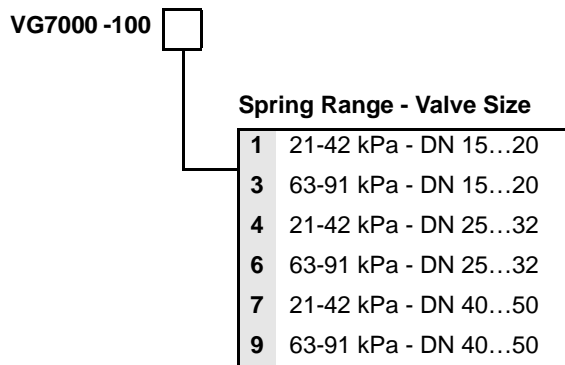
V-3801-8001	pneumatic actuators (without spring)
VG7000-101x	mounting kit for pneumatic actuator (upper spring seat, spring, stem extension set screw)



V-3000 Direct acting actuator

For on-site installation the actuator must be ordered with the mounting kit.

V-3000-8001	pneumatic actuators (without spring)
VG7000-100x	mounting kit for pneumatic actuator (upper spring seat, spring, stem extension set screw)



For fitting the positioner in-situ, the positioner mounting kit and the position springs must be ordered.

V-9502-8033 Direct acting pneumatic actuator

Pneumatic positioner with mounting kit for V-3000 pneumatic actuators.

V-9502-680	Positioner Springs	
	Spring Range - Valve Size	
	1	44 kPa - DN 15...20 73 kPa - DN 25...32 145 kPa - DN 40...50
	2	116 kPa - DN 15...20 174 kPa - DN 25...32
	3	58 kPa - DN 40...50

V-400 Direct acting actuator

For on-site installation the actuator must be ordered with the mounting kit.

V-400-80xx	pneumatic actuators (complete with spring)
VG7000-101x	mounting kit for pneumatic actuator

V-400-80	Spring Range - Valve Size	
	01	21-42 kPa - DN 15...20
	02	63-91 kPa - DN 15...20
	05	21-42 kPa - DN 25...32
	06	63-91 kPa - DN 25...32
	07	21-42 kPa - DN 40...50
	08	63-91 kPa - DN 40...50

VG7000-101	Body Size	
	3	DN 15 + DN 20
	02	DN 25 + DN 50

For on-site installation the actuator must be ordered with the mounting kit.

V-9502-8043

Pneumatic positioner mounting kit for V-400 direct acting pneumatic actuators.

V-9502-810	Positioner Springs		
		Span	Size
	0	21-90 kPa	DN 15/20
	2	21-90 kPa	DN 25/32
	6	21-90 kPa	DN 40/50

Applications

Maximum close-off pressures (in kPa), for valves with brass trim

Actuator	Valves		2-Way PDTC or 3-Way valves with 138 kPa air supply		2-Way PDTO or 3-Way valves with 0 kPa air supply	
	DN	k _{vs}	21 to 42 Spring Range kPa*	63 to 91 Spring Range kPa*	21 to 42 Spring Range kPa*	63 to 91 Spring Range kPa*
V-3801	15	0.25 0.4	1600	1600	580	1600
	15	0.63 1.0 1.6	1180	530	165	715
	15	2.5 4.0	670	300	90	405
	20	6.3	430	190	55	255
V-3000	15	0.25 0.4	1600	1600	1430	1600
	15	0.63 1.0 1.6	1600	1100	405	1450
	15	2.5 4.0	1310	620	230	820
	20	6.3	835	390	145	525
	25	10	520	240	85	315
	32	16	320	145	50	195
	40	25	200	95	35	125
	50	40	130	60	20	85
V-400-80nn	25	10	1600	985	400	1275
	32	16	1220	600	240	780
	40	25	785	385	160	495
	50	40	500	250	95	315

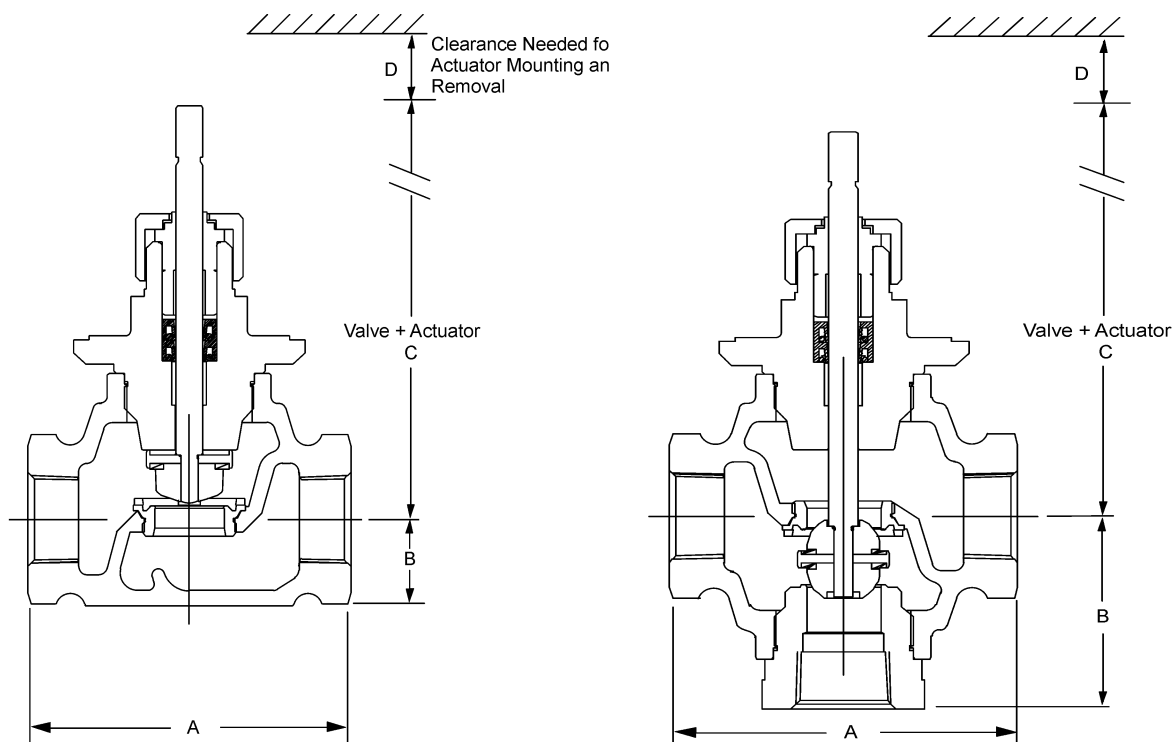
Note: *The recommended spring ranges for use with a V-9502 Positioner are: 21 to 42 kPa for PDTC valves, 63 to 91 kPa for PDTO valves and 63 to 91 kPa for three way valves.

Maximum close-off pressures (in kPa), for valves with stainless steel trim

Actuator	Valves		2-Way PDTC or 3-Way valves with 138 kPa air supply		2-Way PDTO or 3-Way valves with 0 kPa air supply	
	DN	k _{vs}	21 to 42 Spring Range kPa*	63 to 91 Spring Range kPa*	21 to 42 Spring Range kPa*	63 to 91 Spring Range kPa*
V-3000	15	0.25 0.4	1600	1600	1090	1600
	15	0.63 1.0 1.6	1600	825	300	1085
	15	2.5 4.0	980	470	170	615
	20	6.3	630	295	110	395
	25	10	385	180	60	240
	32	16	240	110	35	145
V-400	15	0.25 0.4	1600	1600	1600	1600
	15	0.63 1.0 1.6	1600	1600	1345	1600
	15	2.5 4.0	1600	1600	760	1600
	20	6.3	1600	1175	485	1520
	25	10	1510	740	295	960
	32	16	925	450	185	585
	40	25	595	290	115	370
	50	40	380	185	75	240

Note: *The recommended spring ranges for use with a V-9502 Positioner are: 21 to 42 kPa for PDTC valves, 63 to 91 kPa for PDTO valves and 63 to 91 kPa for three way valves.

Dimensions - Valve Body



Valve body dimensions (in mm)

Valve Size	A		B		
	2-way PDTC		2-way PDTO	Mixing	
DN 15	75	21	39	46	
DN 20	80	24	41	54	
DN 25	105	29	44	65	
DN 32	120	34	51	70	
DN 40	130	55	70	85	
DN 50	150	53	72	95	

Actuator dimensions (in mm), as mounted on valves with brass trim

Actuator	C						D
	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	
V-3000-8001	120	120	145	149	161	172	90
V-3801-8001	102	102	--	--	--	--	60
V-400	--	--	321	323	337	348	90

Actuator dimensions (in mm), as mounted on valves with stainless steel trim

Actuator	C						D
	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	
V-3000-8001	138	145	165	175	--	--	90
V-400-80nn	330	335	340	350	355	360	90

Valve weight (Kg)

Trim	Valve Size	2-way PDTC	2-way PDO	Mixing
Brass	DN 15	0.8	0.9	1.0
	DN 20	1.0	1.2	1.3
	DN 25	1.8	2.2	2.4
	DN 32	2.5	2.8	3.1
	DN 40	3.6	4.2	4.6
	DN 50	5.6	6.1	7.1
Stainless Steel	DN 15	0.9	1.1	1.1
	DN 20	1.2	1.4	1.5
	DN 25	2.1	2.4	2.6
	DN 32	2.9	3.4	3.7
	DN 40	3.8	4.2	5.0
	DN 50	5.8	6.4	7.3

VG Spare Parts

Description	Code Number
U-cup packing kits for valves with brass trim:	
Single pack for DN 15 or DN 20 Valves	VG7000-6001
Single pack for DN 25 through DN 50 Valves	VG7000-6002
PTFE V-ring packing kits for valves with stainless steel trim:	
Single Pack for DN 15 or DN 20 Valves	VG7000-6011
Single Pack for DN 25 through DN 50 Valves	VG7000-6012

Technical Specifications

Product	VG7000		
Models	Two-way PDTC (NO), two-way PDTO (NC) and three-way mixing		
Service	Water, glycol solutions (max 30%) or steam for HVAC applications. Fluid Group 1 according 67/548/EEC - (proper water treatment is recommended, refer to VDI 2035)		
Valve Body Size	DN: DN15, DN20, DN25, DN32, DN40, DN50		
	K_{vs}: 0.25, 0.4, 0.63, 1.0, 1.6, 2.5, 4.0, 6.3, 10, 16, 25 and 40		
Body Thread	BSP Parallel (Gas Parallel) (DIN 259, ISO 228/1, BS 2779)		
Valve Stroke	8 mm for DN15 and DN20 -13 mm for DN25 and DN32 - 19 mm for DN40 and DN50		
Valve Body Rating	Meets Requirements of ANSI B16.15, Class 250 and PN 16 (EN 12360)		
Leakage			
	Brass Trim	0.01% of Maximum Flow per EN60534-4, Class IV	
	Stainless Steel Trim	0.05% of Maximum Flow	
Inherent Flow Characteristics			
	Equal Percentage	2-way Valves	
	Linear	3-Way Valves in compliance with IEC 534	
Rangeability	25:1 at 0.25...1 kvs and 100:1 at 1.6...40 kvs In accordance with EN 60534-2-4		
Maximum Recommended Operating Pressure Drop	240 kPa for DN15 and DN32 - 200 kPa for DN40 to DN50		
Material Body	Cast Bronze		
Material Bonnet	Brass		
Materials Stainless Steel Trim Valves			
	Stem	Stainless Steel X5CrNiMo1712	
	Plug	X10CrNiS1809	
	Seat	Brass on Molded Elastomeric Disc	
	Packing	Self-adjusting EPR (Ethylene Propylene Rubber) Ring Pack U-cups	
Materials Brass Trim Valves			
	Stem	Stainless Steel	
	Plug	Brass	
	Seat	Brass on Molded Elastomeric Disc	
	Packing	Self-adjusting EPR (Ethylene Propylene Rubber) Ring Pack U-cups	
Fluid Temperature Limits			
	Brass Trim	With V-3801 & V-3000	2 °C to 120 °C water
		With V-400	2 °C to 140 °C water
		100 kPa Saturated Steam	
	Stainless Steel Trim	2 to 170 °C	
		690 kPa Saturated Steam	
Ambient Temperature Limits	2 to 65°C		
Compliance	DN15...DN25: PED (Pressure Equipment Directive) 97/23/EC (Paragraph 3, 3). CE marking is not applicable. DN32...DN50: PED (Pressure Equipment Directive) 97/23/EC (Category 1, mod. A). Subject to CE marking.		

The performance specifications are nominal and conform to acceptable industry standard. 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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