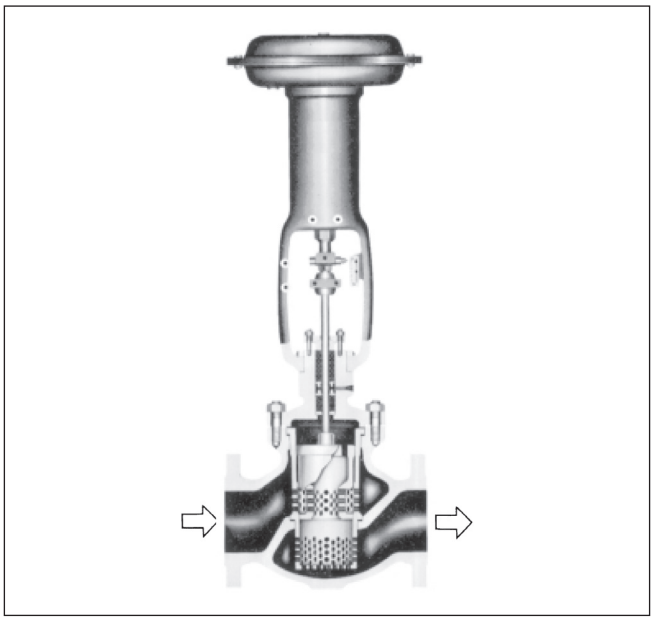
Low-Noise Cage Type Double-Seated Control Valves (Rating : ANSI 600 or less)

Model VDN_ _ _

OVERVIEW

The low-noise cage type double seated control valves are featured with very low operating noise (aerodynamic noise) when they are used to handle compressible fluids (such as stem, air, natural gas, ethylene gas). These valves operate still more silently than model VDC cage type valves.
The cage and valve plug are of a multiple-hole construction. The components for "restriction", "divergence" and "expansion" are laid out in a rational manner to accomplish low-noise pressure reducing action.
The valve plug is designed in such configuration that it produces no torque vibration. Further, overall plug is held directly inside the case so that it is resistant against vibration and wear. The valve body can be easily disassembled and reassembled. The trims can be inspected and replaced very rapidly. Components are interchangeable with those of the model VDC cage type valves.



SPECIFICATIONS

Body

Type

Straight-through, cast glove valve

Nominal size

10, 12 inches

Pressure Rating and End connections

Flange end ;

Connection type	Pressure rating	Applicable standard
FF	JIS10K	JIS B2212-1972
	ANSI Class 150	ANSI B16.5-1968
	JPI Class 150	JPI-7S-15-1993
RF	JIS10K	JIS B2212-1972
	JIS16K	JIS B2213-1967
	JIS20K	JIS B2214-1967
	JIS30K	JIS B2215-1967
	JIS40K	JIS B2216-1967
	ANSI Class 150, 300, 600	ANSI B16.5-1968
	JPI Class 150, 300, 600	JPI-7S-15-1993
RJ	ANSI Class 150, 300, 600	ANSI B16.5-1968
	JPI Class 150, 300, 600	JPI-7S-15-1993

Bonnet

- Plain bonnet (0 to 200°C)
- Radiator finned bonnet (over 200°C)
- Extension bonnet (0°C or less)

Gland type

Bolted gland

Packing/Grease

- Grease not provided
  When V shaped PTFE packing or PTFE yarn packing is used.
- Grease provided
  When graphite packing is used.

Note) PTFE: Polytetrafluoroethylene

Trim

Valve plug

Pressure balanced type

Cage (stuck, or split cage)

Multiple orifice design
Metal seat
Linear (LV)

Note) For cage design (stuck, or split cage), refer to Table 1.

Material:

For body/trim material combinations and operating temperature ranges, refer to Table 1.

Actuator

Type

Actuator type	Actuator model
Single acting diaphragm actuator	VA5_
Spring type piston actuator	PSA6R
Double acting piston actuator	DAP_ _ _

Action

Actuator model	Actuator action
VA5_, DAP_ _ _	Direct or reverse action
PSA6R	Reverse action

Diaphragm

Actuator model	Diaphragm material
VA5_	Cloth-embedded chloroprene rubber

Spring range

Actuator model	Spring range
VA5_	20 to 98 kPa {0.2 to 1.0 kgf/cm^2} 40 to 120 kPA {0.4 to 1.2 kgf/cm^2}
PSA6R	200 to 390 kPa {2.0 to 4.0 kgf/cm^2}}

Supply pressure

Actuator model	Supply pressure
VA5_	270 kPa{2.8 kgf/cm^2}
PSA6R	500 kPa{5.0 kgf/cm^2}
DAP1000	490 kPa {5.0 kgf/cm^2}

Air connection

Actuator model	Connection
VA5_ DAP1000	• Rc1/4 or 1/4NPT internal thread • Rc3/8 or 3/8NPT internal thread • Rc1/2 internal thread
PSA6R	• Rc1/4 or 1/4NPT internal thread • Rc3/8 or 3/8NPT internal thread • Rc1/2 or 1/2NPT internal thread

Ambient temperature

-30 to +70°C

Valve action

Air-to-close (Direct action actuator is combined)
Air-to-open (Reverse action actuator is combined)

Optional accessories

Positioner, pressure regulator with filter, hand wheel, limit switch, solenoid valve, motion transmitter, booster relay, lock-up valve, and others.

Actuator model	Positioner		Hand wheel	
	P/P	I/P	Top	Side
VA5_	HTP- _ _	AVP2 _ _ AVP3 _ _ AVP7 _ _	Mounted	Mounted
PSA6R	HTP- _ _		—	
DAP_ _ _	VPP_ _-_			Mounted (Hydraulic)

Performance

Rated Cv value

Refer to Table 2.

Inherent rangeability

25:1

Allowable differential pressure

Refer to Table 3 and Table 4.

Leakage specification

Refer to Table 2.

Hysteresis error

Without positioner: Within 3% F.S.
With positioner: Within 1% F.S.

Linearity

Without positioner: Within ±5% F.S.
With positioner: Within ±1% F.S.

Dimensions

Refer to Table 5 and Table 6.

Weight

Refer to Table 7.

Finish

Blue (Munsell 10B5/10) or silver, or other specified colors.

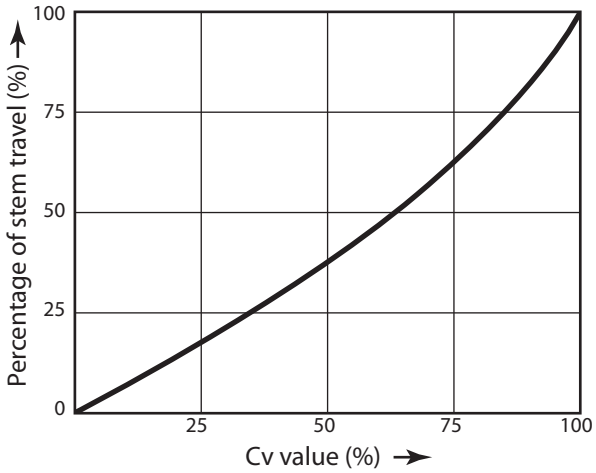


Figure 1. Flow characteristics
(Idealistic flow characteristics is indicated in this graph)

Table 1. Body / trim material combination, operating temperature ranges, and cage design (°C)

Body material	Plug Cage material	Plug Cage type (inches)	Operating temperature (°C)
Carbon steel (SCPH2)	Stainless steel (SCS24)	Stack cage (10, 12)	-5 to +425
Low alloy steel (SCPH21, 61)	Stainless steel (SCS24)	Stack cage (10, 12)	-5 to +425
	Stainless steel (SCS14 hardfacing)	Split cage (10, 12)	426 to 500
Stainless steel (SCS13)	Stainless steel (SCS14)	Stack cage (10, 12)	-195 to +200
	Stainless steel (SCS 14 hardfacing or CoCr-A faced seat)	Split cage (10, 12)	-195 to +200 201 to 600 (500°C when Atomlloy)
Stainless steel (SCS14)	Stainless steel (SCS14)	Stack cage (10, 12)	-195 to +200
	Stainless steel (SCS14 hardfacing)	Split cage (10, 12)	-195 to +200 201 to 600

Table 2. Cv value and rated travel

Nominal size (inches)	10	12
Port size (inches)	10	12
Rated Cv value	600	860
Rated travel (mm)	100	100
Leakage at fully closure (Cv value)	≤ 5.0	≤ 7.5

Allowable differential pressure

Table 3. Air-to-close

Actuator model no.	Supply pressure kPa{kgf/cm²}	Spring range kPa{kgf/cm²}	Positioner	Differential pressure kPa {kgf/cm²}	
				Port size	
				10	12
VA5D	270 {2.8}	40 to 200 {0.4 to 2.0}	✓	1470 {15.0}	120 {13.0}
				2940 {30.0}	2540 {26.0}
DAP1000	490 {5.0}	-	✓	1960 {20.0}	
				3920 {40.0}	

Note) 1. " ▭ " shows a model with standard actuator.

2. The upper figures denote the operating differential pressure. The lower denote allowable differential pressure at full closure.

3. ✓: Positioner is necessary. × : Positioner is not necessary.

Table 4. Air-to-close

Actuator model no.	Supply pressure kPa{kgf/cm²}	Spring range kPa{kgf/cm²}	Positioner	Differential pressure kPa {kgf/cm²}	
				Port size	
				10	12
VA5R	270 {2.8}	80 to 240 {0.8 to 2.4}	✓	1960 {20.0}	1765 {18.0}
				3920 {40.0}	3530 {36.0}
PSA6R	500 {5.0}	200 to 390 {0.2 to 4.0}	✓	——	1960 {20.0}
					3920 {40.0}

Note) 1. " ▭ " shows a model with standard actuator.

2. The upper figures denote the operating differential pressure. The lower denote allowable differential pressure at full closure.

3. ✓: Positioner is necessary.

DIMENSIONS

Table 5. Face-to-face dimensions

[Unit: mm]

Nominal size (inches)	A					
	JIS 10K FF, RF ANSI 150 RF	JIS 16K, 20K, 30K ANSI 300 RF	JIS 40K RF ANSI 600 RF	ANSI 150 RJ	ANSI 300 RJ	ANSI 600 RJ
10	673	708	752	686	724	756
12	737	775	819	749	791	822

Table 6. External dimensions

[Unit: mm]

Nominal size (inches)	Actuator model no	B				ϕ C
		Direct action (Air-to-close)		Reverse action (Air-to-open)		
		Plain bonnet	Radiator finned bonnet	Plain bonnet	Radiator finned bonnet	
10	VA5D, R	1760	2015	1890	2145	620
	PSA6R	-	-	1815	2070	476
	DAP1000	1615	1780	1615	1780	470
12	VA5D, R	1810	1960	1940	2090	620
	PSA6R	-	-	1865	2015	476
	DAP1000	1635	1830	1635	1830	470

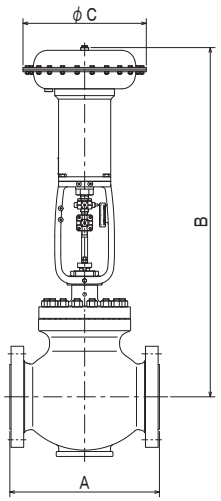


Figure 2. With model VA5 actuator

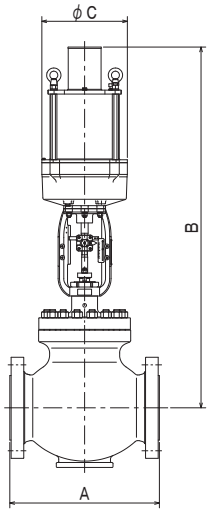


Figure 3. With model PSA6R actuator

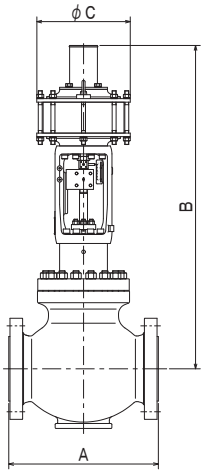


Figure 4. With model DAP1000 actuator

Table 7. Weight

[Unit: kg]

Nominal size (inches)	Actuator model no.	Weight					
		JIS 10K, ANSI 150		JIS 16K, 20K, 30K, ANSI 300		JIS 40K,ANSI 600	
		Plain bonnet	Radiator finned bonnet	Plain bonnet	Radiator finned bonnet	Plain bonnet	Radiator finned bonnet
10	VA5D	600	620	710	730	757	787
	VA5R	635	655	745	765	792	822
	PSA6R	590	610	700	720	747	777
	DAP1000	-	-	-	-	-	-
12	VA5D	836	856	976	996	1058	1158
	VA5R	871	891	1011	1031	1093	1193
	PSA6R	826	846	966	986	1048	1148
	DAP1000	-	-	-	-	-	-

Note) 1. P: Plain bonnet, RF: radiator finned bonnet.

2. For actuators with manual hand wheels, refer to SS2-8210-0100 (model VA actuator).

Ordering Information

When ordering, please specify ;

1) Model Number: VDN_ _ _
2) Valve size × Port size of Cv required
3) Type and rating of end connections
4) Body and trim material, necessity of hardening
5) Plug characteristics (on-off, equal percentage, linear)
6) Type of bonnet
7) Type of actuator, air to diaphragm
8) Valve action (direct or reverse)
9) Accessories (positioner, hand wheel, pressure regulator etc.)
10) Special requirement of degreasing, free from copper and etc.
11) Name of flow medium
12) Normal flow and maximum required flow
13) Pressure of flow medium, upstream and downstream pressure at maximum and minimum required flow
14) Temperature and specific gravity of flow medium
15) Viscosity of flow medium, inclusive or exclusive of slurry

Please read “Terms and Conditions” from the following URL before ordering and use.

https://www.azbil.com/products/factory/order.html

Specifications are subject to change without notice.

Azbil Corporation

Advanced Automation Company

1-12-2 Kawana, Fujisawa
Kanagawa 251-8522 Japan
URL: https://www.azbil.com/

10th edition: Oct. 2019