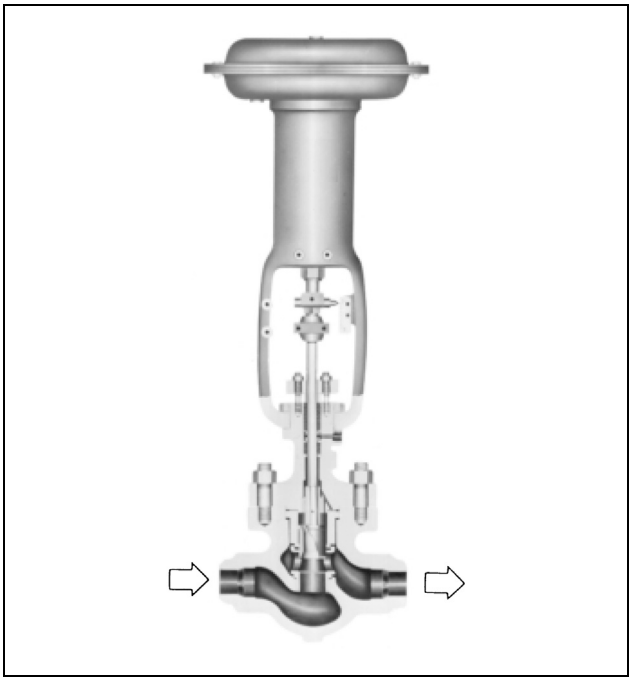
azbil Specifications

High Pressure Service Cage type Double Seated Control Valves (Rating: ANSI 900 to 2500)

Model VDC

OVERVIEW

Model VDC high pressure service control valve with body rating of ANSI 900, JIS 63K or up provides pressure balancing hole in the valve plug, thus, effectively eliminate the unbalanced thrust force on the plug, and relatively small actuator is selectable for high pressure differential service.
The entire valve plug is housed wholly in the cage and guided by guiding part, which makes it durable construction both against vibration and wear.



SPECIFICATIONS

Body

Type
Straight through, cast glove valve

Nominal size
1½, 2, 2½, 3, 4, 5, 6, 8, 10, 12 inches

Pressure rating
- JIS 63K
- ANSI 900, 1500, 2500

End connections
- Flange end ;

Connection type	Pressure rating	Applicable standard
RF	JIS63K	JIS B2217-1967
	ANSI Class 900, 1500, 2500	ANSI B16.5-1968
	JPI Class 900, 1500, 2500	JPI-7S-15-1993
RJ	ANSI Class 900, 1500, 2500	ANSI B16.5-1968
	JPI Class 900, 1500, 2500	JPI-7S-15-1993

- Welded end ;
  SW (1½, 2 inches)
  BW (3 to 12 inches)

Material
Carbon steel (SCPH2),
Low alloy steel (SCPH21, 32, 61)
Stainless steel (SCS13) and other alloy steel

Bonnet
Plain bonnet (0 to 200°C)
Radiator finned bonnet (over 200°C)

Gland type
Bolted gland

Packing / Grease
Grease provided
Graphite packing is used

Gasket

Type
Combination of serrated and flat gasket

Material
Stainless steel, copper, or aluminum

Trim

Valve plug
Pressure balanced type

Cage
Metal seat
  Equal percentage (%V)
  Linear (LV)
Cage design
  Split cage type

Material
Stainless steel (SCS13 Atomlloy treatment) and other alloy steel

Actuator

Type
Single acting diaphragm actuator (Type VA)
Piston actuator (Type DAP)

Action
Direct or reverse action

Diaphragm
Type VA: Cloth-embedded chloroprene rubber

Spring range
Type VA
40 to 200 kPa {0.4 to 2.0 kgf/cm²}
20 to 180 kPa {0.2 to 1.8 kgf/cm²}
80 to 240 kPa {0.8 to 2.4 kgf/cm²}

Supply pressure
Diaphragm actuator
Type VA: 250 or 270 kPa {2.6 or 2.8 kgf/cm²}
Piston actuator
Type DAP: 490 kPa {5.0 kgf/cm²}

Air connection
Type VA:
Rc 1/4 internal thread
(For VA4 and VA5, Rc1/4 adapter is provided on Rc 1/2 internal thread. Rc3/8 adapter is also possible.)
Type DAP:
Rc 1/2 internal thread. Rc 1/4 or 3/8 adapter is provided.

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.

Performance

Rated Cv value
Refer to Table 1.

Inherent rangeability
30:1

Allowable differential pressure
Refer to Table 3,4 and 5.

Leakage specification
IEC 60534-4:2006 or JIS B2005-4:2008
Standard…...Class II: Leakage less than 0.5% of maximum valve capacity.
Optional……Class III: Leakage less than 0.1% of maximum valve capacity.

Hysteresis error
With positioner: Within 1% F.S.

Linearity
With positioner: Within ±1% F.S.

Dimensions
Refer to Table 6.

Weight
Refer to Table 7.

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

Table 1 Cv value

Nominal size (inches)		1½			2			2½			3			4		
Port size (inches)		1	1¼	1½	1¼	1½	2	1½	2	2½	2	2½	3	2½	3	4
Rated Cv value	JIS 63K ANSI 900, 1500	10	14	21	14	21	39	21	39	56	39	56	83	56	83	144
	ANSI2500	-	10	14	10	14	25	14	25	39	25	39	56	39	56	91

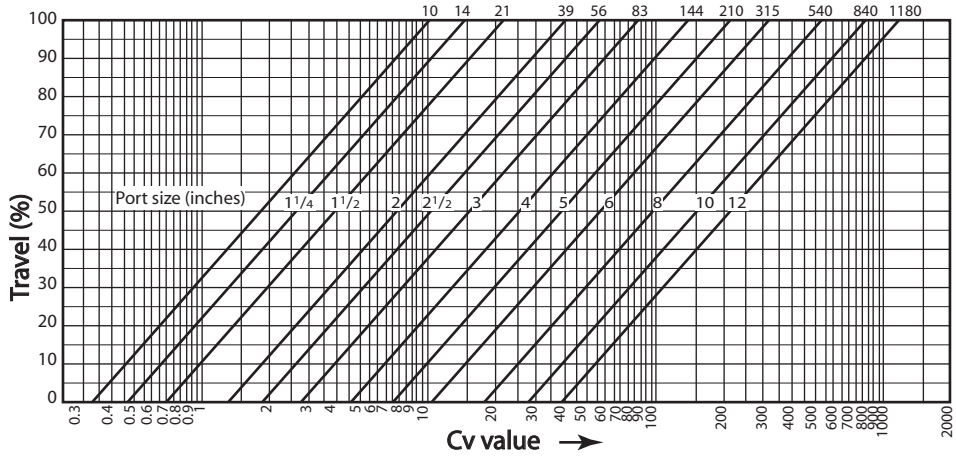
Nominal size (inches)		**5**			**6**			**8**			**10**			**12**		
Port size (inches)		3	4	5	4	5	6	5	6	8	6	8	10	8	10	12
Rated Cv value	JIS 63K ANSI 900, 1500	83	144	210	144	210	315	210	315	540	315	540	840	540	840	1180
	ANSI2500	56	91	144	91	144	210	144	210	365	210	365	580	365	580	820

Table 2 Stem travel

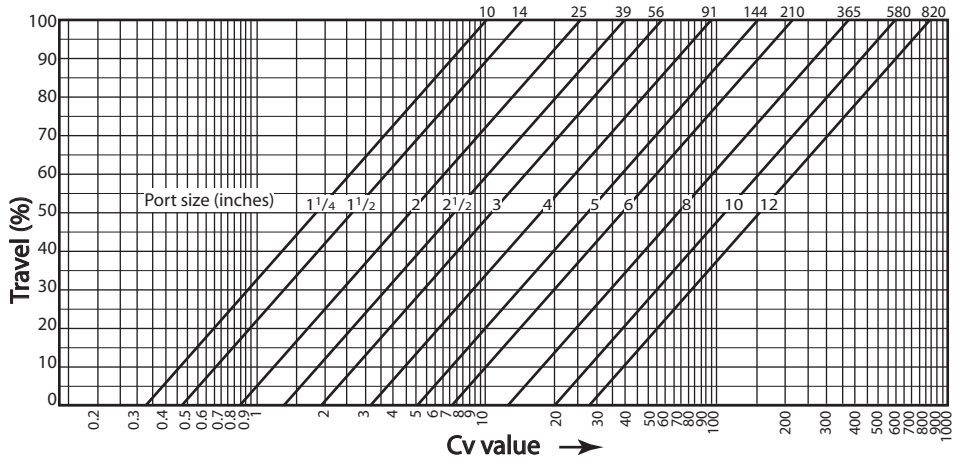
Nominal size (inches)		**1½**	**2**	**2½**	**3**	**4**	**5**	**6**	**8**	**10**	**12**
Rated Cv value	JIS 63K	25	25	37.5	37.5	37.5	50	50	-	-	-
	ANSI 900, 1500, 2500	25	25	37.5	37.5	37.5	50	50	75	100	100

Flow characteristics

Equal percentage (JIS 63K, ANSI 900, 1500)



Equal percentage (ANSI 2500)



(Idealistic flow characteristics is indicated in this gragph.)

Allowable differential pressure

Valves with type VA actuator

Table 3 Air-to-close

Rating	Actuator model no.	Supply pressure kPa{kgf/cm²}	Spring range kPa{kgf/cm²}	Differential pressure MPa {kgf/cm²} Nominal size (inches) 1½	2	2½	3	4	5	6	8	10	12
JIS 63K, ANSI 900, 1500	VA3D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	16.7 {170}	16.7 {170}	16.2 {165} 16.7 {170}	11.8 {120} 16.7 {170}	7.35 {75.0} 12.7 {130}	—	—	—	—	—
		270 {2.8}		23.0 {235}	23.0 {235}	16.2 {165} 19.6 {200}	11.8 {120} 16.7 {170}	—	—	—	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	24.5 {250}	15.2 {155} 24.5 {250}	—	—	—	—	—	—	—	—
	VA4D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	—	—	—	—	14.7 {150}	9.32 {95.0} 14.2 {145}	6.86 {70.0} 11.8 {120}	—	—	—
		270 {2.8}		—	—	20.6 {210}	20.6 {210}	14.7 {150} 17.6 {180}	—	—	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	—	—	24.5 {250}	16.7 {170} 23.5 {240}	—	—	—	—	—	—
	VA5D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	—	—	—	—	—	—	12.7 {130}	4.41 {45.0} 8.34 {85.0}	2.94 {30.0} 6.37 {65.0}	2.45 {25.0} 5.39 {55.0}
		270 {2.8}		—	—	—	—	18.1 {185}	18.1 {185}	14.2 {145} 16.2 {165}	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	—	—	—	—	23.5 {240}	11.8 {120} 19.6 {200}	—	—	—	—
ANSI 2500	VA3D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	16.7 {170}	16.7 {170}	16.2 {165} 16.7 {170}	11.8 {120} 16.7 {170}	7.35 {75.0} 12.7 {130}	—	—	—	—	—
		270 {2.8}		23.0 {235}	23.0 {235}	16.2 {165} 19.6 {200}	11.8 {120} 16.7 {170}	—	—	—	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	29.9 {305}	15.2 {155} 25.0 {255}	—	—	—	—	—	—	—	—
	VA4D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	—	—	—	—	14.7 {150}	13.2 {135} 14.7 {150}	9.32 {95.0} 14.2 {145}	—	—	—
		270 {2.8}		—	—	20.6 {210}	20.6 {210}	14.7 {150} 17.6 {180}	13.2 {135} 17.2 {175}	—	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	—	—	26.5 {270}	16.7 {170} 23.5 {240}	—	—	—	—	—	—
	VA5D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	—	—	—	—	—	—	—	5.39 {55.0} 12.7 {130}	3.92 {40.0} 7.84 {80.0}	2.94 {30.0} 6.37 {65.0}
		270 {2.8}		—	—	—	—	18.1 {185}	18.1 {185}	18.1 {185}	5.39 {55.0} 14.7 {150}	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	—	—	—	—	23.5 {240}	23.5 {240}	11.8 {120} 19.6 {200}	—	—	—

Note) 1) "□" shows a model with standard actuator.
2) The maximum operating pressure are 10.5 MPa {107 kgf/cm²} for rating of JIS 63K and 14.7 MPa {150 kgf/cm²} for rating of ANSI 900.
3) The upper figures denote operating allowable differential pressure. The lower denote allowable differential pressure at full closure.
4) When inlet pressure is larger than differential pressure when a valve is fully closed, use the inlet pressure for actuator sizing.

Table 4 Air-to-open

Rating	Actuator model no.	Supply pressure kPa{kgf/cm²}	Spring range kPa{kgf/cm²}	Differential pressure MPa {kgf/cm²} Port size 1½	2	2½	3	4	5	6	8	10	12
JIS 63K, ANSI 900, 1500	VA3D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	9.81 {100}	9.81 {100}	9.81 {100}	9.81 {100}	9.81 {100}	—	—	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	23.0 {235}	23.0 {235}	16.2 {165} 19.6 {200}	11.8 {120} 16.7 {170}	7.35 {75.0} 12.7 {130}	—	—	—	—	—
	VA4D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	—	—	—	—	—	—	8.82 {90.0}	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	—	—	—	20.6 {210}	14.7 {150} 17.6 {180}	9.81 {100} 14.2 {145}	6.86 {70.0} 11.8 {120}	—	—	—
	VA5D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	—	—	—	—	—	—	—	6.37 {65.0} 7.84 {80.0}	4.90 {50.0} 6.37 {65.0}	3.92 {40.0} 5.39 {55.0}
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	—	—	—	—	—	18.1 {185}	14.7 {150} 16.2 {165}	4.41 {45.0} 8.34 {85.0}	—	—
ANSI 2500	VA3D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	9.81 {100}	9.81 {100}	9.81 {100}	9.81 {100}	9.81 {100}	—	—	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	23.0 {235}	23.0 {235}	16.2 {165} 19.6 {200}	11.8 {120} 16.7 {170}	7.35 {75.0} 12.7 {130}	—	—	—	—	—
	VA4D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	—	—	—	—	—	—	—	—	—	—
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	—	—	—	20.6 {210}	14.7 {150} 17.6 {180}	13.2 {135} 17.2 {175}	9.32 {95.0} 14.2 {145}	—	—	—
	VA5D	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	—	—	—	—	—	—	—	—	5.88 {60.0} 7.84 {80.0}	4.90 {4.90} 6.37 {65.0}
		270 {2.8}	20 ~ 180 {0.2 ~ 1.8}	—	—	—	—	—	18.1 {185}	18.1 {185}	5.39 {55.0} 14.7 {150}	—	—

Note) 1) "□" shows a model with standard actuator.
2) The maximum operating pressure are 10.5 MPa {107 kgf/cm²} for rating of JIS 63K and 14.7 MPa {150 kgf/cm²} for rating of ANSI 900.
3) The upper figures denote operating allowable differential pressure. The lower denote allowable differential pressure at full closure.
4) When inlet pressure is larger than differential pressure when a valve is fully closed, use the inlet pressure for actuator sizing.

Model DAP, springless type piston cylinder actuator (with positioner)

Table 5 Air-to-close and Air-to-open

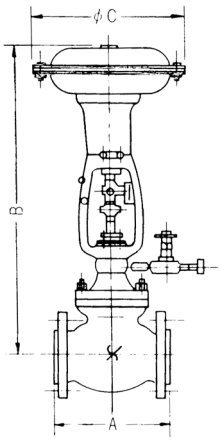
Rating	Actuator model no.	Supply pressure kPa{kgf/cm²}	Differential pressure MPa {kgf/cm²} Nominal size (inches) 1½	2	2½	3	4	5	6	8	10	12
JIS 63K ANSI 900	DAP1000	490 {5.0}	—	—	—	—	—	—	—	14.2 {145}	11.3 {115}	9.41 {96.0}
ANSI 1500	DAP1000	490 {5.0}	—	—	—	—	—	—	—	14.2 {145}	11.3 {115}	9.41 {96.0}
ANSI 2500	DAP1000	490 {5.0}	—	—	—	—	—	—	—	17.6 {180}	13.7 {140}	11.3 {115}

Note) 1. "□" shows a model with standard actuator.
2. The figures are the same for fully open and fully closed position.
3. When inlet pressure is larger than differential pressure when a valve is fully closed, use the inlet pressure for actuator sizing.

DIMENSIONS

Table 6 Face-to-face dimensions [Unit: mm]

Valve size (inches)	JIS 63K RF	ANSI 900		ANSI 1500		ANSI 2500	
		RF, SW, BW	RJ	RF, SW, BW	RJ	RF, SW, BW	RJ
1½	325	335	335	335	335	380	383
2	355	375	378	375	378	440	443
2½	390	410	413	410	413	500	506
3	435	440	443	460	463	540	546
4	495	510	513	530	533	615	625
5	620	635	638	680	683	680	693
6	700	715	718	770	776	770	783
8	880	900	903	900	910	950	966
10	1085	1100	1103	1100	1100	1200	1222
12	1285	1300	1303	1300	1316	1400	1422



WIth model
VA5 actuator

Table 7 Weight [Unit: kg]

Nominal size (inches)	Actuator model no.	B												ϕC
		JIS 63K, ANSI 900				ANSI 1500				ANSI 2500				
		Direct action (Air-to-close)		Reverse action (Air-to-open)		Direct action (Air-to-close)		Reverse action (Air-to-open)		Direct action (Air-to-close)		Reverse action (Air-to-open)		
		P	RF	P	RF	P	RF	P	RF	P	RF	P	RF	
1½	VA3D, R	1055	1260	1055	1266	1055	1266	1055	1266	1055	1266	1055	1266	450
2	VA3D, R	1060	1265	1060	1265	1060	1265	1060	1265	1060	1265	1060	1265	450
2½	VA3D, R	1100	1305	1100	1305	1100	1305	1100	1305	1100	1305	1100	1305	450
3	VA3D, R	1105	1310	1105	1310	1105	1310	1105	1310	1105	1315	1105	1315	450
4	VA3D, R	1115	1315	1115	1315	1115	1315	1115	1315	1155	1325	1155	1325	450
	VA4D, R	1275	1455	1390	1570	1275	1455	1390	1570	1300	1480	1415	1595	520
5	VA4D, R	1310	1490	1425	1600	1310	1490	1425	1600	1310	1490	1425	1600	520
	VA5D, R	1355	1535	1470	1645	1355	1535	1470	1645	1355	1535	1470	1645	620
6	VA4D, R	1375	1575	1490	1690	1375	1575	1490	1690	1375	1580	1490	1695	520
	VA5D, R	1420	1620	1530	1730	1420	1620	1530	1730	1420	1625	1530	1735	620
8	VA5D, R	1470	1770	1580	1880	1520	1820	1630	1930	1570	1870	1680	1980	620
	DAP1000	—	—	—	—	—	—	—	—	—	—	—	—	470
10	VA5D, R	1620	1920	1730	2030	1630	1930	1740	2040	1700	2000	1810	2110	620
	DAP1000	—	—	—	—	—	—	—	—	—	—	—	—	470
12	VA5D, R	1660	1960	1770	2070	1730	2030	1840	2140	1820	2120	1930	2230	620
	DAP1000	—	—	—	—	—	—	—	—	—	—	—	—	470

Note) 1. P: Plain bonnet, RF: radiator finned bonnet.
2. As for model DAP actuator with manual handwheel, add 220 mm to B (mm) above.

Ordering Information

When ordering, please specify ;

1) Model Number: VDC
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, handwheel, 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

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http://www.azbil.com/products/bi/order.html

azbil

Specifications are subject to change without notice.

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