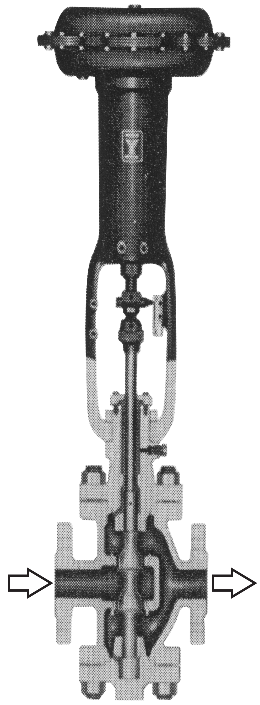
Top and Bottom-Guided Double Seated Control Valve (Rating: ANSI 600 or Less)

Model VDP

INTRODUCTION

Model VDP double seated control valves are supported by guide posts of top and bottom and have high resistance to vibration and abrasion. The body is of reversible construction, therefore, valve action change can be obtained without replacement of actuator.



SPECIFICATIONS

Body

Type: Straight-through type, cast glove valve

Size: 1, 1½, 2, 2½, 3, 4, 6, 8, 10, 12 inches

Rating: JIS 10K, 20K, 30K, and 40K
ANSI 150, 300 and 600

End connection: Flanged end (RF and RJ)

Material: Carbon steel (SCPH2), Stainless steel (SCS13, 14), Low alloy steel (SCPH21, 61) and other alloy steel

Bonnet: Plain bonnet (0-200°)
Radiator finned bonnet (200°C or over)
Extended bonnet (0°C or less)

Gland type: Bolted gland

Packing: V-teflon, asbestos yarn and others

Trim

Valve plug: Double seated,
Equal percentage V-port,
Equal percentage contoured,
Linear contoured

Material:
Stainless steel (SUS316, SUS316 stellite coating furnished to the seat or entire surface and SUS440C) and other alloy steel.

Guide: Top and bottom-guided

Actuator

Type:
Spring type pneumatic diaphragm actuator, direct action

Diaphragm material:
Chloroprene rubber reinforced with fabric

Spring range: 20 to 98 kPa {0.2 to 1.0 kgf/cm^2}
40 to 120 kPa {0.4 to 1.2 kgf/cm^2}
40 to 200 kPa {0.4 to 2.0 kgf/cm^2}

Air to diaphragm:
140 kPa {1.4 kgf/cm^2} or 250 kPa {2.6 kgf/cm^2}

Air connection:
Rc1/4 internal thread
(VA4, VA5 type ...Rc1/2 with Rc1/4 adapter, also available Rc3/8 with Rc1/4 adaptor)

Ambient temperature: -30 to +70°C

Valve action:
Direct or reverse action is available by reversing the valve body (direct action actuator is used).

Optional accessories:
Handwheel (side or top mounted), positioner, limit switch, motion transmitter, volume booster, air lock relay and others are available.

Performance

Seat leakage (percentage to rated Cv value)**:** 0.5% or less

Action: For standard type gland

Hysteresis error: Without positioner: 3% F.S. or less
With positioner: 1% F.S. or less

Linearity: Without positioner: ±5% F.S. or less
With positioner: ±1% F.S. or less

Inherent rangeability: V-port plug: 50:1
Contoured plug: 30:1

Flow coefficient Cv and stem travel

Table 1 Flow coefficient Cv and stem travel

Valve size (inch)	1		1½			2			2½			3			4			6			8			10			12		
Port size (inch)	3/4	1	1	1	1½	1¼	1½	2	1½	2	2½	2	2½	3	2½	3	4	4	5	6	5	6	8	6	8	10	8	10	12
Plug type & characteristic: V-port, Rated Cv	8	13	13	20	30	20	30	50	30	50	75	50	75	110	75	110	195	195	280	450	280	450	750	450	750	1160	750	1160	1620
V-port, Equal percentage V-port	-	✔	-	-	✔	-	-	✔	-	-	✔	-	-	✔	-	-	✔	-	-	✔	✔	-	✔	✔	-	✔	✔	-	✔
Contoured, Rated Cv	9	15	15	22	33	22	33	55	33	55	85	55	85	120	85	120	215	215	310	495	310	495	825	495	825	1275	825	1275	1780
Contoured, Equal percentage contoured	-	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Contoured, Linear contoured	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	-	-	-	-	-	-	-	-	-
Stem travel (mm)	14.3		25						37.5									50			75			100					

Flow characteristics

Equal percentage V-port (Rangeability 50:1)

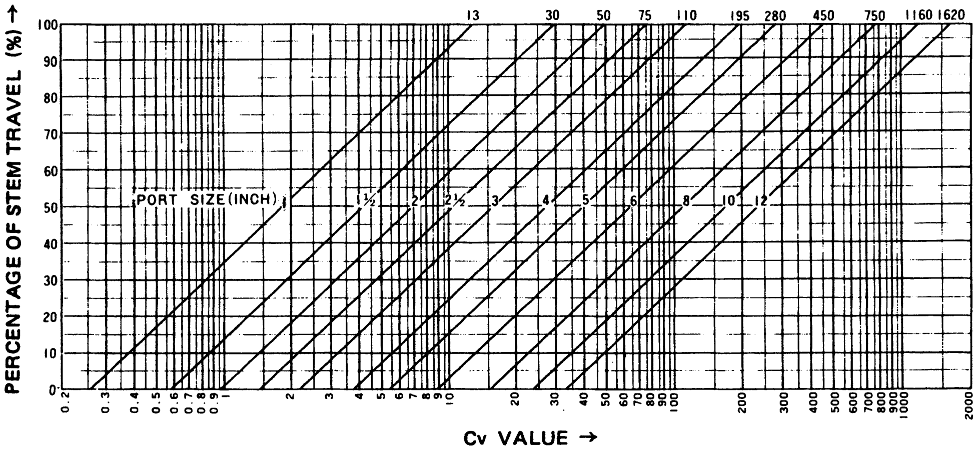


Figure 1 Equal percentage V-port (Rangeability 50:1)

Equal percentage contoured (Rangeability 30:1)

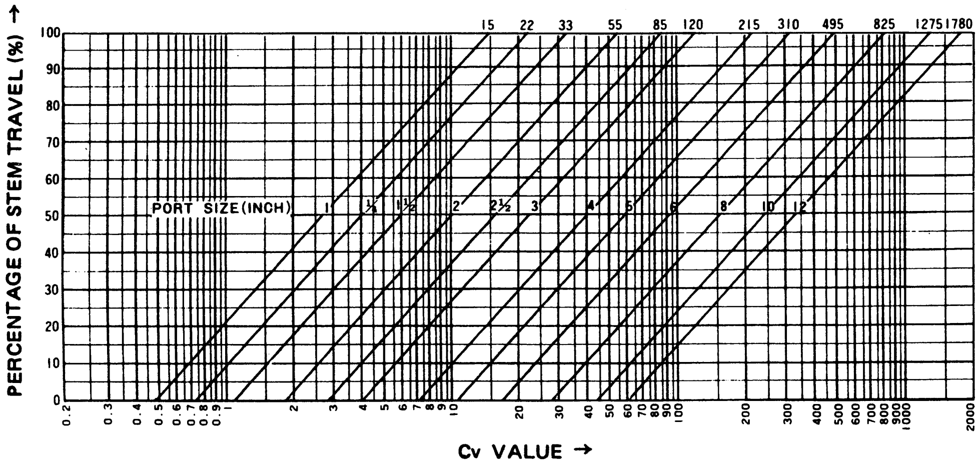
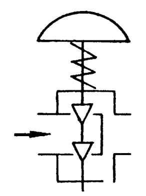


Figure 2 Equal percentage contoured (Rangeability 30:1)

Note) Typical flow characteristics is indicated in this graph

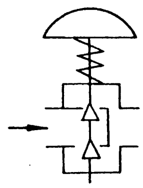
Maximum differential pressure

Table 2 Direct action (air-to-close)

Actuator model no.	Air to diaphragm kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	W or w/o positioner	Differential Pressure kPa {kgf/cm²} At corresponding port size (inch)												
				3/4	1	1¼	1½	2	2½	3	4	5	6	8	10	12
VA1D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o	3920 {40.0}	3920 {40.0}	3920 {40.0}	3430 {35.0}	1670 {17.0}								
	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	w	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3630 {37.0}								
VA2D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o			3820 {39.0}	3820 {39.0}	3730 {38.0}	2060 {21.0}	1160 {12.0}	640 {6.5}					
	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	w			3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3430 {35.0}	1760 {18.0}					
VA3D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o						3920 {40.0}	3920 {40.0}	2740 {28.0}	1470 {15.0}	981 {10.0}			
	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	w						3920 {40.0}	3920 {40.0}	3920 {40.0}	3330 {34.0}	2260 {23.0}			
VA4D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o									3730 {38.0}	1960 {20.0}	390 {4.0}		
	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	w									3920 {40.0}	3920 {40.0}	1080 {11.0}		
VA5D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o											1960* {20.0}	1470* {15.0}	930* {9.5}
	250 {2.6}	40 ~ 200 {0.4 ~ 2.0}	w											1960* {20.0}	1930* {20.0}	1860* {19.0}

Note) *: P1=1960 kPa {20 kgf/cm²}
Depending on fully-opened differential pressure, etc., values can be operated with fully-closed differential pressures higher than the limits indicated in the above table. For details, please refer to us.

Table 3 Direct action (air-to-open)

Actuator model no.	Air to diaphragm kPa {kgf/cm²}	Spring range kPa {kgf/cm²}	W or w/o positioner	Differential pressure kPa {kgf/cm²} At corresponding port size (inch)												
				3/4	1	1¼	1½	2	2½	3	4	5	6	8	10	12
VA1D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o	3040 {31.0}	3040 {31.0}	2450 {25.0}	1960 {20.0}	1570 {16.0}								
		39 ~ 120 {0.4 ~ 1.2}	w	3920 {40.0}	3920 {40.0}	3920 {40.0}	3240 {33.0}	2450 {25.0}								
	250 {2.6}	39 ~ 200 {0.4 ~ 2.0}	w	3920 {40.0}	3920 {40.0}	3920 {40.0}	3920 {40.0}	3330 {34.0}								
VA2D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o			3430 {35.0}	2840 {29.0}	2260 {23.0}	1760 {18.0}	1470 {15.0}	1080 {11.0}					
		39 ~ 120 {0.4 ~ 1.2}	w			3920 {40.0}	3920 {40.0}	3630 {37.0}	2840 {29.0}	2350 {24.0}	1760 {18.0}					
	250 {2.6}	39 ~ 200 {0.4 ~ 2.0}	w			3920 {40.0}	3920 {40.0}	3920 {40.0}	3730 {38.0}	3240 {33.0}	2350 {24.0}					
VA3D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o						2940 {30.0}	2450 {25.0}	1860 {19.0}	1470 {15.0}	1270 {13.0}			
		39 ~ 120 {0.4 ~ 1.2}	w						3920 {40.0}	3920 {40.0}	3040 {31.0}	2350 {24.0}	1960 {20.0}			
	250 {2.6}	39 ~ 200 {0.4 ~ 2.0}	w						3920 {40.0}	3920 {40.0}	3920 {40.0}	3240 {33.0}	2650 {27.0}			
VA4D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o									2060 {21.0}	1760 {18.0}	880 {9.0}		
		39 ~ 120 {0.4 ~ 1.2}	w									3330 {34.0}	2840 {29.0}	1370 {14.0}		
	250 {2.6}	39 ~ 200 {0.4 ~ 2.0}	w									3920 {40.0}	3730 {38.0}	1860 {19.0}		
VA5D	140 {1.4}	20 ~ 98 {0.2~1.0}	w/o											1180 {12.0}	970 {9.9}	810 {8.3}
		39 ~ 120 {0.4 ~ 1.2}	w											1860 {19.0}	1470 {15.0}	1270 {13.0}
	250 {2.6}	39 ~ 200 {0.4 ~ 2.0}	w											2550 {26.0}	2060 {21.0}	1670 {17.0}

Note) *Depending on fully-opened differential pressure, etc., values can be operated with fully-closed differential pressures higher than the limits indicated in the above table. For details, please consult with us.*

DIMENSIONS

Table 4 Face to face dimensions

Valve size (inch)	A (mm) JIS 10K RF ANSI 150 RF	JIS 20K 30K RF ANSI 300 RF	JIS 40K RF ANSI 600 RF	ANSI 150RJ	ANSI 300 RJ	ANSI 600 RJ
1	184	197	210	197	210	210
1½	222	235	251	235	248	251
2	254	267	286	267	283	289
2½	276	292	311	289	308	314
3	298	318	337	311	333	340
4	352	368	394	365	384	397
6	451	473	508	464	489	511
8	543	568	610	556	584	613
10	673	708	752	686	724	756
12	737	775	819	749	791	822

Table 5 External dimensions

Valve size (inch)	Actuator model no.	H (mm)		E (mm)	B (ϕ mm)
		P	RF		
1	VA1D	705	855	130	300
	VA2D	840	990		350
1½	VA1D	745	895	165	300
	VA2D	875	1025		350
2	VA1D	745	895	170	300
	VA2D	875	1025		350
2½	VA2D	925	1075	220	350
	VA3D	1090	1240		450
3	VA2D	925	1075	220	350
	VA3D	1090	1240		450
4	VA2D	935	1085	230	350
	VA3D	1100	1250		450
6	VA3D	1170	1320	290	450
	VA4D	1335	1485		520
8	VA4D	1430	1580	385	520
	VA5D	1485	1635		620
10	VA5D	1780	1930	485	620
12	VA5D	1795	1945	500	620

Note) P: Plain bonnet RF: Radiator finned bonnet

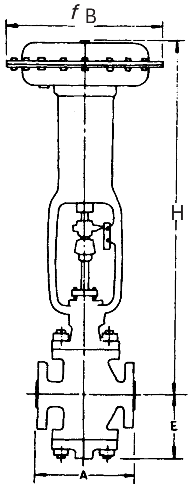


Table 6 Approximate weight

Valve size (inch)	Actuator model no.	Approximate weight					
		JIS 10K, ANSI 150		JIS 20K, 30K, ANSI 300		JIS 40K, ANSI 600	
		P	RF	P	RF	P	RF
1	VA1D	32	35	35	38	38	41
	VA2D	45	48	48	51	51	54
1½	VA1D	40	43	52	55	55	60
	VA2D	43	56	65	70	70	75
2	VA1D	50	53	57	60	60	65
	VA2D	63	66	70	75	75	80
2½	VA2D	80	83	90	95	100	105
	VA3D	110	113	120	125	130	135
3	VA2D	94	97	105	110	120	125
	VA3D	125	128	135	140	150	155
4	VA2D	110	115	120	125	140	145
	VA3D	140	145	150	155	170	175
6	VA3D	195	205	225	235	275	285
	VA4D	275	285	305	315	355	365
8	VA4D	395	405	500	510	700	710
	VA5D	425	435	530	540	730	740
10	VA5D	655	665	780	790	1010	1020
12	VA5D	760	770	890	900	1200	1210

Note) P: Plain bonnet RF: Radiator finned bonnet

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