

Technical Bulletin: CVS – E Series Control Valves

High Duty Single Seated Control Valves

Designs CVS ED, S, T, & Z – 1 through 8 inches.

Features:

- Top entry trim designs to suit specific target applications
- High Cv to size ratio
- Streamlined flow path to optimize capacity
- Standard and low recovery trim options combine multi-stage pressure reduction with velocity control
- Low temp. carbon steel and NACE are standard materials
- Wide range of material options
- ISO 9001 Q.A. Manufacturing processes

Introduction:

CVS E Series Globe Style Control Valves are designed for both general and high duty applications in most process control industries including gas/oil transportation, petrochemical refining & production and power generation.

Whether high or low pressure, severe service or benign, CVS E Series control valves have been developed to serve the most demanding conditions. The overall construction is a modular, high performance concept, capable of extending many standard variations into specialized applications.



1 to 8 inch CVS E Series Control Valves with Single Acting, Spring Opposed Diaphragm Pneumatic Actuator

Technical Specifications

Size / Style:

1 to 8 inch nominal bore through globe.
Modular construction enables an application concept allowing a range of different end connections including oversize when conditions apply.

Pressure Temperature Ratings:

ASME 150, 300, 600, for other ratings consult factory.

Connections:

ANSI and API Flanges. Screwed Connections. Welding ends as specified – butt weld or socket. For other connections consult factory.

Bonnets:

Standard, high and low temperature bonnets are supplied to suit application requirements.

Valve Trims:

Full or reduced, ported cage, low recovery cage, in balanced single, multi-stage or high duty arrangements

Flow Characteristics:

Linear, Equal Percentage and Quick Open. Modified characteristics may be produced to suit application requirements.

Valve & Trim Materials include (but not limited to):

Carbon steel, chrome-moly steels, stainless steel, duplex alloys, hastelloy B & C, ferralium, monel, titanium, bronze, alloy 20 etc., including compliance to NACE MR-01-75 as required.

Hard facings such as stellite, carbide and proprietary material modifications may be accommodated.

Maximum Leak-rates:

Leakage rates are normally in accordance with the ANSI/FCI 70-2 Specification using the Class designation.

Actuation:

Pneumatic piston, hydraulic, electro-hydraulic and electric, with many options of control and operational requirements.

Construction:

The basic design features a top entry, cage retained seat, which enables trim replacement with no special tooling.

Gasket sets and plug seals are available for both high and low temperature applications.

Valve Trim:

Standard arrangements include a balanced ported design combining high capacities that handle greater pressure differentials while keeping actuator forces to a minimum.

Flows may be bi-directional but preference is for flow over on liquids and flow under on gas/vapor service.

Low Recovery Trim:

The CV range of low recovery trims is used to reduce erosion, vibration, cavitation and noise levels. These may be in single stage (CV1) or multi stage (CV2, 3, 4 etc.) combinations, dependant on the severity of the application.

To further support the low recovery trim options, a variety of ancillary equipment is available in the form of diffusers, baffles and attenuators. These are normally engineered as 'application specific'.

Sizing and Selection:

Sizing is undertaken using an in-house engineering program, which undertakes calculations of all aspects relating to correct specification.

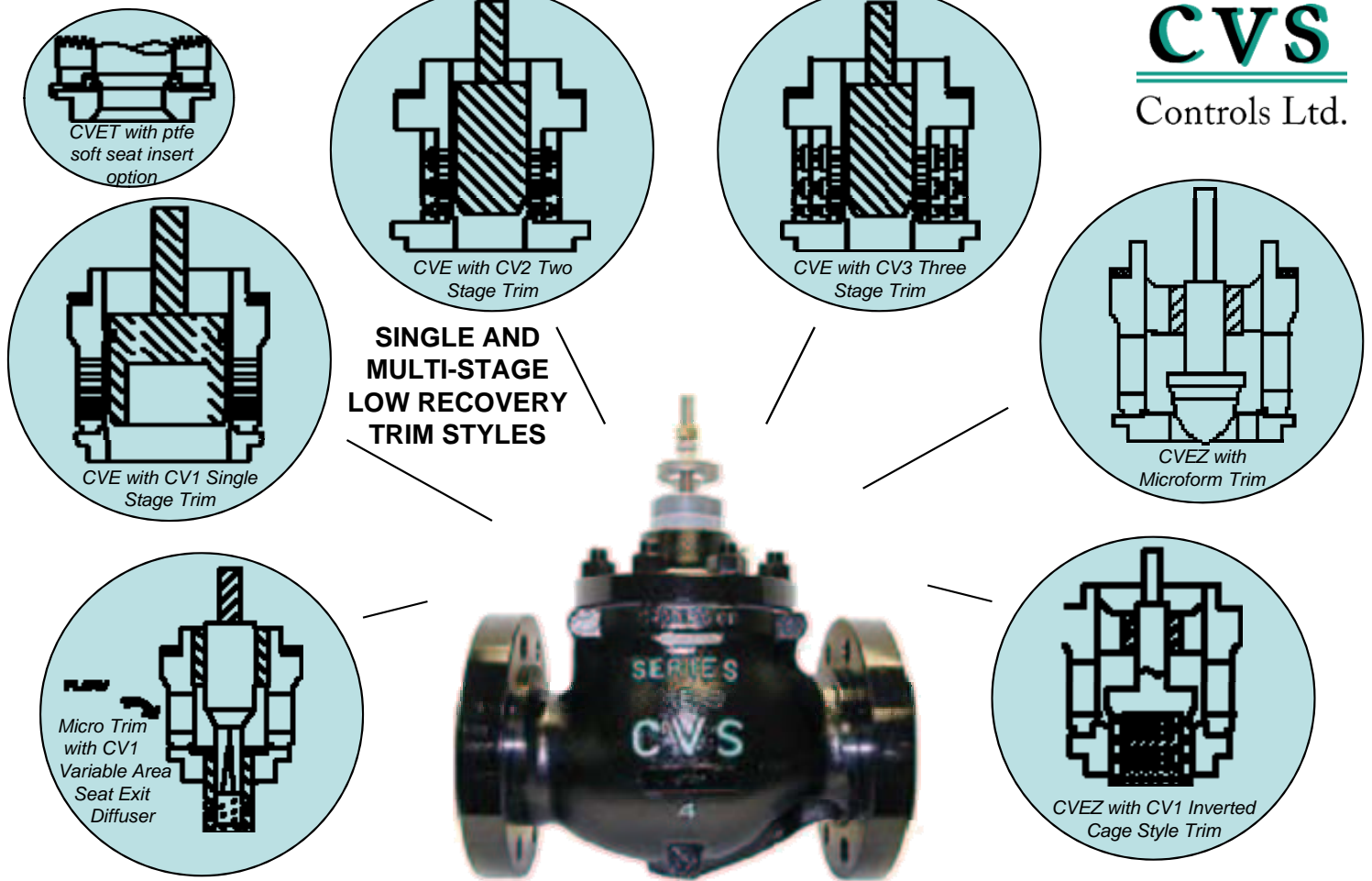
Calculations include capacity, approach, exit and internal velocities, cavitation index, and noise prediction.

A detailed copy is provided together with a complete specification of valve and materials.

Gland Packing Systems:

Several packing systems are available depending on the operating pressure and temperature.

Also included is a live loaded packing system to avoid fugitive emissions in accordance with the Clean Air Act.



Series CVS-ED, ET & ES Maximum Flow Coefficients (Cv) for Full Port Trim

ASME Cl. 150 through 600

Valve Size Ins.	Port Dia. Ins.	Travel Ins.	ED & ET (Balanced)			ES (Unbalanced)			ED, ET, & ES			
			=%	Lin	Q.O.	=%	Lin	Q.O.	CV1 =%	Lin	CV1X =%	Lin
1 & 1-1/4	1-5/16	3/4	17.2	20.6	22.1	17.4	20.1	21.4	13	13	9	9
1-1/2	1-7/8	3/4	35.8	39.2	44	33.4	34.9	38	30	30	20	20
2	2-5/16	1-1/8	59.7	72.9	77.6	56.2	65.3	67.2	50	55	39	39
3	3-7/16	1-1/2	136	148	161	121	135	150	120	120	75	75
4	4-3/8	2	224	236	251	203	212	235	180	200	145	155
6	7	2	394	433	460	357	417	469	350	375	270	290
8	8	2	567	688	744	570	701	787	460	490	345	370
8	8	3	818	846	863	808	836	875	700	730	525	550

Series CVS-EZ Flow Coefficients (Cv) for Full & Reduced Port Trim

ASME Cl. 150 through 600

Valve Size Ins.	Port Dia Ins.	Travel Ins.	EZ			Valve Size Ins.	Port Dia Ins	Travel Ins.	EZ		
			=%	Lin	Q.O.				M-Form	M-Flute	M-Flow
1	1	3/4	13.2	13.6	16.9	1	1/4	3/4	1.5	0.281	0.075*
1-1/2	1-1/2	3/4	28.1	31.9	34.2	1-1/2	1/4	3/4	1.5	0.946	0.075*
2	2	1-1/8	53.8	52.4	58.6	2	1/4	3/4	1.5	0.946	0.181*
3	3	1-1/2	114	110	129	1	3/8	3/4	3.1		
4	4	2	190	209	223	1	1/2	3/4	4.9		
1.1/2	1	3/4	17.3	16.7	19.4	1	3/4	3/4	8.8		
2	1	3/4	15.9	15.7	17.9	1-1/2	3/8	3/4	3.2		
3	2	1	71.5	80.4	88.4	&	1/2	3/4	5.2		
4	2	1	72.7	86.8	86.7	2	3/4	3/4	10.2		

Reduced Port Trim

* Port Dia. 3/16"

CVS Series E Dimensional Data

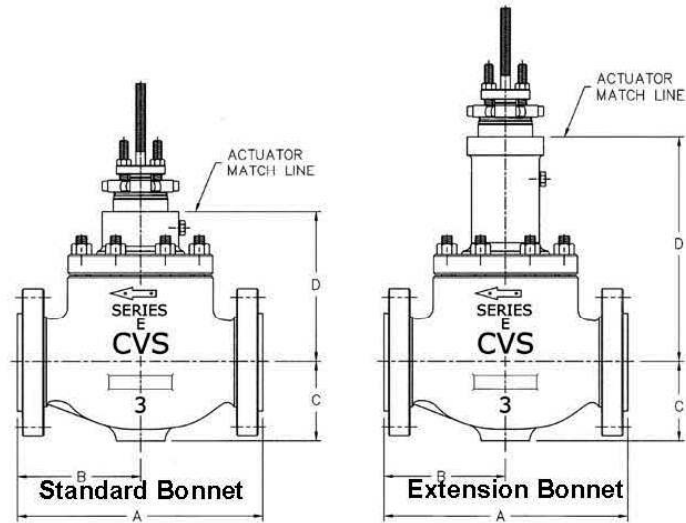
Steel Bodies through 600lb Rating

Size		Dimension A ¹											
		150 RF		150 RTJ		300 RF		300 RTJ		600 RF		600 RTJ	
In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm
1	25.4	7.25	184.2	7.75	196.9	7.75	196.9	8.25	209.6	8.25	209.6	8.25	209.6
1-1/2	38.1	8.75	222.3	9.25	235.0	9.25	235.0	9.75	247.7	9.88	251.0	9.88	251.0
2	50.8	10.00	254.0	10.50	266.7	10.50	266.7	11.13	282.7	11.25	285.8	11.38	289.1
2-1/2	63.5	10.88	276.4	11.38	289.1	11.50	292.1	12.13	308.1	12.25	311.2	12.38	314.5
3	76.2	11.75	298.5	12.25	311.2	12.5	317.5	13.13	333.5	13.25	333.6	13.38	339.9
4	101.6	13.88	352.6	14.38	365.3	14.51	368.3	15.13	384.3	15.50	393.7	15.63	397.0
6	152.4	17.75	450.9	18.25	463.6	18.63	473.2	19.25	489.0	20.00	508.0	20.13	511.3

Size		Dimension C											
		150 RF		150 RTJ		300 RF		300 RTJ		600 RF		600 RTJ	
In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm
1	25.4	2.13	54.1	2.13	54.1	2.13	54.1	2.13	54.1	2.13	54.1	2.13	54.1
1-1/2	38.1	2.44	61.9	2.44	61.9	2.44	61.9	2.44	61.9	2.44	61.9	2.44	61.9
2	50.8	2.88	73.2	2.88	73.2	2.88	73.2	2.88	73.2	2.88	73.2	2.88	73.2
2-1/2	63.5	3.44	87.4	3.44	87.4	3.44	87.4	3.44	87.4	3.44	87.4	3.44	87.4
3	76.2	3.56	90.4	3.56	90.4	3.56	90.4	3.56	90.4	3.56	90.4	3.56	90.4
4	101.6	4.69	119.1	4.69	119.1	4.81	119.1	4.81	119.1	4.94	125.5	4.94	125.5
6	152.4	5.19	131.8	5.31	134.9	5.31	134.9	5.50	139.7	5.50	139.7	5.50	139.7

Size		Standard Bonnet								Extension Bonnet					
		Stem Size								Stem Size					
		3/8	9.5	1/2	12.7	3.4	19.1	3/8	9.5	1/2	12.7	3.4	19.1	3/8	9.5
In	mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm	In	Mm
1	25.4	5	127.0	5.88	150	—	—	8.38	212.8	9.88	251.0	—	—	—	—
1-1/2	38.1	4.88	123.8	5.75	146.1	—	—	8.25	209.6	9.75	247.7	—	—	—	—
2	50.8	—	—	6.50	165.1	6.38	162.1	—	—	10.50	266.7	10.50	266.7	—	—
2-1/2	63.5	—	—	7.38	187.5	7.25	184.2	—	—	11.38	289.1	11.56	293.6	—	—
3	76.2	—	—	7.50	190.5	7.38	187.5	—	—	11.50	292.1	11.60	296.0	—	—
4	101.6	—	—	8.69	221.0	8.56	217.4	—	—	12.69	322.3	12.88	327.2	—	—
6	152.4	—	—	—	—	9.88	251.0	—	—	—	—	14.06	357.1	—	—

1. Dimension B = A divided by 2
 RF=Raised Face RTJ=Ring Type Joint
 Flange Specification ASME/ANSI B16.5 - 1996



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