

CVS Series V500 1-8 Inch Rotary Control Ball Valve

The CVS Controls Series V500 Rotary Control Valve is designed for use in process control of erosive, coking, or hard to handle fluids.

The design allows for both throttling control and on/off service used manually or in conjunction with a variety of actuators. Excellent Pressure and Flow Control for steam, gasses, various liquid, and fibrous slurries.

The CVS V500 flanged design allows for easy installation in a wide range of piping requirements from Class 150, 300, or 600 Raised Face or Ring Type Joint. This also allows for assembly and periodic maintenance as required with less down time, providing operating cost savings.

The Flow characteristic of the CVS V500 is Modified Linear. Shutoff classification is Class IV.

Series V500 Rotary Control Valves are Sour or NACE capable utilizing construction materials which comply with NACE MRO175-latest edition.



CVS Series V500 Rotary Control Valve

CRN# - 0C17465.2

SPECIFICATIONS

Valve style	Flange Style Valve Assembly
Valve size NPS	1, 1-1/2, 2, 3, 4, 6 & 8 inch
End Connection and Size	RFor RTJ standard flange :1 through 8 inch
Max.inlet pressure	ComplywithASME flange ratings B16.5
Max.pressure drop	Detail in table 4,5,6,7& 8
Shutoff Classification	ANSI/FCI 70-2 and IEC60534-4 standard Class IV for both flow directions. (0.01% flow with valve full open). The leakage rate for full or restricted port valves are depending the full port flow capacity. Restricted port valve use a reduced port seat added to the full port valve.
Construction Material	Valve parts material in table 9, Trim material combination in table 10
Material Temperature Range ⁽²⁾	Detail in table 9
Flow Characteristic	Modified linear
Flow Direction	Reverse flow(standard): Fluid pass valve plug then through seat ring, push valve to the close position, recommend for erosive application. Forward flow: Fluid pass the seat ring then valve plug, push valve to open position.
Flow Coefficients	Detail in flow coefficient table12 ~ 19
Flow coefficient rate ⁽³⁾	100:1
Mounting Positions with A c tuator	Two styles when viewed from upstream side of the valve: right hand & left hand. The mounting position depends on the required valve plug open position and the flow direction by application. More detail in valve Mounting description.
Plug Rotation	Counterclockwise rotate 90 degrees to close (viewed from actuator side)
Actuator Action	Push-down-to-close valve (Actuator rod extend to close the valve) Push-down-to-open valve (Actuator rod extend to open the valve) For diaphragm or cylinder actuator, these two actions can be revised on site.
Packing Construction	Standard packing design, ES type packing system
Shaft Diameter	Detail in Table 10- Series V500 eccentric rotary valve material combination
Dimensions and Approximate Weights	Detail in table 11-dimension and weight
Options	Restricted trim for low flow application (retainer and seat ring) Sealed bearing construction Tungsten carbide trim optional Purged bearing
1. Not every trim material is reversible, please contact a CVS Controls sale representative for more information 2. Refer to the pressure and temperature limitation tables for all applications. 3. The flow coefficient ratio or range ability is the ratio of maximum flow coefficient to minimum usable flow coefficient.	

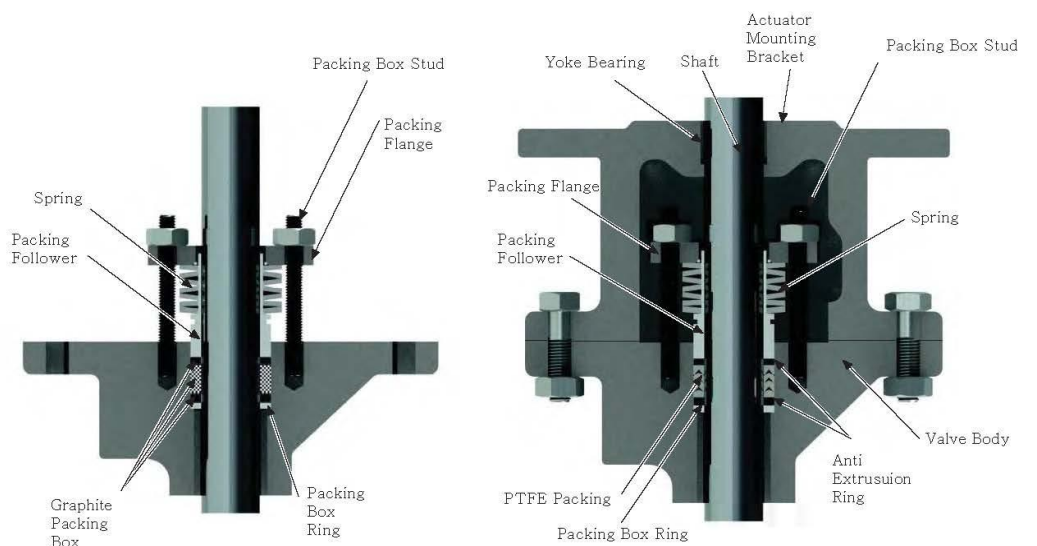
CVS ES Packing System

The long-term, consistent sealing performance of the packing system is achieved by the unique design of packing construction and high performance packing material. The CVS Series V500 valve packing system ensures excellent guide sealing, and load force transfer. Live-loading spring design offers stable load to the packing material during its service. The long-life and reliability of these systems also reduce maintenance costs and downtime.

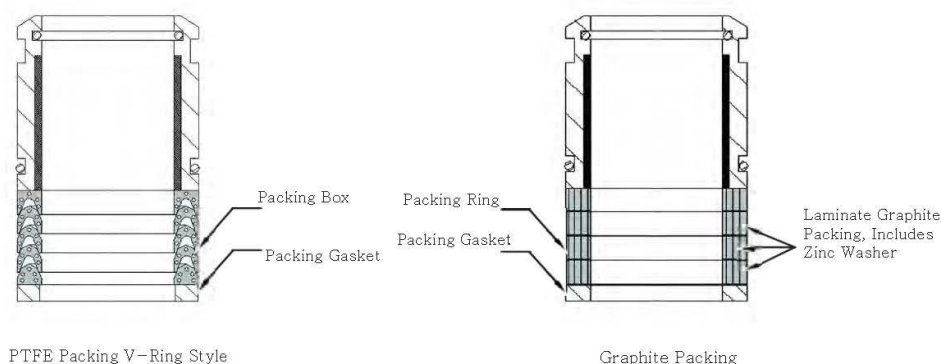
The packing system is field serviceable while the control valve remains on the pipeline installation. The packing kit has all the spare parts needed for on-line mounting or replacement.

CVS V500 Series control valves have several packing system designs, including V-type Single/Duplex PTFE, Graphite Composition, and ES and HS Type.

We offer two different packing materials:
PTFE, which is selected for temperatures below 232°C (450°F)
Graphite which is selected for temperatures above 232°C (450°F)



ES Packing Arrangement



PTFE Packing V-Ring Style

Graphite Packing

Standard Packing Configuration

Figure 3. Packing Configuration

CVS ES Packing System - Specifications

Table 2. CVS ES Packing System Description

Maximum Temperature Pressure Limitations	Maximum Temperature-Pressure Limitation should comply with EPA 500ppm application ES Type PTFE Packing: 232°C (450°F) ES Type Graphite Packing: 316°C (600°F)	
Material Temperature Limit	ES Type PTFE: -46°C to 232°C (-50°F to 450°F) ES Type Graphite Packing: up to 316°C (600°F)	
Construction Materials	PTFE Packing	Packing Ring: PTFE V-Ring Adapter Ring: Carbon Filled PTFE V-Ring Anti-Extrusion Ring: High Strength Polymer Packing Box Ring: S31600 (316 SST)
	Graphite Packing	Packing Ring: Graphite Anti-Extrusion Ring: Carbon Packing Box Ring: S31600 (316 SST)
	Packing Flange	S31600 (316 SST)
	Packing Box Stud	Steel SA-193 B7
	Packing Box Nut	Steel SA-194-2H
	Spring Package	O-Ring: NBR Packing Follower: S31600 with carbon filled PTFE Bushing Spring: N07718 or S17400

CVS V500 – Construction Features and Seal Design

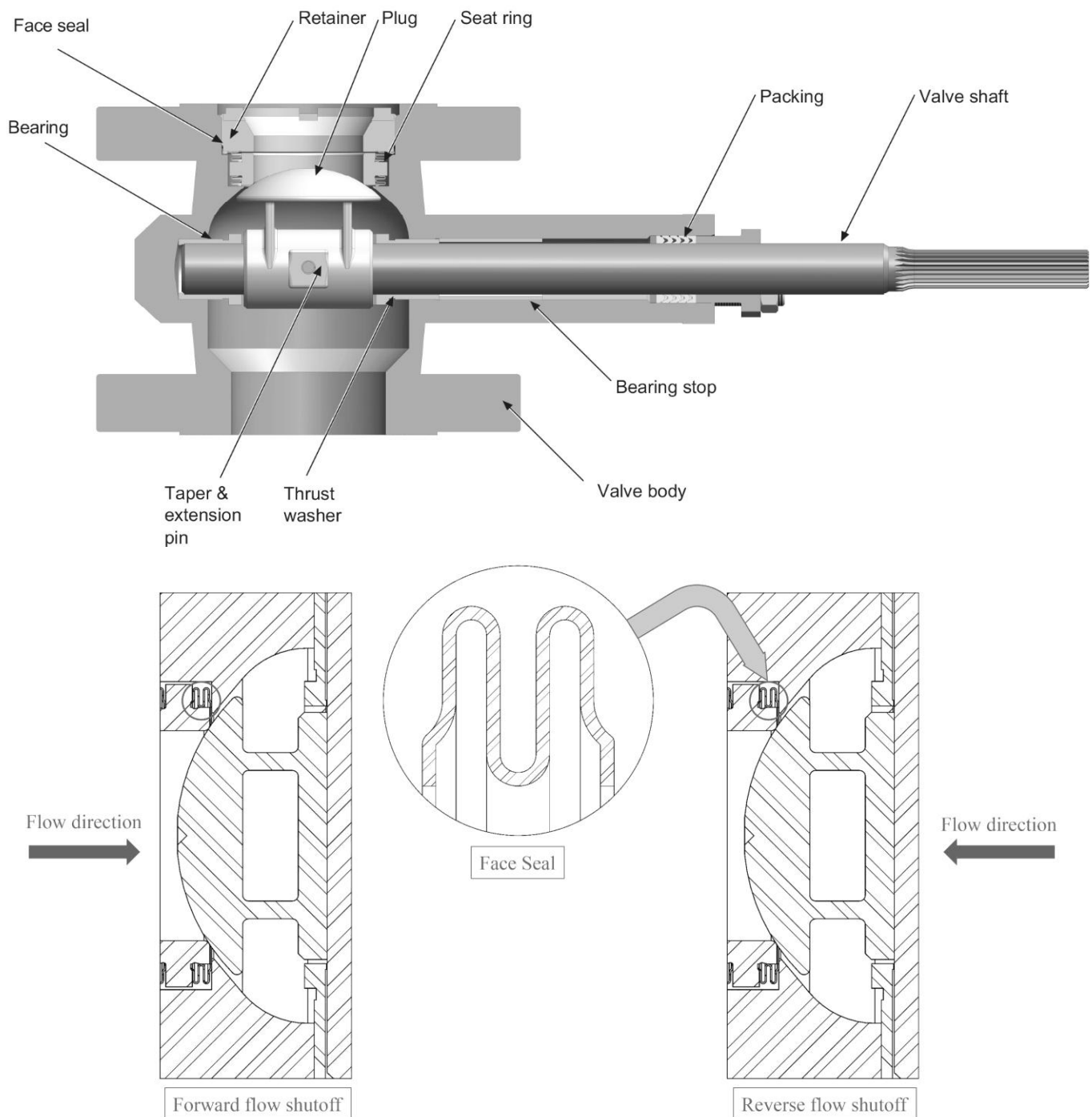


Figure 6. Valve Seat Seal Design

Mounting Style Selection, Open/Close Action and Open Plug Position

The CVS Series V500 is able to be mounted in any position, typical installation is positioning the shaft horizontally in order for best shutoff performance.

The valve is capable of being installed in either forward or reverse flow direction. A forward flow condition (through seat ring and past plug) will open the valve, while a reverse flow condition (past plug through seat ring) will close the valve. For erosive applications it is recommended to install in a reverse flow direction.

For certain operating conditions that demand specific operation of push down to close or open actuator action, and open valve plug position above or below the shaft, CVS Controls is able to supply the appropriate valve and actuator package for the application.

Table 3. Actuator Mounting Style Selection

Mounting Style	Action	Position with Plug Open	
		Forward Flow	Reverse Flow
Right Hand	PDTC	Above Shaft	Below Shaft
	PDTO		
Left Hand	PDTC	Below Shaft	Above Shaft
	PDTO		
PDTC – Push Down to Close Action (extend actuator rod to close valve)			
PDTO – Push Down to Open Action (extend actuator rod to open valve)			



Figure 7. Left Hand Mount, Forward Flow

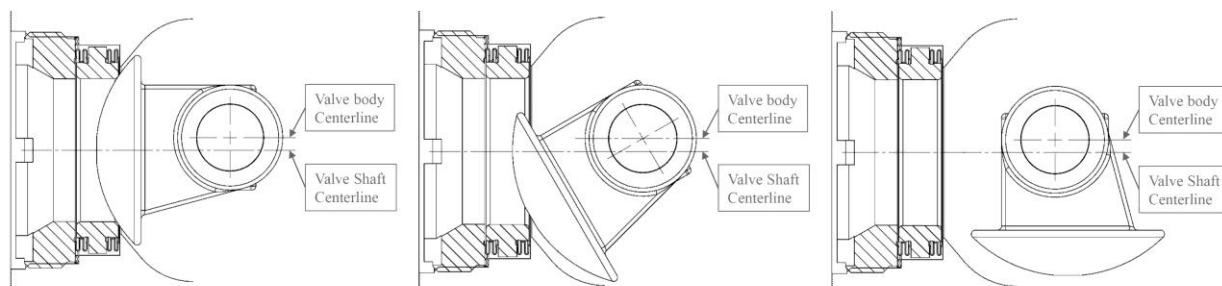


Figure 8. Eccentric Rotary Plug

Installation – Actuator Lever Orientation

Actuator		Valve Open	Actuator Position			
Mounting	Action		1	2	3	4
Right Hand	PDTC	FWD				
		REV				
	PDTO	FWD				
		REV				
Left Hand	PDTO	FWD				
		REV				
	PDTC	FWD				
		REV				
PDTC – Push Down To Close PDTO – Push Down To Open			FWD – Forward Flow REV – Reverse Flow Lever Arrows indicate direction of actuator to close valve.			

Installation

NOTE: Ensure all proper safety and lockout procedures are followed when installing or performing any maintenance.

Never exceed specified application ranges, as personal injury or equipment damage may occur.

It is recommended that a pressure control and/or pressure relieving device be used in order to isolate the valve body for installation and maintenance.

Prior to installation, ensure pipeline is free from debris. Determine correct position and orientation of the valve and actuator by referring to the previous page (Actuator Lever Orientation). Make note of the correct flow direction of the process through the valve for the application.

Typical installation is with the valve shaft in the horizontal position.

1. Prior to installation, verify the correct position of the Flow Direction Arrow for the process through the valve. Reverse the Flow Direction Arrow if required for easy visual reference of the flow process.
2. Install flange gaskets, and install the valve between the mating pipeline flanges.
3. Install line bolts and nuts.
*Always follow proper bolting procedures, lubrication of the line bolts and nuts if required and acceptable practices of tightening in a crisscross pattern to obtain proper gasket load.
4. Pressure lines may now be connected to the actuator. Refer to the correct actuator manual.
*Grounding of the valve shaft is required when valve is exposed to hazardous good or installed for oxygen use.

Scheduled maintenance and inspections are an integral part for continued operation and performance of all pressure control valves and systems. Parts are subject to wear and tear and should be inspected and repaired or replaced as required to maintain optimum operating conditions and reduce downtime.

CVS Series V500 – Technical Specifications – Maximum Allowable Shutoff Pressure Drops

Table 4. Max Allowable Shutoff Pressure Drops – Trim T1 – **PSI**

Valve Body Material	Bearing Material	Temperature °F	Valve Body Size - NPS						
			1	1-1/2	2	3	4	6	8
WCC Steel	S44004	-20 ~ 300	1000	800	600	600	600	600	350
		300 ~ 400	1000	800	600	600	600	600	345
		400 ~ 600	1000	800	600	600	600	600	335
	CoCr-A	-20 ~ 400	1000	800	600	600	600	300	220
		400 ~ 500	1000	800	600	600	600	300	220
		500 ~ 600	1000	800	600	600	600	300	220
	PTFE coated/ composition 316 SST	-20 ~ 200	1000	800	600	600	600	600	350
		200 ~ 300	1000	800	600	600	600	600	350 (1) 335 (2)
		300 ~ 400	1000	800	600	600	600	600	345 (1) 320 (2)
		400 ~ 500	1000	800	600	600	600	600	340 (1) 315 (2)
CF8M SST	CoCr-A	-50 ~ 400	1000	800	600	600	600	300	220
		400 ~ 500	955	800	600	600	600	300	220
		500 ~ 600	905	800	600	600	600	300	220
	PTFE coated/ composition 316 SST	-50 ~ 200	1000	800	600	600	600	600	350
		200 ~ 300	1000	800	600	600	600	600	350 (1) 335 (2)
		300 ~ 400	1000	800	600	600	600	600	345 (1) 320 (2)
		400 ~ 500	955	800	600	600	600	600	340 (1) 315 (2)

1. For S17400 valve shaft only

2. For ASME SA-479 grade S20910 SST valve shaft only. Pressure drop should be suitable for both shaft materials.

Table 5. Max Allowable Shutoff Pressure Drops – Trim T1 – **BAR**

Valve Body Material	Bearing Material	Temperature °C	Valve Body Size - NPS						
			1	1-1/2	2	3	4	6	8
WCC Steel	S44004	-29 ~ 149	68.9	55.2	41.4	41.4	41.4	41.4	24.1
		149 ~ 204	68.9	55.2	41.4	41.4	41.4	41.4	23.8
		204 ~ 316	68.9	55.2	41.4	41.4	41.4	41.4	23.1
	CoCr-A	-29 ~ 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 ~ 260	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		260 ~ 316	68.9	55.2	41.4	41.4	41.4	20.7	15.2
	PTFE coated/ composition 316 SST	-29 ~ 93	68.9	55.2	41.4	41.4	41.4	41.4	24.1
		93 ~ 149	68.9	55.2	41.4	41.4	41.4	41.4	24.1 (1) 23.1 (2)
		149 ~ 204	68.9	55.2	41.4	41.4	41.4	41.4	23.8 (1) 22.1 (2)
		204 ~ 260	68.9	55.2	41.4	41.4	41.4	41.4	23.4 (1) 21.7 (2)
CF8M SST	CoCr-A	-46 ~ 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 ~ 260	65.8	55.2	41.4	41.4	41.4	20.7	15.2
		260 ~ 316	62.4	55.2	41.4	41.4	41.4	20.7	15.2
	PTFE coated/ composition 316 SST	-46 ~ 93	68.9	55.2	41.4	41.4	41.4	41.4	24.1
		93 ~ 149	68.9	55.2	41.4	41.4	41.4	41.4	24.1 (1) 23.1 (2)
		149 ~ 204	68.9	55.2	41.4	41.4	41.4	41.4	23.8 (1) 22.1 (2)
		204 ~ 260	68.9	55.2	41.4	41.4	41.4	41.4	23.4 (1) 21.7 (2)

1. For S17400 valve shaft only

2. For ASME SA-479 grade S20910 SST valve shaft only. Pressure drop should be suitable for both shaft materials.

CVS Series V500 – Technical Specifications – Maximum Allowable Shutoff Pressure Drops

Table 6. Max Allowable Shutoff Pressure Drops – Trim T2 and T3 – PSI

Valve Body Material	Bearing Material	Temperature °F	Valve Body Size - NPS						
			1	1-1/2	2	3	4	6	8
WCC Steel	S44004	-20 ~ 200	1500	1500	1500	1500	1200	750	350
		200 ~ 300	1455	1455	1435	1455	1200	750	350
		300 ~ 400	1410	1410	160	1410	1200	740	345
		400 ~ 500	1330	1330	1325	1330	1200	725	335
		500 ~ 600	1210	1210	1210	1210	1200	715	335
		600 ~ 650	1175	1175	1175	1175	1175	700	325
		650 ~ 700	1135	1135	1135	1135	1135	700	325
		700 ~ 750	1010	1010	1010	1010	1010	680	315
		750 ~ 800	825	825	825	825	825	680	315
	CoCr-A	-20 ~ 400	1000	800	600	600	600	300	220
		400 ~ 500	1000	800	600	600	600	300	220
		500 ~ 600	1000	800	600	600	600	300	220
		600 ~ 650	1000	800	600	600	600	300	220
		650 ~ 700	1000	800	600	600	600	300	220
		700 ~ 750	1000	800	600	600	600	300	220
		750 ~ 800	825	800	600	600	600	300	220
	PTFE coated/ composition 316 SST	-20 ~ 100	1500	1500	1500	1500	1300	800	350
		100 ~ 200	1500	1500	1500	1500	1300	800	350
		200 ~ 300	1455	1455	1455	1455	1300	800	350 (1) 335 (2)
		300 ~ 400	1410	1410	1410	1410	1300	795 (1) 740 (2)	345 (1) 320 (2)
		400 ~ 450	1330	1330	1330	1330	1300	780 (1) 725 (2)	340 (1) 315 (2)
CF8M SST (3)	CoCr-A	-50 ~ 400	1000	800	600	600	600	300	220
		400 ~ 500	955	800	600	600	600	300	220
		500 ~ 600	905	800	600	600	600	300	220
		600 ~ 650	890	800	600	600	600	300	220
		650 ~ 700	865	800	600	600	600	300	220
		700 ~ 750	845	800	600	600	600	300	220
		750 ~ 800	830	800	600	600	600	300	220
	PTFE coated/ composition 316 SST	-50 ~ 100	1440	1440	1440	1440	1300	800	350
		100 ~ 200	1240	1240	1240	1240	1240	800	350
		200 ~ 300	1120	1120	1120	1120	1120	770	350 (1) 335 (2)
		300 ~ 400	1030	1030	1030	1030	1030	795 (1) 740 (2)	345 (1) 320 (2)
		400 ~ 450	955	955	955	955	955	780 (1) 725 (2)	340 (1) 315 (2)

1. For S17400 valve shaft only
2. For ASME SA-479 grade S20910 SST valve shaft only. Pressure drop should be suitable for both shaft materials.
3. The maximum temperature for trim T3 is 600°F.

CVS Series V500 – Technical Specifications – Maximum Allowable Shutoff Pressure Drops

Table 7. Max Allowable Shutoff Pressure Drops – Trim T2 and T3 – BAR

Valve Body Material	Bearing Material	Temperature °C	Valve Body Size - NPS						
			1	1-1/2	2	3	4	6	8
WCC Steel	S44004	-29~93	103.4	103.4	103.4	103.4	82.7	51.7	24.1
		93~149	100.3	100.3	99.0	100.3	82.7	51.7	24.1
		149~204	97.2	97.2	93.8	97.2	82.7	51.0	23.8
		204~260	91.7	91.7	91.4	91.7	82.7	50.0	23.1
		260~316	83.4	83.4	83.4	83.4	82.7	49.3	23.1
		316~343	81.0	81.0	81.0	81.0	81.0	48.3	22.4
		343~371	78.3	78.3	78.3	78.3	78.3	48.3	22.4
		371~399	69.6	69.6	69.6	69.6	69.6	46.9	21.7
		399~427	56.9	56.9	56.9	56.9	56.9	46.9	21.7
	CoCr-A	-29 ~ 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 ~ 260	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		260 ~ 316	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		316 ~ 343	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		343 ~ 371	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		371 ~ 399	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		399 ~ 427	56.9	55.2	41.4	41.4	41.4	20.7	15.2
	PTFE coated/ composition 316 SST	-29 ~ 38	103.4	103.4	103.4	103.4	89.6	55.2	24.1
		38 ~ 93	103.4	103.4	103.4	103.4	89.6	55.2	24.1 ⁽¹⁾
		93 ~ 149	100.3	100.3	100.3	100.3	89.6	55.2	23.1 ⁽²⁾
		149 ~ 204	97.2	97.2	97.2	97.2	89.6	54.8 ⁽¹⁾	23.8 ⁽¹⁾
								51.0 ⁽²⁾	22.1 ⁽²⁾
		204 ~ 232	91.7	91.7	91.7	91.7	89.6	53.8 ⁽¹⁾	23.4 ⁽¹⁾
								50.0 ⁽²⁾	21.7 ⁽²⁾
CF8M SST (3)	CoCr-A	-46 ~ 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 ~ 260	65.8	55.2	41.4	41.4	41.4	20.7	15.2
		260 ~ 316	62.4	55.2	41.4	41.4	41.4	20.7	15.2
		316 ~ 343	61.4	55.2	41.4	41.4	41.4	20.7	15.2
		343 ~ 371	59.6	55.2	41.4	41.4	41.4	20.7	15.2
		371 ~ 399	58.3	55.2	41.4	41.4	41.4	20.7	15.2
		399 ~ 427	57.2	55.2	41.4	41.4	41.4	20.7	15.2
	PTFE coated/ composition 316 SST	-46 ~ 38	99.3	99.3	99.3	99.3	89.6	55.2	24.1
		38 ~ 93	85.5	85.5	85.5	85.5	85.5	55.2	24.1
		93 ~ 149	77.3	77.3	77.3	77.3	77.3	53.1	24.1 ⁽¹⁾
									23.1 ⁽²⁾
		149 ~ 204	71.0	71.0	71.0	71.0	71.0	54.8 ⁽¹⁾	23.8 ⁽¹⁾
								51.0 ⁽²⁾	22.1 ⁽²⁾
		204 ~ 232	65.8	65.8	65.8	65.8	65.8	53.8 ⁽¹⁾	23.4 ⁽¹⁾
								50.0 ⁽²⁾	21.7 ⁽²⁾

1. For S17400 valve shaft only

2. For ASME SA-479 grade S20910 SST valve shaft only. Pressure drop should be suitable for both shaft materials. 3. The maximum temperature for trim T3 is 316°C.

CVS Series V500 – Technical Specifications – Maximum Allowable Shutoff Pressure Drops

Table 8. Max Allowable Shutoff Pressure Drops – Trim T4

Valve Body Material	Bearing Material	Temperature °C	BAR						
			Valve Body Size - NPS						
			1	1-1/2	2	3	4	6	8
WCC Steel	S44004	-29 ~ 93	103.4	103.4	70.3	103.4	78.6	52.4	24.1
		93 ~ 149	100.3	100.3	70.3	100.3	78.6	52.4	24.1
		149 ~ 204	97.2	97.2	70.3	97.2	78.6	51.0	23.8
		204 ~ 260	91.7	91.7	70.3	91.7	78.6	50.0	23.1
		260 ~ 316	83.4	83.4	70.3	83.4	78.6	49.3	23.1
		316 ~ 371	78.3	78.3	70.3	78.3	78.3	48.3	22.4
		371 ~ 427	56.9	56.9	56.9	56.9	56.9	46.9	21.7
	CoCr-A	-29 ~ 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 ~ 260	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		260 ~ 316	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		316 ~ 371	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		371 ~ 427	56.9	55.2	41.4	41.4	41.4	20.7	15.2
CF8M SST	CoCr-A	-46 ~ 204	68.9	55.2	41.4	41.4	41.4	20.7	15.2
		204 ~ 260	65.8	55.2	41.4	41.4	41.4	20.7	15.2
		260 ~ 316	62.4	55.2	41.4	41.4	41.4	20.7	15.2
		316 ~ 371	59.6	55.2	41.4	41.4	41.4	20.7	15.2
		371 ~ 427	57.2	55.2	41.4	41.4	41.4	20.7	15.2
Valve body material	Bearing material	Temperature °F	PSI						
			1	1-1/2	2	3	4	6	8
WCC Steel	S44004	-20 ~ 200	1500	1500	1020	1500	1140	750	350
		200 ~ 300	1455	1455	1020	1455	1140	760	350
		300 ~ 400	1410	1410	1020	1410	1140	740	345
		400 ~ 500	1330	1330	1020	1330	1140	725	335
		500 ~ 600	1210	1210	1020	1210	1140	715	335
		600 ~ 700	1135	1135	1020	1135	1135	700	325
		700 ~ 800	825	825	825	825	825	680	315
	CoCr-A	-20 ~ 400	1000	800	600	600	600	300	220
		400 ~ 500	1000	800	600	600	600	300	220
		500 ~ 600	1000	800	600	600	600	300	220
		600 ~ 700	1000	800	600	600	600	300	220
		700 ~ 800	825	800	600	600	600	300	220
CF8M SST	CoCr-A	-50 ~ 400	1000	800	600	600	600	300	220
		400 ~ 500	955	800	600	600	600	300	220
		500 ~ 600	905	800	600	600	600	300	220
		600 ~ 700	855	800	600	600	600	300	220
		700 ~ 800	830	800	600	600	600	300	220
1.VTC Valve Trim is not available for water and steam with temperature above 180°C(360°F).									

CVS Series V500 – Technical Specifications – Material Temperature Range

Table 9. CVS Series V500 Eccentric Rotary Valve Material Temperature Limits

Description	Material		Temperature range	
			°C	°F
Valve body and retainer NPS 1 & NPS 1-1/2	Steel Body	S316 retainer S31600 retainer with CoCr-A bore S31600 retainer with VTCbore	-29~ 427	-20~800
	CF8M Body	S31600 retainer S31600 retainer with CoCr-A bore S31600 retainer with VTCbore	-198~538	-325~1000
Valve body and retainer NPS 2 ~ NPS 8	WCC Body	S17400retainer	-29~427	-20~ 800
		Solid CoCr-A retainer	-29~427	-20~ 800
		S31600 retainer	-29~260	-20~ 500
		CoCr-A retainer with VTC bore	-29~427	-20~ 800
	CF8M Body	S31600 retainer	-198~ 427	-325~ 800
		Solid CoCr-A retainer	-46~324	-50~ 600
		S31600 retainer with CoCr-A bore	-198~ 427	-325~ 800
		CoCr-A retainer with VTC bore	-46~427	-50~ 800
Seat ring	S31600		-198~ 538	-325~1000
	Solid CoCr-A		-46~538	-50~ 1000
	S31600 with CoCr-A seat		-198~ 538	-325~1000
	Solid VTC		-46~427	-50~ 800
Valve plug	S31600 Coated with Chrome		-198~ 316	-325~ 600
	Solid CoCr-A		-46~427	-50~ 800
	S31600 coated with CoCr-A (available for valve size NPS2~NPS 8)		-198~ 538	-325~1000
	Solid VTC (available for valve size NPS1&NPS1-1/2)		-46~427	-50~ 800
	Plug surface is VTC, connect to CoCr-A hub with stud (available for valve size NPS 3~ NPS8)		-46~427	-50~800
Valve shaft	S17400		-62~427	-80~800
	S20910		-198~538	-325~1000
Taper pin & expansion pin	NPS 1-2 solid VTC Valve plug	N10276	-46~427	-50~800
	other valve plugs	S20910	-198~538	-325~1000
Bearing	PTFE coated/ composition 316		-46~260	-50~500
	CoCr-A ⁽²⁾		-198~538	-325~ 100
	S44004 ⁽²⁾		-29~427	-20~800
O-ring ⁽³⁾ (for Alloy6 or 440CSST seal bearing)	FKM rubber		-18~204	0~400
	NBR		-29~93	-20~200
Bearing stop	S31600		-198~538	-325~1000
Thrust washer	S17700 for S17400 shaft		-198~427	-325~ 800
	R30016 for S20910 SST shaft		-198~538	-325~1000
Face seal	N07718 (NACEMR0175-2002 or PTFE/N10276)		-198~538	-325~1000
Retainer gasket	Laminate graphite for valve size NPS1& NPS1-1/2, S31600for valve size NPS2 ~ NPS8		-198~538	-325~1000
Packing ring	PTFE		-46~260	-50~500
	PTFE/composition		-73~260	-100~500
	Graphite ribbon		-198~538	-325~1000
Packing follower	S31600		-198~538	-325~1000
Stud and nut	SA-193-B7stud and SA-194-2H nut		-46~427	-50~800
	SA-193-B7M stud and SA-194-2HM nut		-29~427	-20~800
	B8M Stud and 8M Nut		-198~538	-325~1000
Packing box ring	S31600		-198~538	-325~1000

1.VTC Valve Trim is not suitable for water and steam with temperature above 180°C(360°F)
2. Recommended for erosive fluids.
3.Used for sealed bearing construction.

CVS Series V500 – Technical Specifications – Dimensions and Approximate Weights

Table 11. CVS Series V500 Dimensions and Weights

Valve size DN	Dimension										Estimate Weight		
	A		B		D	K	S (Shaft diameter) ⁽¹⁾	T	U	W	Flange Type		
	RF	RTJ	RF	RTJ							Pressure Rating		
											CL150	CL300	CL600
mm											kg		
25	102	108	51	57	187	126	12.7	118	---	11	5.4	5.9	5.9
40	114	122	57	63	187	135	15.9	118	---	14	8.6	9.5	10
50	124	124	62	62	187	151	15.9	118	---	14	9.5	11	13
80	165	165	83	83	213	200	25.4 25.4 X 19.1	152	32	14	19	24	26
100	194	194	97	97	208	216	31.8	235	46	18	36	42	50
150	229	229	114	114	208	270	38.1 38.1 X 31.8	235	46	5/8 In 11UNC	54	69	93
200	243	243	121	121	208	318	38.1	235	46	5/8 In 11UNC	79	98	135
Valve size NPS	inches										Lbs		
1	4.00	4.25	2.00	2.25	7.38	4.97	1/2	4.62	---	0.45	12	13	13
1-1/2	4.50	4.75	2.25	2.50	7.38	5.31	5/8	4.62	---	0.56	19	21	23
2	4.88	4.88	2.44	2.44	7.38	5.94	5/8	4.62	---	0.56	21	25	28
3	6.5	6.50	3.25	3.25	8.44	7.88	1 1x3/4	6.00	1.25	0.56	42	52	57
4	7.62	7.62	3.81	3.81	8.19	8.50	1-1/4	9.25	1.81	0.69	79	93	111
6	9.00	9.00	4.50	4.50	8.19	10.6	1-1/2 1-1/2x1-1/4	9.25	1.81	5/8 In 11UNC	120	152	204
8	9.56	9.56	4.78	4.78	8.19	12.5	1-1/2	9.25	1.81	5/8 In 11UNC	175	217	298

1.Valve shaft diameter should match with spline diameter.

1. Valve shaft diameter should match with spline diameter.

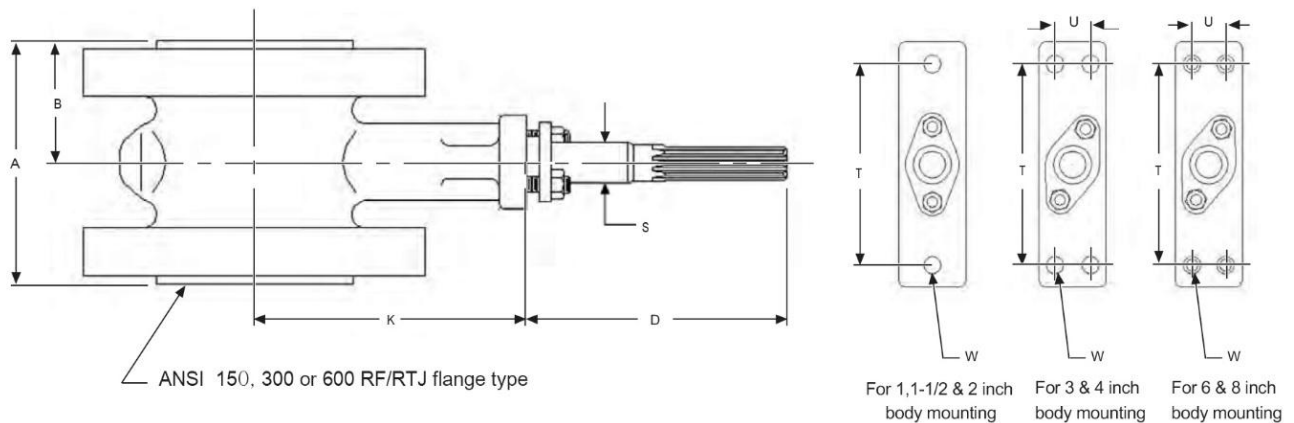


Figure 10. CVS Series V500 Flanged Valve Dimensions

CVS Series V500 – Technical Specifications – Flow Coefficients

Table 12. CVS Series V500, Trim T1, T2, and T3. Full Port Trim, **Forward Flow**.

Flow Coefficient	Valve Size NPS	Valve Rotation (degree) - Modified Linear Flow Characteristic								
		10	20	30	40	50	60	70	80	90
CV	1	1.22	2.89	5.05	7.63	9.94	11.3	11.8	12.0	12.2
KV		1.06	2.50	4.37	6.60	8.60	9.77	10.2	10.4	10.6
Fd		0.49	0.64	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.89	0.89	0.88	0.85	0.85	0.85	0.85	0.85	0.85
XT		0.480	0.497	0.508	0.548	0.597	0.632	0.636	0.612	0.593
CV	1-1/2	2.07	6.15	11.5	16.6	20.7	23.5	25.3	26.1	26.6
KV		1.79	5.32	9.95	14.4	17.9	20.3	21.9	22.6	23.0
Fd		0.48	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.95	0.85	0.85	0.84	0.84	0.84	0.84	0.84	0.84
XT		0.770	0.476	0.483	0.555	0.616	0.636	0.632	0.601	0.589
CV	2	4.11	8.73	16.7	27.0	37.2	43.4	45.8	46.2	46.2
KV		3.56	7.55	14.4	23.4	32.2	37.5	39.6	40.0	40.0
Fd		0.49	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.97	0.92	0.84	0.79	0.77	0.75	0.75	0.74	0.74
XT		0.439	0.422	0.442	0.422	0.422	0.463	0.452	0.442	0.442
CV	3	8.80	22.7	43.3	71.3	96.8	116	130	138	142
KV		7.61	19.6	37.5	61.7	83.7	100	112	119	123
Fd		0.46	0.62	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.86	0.84	0.83	0.83	0.83	0.82	0.78	0.77	0.77
XT		0.469	0.544	0.574	0.526	0.497	0.526	0.508	0.476	0.456
CV	4	16.6	41.3	79.1	123	166	203	230	247	255
KV		14.3	35.7	68.4	106	144	176	199	214	221
Fd		0.45	0.61	0.72	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.85	0.82	0.81	0.81	0.80	0.79	0.77	0.76	0.76
XT		0.439	0.555	0.501	0.466	0.473	0.490	0.480	0.459	0.442
CV	6	17.5	79.1	155	270	363	434	492	540	565
KV		15.1	68.4	134	234	314	375	426	467	489
Fd		0.44	0.60	0.72	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.97	0.93	0.88	0.82	0.76	0.73	0.72	0.71	0.71
XT		0.879	0.585	0.540	0.456	0.439	0.432	0.436	0.426	0.416
CV	8	51.5	146	298	481	646	775	879	981	1050
KV		44.5	126	258	416	559	670	760	849	908
Fd		0.43	0.59	0.72	0.80	0.87	0.92	0.96	0.99	1.00
FL		0.97	0.93	0.87	0.78	0.72	0.71	0.70	0.69	0.67
XT		0.456	0.605	0.533	0.449	0.413	0.403	0.391	0.372	0.36

CVS Series V500 – Technical Specifications – Flow Coefficients

Table 13. CVS Series V500, Trim T1, T2, and T3. Full Port Trim, **Reverse Flow**.

Flow Coefficient	Valve Size NPS	Valve Rotation (deg.) Modified Linear Flow Characteristic								
		10	20	30	40	50	60	70	80	90
CV	1	1.08	2.82	5.26	9.11	12.4	14.7	15.9	16.4	16.8
KV		0.93	2.44	4.55	7.88	10.7	12.7	13.8	14.2	14.5
Fd		0.49	0.64	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.80	0.79	0.73	0.63	0.58	0.55	0.56	0.51	0.48
XT		0.172	0.284	0.406	0.357	0.345	0.322	0.300	0.289	0.283
CV	1-1/2	1.71	5.33	11.3	18.4	24.7	28.6	30.1	30.7	31.0
KV		1.48	4.16	9.77	15.9	21.4	24.7	26.0	26.6	26.8
Fd		0.48	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.75	0.74	0.70	0.66	0.64	0.63	0.63	0.63	0.63
XT		0.375	0.442	0.432	0.397	0.369	0.360	0.360	0.357	0.357
CV	2	2.98	7.40	15.6	27.6	41.9	52.9	56.4	57.2	57.4
KV		2.58	6.40	13.5	23.9	36.2	45.8	48.8	49.5	49.7
Fd		0.49	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.92	0.89	0.81	0.67	0.60	0.58	0.58	0.58	0.58
XT		0.480	0.476	0.462	0.384	0.308	0.265	0.265	0.265	0.265
CV	3	7.19	21.4	47.0	75.4	105	122	132	134	141
KV		6.22	18.5	40.7	65.2	90.8	106	114	116	122
Fd		0.46	0.62	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.80	0.80	0.77	0.71	0.66	0.65	0.65	0.65	0.65
XT		0.375	0.476	0.487	0.436	0.372	0.378	0.384	0.376	0.357
CV	4	12.2	39.0	79.9	124	171	202	222	232	235
KV		10.6	33.7	69.1	107	148	175	192	201	203
Fd		0.45	0.61	0.72	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.90	0.89	0.81	0.73	0.71	0.70	0.69	0.69	0.69
XT		0.522	0.544	0.487	0.456	0.406	0.406	0.416	0.423	0.416
CV	6	15.1	72.4	156	251	351	438	534	638	717
KV		13.1	62.6	135	217	304	379	462	552	620
Fd		0.44	0.60	0.72	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.85	0.85	0.82	0.77	0.70	0.66	0.61	0.57	0.51
XT		0.416	0.597	0.518	0.522	0.452	0.388	0.336	0.270	0.219
CV	8	33.5	143	302	485	663	798	871	897	986
KV		29.0	124	261	420	573	690	753	776	853
Fd		0.43	0.59	0.72	0.80	0.87	0.92	0.96	0.99	1.00
FL		0.81	0.81	0.79	0.76	0.68	0.66	0.66	0.66	0.66
XT		0.697	0.593	0.483	0.410	0.354	0.342	0.366	0.403	0.363

CVS Series V500 – Technical Specifications – Flow Coefficients

Table 14. CVS Series V500, Trim T1, T2, and T3. Restricted Flow Trim, **Forward Flow**.

Flow Coefficient	Valve Size NPS	Valve Rotation (degree) - Modified Linear Flow C characteristic								
		10	20	30	40	50	60	70	80	90
CV	1	0.777	2.09	3.02	3.62	4.53	4.90	4.93	4.96	5.01
KV		0.672	1.81	2.61	3.13	3.92	4.24	4.26	4.29	4.33
Fd ⁽¹⁾		0.54	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.89	0.89	0.88	0.85	0.82	0.79	0.75	0.74	0.74
XT		0.487	0.391	0.497	0.597	0.508	0.439	0.436	0.429	0.419
CV	1-1/2	0.632	2.56	4.47	7.15	9.62	10.7	10.8	10.9	10.9
KV		0.547	2.21	3.87	6.18	8.32	9.26	9.34	9.43	9.43
Fd ⁽¹⁾		0.53	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.84	0.84	0.84	0.82	0.79	0.75	0.73	0.73	0.73
XT		0.559	0.397	0.522	0.574	0.585	0.508	0.497	0.490	0.490
CV	2	1.30	3.49	5.31	9.64	15.1	17.3	17.3	17.3	17.3
KV		1.12	3.02	4.59	8.34	13.1	15.0	15.0	15.0	15.0
Fd ⁽¹⁾		0.54	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.85	0.85	0.84	0.84	0.82	0.79	0.79	0.79	0.79
XT		0.391	0.336	0.452	0.563	0.529	0.462	0.462	0.462	0.462
CV	3	6.78	11.5	16.0	26.7	40.2	47.7	48.4	48.4	48.4
KV		5.86	9.95	13.8	23.1	34.8	41.3	41.9	41.9	41.9
Fd ⁽¹⁾		0.53	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.90	0.88	0.87	0.86	0.85	0.82	0.77	0.77	0.77
XT		0.487	0.501	0.487	0.429	0.459	0.429	0.429	0.429	0.429
CV	4	10.0	18.2	24.4	43.7	69.2	90.6	98.2	98.2	98.2
KV		8.65	15.7	21.2	37.8	59.9	78.4	84.9	84.9	84.9
Fd ⁽¹⁾		0.52	0.65	0.74	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.95	0.89	0.85	0.84	0.84	0.81	0.77	0.77	0.77
XT		0.426	0.459	0.570	0.504	0.487	0.462	0.426	0.426	0.426
CV	6	9.50	26.6	41.8	76.0	129	170	200	200	200
KV		8.22	23.0	36.2	65.7	112	147	173	173	173
Fd ⁽¹⁾		0.52	0.65	0.74	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.97	0.96	0.92	0.86	0.80	0.76	0.74	0.74	0.74
XT		0.995	0.351	0.403	0.487	0.416	0.462	0.410	0.410	0.410
CV	8	39.9	87.8	155	241	343	448	541	606	623
KV		34.5	75.9	134	208	297	388	468	524	539
FD ⁽²⁾		0.48	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.96	0.81	0.80	0.79	0.78	0.76	0.74	0.72	0.70
XT		0.400	0.446	0.459	0.449	0.429	0.413	0.413	0.413	0.391
1. Valve Rotation 60% Port 2. Valve Rotation 40% Port										

CVS Series V500 – Technical Specifications – Flow Coefficients

Table 15. CVS Series V500, Trim T1, T2, and T3. Restricted Flow Trim, **Reverse Flow**.

Flow Coefficient	Valve Size NPS	Valve Rotation (degree) - Modified Linear Flow Characteristic								
		10	20	30	40	50	60	70	80	90
CV	1	0.634	2.09	3.34	3.96	5.21	5.64	5.7	5.71	5.76
KV		0.548	1.81	2.89	3.43	4.51	4.88	4.93	4.94	4.98
Fd ⁽¹⁾		0.54	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
XT		0.230	0.216	0.207	0.406	0.366	0.348	0.339	0.345	0.342
CV	1-1/2	0.464	1.93	4.21	7.81	11.0	12.1	12.1	12.2	12.2
KV		0.401	1.67	3.64	6.76	9.52	10.5	10.5	10.6	10.6
Fd ⁽¹⁾		0.53	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.93	0.93	0.75	0.72	0.70	0.70	0.70	0.70	0.7
XT		0.97	0.416	0.501	0.467	0.416	0.416	0.416	0.413	0.416
CV	2	0.965	2.68	4.82	12.0	17.7	18.7	18.8	18.9	18.9
KV		0.835	2.31	4.17	10.4	15.3	16.2	16.3	16.3	16.3
Fd ⁽¹⁾		0.54	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.96	0.96	0.77	0.67	0.62	0.62	0.62	0.62	0.62
XT		0.518	0.508	0.559	0.354	0.351	0.36	0.357	0.354	0.354
CV	3	5.95	10.6	14.7	29.9	49.0	56.0	56.2	56.2	56.7
KV		5.15	9.17	12.7	25.9	42.4	48.4	48.6	48.6	49.0
Fd ⁽¹⁾		0.53	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00.
FL		0.80	0.79	0.73	0.64	0.59	0.58	0.58	0.58	0.58
XT		0.429	0.455	0.487	0.345	0.286	0.286	0.286	0.286	0.281
CV	4	7.69	15.3	22.7	42.6	75.0	98.0	99.5	100	102
KV		6.65	13.2	19.6	36.8	64.9	84.8	86.1	86.5	88.2
Fd ⁽¹⁾		0.52	0.65	0.74	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.83	0.82	0.81	0.77	0.60	0.59	0.58	0.58	0.58
XT		0.504	0.548	0.555	0.529	0.375	0.322	0.336	0.334	0.319
CV	6	5.10	20.6	34.6	71.9	123	170	230	231	232
KV		4.41	17.8	29.9	62.2	106	147	199	200	201
Fd ⁽¹⁾		0.52	0.65	0.74	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.97	0.95	0.90	0.82	0.73	0.65	0.57	0.55	0.55
XT		0.990	0.551	0.566	0.533	0.432	0.397	0.263	0.260	0.258
CV	8	27.1	74.3	140	232	342	457	552	614	646
KV		23.4	64.3	121	201	296	395	477	531	559
Fd ⁽²⁾		0.48	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.92	0.91	0.88	0.76	0.69	0.66	0.62	0.60	0.58
XT		0.636	0.494	0.494	0.490	0.442	0.388	0.369	0.339	0.311
1. Valve Rotation 60% Port 2. Valve Rotation 40% Port										

CVS Series V500 – Technical Specifications – Flow Coefficients

Table 16. CVS Series V500, Trim T4. Full Port Trim, **Forward Flow**.

Flow Coefficient	Valve Size NPS	Valve Rotation (degree) - Modified Linear Flow Characteristic								
		10	20	30	40	50	60	70	80	90
CV	1	0.30	1.91	4.68	7.3	9.17	10.3	11.0	11.5	11.6
KV		0.260	1.65	4.05	6.31	7.93	8.91	9.52	9.95	10.0
Fd		0.49	0.64	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		---	0.98	0.87	0.87	0.85	0.86	0.85	0.86	0.84
XT		0.668	0.574	0.529	0.566	0.616	0.668	0.685	0.628	0.616
CV	1-1/2	1.46	3.79	8.13	13.4	17.9	20.7	22.4	24.0	25.0
KV		1.26	3.28	7.03	11.6	15.5	17.9	19.4	20.8	21.6
Fd		0.48	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.86	0.86	0.82	0.84	0.80	0.80	0.79	0.79	0.79
XT		0.566	0.605	0.55	0.544	0.551	0.574	0.589	0.585	0.597
CV	2	1.76	6.0	13.8	22.6	29.5	35.2	38.4	38.4	38.4
KV		1.52	5.19	11.9	19.5	25.5	30.4	33.2	33.2	33.2
Fd		0.49	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.95	0.96	0.94	0.83	0.81	0.80	0.77	0.77	0.78
XT		0.819	0.555	0.501	0.480	0.533	0.566	0.570	0.585	0.585
CV	3	76	23.2	44.0	62.6	82.5	102	115	119	124
KV		6.57	20.1	38.1	54.1	71.4	88.2	99.5	103	107
Fd		0.46	0.62	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.88	0.87	0.85	0.84	0.83	0.82	0.80	0.80	0.80
XT		0.578	0.484	0.511	0.54	0.529	0.515	0.518	0.533	0.526
CV	4	9.31	37.0	73.5	111	144	171	192	208	221
KV		8.05	32.0	63.6	96	125	148	166	180	191
Fd		0.45	0.61	0.72	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.96	0.90	0.85	0.84	0.82	0.80	0.77	0.77	0.77
XT		0.526	0.476	0.449	0.452	0.480	0.504	0.511	0.501	0.487
CV	6	9.71	64.3	141	222	299	368	426	469	499
KV		8.40	55.6	122	192	259	318	368	406	432
Fd		0.44	0.60	0.72	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.95	0.88	0.82	0.80	0.78	0.78	0.77	0.77	0.76
XT		0.504	0.459	0.432	0.422	0.429	0.436	0.432	0.422	0.413
CV	8	34.6	142	290	447	592	716	822	911	958
KV		29.9	123	251	387	512	619	711	788	829
Fd		0.43	0.59	0.72	0.80	0.87	0.92	0.96	0.99	1.00
FL		0.92	0.76	0.78	0.79	0.77	0.76	0.73	0.71	0.73
XT		0.544	0.446	0.426	0.429	0.429	0.46	0.419	0.410	0.429

CVS Series V500 – Technical Specifications – Flow Coefficients

Table 17. CVS Series V500, Trim T4. Full Port Trim, **Reverse Flow**.

Flow Coefficient	Valve Size NPS	Valve Rotation (degree) - Modified Linear Flow C characteristic								
		10	20	30	40	50	60	70	80	90
CV	1	0.107	1.85	5.09	8.8	11.9	13.6	14.0	14.0	15.3
KV		0.093	1.60	4.40	7.61	10.3	11.8	12.1	12.1	13.2
Fd		0.49	0.64	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		--	0.88	0.65	0.60	0.54	0.54	0.60	0.62	0.61
XT		0.334	0.526	0.426	0.360	0.334	0.345	0.372	0.384	0.334
CV	1-1/2	0.988	3.37	7.66	13.5	19.3	23.5	25.3	25.3	26.1
KV		0.854	2.92	6.63	11.7	16.7	20.3	21.9	21.9	22.6
Fd		0.48	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.98	0.92	0.75	0.73	0.62	0.58	0.59	0.61	0.61
XT		0.473	0.585	0.563	0.487	0.432	0.403	0.400	0.426	0.429
CV	2	1.42	4.92	11.8	20.9	29.8	36.7	40.9	42.7	43.0
KV		1.23	4.26	10.2	18.1	25.8	31.7	35.4	36.9	37.2
Fd		0.49	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.97	0.93	0.86	0.77	0.72	0.62	0.64	0.63	0.66
XT		0.403	0.718	0.616	0.518	0.472	0.452	0.452	0.446	0.439
CV	3	7.64	20.6	41.3	62.4	80.5	94.8	105	109	111
KV		6.61	17.8	34.9	54.0	69.6	82.0	90.8	94.3	96.0
Fd		0.46	0.62	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.93	0.91	0.89	0.81	0.73	0.72	0.71	0.74	0.76
XT		0.616	0.656	0.537	0.497	0.501	0.508	0.504	0.515	0.511
CV	4	8.07	31.3	67.1	102	129	153	174	189	192
KV		6.98	27.1	58.0	88.2	112	132	151	163	166
Fd		0.45	0.61	0.72	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.86	0.85	0.84	0.80	0.75	0.75	0.75	0.75	0.74
XT		0.456	0.664	0.533	0.490	0.515	0.526	0.522	0.504	0.515
CV	6	10.5	58.6	134	218	294	356	406	445	461
KV		9.08	50.7	116	189	254	308	351	385	399
Fd		0.44	0.60	0.72	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.80	0.76	0.72	0.70	0.68	0.69	0.69	0.69	0.69
XT		0.511	0.551	0.459	0.406	0.391	0.397	0.401	0.416	0.429
CV	8	25.4	136	266	413	554	686	818	895	897
KV		22.0	118	230	357	479	593	708	774	776
Fd		0.43	0.59	0.72	0.80	0.87	0.92	0.96	0.99	1.00
FL		0.75	0.77	0.75	0.72	0.73	0.69	0.70	0.70	0.72
XT		0.731	0.439	0.483	0.469	0.439	0.397	0.360	0.375	0.426

CVS Series V500 – Technical Specifications – Flow Coefficients

Table 18. CVS Series V500, Trim T4. Restricted Flow Trim, **Forward Flow**.

Flow Coefficient	Valve Size NPS	Valve Rotation (degree) - Modified Linear Flow Characteristic								
		10	20	30	40	50	60	70	80	90
CV	1	2.14	3.70	4.65	5.25	5.50	5.57	5.66	5.66	5.66
KV		1.84	3.18	4.00	4.52	4.73	4.79	4.87	4.87	4.87
Fd ⁽¹⁾		0.54	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.64	0.75	0.75	0.79	0.75	0.74	0.73	0.73	0.73
XT		0.286	0.388	0.464	0.483	0.471	0.459	0.444	0.444	0.444
CV	1-1/2	2.10	4.55	6.16	8.00	10.4	11.3	11.3	11.3	11.3
KV		1.81	3.91	5.30	6.88	8.94	9.72	9.72	9.72	9.72
Fd ⁽¹⁾		0.53	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.82	0.79	≥0.79	0.79	0.79	0.72	0.72	0.72	0.72
XT		0.469	0.379	0.454	0.500	0.502	0.482	0.482	0.482	0.482
CV	2	2.75	5.15	6.70	9.65	13.7	16.9	18.8	18.8	17.9
KV		2.37	4.43	5.76	8.30	11.8	14.5	16.2	16.2	15.4
Fd ⁽¹⁾		0.54	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.75	0.76	0.83	≥0.86	0.87	0.85	0.77	0.77	0.81
XT		0.467	0.448	0.519	0.624	0.612	0.543	0.444	0.439	0.484
CV	3	4.12	9.50	13.1	19.8	29.6	39.0	45.3	48.0	48.0
KV		3.56	8.22	11.3	17.1	25.6	33.7	39.2	41.5	41.5
Fd ⁽¹⁾		0.53	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.80	0.80	0.88	0.86	0.84	0.82	0.81	0.79	0.77
XT		0.469	0.551	0.605	0.522	0.518	0.551	0.515	0.466	0.466
CV	4	2.26	11.2	20.1	33.3	50.8	69.1	83.0	89.3	90.1
KV		1.95	9.69	17.4	28.8	43.9	59.8	71.8	77.2	77.9
Fd ⁽¹⁾		0.52	0.65	0.74	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.96	0.95	0.85	0.86	0.86	0.83	0.80	0.77	0.74
XT		0.779	0.779	0.632	0.620	0.612	0.589	0.537	0.466	0.452
CV	6	13.6	37.9	49.8	82.9	122	159	184	194	196
KV		11.6	32.8	43.1	71.7	106	138	159	168	170
Fd ⁽¹⁾		0.52	0.65	0.74	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.97	0.69	0.72	0.74	0.77	0.81	0.81	0.77	0.77
XT		0.518	0.280	0.381	0.357	0.397	0.452	0.476	0.452	0.442
CV	8	19.7	63.6	134	228	334	438	526	587	605
KV		19.0	55.0	116	197	289	379	455	508	523
Fd ⁽²⁾		0.48	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.93	0.83	0.76	0.77	0.77	0.77	0.75	0.75	0.72
XT		0.597	0.473	0.422	0.394	0.378	0.381	0.40	0.429	0.436
1. Valve Rotation 60% Port 2. Valve Rotation 40% Port										

CVS Series V500 – Technical Specifications – Flow Coefficients

Table 19. CVS Series V500, Trim T4. Restricted Flow Trim, **Reverse Flow**.

Flow Coefficient	Valve Size NPS	Valve rotation (degree) - Modified Linear Flow C haracteristic								
		10	20	30	40	50	60	70	80	90
CV	1	1.90	3.80	4.85	5.82	5.90	5.90	5.90	5.90	5.90
KV		1.63	3.27	4.17	5.01	5.07	5.07	5.07	5.07	5.07
Fd ⁽¹⁾		0.54	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.56	0.67	0.68	0.69	0.73	0.75	0.750.	0.75	0.75
XT		0.312	0.386	0.427	0.409	0.448	0.448	0.448	0.448	0.448
CV	1-1/2	1.95	4.45	5.75	7.75	11.4	11.8	11.8	11.8	11.8
KV		1.68	3.83	4.96	6.67	9.80	10.2	10.2	10.2	10.2
Fd ⁽¹⁾		0.53	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.83	0.77	0.78	0.76	0.68	0.72	0.73	0.73	0.73
XT		0.395	0.415	0.527	0.519	0.421	0.459	0.459	0.459	0.459
CV	2	2.70	4.65	6.30	11.1	18.3	19.8	20.2	20.4	21.0
KV		2.32	4.00	5.42	9.55	15.7	17.0	17.4	17.5	18.1
Fd ⁽¹⁾		0.54	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.91	0.89	0.84	0.71	0.58	0.61	0.62	0.62	0.60
XT		0.459	0.464	0.594	0.453	0.307	0.358	0.366	0.337	0.328
CV	3	4.41	9.60	13.7	19.5	37.3	53.3	56.7	57.9	57.9
KV		3.38	8.30	11.9	16.9	32.3	46.1	49.0	50.1	50.1
Fd ⁽¹⁾		0.53	0.66	0.75	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.96	0.93	0.93	0.87	0.73	0.64	0.62	0.62	0.63
XT		0.469	0.578	0.578	0.537	0.319	0.258	0.265	0.268	0.268
CV	4	9.78	11.1	19.4	32.1	49.7	67.8	80.5	84.6	86.6
KV		8.46	9.60	16.8	27.8	43.0	58.6	69.6	73.2	74.9
Fd ⁽¹⁾		0.52	0.65	0.74	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.93	0.93	0.89	0.84	0.79	0.72	0.64	0.65	0.65
XT		0.620	0.620	0.593	0.605	0.570	0.522	0.476	0.459	0.436
CV	6	10.6	30.0	43.4	77.1	122	168	198	223	226
KV		9.17	26.6	37.5	66.7	106	145	171	193	195
Fd ⁽¹⁾		0.52	0.65	0.74	0.82	0.88	0.92	0.96	0.99	1.00
FL		0.77	0.79	0.77	0.75	0.69	0.64	0.63	0.58	0.58
XT		0.640	0.369	0.476	0.41	0.381	0.357	0.336	0.284	0.278
CV	8	19.8	55.8	125	222	323	413	488	549	569
KV		17.1	48.3	108	192	279	357	422	475	492
Fd ⁽²⁾		0.48	0.63	0.73	0.81	0.87	0.92	0.96	0.99	1.00
FL		0.75	0.77	0.78	0.75	0.70	0.68	0.70	0.68	0.70
XT		0.459	0.581	0.462	0.394	0.375	0.381	0.391	0.391	0.391

1. Valve Rotation 60% Port
2. Valve Rotation 40% Port

CVS Series V500 – Ordering Information

CVS Series V500 Eccentric Rotary Ball Valve Ordering Table						
CV500	Body Size	Body Material	Flange Type & Pressure Rating	Stem Size	Trim Type	Special

ORDERING
CODE

CV500	02	W	3F	58	T1
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CVS Series V500 -

2" WCC Body, 300lb Raised Face Flanges, 5/8 Stem with T1 Trim

Body Size

Body Size (inch)	Code
1	01
1-1/2	1.5
2	02
3	03
4	04
6	06
8	08

Trim Type

Trim Type	Code
T1	T1
T2	T2
T3	T3
T4	T4
Other designs	Y

Stem Size (in)

1/2	12
5/8	58
1	10
1 X 3/4	
1-1/4	125
1-1/2	150
1-1/2 X 1-1/4	

Body Material

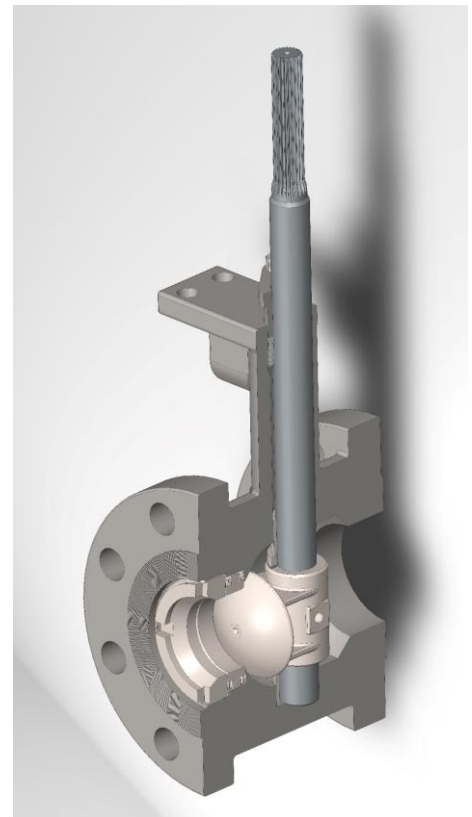
Body Material	Code
WCC Steel	W
CF8M SST	C
Others	Y

Flange Type and
Pressure Rating

Body Material	Available Valve Size (in)	Flange Type	Pressure Rating	Code
WCC Steel & Stainless Steel	1-8 inch	RF Flange	Class150	1F
			Class300	3F
			Class600	6F
		RTJ Flange	Class150	1T
			Class300	3T
			Class600	6T

Valve Shaft and Spline Diameters

Body Size	Shaft Size Through Body	Spline End	Shaft Size Through Body	Spline End
	Inches		mm	
1	0.50	0.50	12.7	12.7
1 – 1/2	0.62	0.62	15.9	15.9
2	0.62	0.62	15.9	15.9
3	1.00	1.00	25.4	25.4
	1.00	0.75	25.4	19.1
4	1.25	1.25	31.8	31.8
6	1.50	1.50	38.1	38.1
	1.50	1.25	38.1	31.8
8	1.50	1.50	38.1	38.1



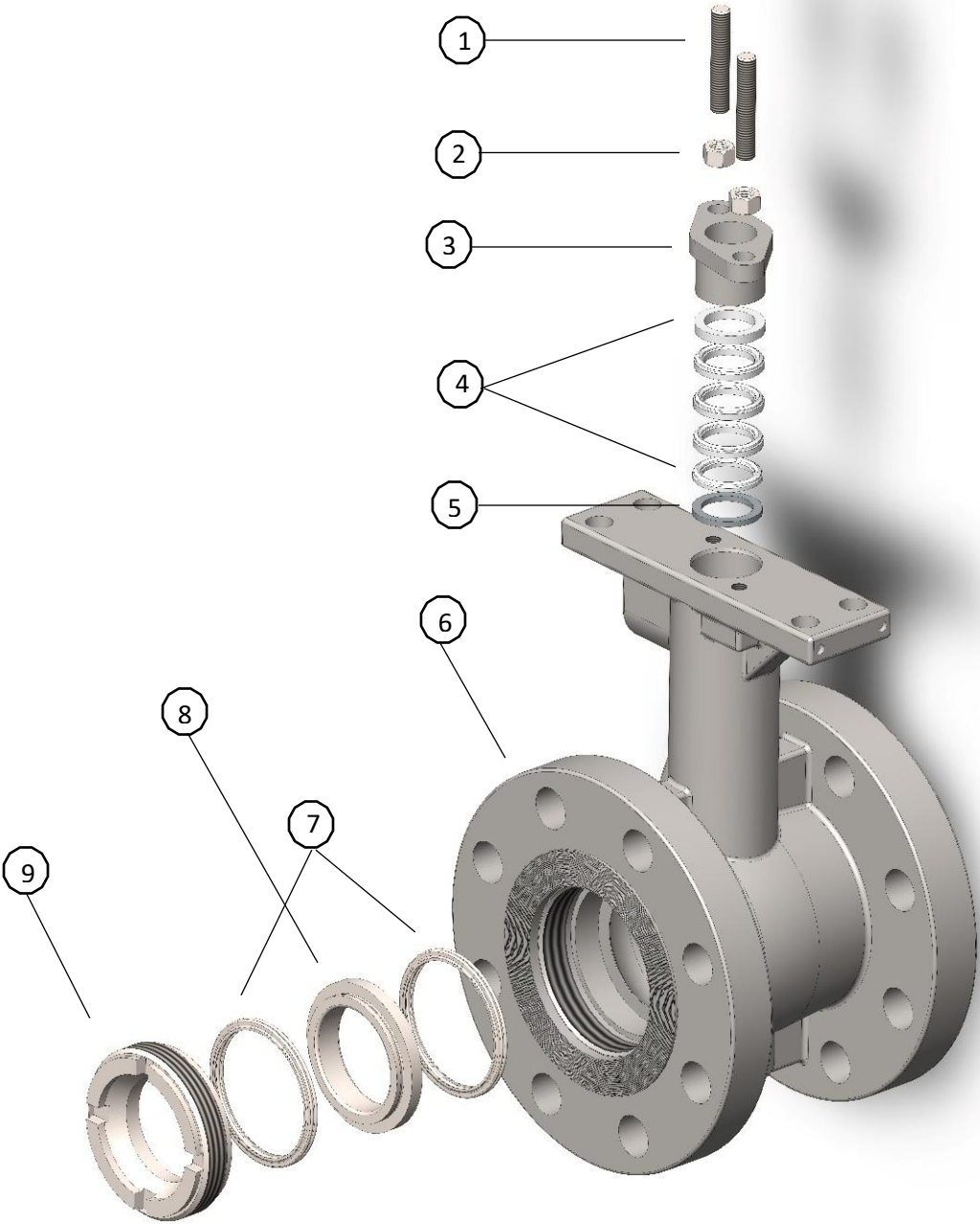
CVS Series V500 Sectional View

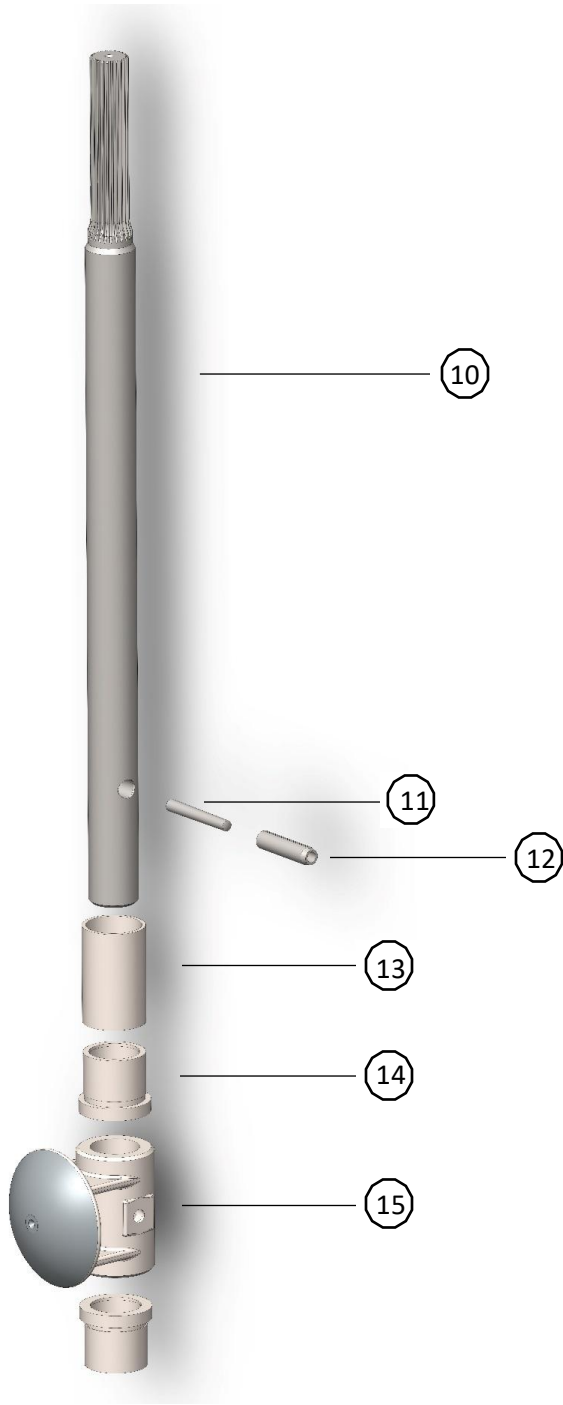
Trim Material Selection

Trim #	Plug	Seat Ring	Retainer	Shaft	Bearing	O-ring	Body (WCC/CF8M)		
T1	316SS Chrome Plated	316SS	17-4 (WCC body) or 316SS	17-4	PTFE Comp-lined S31600		Both		
					Alloy 6				
					S44004		WCC		
				S20910 Grade			Both		
T2	Solid Alloy 6 (1-4in valves)	Solid Alloy 6 (1 – 4in valves)	17-4 (WCC body) or 316SS	17-4	PTFE Comp-lined S31600		Both		
					Alloy 6			Nitrile	
								Fluorocarbon	
						S44004			Nitrile
		Fluorocarbon							
	316SS w/Alloy 6 face (6 and 8in valves)	316SS with Alloy 6 seat (6 and 8in valves)		S20910 Grade	PTFE Comp-lined S31600		Both		
					Alloy 6			Nitrile	
								Fluorocarbon	
T3	Solid Alloy 6 (1 – 8in valves)	Solid Alloy 6	316 SS with Alloy 6 Sleeve (1 and 1.5in valves)	17-4	PTFE Comp-lined S31600		Both		
					Alloy 6			Nitrile	
								Fluorocarbon	
						S44004			Nitrile
		Fluorocarbon							
	Alloy 6 (2 – 8in valves)	S20910 Grade	PTFE Comp-lined S31600		Both				
			Alloy 6			Nitrile			
						Fluorocarbon			
T4*	Solid Ceramic (1 and 2in valves)	Ceramic	316 SS with Ceramic bore (1 and 1.5in valves)	17-4	PTFE Comp-lined S31600		Both		
					Alloy 6			Nitrile	
								Fluorocarbon	
						S44004			Nitrile
		Fluorocarbon							
	Alloy 6 with Ceramic bore (2 – 8in valves)	S20910 Grade	PTFE Comp-lined S31600		Both				
			Alloy 6			Nitrile			
						Fluorocarbon			
NACE compliant trim available – Please contact a CVS Controls sales representative for more information									
*Ceramic Trim is not compatible in applications of water and steam above 360°F (180°C)									

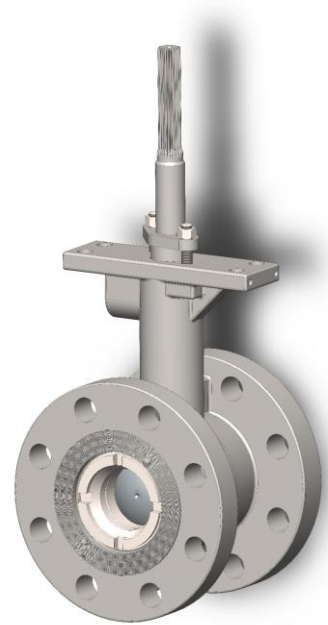
NACE compliant trim available – Please contact a CVS Controls sales representative for more information

*Ceramic Trim is not compatible in applications of water and steam above 360°F (180°C)





Item Number	Description
1	Packing Box Stud
2	Packing Box Nut
3	Packing Follower
4	Packing Box
5	Gasket
6	Valve Body
7	Seat Ring Seals
8	Seat Ring
9	Retainer
10	Valve Shaft
11	Taper Pin
12	Extension Pin
13	Bearing Stop
14	Bearing
15	Valve Plug



Notes:

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