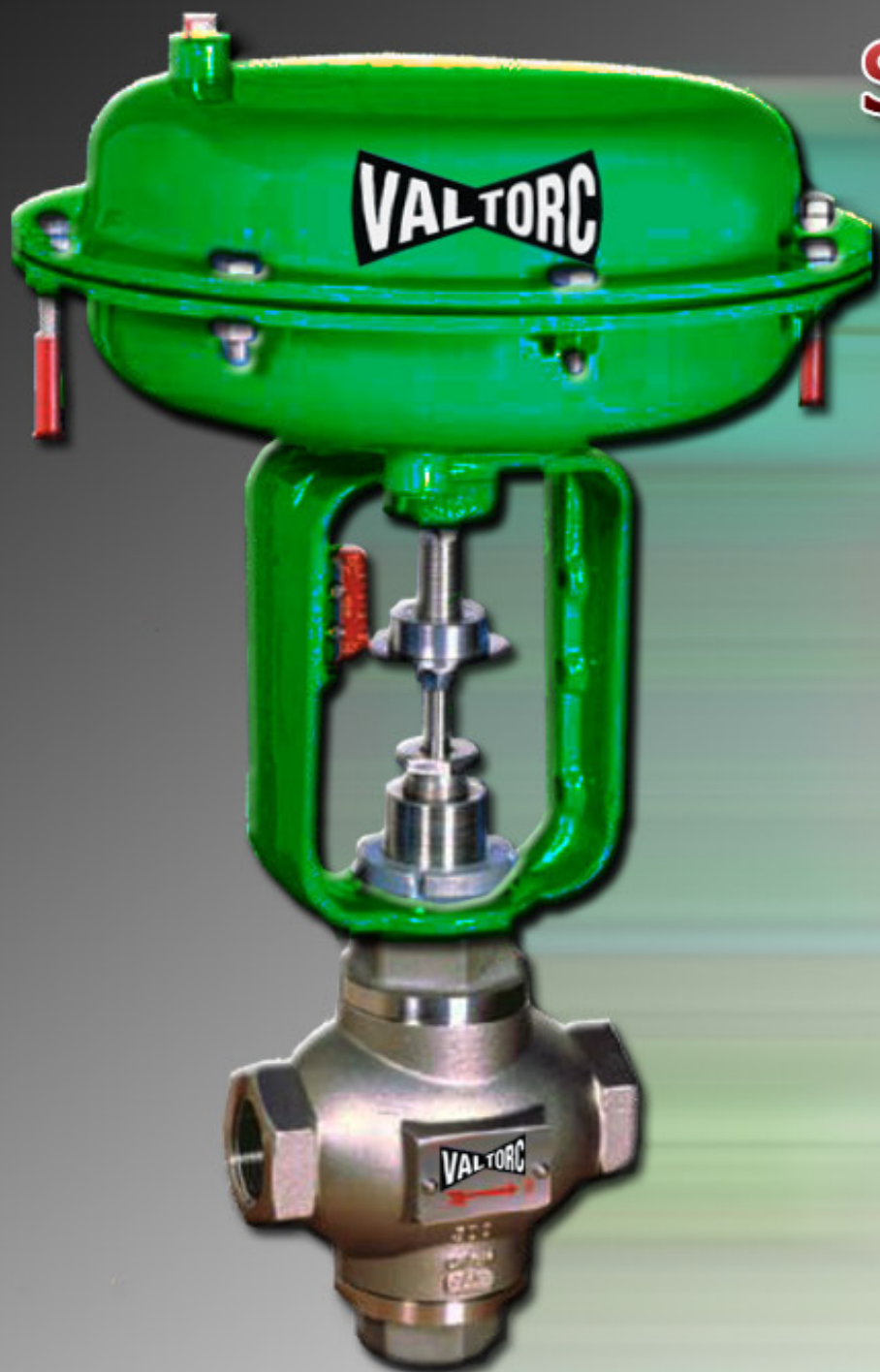


**VALTORC**

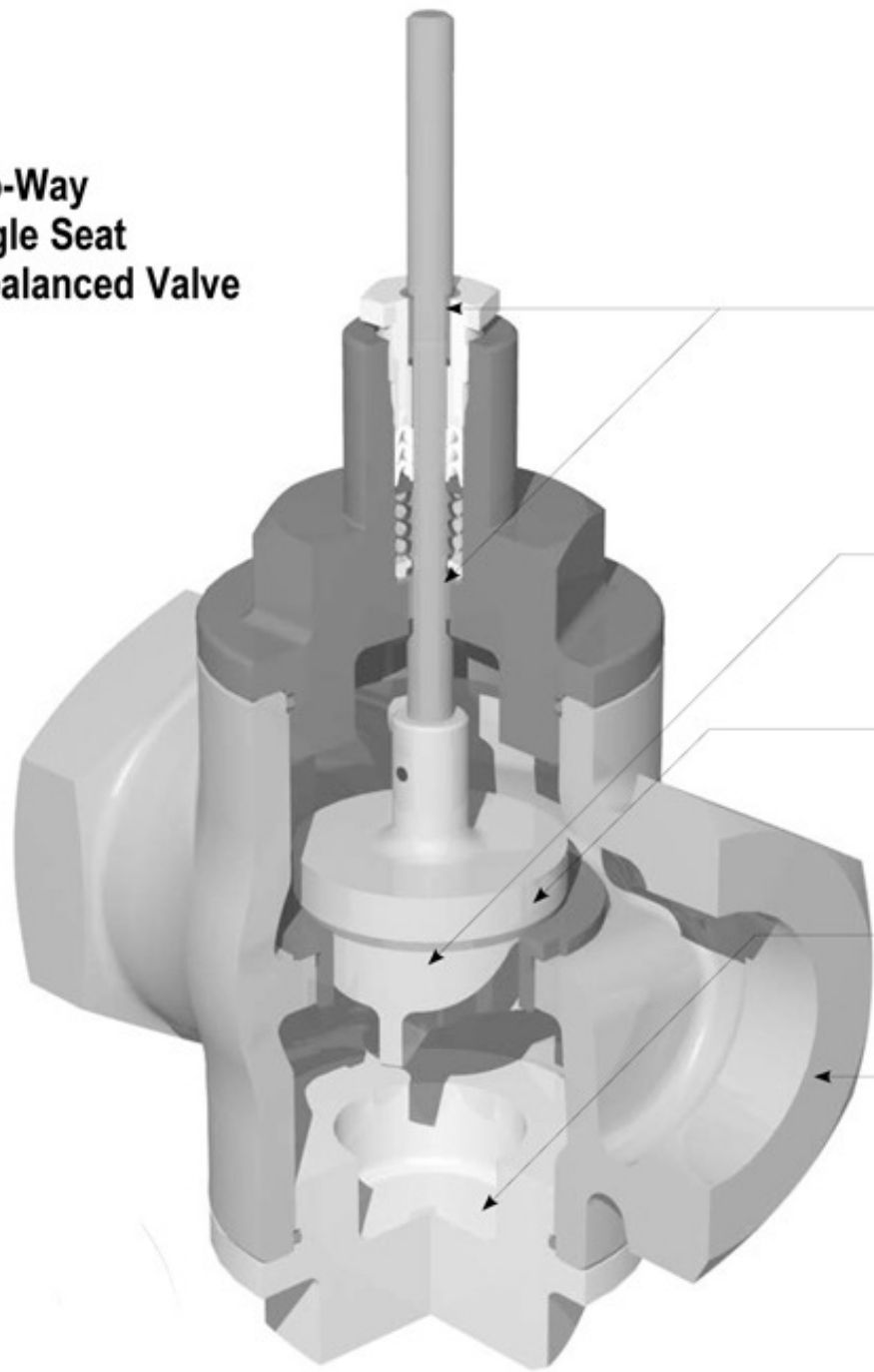
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AJBENTAL@VALTORC.COM  
1 (866) VALTORC

# CONTROL VALVES

**SERIES CV-510**



## Two-Way Single Seat Unbalanced Valve



### Flexible Design Options

provide optimum performance and extended reliability in a cost effective, application specific package.

### Dual Point PEEK Bearing Stem Guiding

provides both stability and low friction, yielding reduced hysteresis and optimum control.

### Trim

available in 316SS, 17-4 pH, Alloy 6, PEEK, and PTFE.

### Port Guided Plug Assembly

provides stability and desired equal percentage flow characteristic.

### Lower Plug

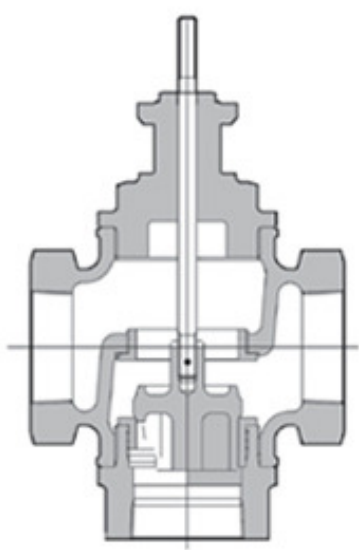
offers easy access for inspection and clean out.

### Rugged Body

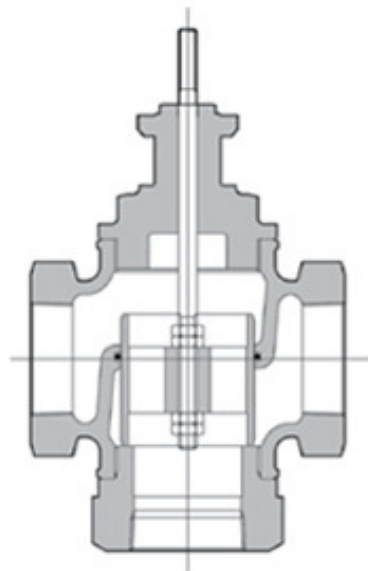
with a selection of port reductions.

## Precision Globe Control Valves

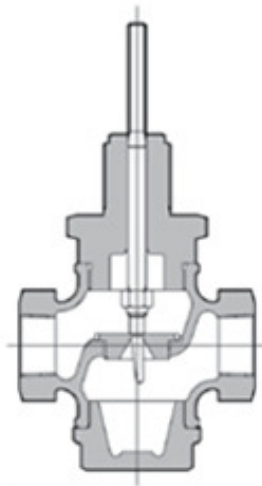
**Description:** Precision Globe Control Valves feature rugged bronze or stainless steel bodies with a variety of trim materials and port sizes. The equal percentage and linear plugs in the 2-way valves and linear plugs in the 3-way valves provide excellent modulating control of a wide variety of fluids for pressure, temperature, level, and flow applications from -20 to 500°F. The Series CV-510 is ideally suited where value and long life are important objectives for applications including but not limited to the Chemical, Food & Beverage, General Service, Refining, District Energy, and Pharmaceutical Industries.



Three-Way Mixing Valve



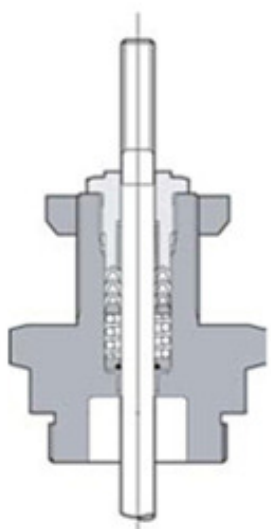
Three-Way Diverting/  
Mixing Valve



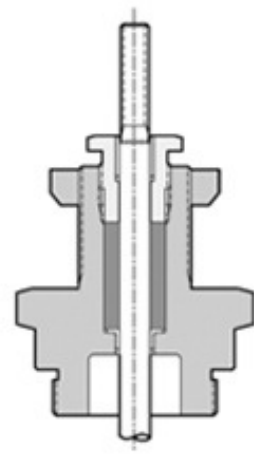
Two-Way Single Seat Low  
Flow Unbalanced Valve



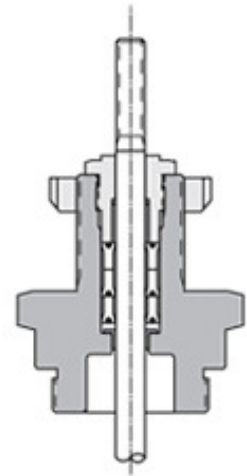
Fluoraz O-Ring  
Upper and Lower  
Body Seals in  
Stainless Steel  
Body Valves



Guided Low-Friction TFE V-  
Ring Packing Spring Loaded



Adjustable Graphite  
Packing



Long-Life Multi-Stack  
EPDM Lip Packing

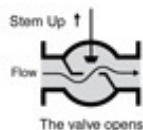
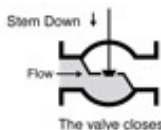
## Body Style Versus Application

### 2-Way Valves (Control of Liquids, Gases, and Steam)

#### Two-Way Single Seat Unbalanced Valve

The most commonly applied solution with ANSI Class IV and VI shut-off.

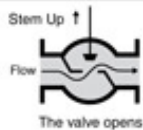
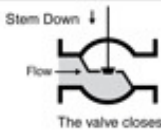
<b>Sizes:</b>	1/2, 3/4, 1, 1-1/4, 1-1/2, 2 inch
<b>Body:</b>	ANSI B16.15 Bronze 250LB Threaded (NPT), or 316 Stainless Steel 300LB Threaded (NPT), or 316 Stainless Steel 300LB SCH 40 Buttweld (BWE)
<b>Trim:</b>	EQ% or Linear, 316 Stainless Steel, Alloy 6, TFE, PEEK, or 17-4 PH Hardened Stainless Steel
<b>Shut-off:</b>	ANSI Class IV (Stainless Steel and Alloy 6 Trim), ANSI Class VI (TFE and PEEK Trim)
<b>Packing:</b>	Long-Life Multi-Stack EPDM Lip Packing (+32 to 350°F) Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (+32 to 500°F)
<b>Temperature:</b>	+32 to 400°F (Bronze 250LB Threaded Body) +32 to 450°F (316 Stainless Steel 300LB Threaded or Buttweld Body w/ TFE or PEEK Trim) +32 to 500°F (316 Stainless Steel 300LB Threaded or Buttweld Body w/ Stainless Steel or Alloy 6 Trim)
<b>Rangeability:</b>	50:1



#### Two-Way Single Seat Low Flow Unbalanced Valve

Low Flow Trim with ANSI Class IV and VI shut-off.

<b>Sizes:</b>	1/2, 3/4, 1 inch
<b>Body:</b>	ANSI B16.15 Bronze 250LB Threaded (NPT), 316 Stainless Steel 300LB Threaded (NPT), or 316 Stainless Steel 300LB SCH 40 Buttweld (BWE)
<b>Trim:</b>	Modified Linear, 316 Stainless Steel, TFE, or PEEK
<b>Shut-off:</b>	ANSI Class IV (Stainless Steel Trim), ANSI Class VI (TFE and PEEK Trim)
<b>Packing:</b>	Long-Life Multi-Stack EPDM Lip Packing (+32 to 350°F) Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (+32 to 500°F)
<b>Temperature:</b>	+32 to 400°F (Bronze 250LB Threaded Body) +32 to 450°F (316 Stainless Steel 300LB Threaded or Buttweld Body w/ TFE or PEEK Trim) +32 to 500°F (316 Stainless Steel 300LB Threaded Body or Buttweld Body w/ Stainless Steel Trim)
<b>Rangeability:</b>	40:1 for Cv 1.00 and 0.50. 20:1 for Cv 0.25

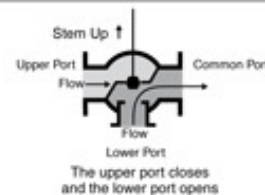
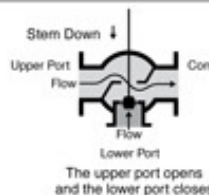


### 3-Way Valves (Control of Liquids)

#### Three-Way Mixing Valve

This valve has two inlets and one outlet, and is the simplest solution for mixing or bypass applications with ANSI Class IV shut-off. In normal applications the inlet pressures are near equal and control is possible from 5% to 95% of travel with inlet pressures up to 100 PSI.

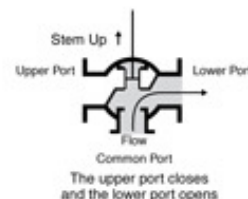
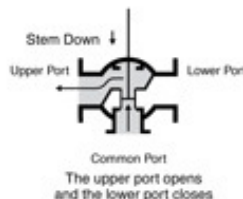
<b>Sizes:</b>	1/2, 3/4, 1, 1-1/4, 1-1/2, 2 inch
<b>Body:</b>	ANSI B16.15 Bronze 250LB Threaded (NPT), or 316 Stainless Steel 300LB Threaded (NPT), or 316 Stainless Steel 300LB SCH 40 Buttweld (BWE)
<b>Trim:</b>	Linear, 316 Stainless Steel
<b>Packing:</b>	Long-Life Multi-Stack EPDM Lip Packing (+32 to 350°F) Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (+32 to 500°F)
<b>Temperature:</b>	+32 to 400°F (Bronze 250LB Threaded) +32 to 500°F (316 Stainless Steel 300LB Threaded or Buttweld)
<b>Rangeability:</b>	50:1



#### Three-Way Diverting/Mixing Valve

Designed as a diverting valve with one inlet and two outlets with ANSI Class III shut-off. However, flow can be reversed for mixing if this port configuration is desirable. The difference between the upper port and lower port pressure must not exceed 50 PSID.

<b>Sizes:</b>	1, 1-1/2, 2 inch
<b>Body:</b>	ANSI B16.15 Bronze 250LB Threaded (NPT), or 316 Stainless Steel 300LB Threaded (NPT), or 316 Stainless Steel 300LB SCH 40 Buttweld (BWE)
<b>Trim:</b>	Linear, Bronze (Bronze 250LB Threaded), or 316 Stainless Steel (316 Stainless Steel 300LB Threaded or Buttweld)
<b>Packing:</b>	Long-Life Multi-Stack EPDM Lip Packing (+32 to 350°F) Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (+32 to 500°F)
<b>O-Ring:</b>	EPR (Bronze 250LB Threaded), Fluoraz 797 (316 Stainless Steel 300LB Threaded or Buttweld)
<b>Temperature:</b>	+32 to 300°F (Bronze 250LB Threaded) +32 to 500°F (316 Stainless Steel 300LB Threaded or Buttweld)
<b>Rangeability:</b>	50:1

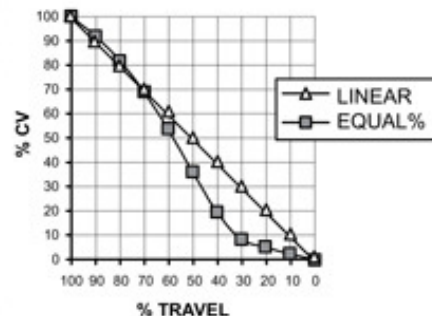


## Flow Coefficients (Cv) Versus

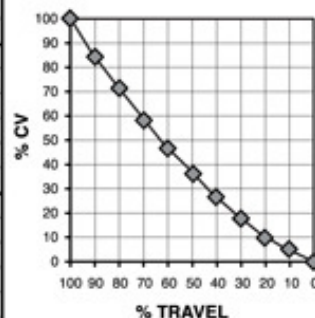
2-Way Valves (Control of Liquids, Gases, and Steam)

Valve		Flow Coefficients (Cv)											
		Two-Way Single Seat Unbalanced Valve											
Valve Size(IN)	Trim Style	Trim Size(IN)	Port Size	%Travel									
				100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
1/2	EQ%	0.876	FULL	4.90	4.78	3.53	2.57	1.92	1.20	0.95	0.69	0.43	0.17
		0.876	1SR	3.20	3.16	2.29	1.61	1.19	0.75	0.51	0.39	0.26	0.13
	LINEAR	0.626	2SR	1.50	1.44	0.96	0.72	0.52	0.42	0.31	0.21	0.10	0.06
		0.876	FULL	6.00	5.40	4.80	4.20	3.60	3.00	2.40	1.80	1.20	0.60
3/4	EQ%	0.876	FULL	7.20	7.09	5.53	3.51	2.53	1.73	1.24	0.88	0.52	0.27
		0.876	1SR	5.50	5.31	3.73	2.64	1.95	1.21	0.96	0.70	0.43	0.17
	LINEAR	0.876	2SR	3.30	3.30	2.34	1.63	1.20	0.75	0.51	0.39	0.26	0.13
		0.626	3SR	1.50	1.45	0.96	0.73	0.52	0.42	0.31	0.21	0.10	0.06
1	EQ%	1.126	FULL	10.0	9.70	6.52	4.40	2.82	2.04	1.36	0.81	0.55	0.30
		0.876	1SR	8.60	8.38	6.09	3.64	2.58	1.74	1.25	0.89	0.52	0.27
	LINEAR	0.876	2SR	6.00	5.79	3.88	2.70	1.97	1.22	0.96	0.70	0.43	0.17
		0.626	3SR	3.40	3.41	2.38	1.64	1.20	0.75	0.51	0.39	0.26	0.13
1-1/4	EQ%	1.126	FULL	10.0	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00
		1.126	1SR	10.0	9.70	6.52	4.40	2.82	2.04	1.36	0.81	0.55	0.30
	LINEAR	0.876	2SR	8.60	8.38	6.09	3.64	2.58	1.74	1.25	0.89	0.52	0.27
		0.626	3SR	6.00	5.79	3.88	2.70	1.97	1.22	0.96	0.70	0.43	0.17
1-1/2	EQ%	1.676	FULL	17.2	15.5	13.8	12.0	10.3	8.60	6.88	5.16	3.44	1.72
		1.126	1SR	16.0	15.5	10.4	7.04	4.51	3.26	2.18	1.30	0.88	0.48
	LINEAR	0.876	2SR	8.60	8.38	6.09	3.64	2.58	1.74	1.25	0.89	0.52	0.27
		0.626	3SR	6.00	5.79	3.88	2.70	1.97	1.22	0.96	0.70	0.43	0.17
2	EQ%	1.676	FULL	18.0	16.2	14.4	12.6	10.8	9.00	7.20	5.40	3.60	1.80
		1.438	1SR	16.0	15.5	10.4	7.04	4.51	3.26	2.18	1.30	0.88	0.48
	LINEAR	1.126	2SR	10.0	9.70	6.52	4.40	2.82	2.04	1.36	0.81	0.55	0.30
		0.876	3SR	8.60	8.38	6.09	3.64	2.58	1.74	1.25	0.89	0.52	0.27

2-WAY VALVES  
TYPICAL FLOW CURVES



2-WAY VALVES (FLOW)  
TYPICAL FLOW CURVE



Valve		Flow Coefficients (Cv)											
		Two-Way Single Seat Flow Unbalanced Valve											
Valve Size(IN)	Trim Style	Trim Size(IN)	Port Size	%Travel									
				100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
1/2	MODIFIED	0.250	FULL	1.00	0.85	0.72	0.58	0.47	0.36	0.26	0.17	0.10	0.05
	LINEAR		1SR	0.50	0.43	0.36	0.29	0.23	0.18	0.13	0.09	0.05	0.03
			2SR	0.25	0.21	0.18	0.15	0.12	0.09	0.07	0.04	0.03	0.01
3/4	MODIFIED	0.250	FULL	1.00	0.85	0.72	0.58	0.47	0.36	0.26	0.17	0.10	0.05
	LINEAR		1SR	0.50	0.43	0.36	0.29	0.23	0.18	0.13	0.09	0.05	0.03
			2SR	0.25	0.21	0.18	0.15	0.12	0.09	0.07	0.04	0.03	0.01
1	MODIFIED	0.250	FULL	1.00	0.85	0.72	0.58	0.47	0.36	0.26	0.17	0.10	0.05
	LINEAR		1SR	0.50	0.43	0.36	0.29	0.23	0.18	0.13	0.09	0.05	0.03
			2SR	0.25	0.21	0.18	0.15	0.12	0.09	0.07	0.04	0.03	0.01

Pressure ratings are PSIG  
 For applications below 32° consult factory.  
 For applications above 375°, 300 THD Stainless Steel Body is recommended.

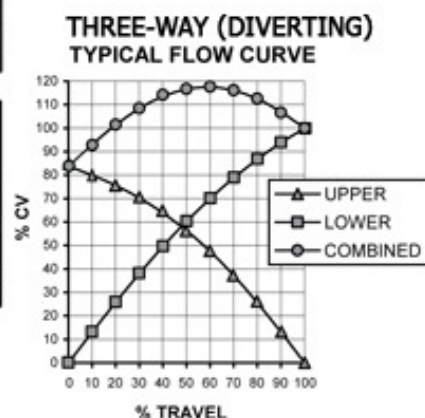
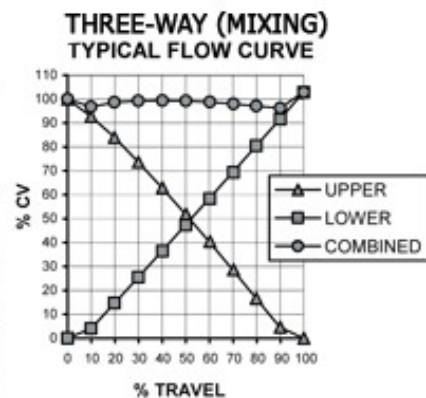
Body Pressure-Temperature Ratings:		
Temperature (F)	250 THD Bronze	300 THD & BWE SS
+32° To 100°F	400	720
150°	400	670
175°	392	645
200°	385	620
225°	375	605
250°	365	590
275°	350	575
300°	335	560
325°	317	548
350°	300	537
375°	275	526
400°	250	515
450°	-	497
500°	-	480

Trim Materials	Flow Different Pressure LI
Bronze	50 PSID
316 Stainless Steel	100 PSID
TFE	100 PSID
PEEK	100 PSID
17-4 pH	
Hardened Steel	200 PSID
Alloy 6	300 PSID

3-Way Valves (Control of Liquids)

Valve		Flow Coefficients (Cv) Three-Way Mixing Valve									
Valve Size (IN)	Trim Style	Trim Size (IN)	Port Size	Travel 100%	Valve Size (IN)	Trim Style	Trim Size (IN)	Port Size	Travel 100%		
1/2	LINEAR	1.126	FULL	6.30	1-1/4	LINEAR	1.676	FULL	18.5		
		0.876	1SR	4.00			1.126	1SR	10.0		
		0.626	2SR	2.00			1-1/2	LINEAR	1.676	FULL	20.0
		0.626	3SR	1.00					1.126	1SR	10.0
3/4	LINEAR	1.126	FULL	8.20	2	LINEAR	2.126	FULL	40.0		
		0.876	1SR	4.00			1.676	1SR	20.0		
		0.626	2SR	2.00							
		0.626	3SR	1.00							
1	LINEAR	1.126	FULL	10.0							
		0.876	1SR	4.00							
		0.626	2SR	2.00							
		0.626	3SR	1.00							

Valve		Flow Coefficients (Cv) Three-Way Diverting/Mixing Valve			
Valve Size (IN)	Trim Style	Travel 100%			
		Upper	Lower		
1	LINEAR	12	15		
1-1/2	LINEAR	22	26		
2	LINEAR	40	47		



## Sizing Reference

### Load Sizing Calculations

#### Glossary of Terms

- t = Time in Hours
- Cp = Specific Heat of Liquid
- S = Specific Gravity of Fluid
- W = Weight in Lbs.
- ΔT = Temperature Rise or Fall in °F
- h<sub>g</sub> = Latent Heat of Steam

#### Conversion Factors

- 1 Lb. Steam / Hr. = 1000 BTU / Hr.
- 1 Cubic Meter = 264 U.S. Gallons
- 1 Cubic Foot Water = 62.4 Lbs.
- 1 PSI = 2.04 Inches of Mercury
- 1 PSI = 2.3 Feet of Water
- 1 PSI = 27.7 Inches of Water
- 1 U.S. Gallon Water = 231 Cubic Inches
- 1 U.S. Gallon Water = 8.33 Lbs.

#### Heating Water with Steam

Quick Method

$$\text{Lbs./Hr.} = \frac{\text{GPM}}{2} \times \Delta T$$

Accurate Method

$$\text{Lbs./Hr.} = \frac{\text{GPM} \times 500 \times \Delta T}{h_g}$$

#### Heating or Cooling Water with Water

$$\text{GPM}_1 = \text{GPM}_2 \times \frac{\text{°F water}_2 \text{ temp. rise or drop}}{\text{°F water}_1 \text{ temp. rise or drop}}$$

#### Heating or Cooling Water

$$\text{GPM} = \frac{\text{BTU / Hr.}}{(\text{°F water temp. rise or drop}) \times 500}$$

#### Heating Oil with Steam

$$\text{Lbs./Hr.} = \frac{\text{GPM}}{4} \times (\text{°F oil temp. rise})$$

#### Heating Air with Water

$$\text{GPM} = 2.16 \times \frac{\text{CFM} \times (\text{°F air temp. rise})}{1000 \times (\text{°F water temp. drop})}$$

#### Heating Liquids with Steam

$$\text{Lbs./Hr.} = \frac{\text{GPM} \times 60 \times \text{Cp} \times \text{W}}{h_g} \times \Delta T$$

#### Heating Liquids in Steam Jacketed Kettles

$$\text{Lbs./Hr.} = \frac{\text{Gallons} \times \text{Cp} \times \text{S} \times 8.33}{h_g \times t} \times \Delta T$$

#### General Liquid Heating

$$\text{Lbs./Hr.} = \frac{\text{W} \times \text{Cp}}{h_g \times t} \times \Delta T$$

#### Heating Air with Steam

$$\text{Lbs./Hr.} = \frac{\text{CFM}}{900} \times \Delta T$$

## Shut-Off ΔP Ratings

Valve			Actuator		Shut-Off ΔP Two-Way, Single Seat Unbalanced								
Trim Size (IN)	Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	Maximum Shut-off ΔP in PSI								
					Fail Closed Reverse Acting				Fail Open Direct Acting				
					Air Signal to Actuator				Air Signal to Actuator				
					3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	
0.626	1/2 thru 1-1/4	3/4	EL SERIES	Low	N/A	226	386			704	720	720	
				Full	67	386	545		67	386	720		
				High	720	720	720		226	545	720		
0.876	1/2 thru 2	3/4	EL SERIES	Low	N/A	90	171			333	496	720	
				Full	8	171	252		8	171	720		
				High	415	577	659		90	252	720		
1.126	1 thru 2	3/4	EL SERIES	Xtra-High	N/A	N/A	720			N/A	N/A	N/A	
				Low	N/A	38	88		186	284	720		
				Full	N/A	88	137		N/A	88	720		
1.438	1-1/4 thru 2	3/4	EL SERIES	High	235	334	383		38	137	720		
				Xtra-High	N/A	N/A	580		N/A	N/A	N/A		
				Low	N/A	60	144		397	566	720		
1.676	1-1/4 thru 2	3/4	EL SERIES	Full	N/A	60	144		N/A	60	720		
				High	397	566	650		N/A	60	720		
				Xtra-High	N/A	N/A	542		N/A	N/A	N/A		
2.126	2 thru 3	3/4	EL SERIES	Low	N/A	11	42		102	162	555		
				Full	N/A	42	72		N/A	42	434		
				High	132	193	223		11	72	464		
1.676	1-1/4 thru 2	3/4	EL SERIES	Xtra-High	N/A	N/A	343		N/A	N/A	N/A		
				Low	N/A	24	76		231	335	720		
				Full	N/A	24	76		N/A	24	697		
1.676	1-1/4 thru 2	3/4	EL SERIES	High	231	335	386		N/A	24	697		
				Xtra-High	N/A	N/A	542		N/A	N/A	N/A		
				Low	N/A	11	49		68	113	401		
1.676	1-1/4 thru 2	3/4	EL SERIES	Full	N/A	11	49		N/A	24	313		
				High	163	240	278		N/A	46	335		
				Xtra-High	N/A	N/A	392		N/A	N/A	N/A		
2.126	2 thru 3	3/4	EL SERIES	Low	N/A	11	49		163	240	720		
				Full	N/A	11	49		N/A	11	506		
				High	48	76	90		N/A	11	506		
2.126	2 thru 3	3/4	EL SERIES	Xtra-High	N/A	N/A	145		N/A	N/A	N/A		
				Low	N/A	N/A	23		34	62	242		
				Full	N/A	N/A	23		N/A	7	186		
2.126	2 thru 3	3/4	EL SERIES	High	94	141	165		N/A	21	200		
				Xtra-High	N/A	N/A	236		N/A	N/A	N/A		
				Low	N/A	N/A	23		94	141	449		
2.126	2 thru 3	3/4	EL SERIES	Full	N/A	N/A	23		N/A	N/A	307		
				High	94	141	165		N/A	N/A	307		
				Xtra-High	N/A	N/A	236		N/A	N/A	N/A		

**NOTES:**

- 1) Seat closure ANSI Class IV (Stainless Steel Trim and Alloy 6 Trim), ANSI Class VI (TFE and PEEK Trim)  
2828 Seat closure ANSI Class IV (Stainless Steel Trim), ANSI Class VI (TFE and PEEK Trim).
- 2) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.
- 3) The 3-15 and 1-17 columns of the table apply to valves with control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 columns apply to valves with a positioner or an I/P transducer of suitable range.
- 4) N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

N/A Exceeds DL49 and DL84 Actuator's Maximum Air Pressure

N/A Exceeds DL49 and DL84 Actuator's Maximum Air Pressure

Valve			Actuator		Shut-Off ΔP Two-Way, Single Seat , Low Flow, Unbalanced								
Trim Size (IN)	Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	Maximum Shut-off ΔP in PSI								
					Fail Closed Reverse Acting				Fail Open Direct Acting				
					Air Signal to Actuator				Air Signal to Actuator				
					3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	
0.250	1/2	3/4	EL SERIES	Low	N/A	720	720			720	720	720	
All Ports	thru 1			Full	401	720	720			401	720	720	
				High	720	720	720			720	720	720	

N/A Exceeds Actuator Rating

N/A Exceeds Actuator Rating

## Shut-Off ΔP Ratings

### NOTES:

- Mixing Valves have two inlets and one outlet. Published shut-off values are with respect to worst case conditions with zero downstream pressure on the outlet port and zero upstream pressure on the opposing inlet port. Pneumatic Actuators used with the CV-510 are direct acting. The upper port fails closed on loss of air pressure to the actuator.
- Seat closure ANSI Class IV.
- Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.
- The 3-15 and 1-17 columns of the table apply to valves with control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 columns apply to valves with a positioner or an I/P transducer of suitable range.
- N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

Valve			Actuator		Shut-Off ΔP Three-Way Mixing							
Trim Size (IN)	Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	Maximum Shut-off ΔP in PSI							
					Upper Port Closed Direct Acting				Lower Port Closed Direct Acting			
					Air Signal to Actuator				Air Signal to Actuator			
				3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	
0.626	1/2	9/16	EL SERIES	Low	N/A	67	226	N/A Exceeds DL49 and DL94 Actuator's Maximum Air Pressure	560	720	720	N/A Exceeds DL49 and DL94 Actuator's Maximum Air Pressure
				Full	N/A	226	386		N/A	242	720	
				High	545	720	720		83	401	720	
0.876	1/2	9/16	EL SERIES	Low	N/A	8	90		260	423	720	
				Full	N/A	90	171		N/A	98	720	
				High	252	415	496		16	179	720	
1.126	1/2	9/16	EL SERIES	Low	N/A	N/A	38		142	240	720	
				Full	N/A	38	88		N/A	43	683	
				High	137	235	284		N/A	92	720	
1.676	1-1/4	3/4	EL SERIES	Low	N/A	N/A	2		48	93	381	
				Full	N/A	2	24	N/A	4	293		
				High	46	91	113	N/A	26	315		
			EL SERIES	Low	N/A	11	49	140	223	715		
				Full	N/A	11	49	N/A	N/A	486		
				High	163	240	278	N/A	N/A	486		
2.126	2	3/4	EL SERIES	Low	N/A	N/A	N/A	22	50	229		
				Full	N/A	N/A	N/A	N/A	N/A	174		
				High	21	48	62	N/A	8	188		
			EL SERIES	Low	N/A	N/A	23	81	129	436		
				Full	N/A	N/A	23	N/A	N/A	58		
				High	94	141	165	N/A	N/A	294		
			EL SERIES	Low	N/A	N/A	236	N/A	N/A	294		
				High	165	212	236	N/A	N/A	294		

### Three-Way Mixing Valve



- Published shut-off values are for diverting applications. The values are worst case and based on the pressure difference between the inlet and the outlet that is closed. Consult the factory if the required shut-off exceeds the published value and the pressure at the inlet and both outlets is known. For proper operation in diverting applications, the pressure difference between both outlets must not exceed 50 PSI. Consult the factory for shut-off values for CV-510 mixing applications. Pneumatic Actuators used with the CV-510 are direct acting. The upper port fails closed on loss of air pressure to the actuator.

Valve		Actuator		Shut-Off ΔP Three-Way Diverting/Mixing							
Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	Maximum Shut-off ΔP in PSI							
				Upper Port Closed Direct Acting				Lower Port Closed Direct Acting			
				Air Signal to Actuator				Air Signal to Actuator			
				3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI
1	3/4	EL SERIES	High	110	113	115	N/A Exceeds Actuator Rating	N/A	N/A	115	N/A Exceeds Actuator Rating
		EL SERIES	High	113	115	118		N/A	N/A	120	
1-1/2	3/4	EL SERIES	High	N/A	110	113		N/A	N/A	113	
		EL SERIES	High	110	113	115		N/A	N/A	118	
2	3/4	EL SERIES	High	N/A	N/A	110		N/A	111		
		EL SERIES	High	108	110	113		N/A	N/A	115	

- Seat closure ANSI Class III.
- Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.
- The 3-15 and 1-17 columns of the table apply to valves with control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 columns apply to valves with a positioner or an I/P transducer of suitable range.

- N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

### Three-Way Diverting Valve





## Dimensions & Weights

Dimension (IN)		Valve Size (IN) TWO-WAY VALVE		
		1/2, 3/4, 1	1-1/4 & 1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
	300BWE	15-3/8	16-7/8	17
B	250THD	2-3/4	3-1/4	3-5/8
	300THD & BWE	3	3-1/2	3-7/8
C	250THD	2-7/8	3-1/2	3-3/4
	300THD & BWE	2-7/8	3-1/2	3-3/4
Weight (LB)	250THD	8-1/2	14-1/2	18-1/2
	300THD	8	15-1/2	19
	300BWE	9-1/2	18	22-1/2

Dimension (IN)		Valve Size (IN) THREE-WAY (MIXING)		
		1/2, 3/4, 1	1-1/4 & 1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
	300BWE	15-3/8	16-7/8	17
B	250THD	2-23/32	3-13/16	4
	300THD	2-23/32	3-3/8	3-3/4
	300 BWE	8	8-3/4	9
C	250THD	2-7/8	3-1/2	3-3/4
	300THD & BWE	2-7/8	3-1/2	3-3/4
Weight (LB)	250THD	9	15-1/2	20
	300THD	8	15	18-1/2
	300BWE	10-1/2	19	23-1/2

Dimension (IN)		Valve Size (IN) TWO-WAY (FLOW)		
		1/2, 3/4, 1		
A	250THD	4-7/8		
	300THD	5		
	300BWE	15-3/8		
B	250THD	2-3/4		
	300THD & BWE	3		
C	250THD	2-7/8		
	300THD & BWE	2-7/8		
Weight (LB)	250THD	8-1/2		
	300THD	8		
	300BWE	9-1/2		

Dimension (IN)		Valve Size (IN) THREE-WAY (DIVERTING)		
		1	1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
	300BWE	15-3/8	16-7/8	17
B	250THD	3-15/32	3-13/16	4
	300THD	2-23/32	3-3/8	3-3/4
	300 BWE	8	8-3/4	9
C	250THD	2-7/8	3-1/2	3-3/4
	300THD & BWE	2-7/8	3-1/2	3-3/4
Weight (LB)	250THD	9	16-1/2	21
	300THD	8	16	19-1/2
	300BWE	10-1/2	20	24-1/2

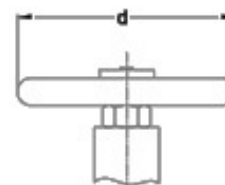
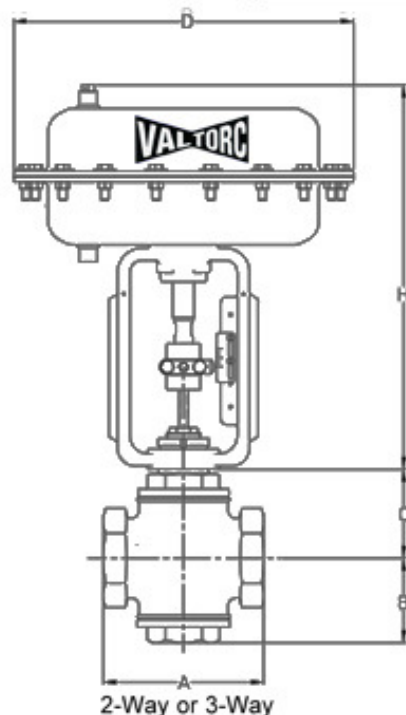
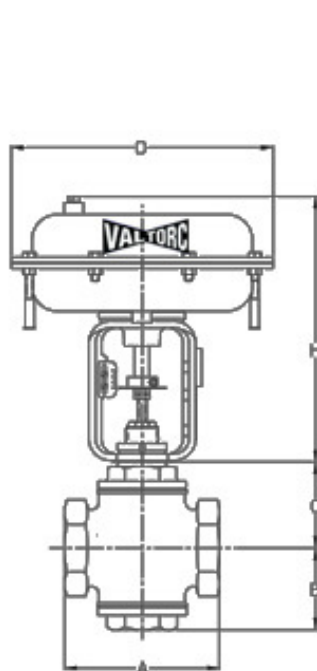
\* Includes 1-3/8 inch for air fitting on direct acting diaphragm actuators

CF = Consult factory

Allow 4-7/8 inch clearance above actuator for removal.

Actual shipping weights may vary.

Actuator			H MAX (IN)		WEIGHT (LB)	
EL-SERIES	11	6-3/8	12-1/4	16	25	CF
EL-SERIES	11	6-3/8	11-1/4	13-3/4	25	CF
EL-SERIES	13-7/8	8-1/8	16-3/4	24-1/8	48-1/2	CF
EL-SERIES	13-7/8	8-1/8	5-3/4	24	48-1/2	CF



Top mounted Handwheel