



Rate of flow through a valve depends upon the pressure drop. The most common method of presenting this information is by Cv. The Cv is the valve coefficient of flow and represents the flow of water in gallons per minute (GPM) with a 1 PSIG pressure drop through the valve. The higher the Cv the greater the flow and the better the control characteristics.

RATE OF FLOW CALCULATIONS FOR LIQUIDS

To determine the flow rate of a liquid passing through a valve use the following formula:

$$Q_L = C_v \times \sqrt{\frac{\Delta P}{S_L}}$$

Where Q_L = flow of liquid in gallons per minute (GPM)
 C_v = flow coefficient
 ΔP = pressure drop (psi)
 S_L = Specific gravity of liquid

PRESSURE DROP CALCULATIONS

$$\Delta P = S_L \left(\frac{Q_L}{C_v} \right)^2$$

RATE OF FLOW CALCULATIONS FOR GASES

For Gases the relationship between flow in standard cubic feet per hour Q_g and pressure drop is described by the following formulas:

$$Q_g = 1360 \times C_v \sqrt{\frac{\Delta P}{S_g T}} \times \sqrt{\frac{P_1 + P_2}{2}}$$

Where Q_g = Volumetric flow of gas (SCFH)
 S_g = Specific gravity of gas (air @ 14.7 PSIA and 60° F = 1)
 T = Absolute temperature of flowing medium (°F + 460)
 P₁ = Inlet pressure (PSIA)
 P₂ = Outlet pressure (PSIA)
 ΔP = (P₁ - P₂) Pressure Drop (PSIA)
 C_v = Flow in GPM of water @ 1 PSI pressure drop, flow coefficient.

BALL VALVE Cv VALUES: TWO WAY BALL VALVES

SERIES / SIZE	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"	8"
TRIAD 11	2.6	4.3	6.6	12.5	20.2	32	51	98						
TRIAD 22/22D/22E	12	13	19	37	64	103	143	360						
TRIAD 50	12	13	19	37	64	103	143	360	440	520	820			
TRIAD 50D	12	13	19	37	64	103	143	360	440	520	820			
TRIAD 66	8	8	15	34	56	85	125	250						
TRIAD VS	5	7	35	61	105	210	285	425	750	1038				
TRIAD HP/ XHP	5	7	35	61	105	210	285	425						
TRIAD 99	12	13	19	37	64	103	143	360						
TRAD 920			9	32	55		135	325	420	499	750			
TRIAD 9150			30	60	90	150	260	480	750	800	2300	3600	5000	10,000

THE FOLLOWING TABLE DEPICTS THE VALUE BASED ON THE POSITION OF THE VALVE: L PORT POSITION, T PORT POSITION AND CROSS (X) PORT POSITION. (WHEN AVAILABLE).

BALL VALVE Cv VALUES: THREE WAY BALL VALVES

SERIES / SIZE	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"
TRIAD 30 L			12	25	26	57	100	117			
TRIAD 30 T			16	45	46	101	180	200			
TRIAD 33 L			11	12	25	26	57	100			
TRIAD 33 T			15	16	45	46	101	180			
TRIAD 36 L	3.5	3.5	11	12	25	26	57	100	117	128	226
TRIAD 36 T	5.2	5.2	15	16	45	46	101	180	200	229	405
TRIAD 36 X	2.8	2.8	9	10	20	21	47	79	83	90	180
TRIAD 920 L			12	25	26		26	57	100	117	128
TRIAD 920 T			16	45	46		46	101	180	200	229
TRIAD XHP 3W L	3.5	3.5	12	25	26	57	100	117			
TRIAD XHP 3W T	5.2	5.2	16	45	46	101	180	200			