

ANSWER KEY - LABORATORY EXERCISE 2

CONTROL VALVE CHARACTERISTICS

3. FLOW RATE VS CONTROLLER OUTPUT

3.1 Equal Percentage Valve

TABLE I
Equal Percentage Valve

Pressure Drop Ratio	1.0	0.3	0.1
Valve: Cv-max	11.18	20.41	35.35
Controller Output	Flow Rate - %		
0.1%	2.01	3.66	6.34
10%	2.96	5.39	9.31
20%	4.37	7.97	13.71
40%	9.56	17.28	29.07
60%	20.91	36.37	56.01
80%	45.73	68.44	85.17
90%	67.62	85.86	94.53
99.9%	99.61	99.87	99.95

3.2 Linear Valve

TABLE 2
Linear Valve

Pressure Drop Ratio	1.0	0.3	0.1
Valve: Cv-max	11.18	20.41	35.35
Controller Ouput	Flow Rate - %		
0.1%	0.10	0.19	0.32
10%	10.00	18.05	30.28
20%	20.00	34.92	54.22
40%	40.00	62.31	80-97
60%	60.00	80.75	92.13
80%	80.00	92.49	97.27
90%	90.00	96.64	98.93
99.9%	99.90	99.95	99.97

3.3 Interpretation of Data:

...typical pressure drop ratio of 0.3... Eq. Percent

...constant pressure drop... Linear

3.4 Confirmation of Interpretation

1. Case 2-EP (Column 1)

.... same at all points? Yes

Set the set point at 40%, Yes

... could this be predicted ... ? Yes

2. Case 1-EP (Column 2)

Did you observe this? Yes

Does this indicate ? Decreased

3. Case 2-L (Column 3)

For a 10% set point change,? High

Is this predictable...? Yes

4. Case 1-L (Column 4)

For a 10% set point change ...? About the same

Is this predictable ? Yes