

STEAM - Flow Table

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Table B - Based upon inlet pressure 5 times higher than drop through valve
(valve pressure drop is 20% of inlet pressure)

FLOW IN POUNDS OF STEAM PER HOUR	PRESSURE DROP																										
	IN POUNDS PER SQUARE INCH THRU { V - FULL PORT MAGNATROL OR GLOBE VALVE PIPE - PER LENGTH AS INDICATED																										
	3/8"			1/2"			3/4"			1"			1-1/4"			1-1/2"			2"			2-1/2"			3"		
	V	PIPE		V	PIPE		V	PIPE		V	PIPE		V	PIPE		V	PIPE		V	PIPE		V	PIPE		V	PIPE	
12.5'		25'	12.5'		25'	12.5'		25'	25'		50'	25'		50'	25'		50'	50'		100'	50'		100'	50'		100'	
12	.20	.54	1.1																								
18	.41	.83	2.3	.18	.37	.91																					
25	.96	1.3	3.4	.33	.56	1.5																					
35	1.3	1.9	5.1	.58	.85	2.2	.16	.31	.73																		
50	2.2	2.8	7.6	1.1	1.3	3.4	.27	.49	1.2																		
75	3.4	4.7	12	2.0	2.0	5.6	.62	.81	2.1	.22	.58	1.4															
100	5.1	5.8	16	3.0	2.8	7.6	1.0	1.1	3.0	.38	.86	2.1	.18	.32	.73												
150	8.6	8.9	25	5.0	4.6	12	2.1	1.8	4.8	.76	1.4	3.7	.38	.58	1.4	.22	.30	.70									
200	12	12	35	7.0	5.8	16	2.8	2.5	6.7	1.2	2.0	5.3	.62	.85	2.1	.38	.46	1.1	.12	.35	.71						
300	19	19	51	11	8.9	25	4.7	3.8	10	2.2	3.2	8.5	1.2	1.4	3.7	.76	.78	2.0	.29	.62	1.3	.15	.23	.49			
400	25	25	70	15	12	35	6.7	5.2	14	3.3	4.4	12	1.9	2.0	5.3	1.2	1.2	3.0	.47	1.0	2.3	.25	.38	.84	.12	.13	.28
600	39	39	97	23	19	51	11	7.9	22	5.1	6.8	19	3.3	3.2	8.5	2.2	1.8	4.6	.94	1.7	4.3	.52	.72	1.7	.26	.28	.59
800	50	52	143	33	25	70	15	11	30	7.7	9.8	26	4.1	4.4	12	3.3	2.7	7.2	1.5	2.4	6.3	.85	1.1	2.7	.42	.45	1.0
1,000	-	-	-	42	32	88	19	14	38	10	12	32	6.0	5.7	15	4.6	3.4	9.3	2.1	3.2	8.4	1.2	1.5	3.7	.68	.64	1.5
1,500	-	-	-	-	-	-	29	21	58	16	18	50	10	8.6	24	7.1	5.5	15	3.6	5.2	14	2.2	2.5	6.5	1.2	1.2	2.8
2,000	-	-	-	-	-	-	40	28	77	22	24	70	14	12	32	10	7.5	20	5.1	9.0	19	3.3	3.8	9.3	1.9	1.7	4.3
3,000	-	-	-	-	-	-	-	-	-	33	37	103	22	18	50	16	11	31	8.3	11	31	5.1	5.7	15	3.3	2.8	7.3
4,000	-	-	-	-	-	-	-	-	-	45	50	140	29	24	70	22	15	43	12	15	40	7.7	7.9	21	4.8	4.0	11
6,000	-	-	-	-	-	-	-	-	-	-	-	-	45	37	103	33	23	65	18	23	64	12	12	33	7.8	6.4	17
8,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	31	88	25	32	88	17	17	46	11	8.8	24
10,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	31	44	114	22	21	58	14	11	31
15,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48	61	170	33	32	89	22	17	48
20,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45	43	121	30	23	64
30,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46	36	99

PROBLEM: Steam is required at the rate of 700 pounds per hour. Boiler pressure is 15 PSI. Drop should not exceed 3 PSI. Branch layout to heat exchanger calls for one Magnatrol Valve, 25 feet of pipe, various fittings with a combined resistance equal to 10 feet of pipe.

SOLUTION: Pressure drop represents 20% of the inlet pressure. Less than half of this drop goes to valve; therefore table (A) should be used. The rate of 700 pounds is not shown, but will be taken as half-way between 600 and 800 pounds. The equivalent length of 35 feet of pipe and fittings together also is not shown, but can be taken as half-way between 25 and 50. Reading along the 600 and 800 pound lines, the 1-1/2 inch valve shows 1.7 plus 2.6 divided by 2 equals 2.2 pounds drop for the 700 pound flow rate; for the pipe the figures 1.5, 3.6, 2.0 and 5.4 are added and divided by 4, equaling 3.1 as the mid-point drop. 2.2 plus 3.1 equals 5.3 as the drop in PSI, which is too high. Repeating with the 2 inch size, the valve comes to 1.0 pounds drop, the piping for 50 feet would come to 1.6 pounds, or less than 1.0 pounds for 35 feet; a total indicated pressure drop of slightly less than 2 PSI.

The solutions given for the air flow are also applicable to steam flow tables.