



Sizing and Selection Chart 25BP and 26BP

The data required to size the valve are identical to those required for a pressure reducing valve, i.e. upstream pressure, downstream pressure and capacity.

Valve sizing depends upon the application.

As a flash steam surplussing valve

1. To size a Spirax Sarco 25BP or 26BP Back Pressure Regulator properly, determine the maximum probable pounds of flash steam that will be generated within the flash tank.

The amount of flash can be calculated from the table overleaf. To this add approximately 20% as a safety factor for errors in calculating the load and/or possible future growth.

2. Determine the minimum amount of low pressure steam that will be used. If at times there is no demand for low pressure steam, then the back pressure regulator must be sized for the total amount of flash steam generated in the tank plus 20% safety factor. Where there is a definite minimum amount of low pressure steam used at all times, this amount of flash steam should be subtracted from the total flash steam generated and the regulator sized for the surplus amount.

Example:

Suppose the high pressure system is operating at 125 psi, the amount of steam used at this pressure is 10,000#/hr and it is desired to keep the flash tank at 5 psi.

Under these conditions, 13.4% of the 10,000#/hr (1340#/hr of flash steam) will be generated in the flash tank.

If there is no demand for the low pressure steam at times, then the regulator must be sized for the 1340#/hr plus 20% or approximately 1600#.hr.

If there is a constant demand for 500#/hr of low pressure steam at 5 psi, then the regulator should be sized to vent the difference between 1600 and 500 or 1100#/hr.

Eliminating non-critical loads

For this application, a 25BP or 26BP valve must be sized for the minimum allowable pressure drop to insure that the valve is normally fully open. Select valve size with load capacity at the minimum pressure drop on the 25P capacity table given in TI-P717-08.

A combination P-BP regulator must be sized using the inlet and reduced pressure the same as for a 25P pressure reducing valve.

For a combination T-BP regulator size the same as a 25T temperature control.

Surplussing valve capacities pounds of saturated steam per hour to atmosphere

Inlet steam pressure psi g	Nominal valve size									
	½"	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	6"
C.V. Factors	3.48	6.5	10.5	14	20	35	56	74	115	280
2	45	85	140	180	260	455	725	960	1,490	
3	55	105	170	225	320	560	900	1,185	1,840	
5	75	135	215	290	415	725	1,160	1,530	2,380	
10	110	210	335	445	640	1,120	1,790	2,360	3,675	
15	150	275	445	590	845	1,480	2,365	3,130	4,860	11,220
20	180	335	540	720	1,025	1,795	2,870	3,790	5,895	13,592
25	205	385	620	825	1,180	2,065	3,305	4,360	6,785	15,647
30	230	430	695	925	1,320	2,310	3,695	4,885	7,590	17,503
40	280	525	850	1,135	1,620	2,835	4,535	5,995	9,315	21,481
50	350	650	1,050	1,400	2,000	3,500	5,600	7,400	11,500	26,520
60	385	720	1,165	1,555	2,220	3,885	6,215	8,215	12,765	29,437
75	460	875	1,415	1,890	2,700	4,725	7,560	9,990	15,525	35,802
100	600	1,120	1,815	2,420	3,460	6,055	9,690	12,800	19,895	45,900
125	730	1,365	2,200	2,940	4,200	7,350	11,760	15,540	24,150	55,692
150	860	1,600	2,590	3,460	4,940	8,645	13,830	18,280	28,400	65,504
175	985	1,840	2,970	3,960	5,660	9,900	15,850	20,950	32,545	75,052
200	1,125	2,100	3,390	4,520	6,460	11,300	18,000	23,900	37,145	85,660
250	1,385	2,590	4,180	5,570	7,960	13,930	22,300	29,450	45,800	105,570
*300	1,640	3,070	4,960	6,600	9,440	16,400	26,400	34,900	53,300	

* Cast steel construction required for service above 250 psi g

Percent flash

Percent flash for various initial steam pressures and flash tank pressures

Steam pressure psi g	Flash tank pressure, psi g										
	0	2	5	10	15	20	30	40	60	80	100
5	1.7	1.0	0								
10	2.9	2.2	1.4	0							
15	4.0	3.2	2.4	1.1	0						
30	6.5	5.8	5.0	3.8	2.6	1.7	0				
40	7.8	7.1	6.4	5.1	4.0	3.1	1.3	0			
60	10.0	9.3	8.6	7.3	6.3	5.4	3.6	2.2	0		
80	11.7	11.1	10.3	9.0	8.1	7.1	5.5	4.0	1.9	0	
100	13.3	12.6	11.8	10.6	9.7	8.8	7.0	5.7	3.5	1.7	0
125	14.8	14.2	13.4	12.2	11.3	10.3	8.6	7.4	5.2	3.4	1.8
160	16.8	16.2	15.4	14.1	13.2	12.4	10.6	9.5	7.4	5.6	4.0
200	18.6	18.0	17.3	16.1	15.2	14.3	12.8	11.5	9.3	7.5	5.9
250	20.6	20.0	19.3	18.1	17.2	16.3	14.7	13.6	11.2	9.8	8.2
300	22.7	21.8	21.1	19.9	19.0	18.2	16.7	15.4	13.4	11.8	10.1
350	24.0	23.3	22.6	21.6	20.5	19.8	18.3	17.2	15.1	13.5	11.9
400	25.3	24.7	24.0	22.9	22.0	21.1	19.7	18.5	16.5	15.0	13.4

Note:

Table is for trap discharge at saturated steam temperature. Subcooled discharge traps release less flash. Load should be increased by 20% to allow for trap leakage, future growth, etc.