Maximum Recommended Air Flow (SCFM) Through ANSI Standard Weight Schedule 40 Metal Pipe

- Flow values in the table below are based on a pressure drop of 10% of the applied pressure per 100 feet of pipe for 1/8", 1/4", 3/8", and 1/2" pipe sizes; and a pressure drop of 5% of the applied pressure per 100 feet of pipe for 3/4", 1", 1-1/4", 2", 2-1/2", 3" pipe sizes. The table gives recommended flows for pipe sizes at listed pressures and should be used to determine appropriate piping for air systems.

Applied Pressure PSI	Nominal Standard Pipe Size										
	1/8"	1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
5	0.5	1.2	2.7	4.9	6.6	13	27	40	80	135	240
10	0.8	1.7	3.9	7.7	11.0	21	44	64	125	200	370
20	1.3	3.0	6.6	13.0	18.5	35	75	110	215	350	600
40	2.5	5.5	12.0	23.0	34.0	62	135	200	385	640	1100
60	3.5	8.0	18.0	34.0	50.0	93	195	290	560	900	1600
80	4.7	10.5	23.0	44.0	65.0	120	255	380	720	1200	2100
100	5.8	13.0	29.0	54.0	80.0	150	315	470	900	1450	2600
150	8.6	20.0	41.0	80.0	115.0	220	460	680	1350	2200	3900
200	11.5	26.0	58.0	108.0	155.0	290	620	910	1750	2800	5000
250	14.5	33.0	73.0	135.0	200.0	370	770	1150	2200	3500	6100

Suggested Pipe Size for Compressed Air Flow at 100 PSI Length of Run, Feet

SCFM Air Flow	25	50	75	100	150	200	300	500	1000	Compressor HP
4	1/2	1/2	1/2	1/2	1/2	1/2	1/2	3/4	3/4	1
12	1/2	1/2	1/2	3/4	3/4	1/2	3/4	1	1	3
20	3/4	3/4	3/4	3/4	1	3/4	1	1-1/4	1-1/4	5
30	3/4	3/4	1	1	1	1	1-1/4	1-1/4	1-1/4	7-1/2
40	3/4	1	1	1	1-1/4	1	1-1/4	1-1/2	1-1/2	10
60	1	1	1-1/4	1-1/4	1-1/4	1-1/4	1-1/2	1-1/2	2	15
80	1	1-1/4	1-1/4	1-1/4	1-1/2	1-1/4	1-1/2	2	2	20
100	1-1/4	1-1/4	1-1/2	1-1/2	1-1/2	1-1/2	2	2	2-1/2	25
120	1-1/4	1-1/2	1-1/2	1-1/2	2	1-1/2	2	2-1/2	2-1/2	30
160	1-1/4	1-1/2	1-1/2	2	2	1-1/2	2-1/2	2-1/2	3	40
200	1-1/2	2	2	2	2	2	2-1/2	3	3	50
240	1-1/2	2	2	2	2-1/2	2	2-1/2	3	3	60
300	2	2	2	2-1/2	2-1/2	2	3	3	3-1/2	75
400	2	2-1/2	2-1/2	2-1/2	3	2-1/2	3	3-1/2	4	100
500	2	2-1/2	2-1/2	3	3	2-1/2	3-1/2	3-1/2	4	125

On a compressed air distribution system, pressure losses greater than 3% are considered excessive, and a well-designed system having a steady rate of air flow is usually designed for not more than a 1% loss or **1 PSI** for a **100 PSI** system. The pipe size depends not only on the volume of air flow but how far it must be carried. To hold the distribution loss to 1 PSI, pipes of larger diameter must be used on longer runs to carry the same flow that can be handled by smaller pipes on shorter runs.

Figures in the body of the chart above are pipe sizes recommended on a **100 PSI** system to carry air with less than **1 PSI** loss. When measuring lengths of runs, add 5' of length for each pipe fitting. If carrying **120 PSI** pressure these sizes will carry slightly more air than shown, or pressure loss will be slightly less than **1 PSI**. If carrying **80 PSI** pressure these pipes will carry slightly less air at **1 PSI** pressure loss than shown in the chart.

The left column of the chart shows the volume of air to be carried. It is difficult to estimate the air flow volume to be carried in each leg of the distribution system. This varies with the application. On some applications, like in a large plant with many legs in the distribution system serving dozens of air-operated machines, the air usage may be at a fairly steady rate. Other applications, usually on small systems, may have to carry a high surge of air if several machines happen to be operated at the same time. Then there may be a period with almost no flow.

To make a realistic estimate of air flow volume, the far right column of the chart showing compressor HP may be used. On steady pumping, a compressor will produce a minimum of 4 SCFM air flow for each 1 HP of capacity. This is a conservative figure, as most compressors will produce 5 or 6 SCFM.

For example, a 25 HP compressor will produce at least 100 SCFM of air as shown in the far left column on the same line as 25 HP.

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