

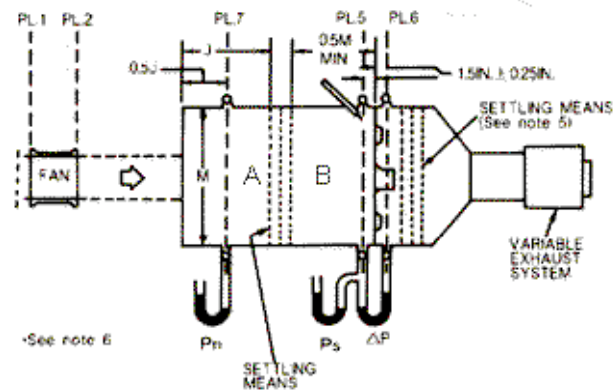
How to Measure the Airflow vs. Pressure

It is very difficult to measure the air performance. The measurement varies by method. There are two methods to measure the static pressure and the airflow. One is wind tunnel and the other is the double chamber method.

The performance specification of airflow and static pressure shown in this Web page is measuredly using the double chamber method. Here, we would like to explain the double chamber method. (See Figure #1) The variable exhaust system adjusts the air density by drawing out the air. Sudden opening of the nozzle induces the instantaneous change of the static pressure and the air flow. The pressure of each manometer is then read.

Maximum Air Flow is measured under the condition of zero static pressure created in chamber B by the variable exhaust system. At this point, the difference in air pressure between chamber A & B is measured with the fan running and the nozzle open.

(Figure 1)



Maximum Static Pressure is measured with the fan running in chamber A with the nozzle shut. This creates a sealed box in which static pressure reaches its maximum value. The static pressure value is the difference between the maximum pressure and atmospheric pressure in chamber A. Actual measurement is recorded when the fan speed is stabilized at rated voltage.

(The Airflow Conversion Table)

m ³ /s	m ³ /min	l/s	l/min	m ³ /h	ft ³ /S	CFM
1	6 x 10	1 x 10 ³	6 x 10 ⁴	3.6 x 10 ³	3.531 x 10	2.118 x 10 ³
1.66666 x 10 ⁻²	1	1.66666 x 10	1x 10 ³	6 x 10	5.885 x 10 ⁻¹	3.531x 10
1 x 10 ⁻³	6 x 10 ⁻²	1	6 x 10	3.6	3.531 x 10 ⁻²	2.118
1.66666 x 10 ⁻⁵	1 x 10 ⁻³	1.66666 x 10 ⁻²	1	6 x 10 ⁻²	5.9 x 10 ⁻⁴	3.54 x 10 ⁻²
2.77777 x 10 ⁻⁴	1.66666 x 10 ⁻²	2.77777x 10 ⁻¹	1.66666 x 10	1	9.81x10 ⁻³	5.886 x 10 ⁻¹
2.832 x 10 ⁻²	1.69833	2.831x 10	1.69833 x 10 ³	1.019 x 10 ²	1	6 x 10
4.72 x 10 ⁻⁴	2.831x 10 ⁻²	0.472	2.831 x 10	1.6983	1.66666 x 10 ⁻²	1

(The Static Pressure Conversion Table)

Pa=N/m ²	mmH ₂ O	inH ₂ O	kgf/cm ²	afm	bar	lbf/in ²
1	1.0197 x 10 ⁻¹	4.017 x 10 ⁻³	1.0197 x 10 ⁻⁵	9.869x 10 ⁻⁶	1 x 10 ⁻⁵	1.450 x 10 ⁻⁴
9.80665	1	3.939 x 10 ⁻²	1x 10 ⁻⁴	9.678 x 10 ⁻⁵	9.806 x 10 ⁻⁵	1.422 x 10 ⁻³
2.49 x 10 ²	25.4	1	2.54 x 10 ⁻³	2.46 x 10 ⁻³	2.49 x 10 ⁻³	3.61 x 10 ⁻²
9.80665 x 10 ⁴	10 ⁴	3.937 x 10 ²	1	0.9678	0.980665	14.2234
1.01325 x 10 ⁵	1.0332 x 10 ⁴	4.071x 10 ²	1.03323	1	1.01325	14.6960
1 x 10 ⁵	1.0197 x 10 ⁴	4.018 x 10 ²	1.01972	0.986932	1	14.5038
6.895 x 10 ³	7.031 x 10 ²	27.686	7.031 x 10 ⁻²	6.805 x 10 ⁻²	6.895 x 10 ⁻²	1