

for total pressure put hose facing Air flow
 for static pressure put hose ⊥ to air flow

CONVERSION CHART

VELOCITY PRESSURE in inches of water to VELOCITY in feet per minute

Calculating Air Velocity. Fechheimer Pitot airflow stations and traverse probes measure in the same manner and magnitude as the Pitot tube, via separate signals of airstream *total pressure* and *static pressure*, in inches water column (IN w.c.). To obtain *velocity pressure* (the force generated by the velocity of the air moving in a duct), the *static pressure* must be subtracted from the *total pressure*:

$$\text{Velocity Pressure (IN w.c.)} = \text{Total Pressure (IN w.c.)} - \text{Static Pressure (IN w.c.)}$$

Air velocity, expressed in feet per minute, is a function of *velocity pressure*, converted by means of the following formula:

$$\text{Air Velocity (FPM)} = 1096.5 \times \sqrt{\frac{\text{Velocity Pressure (IN w.c.)}}{\text{Density of (Gas)}}}$$

In commercial applications where air is the gas, its density is at 70° Fahrenheit and 29.92 inches of mercury (barometric pressure), and the airflow is not compressed (under 10 IN w.c.), the formula reduces to:

$$\text{Air Velocity (FPM)} = 4005 \times \sqrt{\text{Velocity Pressure (IN w.c.)}}$$

Velocity Pressure is differential pressure
 ✓ Velocity Pressure only when Pitot is used

VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V	VP	V
.001"	127	.052"	913	.102"	1279	.152"	1561	.202"	1800	.252"	2011	.302"	2200	.352"	2376	.51"	2860	1.01"	4025	1.51"	4921
.002"	179	.053"	922	.103"	1285	.153"	1567	.203"	1804	.253"	2015	.303"	2204	.353"	2379	.52"	2888	1.02"	4045	1.52"	4938
.003"	219	.054"	931	.104"	1292	.154"	1572	.204"	1809	.254"	2019	.304"	2208	.354"	2383	.53"	2916	1.03"	4064	1.53"	4954
.004"	253	.055"	939	.105"	1298	.155"	1577	.205"	1813	.255"	2023	.305"	2212	.355"	2386	.54"	2943	1.04"	4084	1.54"	4970
.005"	283	.056"	948	.106"	1304	.156"	1582	.206"	1818	.256"	2027	.306"	2215	.356"	2389	.55"	2970	1.05"	4103	1.55"	4986
.006"	310	.057"	956	.107"	1310	.157"	1587	.207"	1822	.257"	2031	.307"	2219	.357"	2393	.56"	2997	1.06"	4123	1.56"	5002
.007"	335	.058"	964	.108"	1316	.158"	1592	.208"	1827	.258"	2035	.308"	2223	.358"	2396	.57"	3024	1.07"	4142	1.57"	5018
.008"	358	.059"	973	.109"	1322	.159"	1597	.209"	1831	.259"	2039	.309"	2226	.359"	2400	.58"	3050	1.08"	4162	1.58"	5034
.009"	380	.060"	981	.110"	1328	.160"	1602	.210"	1835	.260"	2042	.310"	2230	.360"	2403	.59"	3076	1.09"	4181	1.59"	5050
.010"	400	.061"	989	.111"	1334	.161"	1607	.211"	1839	.261"	2046	.311"	2233	.361"	2406	.60"	3102	1.10"	4200	1.60"	5066
.011"	420	.062"	996	.112"	1340	.162"	1612	.212"	1844	.262"	2050	.312"	2236	.362"	2410	.61"	3127	1.11"	4219	1.61"	5082
.012"	439	.063"	1004	.113"	1346	.163"	1617	.213"	1848	.263"	2054	.313"	2239	.363"	2413	.62"	3153	1.12"	4238	1.62"	5098
.013"	457	.064"	1012	.114"	1352	.164"	1622	.214"	1853	.264"	2058	.314"	2242	.364"	2416	.63"	3179	1.13"	4257	1.63"	5114
.014"	474	.065"	1020	.115"	1358	.165"	1627	.215"	1857	.265"	2062	.315"	2245	.365"	2420	.64"	3204	1.14"	4276	1.64"	5129
.015"	491	.066"	1029	.116"	1364	.166"	1632	.216"	1862	.266"	2066	.316"	2248	.366"	2423	.65"	3229	1.15"	4295	1.65"	5144
.016"	507	.067"	1037	.117"	1370	.167"	1637	.217"	1866	.267"	2070	.317"	2251	.367"	2426	.66"	3254	1.16"	4314	1.66"	5160
.017"	522	.068"	1045	.118"	1376	.168"	1642	.218"	1870	.268"	2074	.318"	2254	.368"	2429	.67"	3279	1.17"	4332	1.67"	5175
.018"	537	.069"	1052	.119"	1382	.169"	1646	.219"	1875	.269"	2078	.319"	2257	.369"	2432	.68"	3303	1.18"	4350	1.68"	5191
.019"	552	.070"	1060	.120"	1387	.170"	1651	.220"	1879	.270"	2081	.320"	2260	.370"	2436	.69"	3327	1.19"	4368	1.69"	5206
.020"	566	.071"	1067	.121"	1393	.171"	1656	.221"	1883	.271"	2085	.321"	2264	.371"	2439	.70"	3351	1.20"	4386	1.70"	5222
.021"	580	.072"	1075	.122"	1399	.172"	1661	.222"	1887	.272"	2089	.322"	2268	.372"	2443	.71"	3375	1.21"	4405	1.71"	5237
.022"	594	.073"	1082	.123"	1404	.173"	1666	.223"	1892	.273"	2093	.323"	2272	.373"	2445	.72"	3398	1.22"	4423	1.72"	5253
.023"	607	.074"	1089	.124"	1410	.174"	1670	.224"	1896	.274"	2097	.324"	2276	.374"	2449	.73"	3422	1.23"	4442	1.73"	5268
.024"	620	.075"	1097	.125"	1416	.175"	1675	.225"	1900	.275"	2101	.325"	2280	.375"	2453	.74"	3445	1.24"	4460	1.74"	5283
.025"	633	.076"	1104	.126"	1422	.176"	1680	.226"	1905	.276"	2105	.326"	2284	.376"	2456	.75"	3468	1.25"	4478	1.75"	5298
.026"	645	.077"	1111	.127"	1427	.177"	1685	.227"	1909	.277"	2109	.327"	2289	.377"	2459	.76"	3491	1.26"	4495	1.76"	5313
.027"	658	.078"	1119	.128"	1433	.178"	1690	.228"	1913	.278"	2113	.328"	2293	.378"	2462	.77"	3514	1.27"	4513	1.77"	5328
.028"	670	.079"	1125	.129"	1439	.179"	1695	.229"	1917	.279"	2116	.329"	2297	.379"	2466	.78"	3537	1.28"	4531	1.78"	5343
.029"	682	.080"	1133	.130"	1444	.180"	1699	.230"	1921	.280"	2119	.330"	2301	.380"	2469	.79"	3560	1.29"	4549	1.79"	5359
.030"	694	.081"	1140	.131"	1449	.181"	1704	.231"	1925	.281"	2123	.331"	2304	.381"	2472	.80"	3582	1.30"	4566	1.80"	5374
.031"	705	.082"	1147	.132"	1455	.182"	1709	.232"	1929	.282"	2127	.332"	2308	.382"	2475	.81"	3604	1.31"	4583	1.81"	5388
.032"	716	.083"	1154	.133"	1461	.183"	1713	.233"	1933	.283"	2131	.333"	2311	.383"	2479	.82"	3625	1.32"	4601	1.82"	5403
.033"	727	.084"	1161	.134"	1466	.184"	1718	.234"	1937	.284"	2135	.334"	2315	.384"	2481	.83"	3657	1.33"	4619	1.83"	5418
.034"	738	.085"	1167	.135"	1471	.185"	1723	.235"	1941	.285"	2139	.335"	2318	.385"	2485	.84"	3669	1.34"	4636	1.84"	5433
.035"	749	.086"	1175	.136"	1477	.186"	1727	.236"	1945	.286"	2143	.336"	2322	.386"	2488	.85"	3690	1.35"	4653	1.85"	5447
.036"	759	.087"	1181	.137"	1482	.187"	1732	.237"	1950	.287"	2147	.337"	2325	.387"	2491	.86"	3709	1.36"	4671	1.86"	5462
.037"	770	.088"	1188	.138"	1488	.188"	1737	.238"	1954	.288"	2151	.338"	2329	.388"	2495	.87"	3729	1.37"	4688	1.87"	5477
.038"	780	.089"	1193	.139"	1493	.189"	1741	.239"	1958	.289"	2154	.339"	2332	.389"	2499	.88"	3758	1.38"	4705	1.88"	5491
.039"	791	.090"	1201	.140"	1498	.190"	1746	.240"	1962	.290"	2157	.340"	2335	.390"	2501	.89"	3779	1.39"	4722	1.89"	5506
.040"	801	.091"	1208	.141"	1504	.191"	1750	.241"	1966	.291"	2161	.341"	2338	.390"	2501	.90"	3800	1.40"	4739	1.90"	5521
.041"	811	.092"	1215	.142"	1509	.192"	1755	.242"	1970	.292"	2164	.342"	2342	.410"	2563	.91"	3821	1.41"	4756	1.91"	5535
.042"	821	.093"	1222	.143"	1515	.193"	1759	.243"	1974	.293"	2168	.343"	2345	.420"	2595	.92"	3842	1.42"	4773	1.92"	5550
.043"	831	.094"	1228	.144"	1520	.194"	1764	.244"	1978	.294"	2171	.344"	2349	.430"	2626	.93"	3863	1.43"	4790	1.93"	5564
.044"	840	.095"	1234	.145"	1525	.195"	1768	.245"	1982	.295"	2175	.345"	2352	.440"	2656	.94"	3884	1.44"	4806	1.94"	5579
.045"	849	.096"	1241	.146"	1530	.196"	1773	.246"	1987	.296"	2179	.346"	2356	.450"	2687	.95"	3904	1.45"	4823	1.95"	5593
.046"	859	.097"	1247	.147"	1536	.197"	1777	.247"	1991	.297"	2182	.347"	2360	.460"	2716	.96"	3924	1.46"	4840	1.96"	5608
.047"	868	.098"	1254	.148"	1541	.198"	1782	.248"	1995	.298"	2186	.348"	2363	.470"	2746	.97"	3945	1.47"	4856	1.97"	5623
.048"	877	.099"	1260	.149"	1546	.199"	1787	.249"	1999	.299"	2189	.349"	2366	.480"	2775	.98"	3965	1.48"	4873	1.98"	5637
.049"	887	.100"	1266	.150"	1551	.200"	1791	.250"	2003	.300"	2193	.350"	2369	.490"	2804	.99"	3985	1.49"	4889	1.99"	5651
.050"	896	.101"	1273	.151"	1556	.201"	1795	.251"	2007	.301"	2197	.351"	2372	.500"	2832	1.00"	4005	1.50"	4905	2.00"	5664
.051"	904																				

Calculating Air Volume. The *station air volume*, expressed cubic feet per minute (CFM), is the product of the *air velocity* through the airflow station and the *station area* in square feet (Ft²).

$$\text{Station Air Volume (CFM)} = \text{Air Velocity (FPM)} \times \text{Station Area (Ft}^2\text{)}$$

Diam = A = $\pi \left(\frac{X}{12}\right)^2$ to get in²