

Pressure Sensors

Conversion Factors

CONVERSION FACTORS

Converting To PSI

1 in. H₂O (@ 0°C) = 3.6127 × 10⁻² psi
 1 in. H₂O (@ 20°C) = 3.6063 × 10⁻² psi
 1mm H₂O (@ 0°C) = 1.4223 × 10⁻³ psi
 1mm H₂O (@ 20°C) = 1.4198 × 10⁻³ psi
 1 in. Hg (@ 0°C) = .49118 psi
 1mm Hg (@ 0°C) = 1 TORR = 1.9337 × 10⁻² psi
 1 bar = 14.504 psi
 1mbar = 1.4504 × 10⁻² psi
 1 Pa = 1.4504 × 10⁻⁴ psi
 1 kPa = .14504 psi
 ATM = 14.696 psi

Example:

Convert 3.0 ATM to psi:

$$3.0 \text{ ATM} \times \frac{14.696 \text{ psi}}{\text{ATM}} = 44.088 \text{ psi}$$

Converting From PSI

1 psi = 27.68 in. H₂O (@ 0°C)
 1 psi = 27.73 in. H₂O (@ 20°C)
 1 psi = 703.05mm H₂O (@ 0°C)
 1 psi = 704.33mm H₂O (@ 25°C)
 1 psi = 2.0359 in. Hg (@ 0°C)
 1 psi = 51.714mm Hg = 51.714 TORR (@ 0°C)
 1 psi = 6.8946 × 10⁻² bar
 1 psi = 68.946 mbar
 1 psi = 6.8946 × 10³ Pa
 1 psi = 6.8946 kPa
 1 psi = 6.8045 × 10⁻² ATM

Example:

Convert 6.0 psi to mbar:

$$6.0 \text{ psi} \times \frac{68.946 \text{ mbar}}{\text{psi}} = 413.676 \text{ mbar}$$

Temperature

$$^{\circ}\text{C} = \frac{(^{\circ}\text{F} - 32)}{1.8}$$

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

Metric

mm = 0.03937 in. in. = 25.4 mm
 cm = 0.3937 in. in. = 2.54 cm
 m = 39.37 in. in. = 2.54 × 10⁻²m

Key:

psi = lbs. per square inch
 in. H₂O = inches of water
 in. Hg = inches of mercury
 mm Hg = millimeters of mercury
 bar = bar
 mbar = millibar
 kPa = kilopascal = 1000 (N/m²)
 ATM = atmosphere
 Pa = pascal

ALTITUDE (Feet)	EQUIVALENT PRESSURE (Inches of Mercury)
-1,000	31.0185
-900	30.9073
0	29.9213
500	29.3846
1,000	28.8557
1,500	28.3345
2,000	27.8210
3,000	26.8167
4,000	25.8418
6,000	23.9782
8,000	22.2250
10,000	20.5770
12,000	19.0294
14,000	17.5774
16,000	16.2164
18,000	14.9421
20,000	13.7501
22,000	12.6363
25,000	11.1035
30,000	8.88544
35,000	7.04062
40,000	5.53802
45,000	4.35488
50,000	3.42466

Airspeed	
Knots	Inches of Mercury
60	0.1727
80	0.3075
100	0.4814
110	0.5832
120	0.6950
130	0.8168
140	0.9488
150	1.0910
175	1.4918
200	1.9589
225	2.4943
250	3.1002
275	3.7792
300	4.5343
325	5.3687
350	6.2859
375	7.2900
400	8.3850
425	9.5758
450	10.8675
475	12.2654
500	13.7756
525	15.4045
550	17.1590
575	19.0465
600	21.0749
650	25.5893
700	30.7642
750	36.5662
800	42.9378
850	49.8423
900	57.2554
1,000	73.5454

1 knot ≅ 1.15 statute miles

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PRESSURE CONVERSION CHART

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psi	in. H ₂ O	in. Hg	cm H ₂ O	mm Hg	bar	mbar	kPa
0.01	0.2768	0.0204	0.7031	0.5171	0.0007	0.6895	0.0690
0.02	0.5536	0.0407	1.406	1.034	0.0014	1.379	0.1379
0.03	0.8304	0.0611	2.109	1.551	0.0021	2.068	0.2068
0.04	1.107	0.0814	2.812	2.068	0.0028	2.758	0.2758
0.05	1.384	0.1018	3.512	2.586	0.0034	3.447	0.3447
0.06	1.661	0.1222	4.218	3.103	0.0041	4.137	0.4137
0.07	1.938	0.1425	4.922	3.620	0.0048	4.826	0.4826
0.08	2.214	0.1629	5.625	4.137	0.0055	5.516	0.5516
0.09	2.491	0.1832	6.328	4.654	0.0062	6.205	0.6205
0.10	2.768	0.2036	7.031	5.171	0.0069	6.895	0.6895
0.20	5.536	0.4072	14.06	10.34	0.0138	13.79	1.379
0.30	8.304	0.6108	21.09	15.51	0.0207	20.68	2.068
0.40	11.70	0.8144	28.12	20.68	0.0276	27.58	2.758
0.50	13.84	1.018	35.12	25.86	0.0345	34.47	3.447
0.60	16.61	1.222	42.18	31.03	0.0414	41.37	4.137
0.70	19.38	1.425	49.22	36.20	0.0483	48.26	4.826
0.80	22.14	1.629	56.25	41.37	0.0552	55.16	5.516
0.90	24.91	1.832	63.28	46.54	0.0620	62.05	6.205
1.0	27.68	2.036	70.31	51.71	0.0690	68.95	6.895
2.0	55.36	4.072	140.6	103.4	0.1379	137.9	13.79
3.0	83.04	6.108	210.9	155.1	0.2068	206.8	21.37
4.0	110.7	8.144	281.2	206.8	0.2758	275.8	27.58
5.0	138.4	10.18	351.5	258.6	0.3447	344.7	34.47
6.0	166.1	12.22	421.8	310.3	0.4137	413.7	41.37
7.0	193.8	14.25	492.2	362.0	0.4826	482.6	48.26
8.0	221.4	16.29	562.5	413.7	0.5516	551.6	55.16
9.0	249.1	18.32	632.8	465.4	0.6205	620.5	62.05
10.0	276.8	20.36	703.1	517.1	0.6895	689.5	68.95
14.7	406.9	29.93	1034.0	760.2	1.014	1014	101.4
15.0	415.2	30.54	1055.0	775.7	1.034	1034	103.4
20.0	553.8	40.72	1406.0	1034	1.379	1379	137.9
25.0	692.0	60.80	1758.0	1293	1.724	1724	172.4
30.0	830.4	61.08	2109.0	1551	2.068	2068	206.8
40.0	1107	81.44	2812.0	2068	2.758	2758	275.8
50.0	1384	101.8	3515.0	2586	3.447	3447	344.7
100.0	2768	203.6	7031.0	5171	6.895	6895	689.5
150.0	4152	305.4	10550.0	7757	10.34	10340	1034
200.0	5538	407.2	14060.0	10340	13.79	13790	1379
250.0	6920	608.0	17580.0	12930	17.24	17240	1724