

What is pressure?

What are the common units of pressure in compressed air?

Imperial units

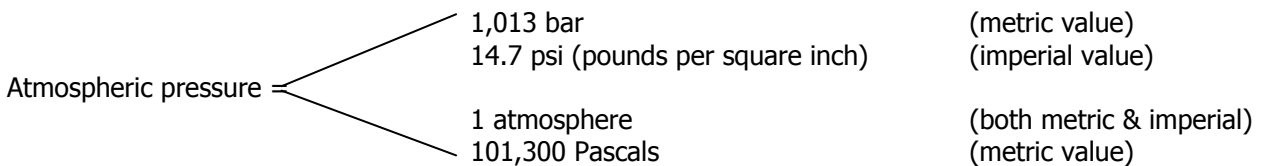
Atmosphere (atm)
Pounds per square inch (psi)

Metric units

Atmosphere (atm)
Bar
Pascal (Pa)

What is atmospheric pressure?

This is the pressure exerted by the atmosphere. Although we are not generally aware of the atmosphere exerting a pressure on us, it does so, and has a value of:



NOTE As can be seen atmospheric values in either 'bar' or 'psi' are not convenient numbers. Therefore many calculations using the 'bar' round of atmospheric pressure as '1 bar'. In most cases this provides sufficient accuracy, however if high accuracy is required then the actual atmospheric value shall be used.

What is gauge pressure?

This is the most commonly used value in the compressed air industry when referring to the pressure in a system or equipment. Compressors provide that increase in pressure. A pressure gauge senses the increase in pressure and indicates it on a scale that for convenience starts at zero. Pressure gauges measure the pressure **above** atmospheric pressure. Hence:

Pressure gauges register a value of zero at atmospheric pressure

So what is absolute pressure?

The everyday gauge pressure values cannot always be used in calculations, so the value of *absolute pressure* must be used. Hence:

Absolute Pressure = Gauge Pressure + Atmospheric Pressure

How do I convert gauge pressure to absolute pressure?

Compressed air systems commonly operate between 6 barg and 8 barg (equivalent to 87 psig and 116psig). A conversion widely used in the compressed air industry is:

1 bar = 14.5psi

Useful rule of thumb: 7 barg ≈ 100 psig

If a pressure gauge registers 6 barg, then the equivalent absolute pressure is:
 6 + 1 = 7 bar (≈ 100 psi), or more correctly, 7 bara (≈ 100 psia) to show it is an absolute value.
 And 7 barg (≈ 100 psig) is 8 bara (≈ 116 psia)
 Also 8 barg (≈ 116 psig) is 9 bara (≈ 130 psia)