

Gas Constant Values based on Pressure and Volume Units

IDEAL GAS LAW: $PV = nRT$

where **R** = “gas constant” $R = \frac{P \times V}{\text{mole} \times \text{Kelvin}}$

Common R values:

$$R = 0.0821 \frac{\text{L} \cdot \text{atm}}{\text{mole} \cdot \text{Kelvin}}$$

$$R = 8.314 \frac{\text{L} \cdot \text{kPa}}{\text{mole} \cdot \text{Kelvin}}$$

$$R = 8.31447 \frac{\text{m}^3 \cdot \text{Pa}}{\text{mole} \cdot \text{Kelvin}}$$

$$R = 62.3638 \frac{\text{L} \cdot \text{mm Hg}}{\text{mole} \cdot \text{Kelvin}}$$

*This table is based on **moles** as the unit for the amount of matter and **Kelvin** as the unit for temperature:*

	cm ³	liter	m ³	ft ³	inch ³
atm	82.0575	0.0820575	8.20575×10 ⁻⁵	0.00289783	5.00745
bar	83.1447	0.0831447	8.31447×10 ⁻⁵	0.00293623	5.0738
foot H₂O	2781.63	2.78163	0.00278163	0.0982323	169.745
inch H₂O	33379.5	33.3795	0.0333795	1.17879	2036.94
inch Hg	2455.27	2.45527	0.00245527	0.086707	149.83
kgf/cm²	84.784	0.084784	8.4784×10 ⁻⁵	0.00299412	5.17384
kPa	8314.47	8.31447	0.00831447	0.293623	507.38
lbf/ft²	173651	173.651	0.173651	6.13244	10596.9
mbar	83144.7	83.1447	0.0831447	2.93623	5073.8
meter H₂O	847.84	0.84784	0.00084784	0.0299412	51.7384
mm H₂O	847840	847.84	0.84784	29.9412	51738.4
mm Hg	62363.8	62.3638	0.0623638	2.20236	3805.68
Pa	8.31447×10 ⁶	8314.47	8.31447	293.623	507380
PSI	1205.91	1.20591	0.00120591	0.0425864	73.5893