

Barometric formula @model

@wikipedia

Motivation

Ideal Gas Static Vertical Pressure Variation

Output

$p(z)$	Fluid pressure p
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Input

z	Elevation	ρ_0	Fluid density at Logging reference point z_0
z_0	Logging reference point (usually at surface)	c_0	Fluid Compressibility at Logging reference point z_0
g	Standard gravity constant		

Equation

(1)
$$p(z) = p_0 \cdot \exp \left[-\frac{\rho_0 g}{p_0} \cdot (z - z_0) \right]$$

where

z	Elevation	p_0	Gas pressure at Logging reference point z_0
z_0	Logging reference point (usually at surface)	ρ_0	Gas density at Logging reference point z_0
g	Standard gravity constant	c_0	Gas Compressibility at Logging reference point z_0

Alternative form

(2)
$$p(z) = p_0 \cdot \exp \left[-\frac{M}{RT} \cdot (z - z_0) \right]$$

where

z	Elevation	p_0	Gas pressure at Logging reference point z_0
z_0	Logging reference point (usually at surface)	M	Gas molar mass
g	Standard gravity constant	T	Gas temperature
		R	Gas constant

Following [Ideal Gas Equation of State](#):

(3)

$$\frac{\rho_0}{p_0} = \frac{M}{RT}$$

See also

[Physics](#) / [Mechanics](#) / [Continuum mechanics](#) / [Fluid Mechanics](#) / [Fluid Statics](#)

[[Fluid Dynamics](#)]