KegCalc | Calculation reference

Current iOS implementation • September 13, 2026

The app combines a carbonation-pressure polynomial with a simplified pressure-budget model for beer-line length. The equations below reproduce the current Swift implementation; they are not a full flow simulation.

1. Carbonation pressure

Let T denote the numerical beer temperature in °F and V the carbonation target in volumes of CO_2 (gas volume per beer volume). The regulator pressure is interpreted as PSI gauge.

$$P_{poly} = -1.66999 \times 10^{1} - 1.01059 \times 10^{-2}T + 1.16512 \times 10^{-3}T^{2} + 1.73354 \times 10^{-1}TV + 4.24267V - 6.84226 \times 10^{-2}V^{2}$$

$$P_{CO2} = \max(0, P_{poly})$$

For a Celsius input: $T = (9/5)T_C + 32$. Coefficients are unit-dependent: the polynomial requires °F and returns PSI. The source code does not document the original correlation, its calibration range, or its uncertainty. The reference conditions defining a "volume" of CO_2 are also not specified in the code.

2. Vertical lift loss

For faucet rise h, measured in feet above the keg:

$$\Delta P_{lift} = \max[0, (5.0 \times 10^{-1}\ \text{psi/ft})h]$$

This is a fixed hydrostatic-loss approximation. The app does not evaluate density-dependent ρgh, and it gives no pressure credit for a faucet below the keg.

3. Beer-line pressure budget

$$P_{available} = P_s - P_f - \Delta P_{lift}$$
$$L = \max[0, P_{available} / R_{line}]$$

Here P_s is serving pressure, P_f is the reserved faucet-pressure allowance, and R_{line} is the assumed pressure loss per unit length. Definitions and presets follow on page 2.

Parameters & interpretation

KegCalc engineering reference • continued

Symbol	Meaning	Units / default
P_s	Serving pressure; calculated CO_2 pressure unless manually overridden	PSI
P_f	Reserved faucet-pressure allowance	2.5 PSI
h	Faucet rise above the keg	ft; default 0
R_{line}	Assumed pressure loss per unit line length	PSI/ft
L	Estimated beer-line length	ft

Implemented tubing presets

Tubing preset	Pressure gradient (PSI/ft)
3/16-inch ID vinyl	2.7
1/4-inch ID vinyl	0.9
5/16-inch ID vinyl	0.4
EVABarrier - approximate preset	2.3

EVABarrier metric sizes are not exact equivalents of 3/16 inch. This preset is explicitly approximate.

Rounding and unit conversion

$$L_{display,ft} = \text{round}(12L) / 12$$
$$P_{bar} = 6.89476 \times 10^{-2} P_{psi}$$
$$P_{kPa} = 6.89476 P_{psi}$$

Length is rounded to the nearest inch. The metric app display converts that rounded length to centimeters and rounds to a whole centimeter. A nonpositive pressure budget produces an insufficient-pressure message instead of recommending a zero-length line.

Engineering interpretation

The line model assumes $\Delta P_{line} = R_{line} L$. Here R_{line} is a fixed pressure gradient, not a hydraulic resistance multiplied by a calculated flow rate. The app does not solve for velocity, volumetric flow, Reynolds number, friction factor, viscosity, fitting losses, or CO_2 breakout. The faucet allowance is a lumped pressure term.

The output is a starting length for tuning a home CO_2 draft system. It is not a resolved fluid-dynamics prediction for nitrogen blends or long-draw systems. Start with extra tubing and trim gradually after checking temperature and flow.

Implementation sources: KegCalc/Utilities/CarbonationPressureCalculator.swift; LineBalancingCalculator.swift; UnitConverter.swift; KegCalc/Views/CalculatorView.swift. This reference describes the local app build, not a separately validated scientific correlation.