

DIFFERENCE BETWEEN PRESSURE/HEAD?

INTRODUCTION TO HYDROSTATICS SERIES BY MEYERFIRE UNIVERSITY | OCTOBER 2022

SUMMARY

Pressure and **Head** are two different ways to represent pressure.

- **Pressure** is a measurement of force divided by unit area. In IP, it's represented as pounds per square inch (psi). In SI, that's Kilopascals (kPa) or Bar.
- **Head** is an equivalent height of a fluid column that would produce a specific pressure. In IP, it's represented in feet of head (ft), in SI, it's represented in meters of head (m).
- As an example, a water tower is 85-ft in height (25.9 m).
 - The pressure at the bottom of the tower can be represented as having 85-ft of head, or as 36.8 psi (85 x 0.433 psi/ft).
 - In SI, the pressure at the bottom of the tower can be represented as having 25.9 meters of head, or 2.5 bar (25.9m x 0.098 bar/m)

Gauge Pressure is a system of pressure that does not consider atmospheric pressure.

Absolute Pressure does incorporate the pressure applied by the atmosphere.

WATER SUPPLY: 20 PSI (1.4 BAR)

PUMP: 100-FT HEAD (30.5 M)

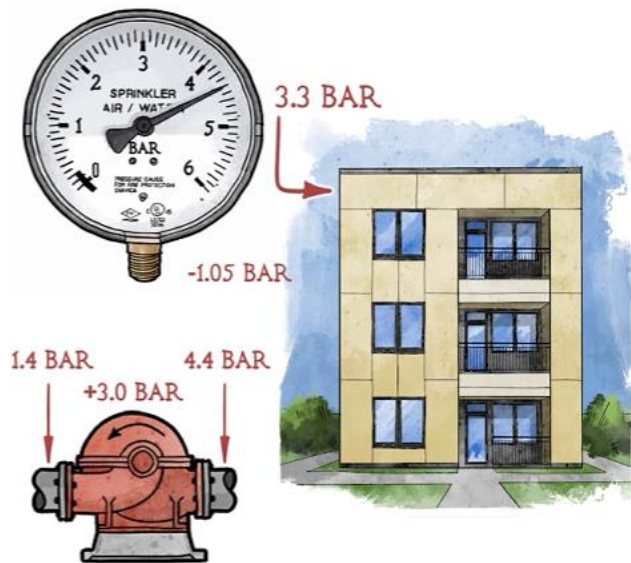
HEIGHT TO 3RD FLOOR: 35-FT (10.7 M)

CONVERT PUMP HEAD TO PRESSURE:
 $0.098 \text{ BAR/M} \times 30.5 \text{ M} = 3.0 \text{ BAR (NET PUMP PRESSURE)}$

PRESSURE AT PUMP DISCHARGE:
 $1.4 \text{ BAR} + 3.0 \text{ BAR} = 4.4 \text{ BAR (AT PUMP DISCHARGE)}$

CONVERT BUILDING HEIGHT TO PRESSURE LOSS:
 $10.7 \text{ M} \times 0.098 \text{ BAR/M} = 1.05 \text{ BAR (ELEVATION LOSS)}$

PRESSURE AT THIRD LEVEL:
 $4.4 \text{ BAR} - 1.05 \text{ BAR} = 3.3 \text{ BAR (PRESSURE AT THIRD LEVEL)}$



Worked Example of Pressure Added by a Pump and Lost Due to Elevation
(IP Version)

VIDEO LINK

www.meyerfire.com/university/difference-between-pressure-and-head

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