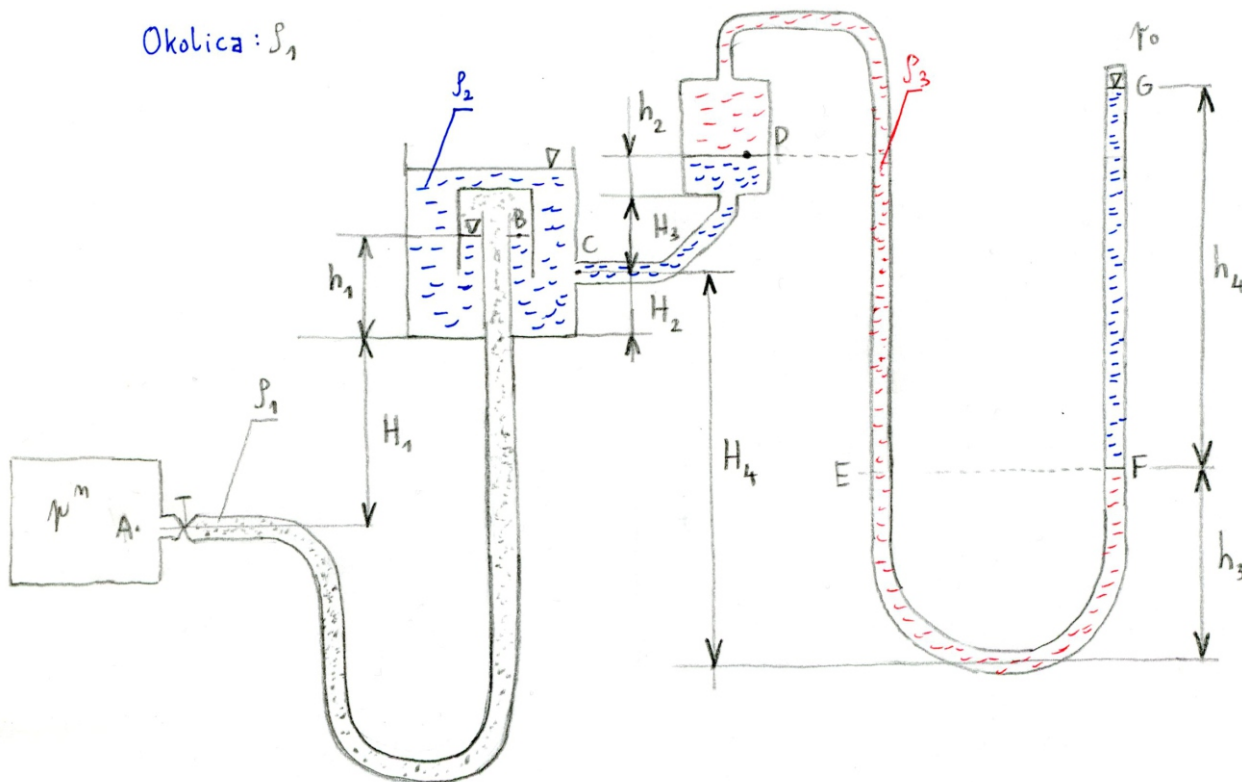


**Naloga 1.** Odpremo ventil, ki povezuje sistem in tlačno posodo, v kateri je neznan nadtlak. Kolikšen mora biti nadtlak, da bo sistem v ravnovesju?



Podatki:

$H_1 = 1\text{ m}$        $h_1 = 0,5\text{ m}$        $\gamma_0 = 1\text{ bar}$

$\rho_1 = 1,25 \frac{\text{kg}}{\text{m}^3}$        $H_2 = 0,3\text{ m}$        $h_2 = 0,8\text{ m}$        $g = 9,807 \frac{\text{m}}{\text{s}^2}$

$\rho_2 = 1000 \frac{\text{kg}}{\text{m}^3}$        $H_3 = 3\text{ m}$        $h_3 = 4\text{ m}$

$\rho_3 = 315 \frac{\text{kg}}{\text{m}^3}$        $H_4 = 4,5\text{ m}$        $h_4 = 3,5\text{ m}$

$p^N = ?$

## Rešitev naloge 1:

$$\rightarrow p^N = p_A - p_0$$

$$p_B = p_A - \rho_1 g (H_1 + h_1)$$

$$p_C = p_B + \rho_2 g (h_1 - H_2)$$

$$p_D = p_C - \rho_2 g (H_3 + h_2)$$

$$p_E = p_D + \rho_3 (H_3 + H_4 + h_2 - h_3)$$

$$p_F = p_E$$

$$p_G = p_F - \rho_2 g h_4, \quad p_G = p_0$$

$$\rightarrow p_F = p_0 + \rho_2 g h_4$$

$$p_E = p_0 + \rho_2 g h_4$$

$$p_D = p_0 + \rho_2 g h_4 - \rho_3 (H_3 + H_4 + h_2 - h_3)g$$

$$p_C = p_0 + \rho_2 g h_4 - \rho_3 g (H_3 + H_4 + h_2 - h_3) + \rho_2 g (H_3 + h_2) =$$

$$= p_0 + \rho_2 g (H_3 + h_2 + h_4) - \rho_3 g (H_3 + H_4 + h_2 - h_3)$$

$$p_B = p_C - \rho_2 g (h_1 - H_2) =$$

$$= p_0 + \rho_2 g (h_2 + h_4 - h_1 + H_2 + H_3) - \rho_3 (H_3 + H_4 + h_2 - h_3)g$$

$$p_A = p_B + \rho_1 g (h_1 + H_1) =$$

$$= p_0 + \rho_1 g (h_1 + H_1) + \rho_2 g (h_2 + h_4 - h_1 + H_2 + H_3) - \rho_3 g (H_3 + H_4 + h_2 - h_3)$$

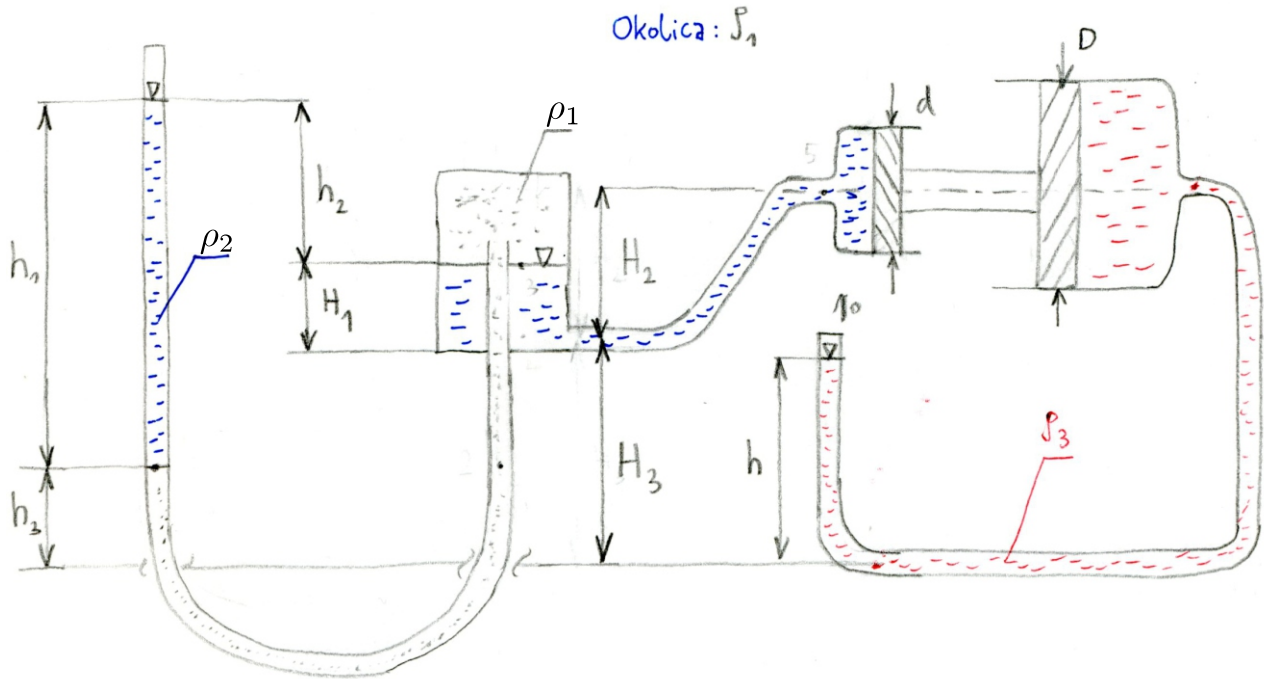
$$p^N = p_A - p_0 = \rho_1 g (h_1 + H_1) + \rho_2 g (h_2 + h_4 - h_1 + H_2 + H_3) - \rho_3 g (H_3 + H_4 + h_2 - h_3) =$$

$$= 1,25 \frac{\text{kg}}{\text{m}^3} \cdot 9,807 \frac{\text{m}}{\text{s}^2} (1\text{m} + 0,5\text{m}) + 1000 \frac{\text{kg}}{\text{m}^3} \cdot 9,807 \frac{\text{m}}{\text{s}^2} (0,8\text{m} + 0,35\text{m} - 0,5\text{m} + 0,3\text{m} + 3\text{m}) -$$

$$- 315 \frac{\text{kg}}{\text{m}^3} \cdot 9,807 \frac{\text{m}}{\text{s}^2} (3\text{m} + 4,5\text{m} + 0,8\text{m} - 4\text{m}) = \rightarrow = 56364,507 \text{ Pa} \approx 0,564 \text{ bar}$$

$$= 1,25 \frac{\text{kg}}{\text{m}^3} \cdot 9,807 \frac{\text{m}}{\text{s}^2} \cdot 1,5\text{m} + 1000 \frac{\text{kg}}{\text{m}^3} \cdot 9,807 \frac{\text{m}}{\text{s}^2} \cdot 7,1\text{m} - 315 \frac{\text{kg}}{\text{m}^3} \cdot 9,807 \frac{\text{m}}{\text{s}^2} \cdot 4,3\text{m} =$$

**Naloga 2.** Določí višino stolpca  $h$ , da bo sistem v ravnovesju.



Podatki:

$$P_1 = 1,25 \frac{\text{kg}}{\text{m}^3} \quad H_1 = 1,5 \text{ m} \quad h_1 = 8 \text{ m} \quad p_0 = 1 \text{ bar}$$

$$P_2 = 1000 \frac{\text{kg}}{\text{m}^3} \quad H_2 = 5 \text{ m} \quad h_2 = 5,4 \text{ m} \quad d = 0,4 \text{ m}$$

$$P_3 = 284 \frac{\text{kg}}{\text{m}^3} \quad H_3 = 3,4 \text{ m} \quad h_3 = 2,2 \text{ m} \quad D = 1 \text{ m} \quad g = 9,807 \frac{\text{m}}{\text{s}^2}$$

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$$h = ?$$