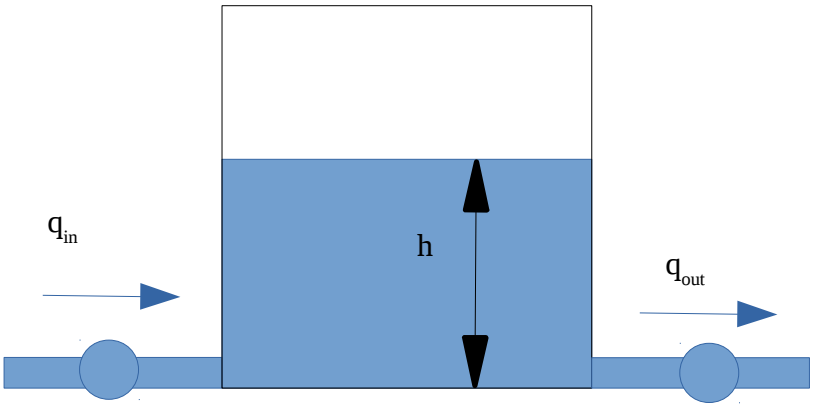
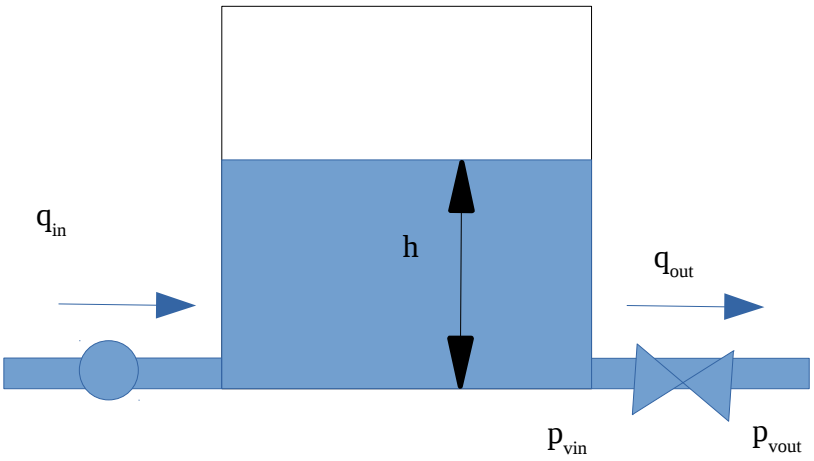
$$\frac{dh}{dt} = q_{in} - q_{out} \qquad h = \int (q_{in} - q_{out})\, dt$$

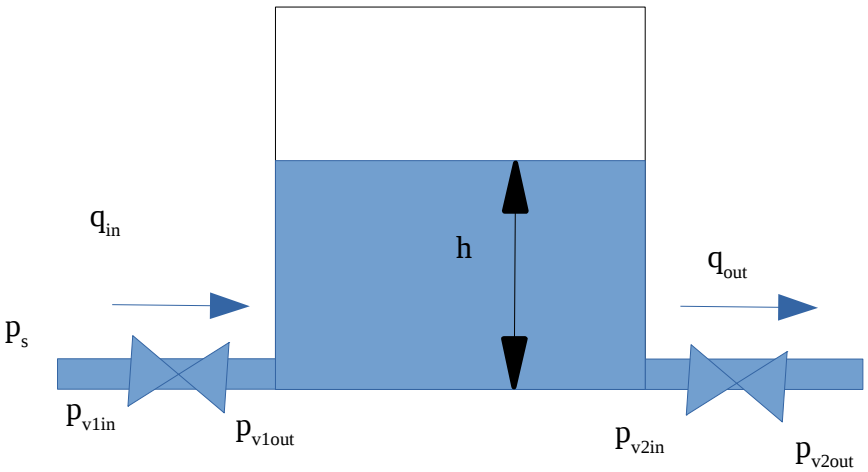
a




$$q_v = K_v\, l \sqrt{(p_{vin} - p_{vout})}$$
$$q_{out} = K_{vout}\, l_{out} \sqrt{(\rho\, g\, h - 0)}$$




$$q_v = K_v\, l \sqrt{(p_{vin} - p_{vout})}$$
$$q_{out} = K_{vout}\, l_{out} \sqrt{(\rho\, g\, h - 0)}$$
$$q_{in} = K_{vin}\, l_{in} \sqrt{(p_s - \rho\, g\, h)}$$
$$h_s = \frac{p_s}{(\rho\, g)}$$



$$q_v = K_v \, l \sqrt{(p_{vin} - p_{vout})}$$

$$q_{out} = K_{vout} \, l_{out} \sqrt{(\rho \, g h - 0)}$$

$$q_{in} = K_{vin} \, l_{in} \sqrt{p_s}$$

$$h_s = \frac{p_s}{(\rho \, g)}$$