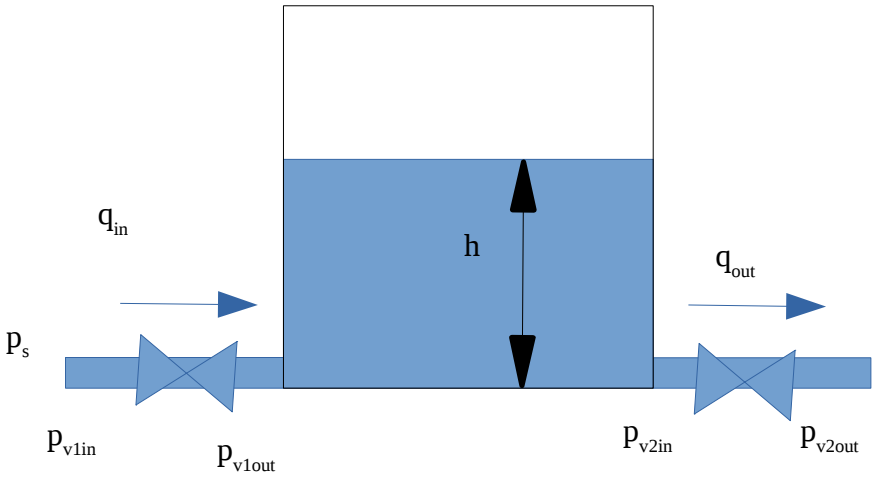
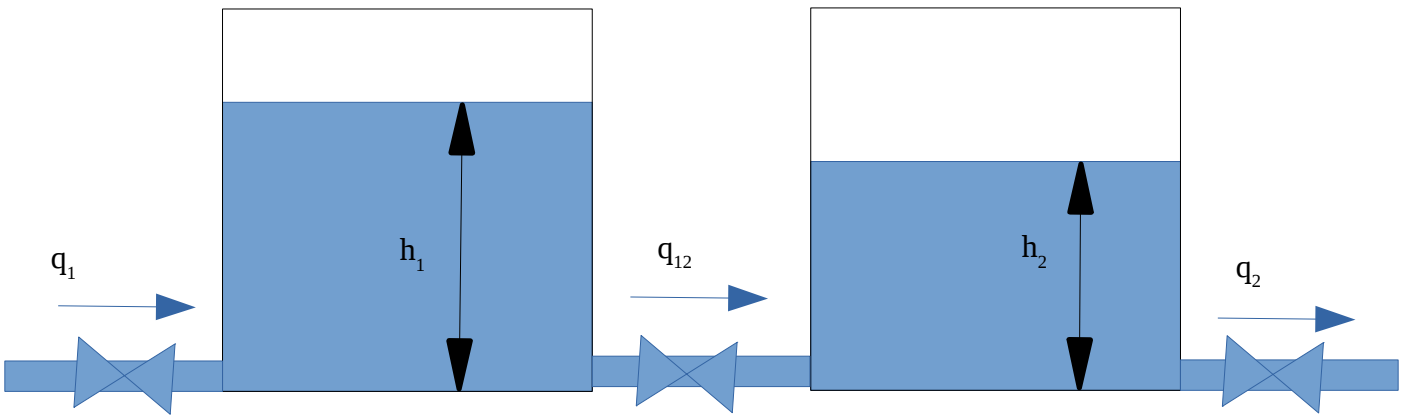
$$q_{out} = K_{vout}\, l_{out} \sqrt{(\rho g h - 0)}$$
$$q_{in} = K_{vin}\, l_{in} \sqrt{(p_s - \rho g h)}$$
$$h_s = \frac{p_s}{(\rho g)}$$
$$\frac{dh}{dt} A = q_{in} - q_{out}$$
$$\frac{dV}{dt} = q_{in} - q_{out}$$
$$h = \frac{V}{A}$$



C



$$q_1 = K_{v1} l_1 \sqrt{(p_s - \rho g h_1)} \qquad q_{12} = K_{v12} l_{12} \sqrt{(\rho g h_1 - \rho g h_2)} \qquad q_2 = K_{v2} l_2 \sqrt{(\rho g h_2 - 0)}$$
$$\frac{dV_1}{dt} = q_1 - q_{12} \qquad \frac{dV_2}{dt} = q_{12} - q_2$$