

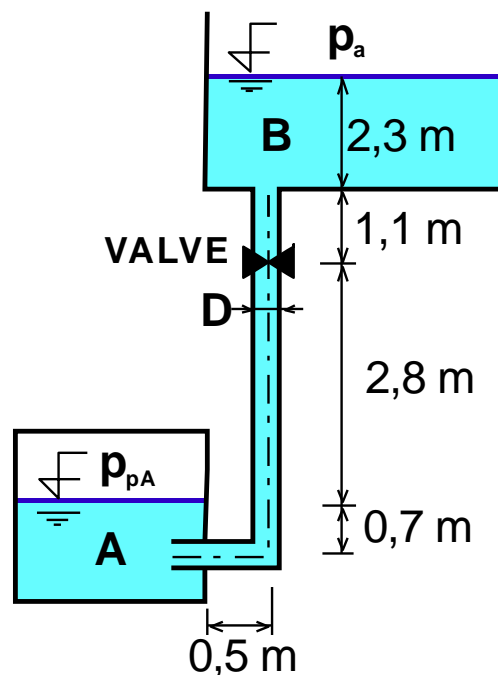
5th exercise

Hydraulics of pipeline: Hydraulic calculation of pipeline, friction losses and local losses

5.1.

The discharge $Q = 8 \text{ l.s}^{-1}$, at the least, is to pass through the pipeline from the pressure reservoir A to the reservoir B where the water level is free. Determine the minimum produced diameter ($D = ?$) which will be needed to fulfil this request. Above water level in reservoir A ($T = 15^\circ\text{C}$) there is an overpressure $p_{pA} = 115 \text{ kPa}$. On the pipeline (older used steel) there is one sharp 90° knee pipe and fully opened valve. Produced diameters of pipelines: 40, 50, 65, 80, 100 mm.

Calculate the discharge which will flow through this pipeline of designed diameter, when the valve stays fully opened. Determine the percentage of the valve opening under which the originally given discharge of 8 l.s^{-1} will flow through the pipeline.



(Result: $D = 65 \text{ mm}$; $Q = 10,8 \text{ l.s}^{-1}$; valve opening 60%)