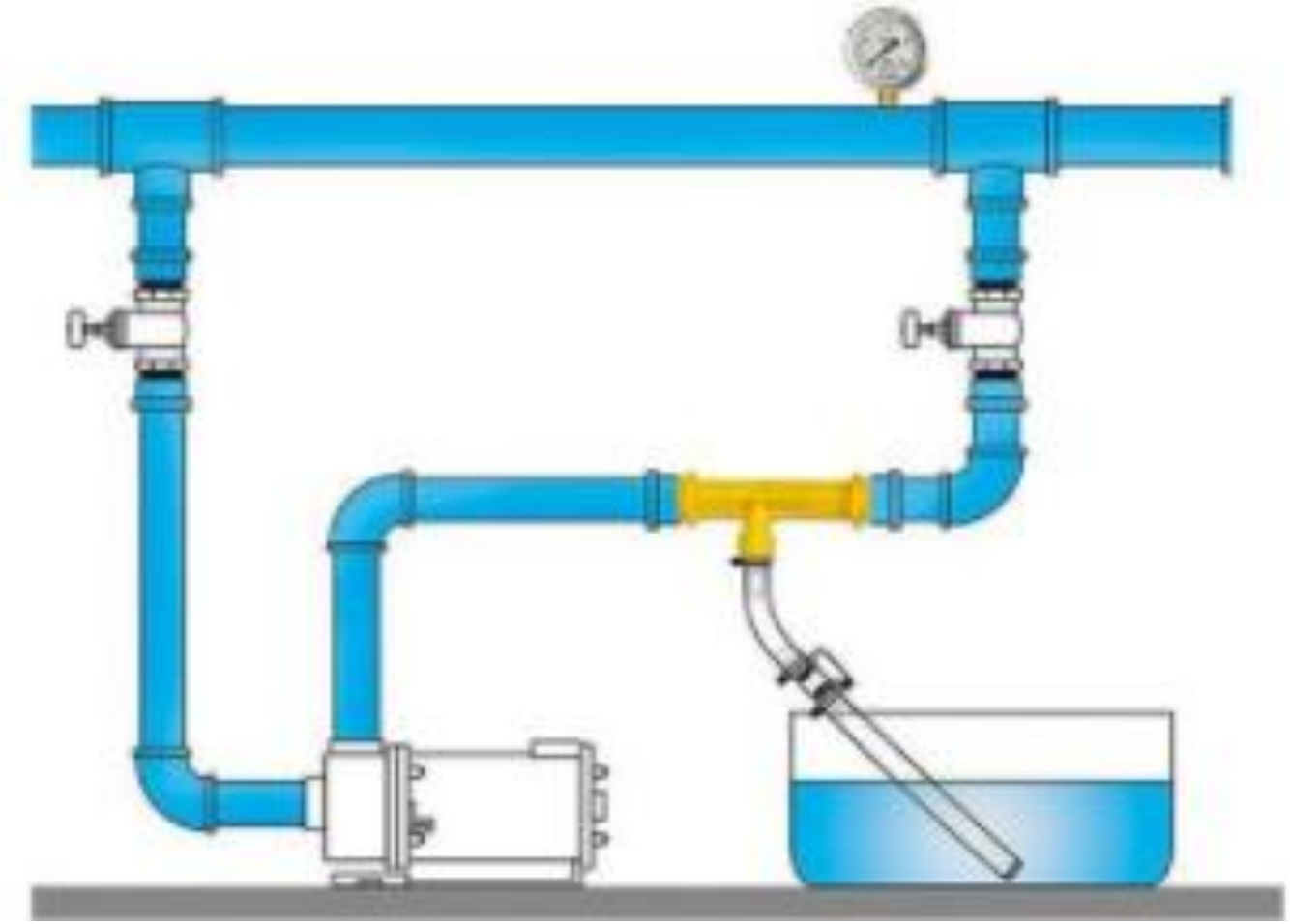
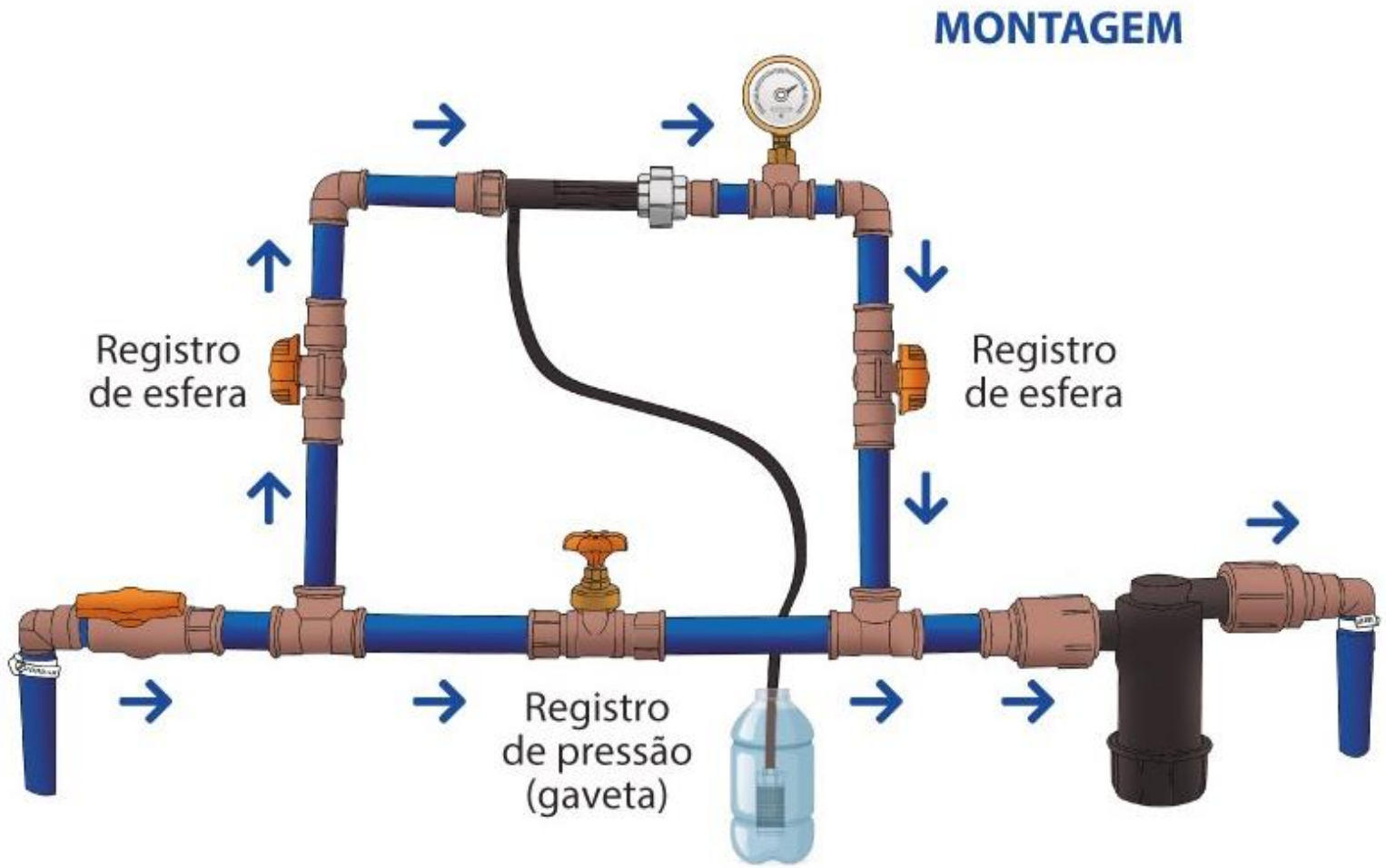
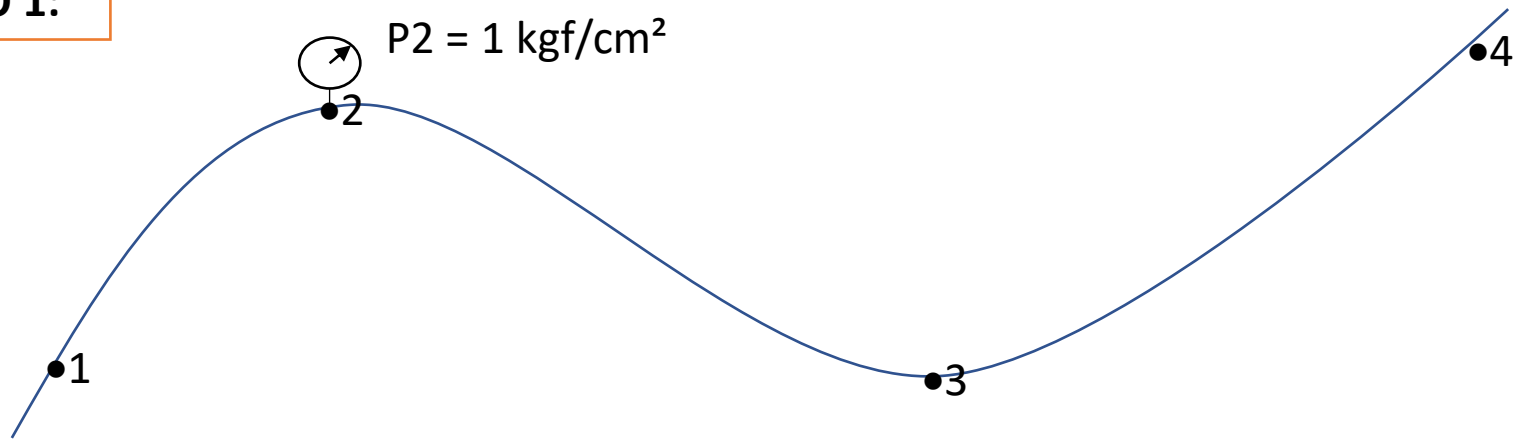


https://www.facebook.com/petroisa.ltda/posts/1366724503340176/



https://www.google.com/url?sa=i&url=https%3A%2F%2Fcasairriga.com.br%2Fproduto%2Ffertirrigacao-injetor-de-fertilizante-tubo-venturi%2F&psig=AOvVaw2ObqF_kbGgim_w1jLE5uDD&ust=1599245302857000&source=images&cd=vfe&ved=0CAIQjRxqFwoTCKj5vJfTzesCFQAAAAAdAAAAABAV

EXEMPLO 1:



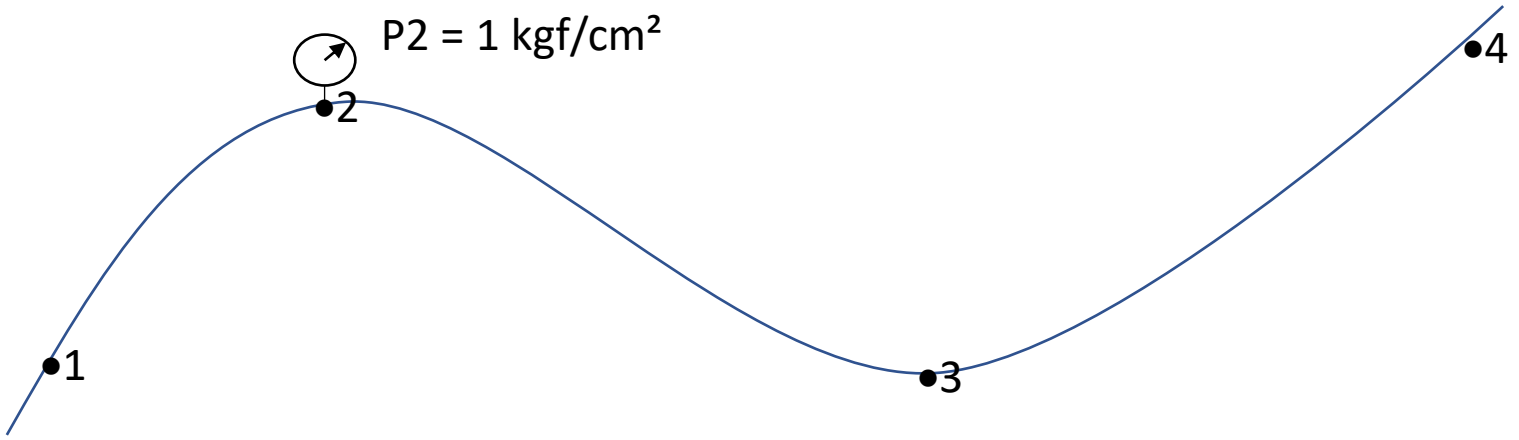
NR

Dados: Considerar escoamento ideal, ∅ = 250mm; V = 0,4 m/s; z1 = 10m; z2 = 30m; z3 = 27m e z4 = 45m. Calcule:

a) Vazão Q
b) E1; E2; E3 e E4
c) P1; P3 e P4

Solução:

a) $Q = S \times V = \frac{\pi D^2}{4} \times V = \frac{\pi\, 0{,}25^2}{4} \times 0{,}4 = 0{,}01964 \frac{m^3}{s} = 19{,}64\ L/s$



NR

Solução:

b) E1 = E2 = E3 = E4 = ?

Ponto 2 tem as 3 informações: P2 = 10000 kgf/m²; z2 = 30m e V2 = 0,4m/s

$$E2 = \frac{P2}{\gamma} + z2 + \frac{V2^2}{2g}$$

Solução:

c) P1; P3 e P4 ? → E1 = E2 = E3 = E4 = $40{,}00815\ mca$

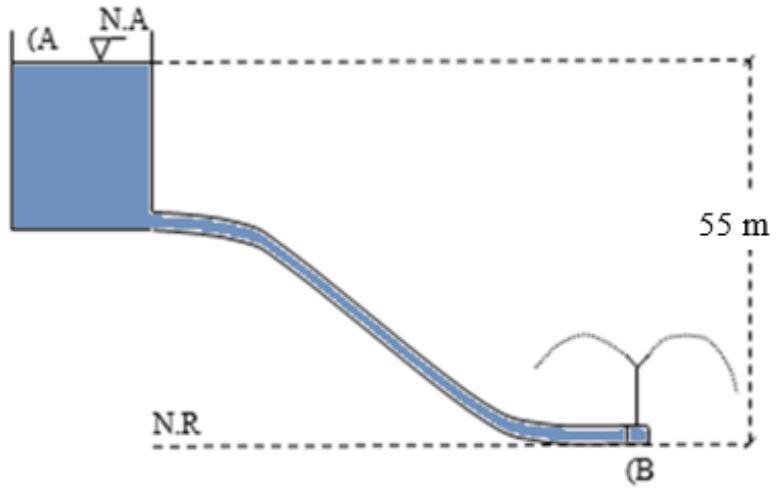
$$E1=\frac{P1}{\gamma}+z1+\frac{V1^2}{2g}\Rightarrow\quad 40{,}00815=\frac{P1}{1000\ kgf/m^3}+10m+\frac{(0{,}4m/s)^2}{2\ x\ 9{,}81\ m/s^2}\quad\rightarrow\quad P1=30000\ kgf/m^2$$

$$E3=\frac{P3}{\gamma}+z3+\frac{V3^2}{2g}\Rightarrow\quad 40{,}00815=\frac{P3}{1000\ kgf/m^3}+27m+\frac{(0{,}4m/s)^2}{2\ x\ 9{,}81\ m/s^2}\quad\rightarrow\quad P3=13000\ kgf/m^2$$

$$E4=\frac{P4}{\gamma}+z4+\frac{V4^2}{2g}\Rightarrow\quad 40{,}00815=\frac{P4}{1000\ kgf/m^3}+45m+\frac{(0{,}4m/s)^2}{2\ x\ 9{,}81\ m/s^2}\quad\rightarrow\quad P4=-5000\ kgf/m^2$$

EXEMPLO 2:

No esquema a seguir, a água flui de um reservatório (A) para um aspersor (B) sob pressão de 3 kgf/cm² e vazão de 5 m³/h. A tubulação tem diâmetro de 25mm. Calcule a perda de carga do ponto A ao ponto B.



$$Q = \frac{5\ m^3}{h}\ x\ \frac{1\ h}{3600\ s} = 0{,}001389\ m^3/s$$

$$VB = \frac{4\ Q}{\pi\ D^2} = \frac{4\ \ 0{,}001389}{\pi\ \ 0{,}025^2} = 2{,}83\ m/s$$

$$EA = EB + hf_{A\text{-}B}$$

$$\frac{PA}{\gamma} + zA + \frac{VA^2}{2g} = \frac{PB}{\gamma} + zB + \frac{VB^2}{2g} + hf_{A\text{-}B}$$

$$0 + 55 + 0 = \frac{30000}{1000} + 0 + \frac{2{,}83^2}{2\ x\ 9{,}81} + hfA\_B$$

$$hf_{A-B} = 24{,}592\ mca$$