INDUSTRIAL CENTRIFUGE

1. TECHNICAL DESCRIPTION, BACKGROUND

In the medical industry, a company uses an industrial centrifuge in its process. After the process is complete, the contents are drained with the help of a valve, which is located on the side of the centrifuge. In order to avoid down time, the centrifuge is emptied while running. The required flow rate of the fluid is given by the requirements of the process following the centrifuge. It must also be taken into consideration, that the fluid level in the tank is constant at all times.

2. PROCEDURE

How can the flow rate of the fluid leaving the centrifuge be controlled?

3. ENGINEERING CALCULATIONS

Calculate the angular velocity and the RPM of the centrifuge, in order to attain the required flow rate.

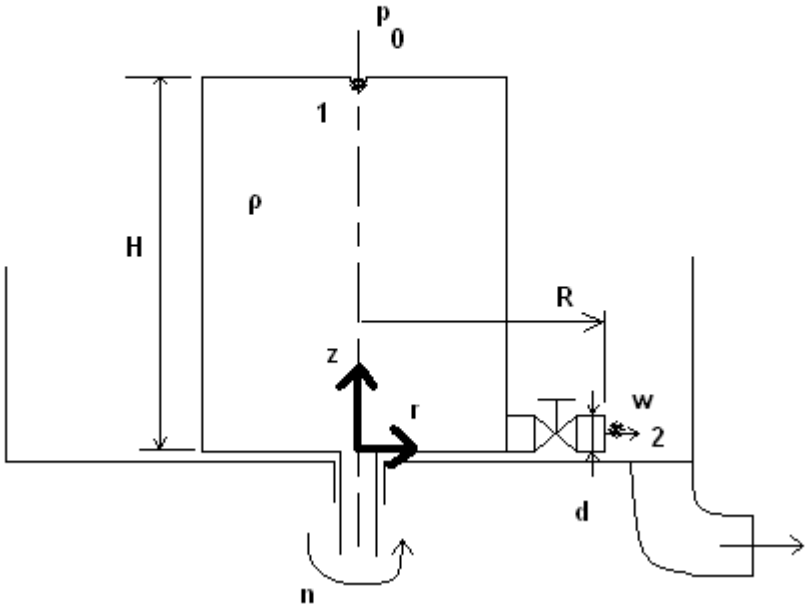

Figure 1.

Data:

Height of tank $H = 2[m]$

Radius to the point of exit $R = 1[m]$

Diameter of the pipe $d = 50[mm]$

Density of the liquid $\rho = 1200\left[\frac{kg}{m^3}\right]$

Required volume flow rate $q_v = 20\left[\frac{l}{s}\right]$