$$\frac{1}{2}\Delta mV_1^2 + \Delta mgh_1 + F_1\Delta x_1 = \frac{1}{2}\Delta mV_2^2 + \Delta mgh_2 + F_2\Delta x_2$$

$$\Delta m = \rho\Delta V$$

$$\Delta V = \Delta xA$$

$$\Delta x = \frac{\Delta V}{A}$$

$$\frac{1}{2}(\rho\Delta V)V_1^2 + (\rho\Delta V)gh_1 + F_1(\frac{\Delta V}{A_1}) = \frac{1}{2}(\rho\Delta V)V_2^2 + (\rho\Delta V)gh_2 + F_2(\frac{\Delta V}{A_2})$$

$$\Delta V[\frac{1}{2}(\rho)V_1^2 + (\rho)gh_1 + F_1(\frac{1}{A_1})] = \Delta V[\frac{1}{2}(\rho)V_2^2 + (\rho)gh_2 + F_2(\frac{1}{A_2})]$$

$$\frac{1}{2}(\rho)V_1^2 + (\rho)gh_1 + (\frac{F_1}{A_1}) = \frac{1}{2}(\rho)V_2^2 + (\rho)gh_2 + (\frac{F_2}{A_2})$$

$$P = \frac{F}{A}$$

$$\frac{1}{2}(\rho)V_1^2 + (\rho)gh_1 + P = \frac{1}{2}(\rho)V_2^2 + (\rho)gh_2 + P$$