解：$Q=akh\sqrt{\frac{2(\rho_z-\rho_f)gV}{\rho_f S}}$ [redacted]

(1) $Q_\varphi=akh\sqrt{\frac{2(\rho_{空标}-\rho_{水})gV}{\rho_{水}S}}$ $Q_A=akh\sqrt{\frac{2(\rho_{空标}-\rho_A)gV}{\rho_A S}}$ $Q_1=3m^3/h$

$\frac{Q_\varphi}{Q_A}=\sqrt{\frac{\rho_{空标}-\rho_{水}}{\rho_{空标}-\rho_A}\frac{\rho_A}{\rho_{水}}}\Rightarrow Q_A=23.29\,m^3/h$

(2) $Q_{m1}=akh\sqrt{\frac{2(\rho_{空标}-\rho_{水})gV}{\rho_{水}S}}$ $Q_{m2}=akh\sqrt{\frac{2(\rho_{空标}-\rho_{水})gV}{\rho_{水}S}}$ $Q_{m_1}=50\,m^3/h$

$\frac{Q_{m_1}}{Q_{m_2}}=\sqrt{\frac{\rho_{空标}-\rho_{水}}{\rho_{空标}-\rho_{水}}}\Rightarrow Q_{m_2}=61.68\,m^3/h$

(3) $Q_2=akh\sqrt{\frac{2(\rho_{空标}-\rho_{水})gV}{\rho_{水}S}}$ $Q_A=akh\sqrt{\frac{2(\rho_{空标}-\rho_A)gV}{\rho_A S}}$ $Q_2=25m^3/h$

$\frac{Q_2}{Q_\varphi}=\sqrt{\frac{\rho_{空标}-\rho_{水}}{\rho_{空标}-\rho_A}\frac{\rho_A}{\rho_{水}}}\Rightarrow Q_A=24.29\,m^3/h$