2do Parcial

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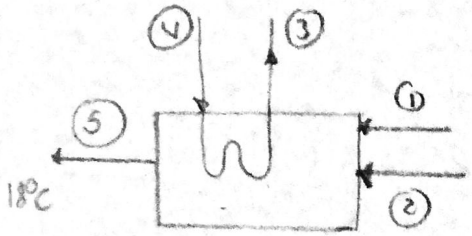
Aire



R12

$\dot{m}_1 = 1500 [kg/h]$
$T_1 = 47°C$

$\dot{m}_2 = 500 [kg/hr]$
$T_2 = 27°C$

aire
$Cp = 1.005 (KJ/kg\,K)$

$X_4 = 0$ $\quad X_5 = 1$ $\quad P_5 = 100 [kPa]$
$P_4 = 500 [kPa]$ $\quad P_5 = 500 [kPa]$ $\quad T_5 = 18°C$

helio
$S2 \left[\frac{KJ}{kg\,K}\right]$

$$\cancel{\delta Q} + \sum \dot{m}_e \left(h_e + \cancel{\frac{v_e^2}{2}} + g\cancel{z_e}\right) = \cancel{\delta W} + \sum \dot{m}_s \left(h_s + \cancel{\frac{v_s^2}{2}} + g\cancel{z_s}\right)$$

$$\begin{cases} \dot{m}_1 h_1 + \dot{m}_2 h_2 + \dot{m}_4 h_4 = \dot{m}_3 h_3 + \dot{m}_5 h_5 \\ \dot{m}_1 + \dot{m}_2 = \dot{m}_5 \\ \dot{m}_3 = \dot{m}_4 \end{cases}$$

① $h_1 = Cp \cdot T_1 = 321.75075 \left[\frac{KJ}{kg}\right]$
② $h_2 = Cp \cdot T_2 = 301.65075 \left[\frac{KJ}{kg}\right]$
⑤ $h_5 = Cp\, T_5 = 292.6057 \left[\frac{KJ}{kg}\right]$

$\dot{m}_5 = \dot{m}_1 + \dot{m}_2$
$\dot{m}_5 = 2000 \left[\frac{kg}{h}\right]$

④ $X_4 = 0$ $\quad P_4 = 500$ $\quad T_4 = 15°C$, $h_4 = 50.100 \left[\frac{KJ}{kg}\right]$

③ $X_3 = 1$ $\quad P_3 = 500$ $\quad T_3 = 15°C$, $h_3 = 193.784 \left[\frac{KJ}{kg}\right]$

$\dot{m}_1 h_1 + \dot{m}_2 h_2 + \dot{m}_4 h_4 = \dot{m}_3 h_3 + \dot{m}_5 h_5$
$\dot{m}_4 (-h_4 + h_3) = \dot{m}_5 h_5 - \dot{m}_1 h_1 - \dot{m}_2 h_2$

$$\dot{m}_4 = \frac{\dot{m}_5 h_5 - \dot{m}_1 h_1 - \dot{m}_2 h_2}{-h_4 + h_3}$$

$$\dot{m}_4 = \frac{2000(292.6057) - 1500(321.75) - 500(301.65)}{-50.100 + 193.784}$$

$$\boxed{\dot{m}_4 = 8481.5 \left[\frac{kg}{h}\right]}$$