Examen de Entrada Termodinamica II

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1. Primero transformamos de lt a m^3:

$V = 5L * 1m^3/1000L = \boxed{0,005\ m^3}$ ✓

Para el calculo de la Energia: $\Delta E = E_{salida} - E_{entrada}$

$\Delta U = W_{cilindro} + \underbrace{W_{paletas}}_{\hookrightarrow 400\ kJ}$

$m(h_2 - h_1) = \frac{(Volt)(Amp)(t)}{1000} + 400\ kJ \quad (*)$

→ Por tablas para una presión de 175kPa:

$h_1 = 1,6941\ m^3/kg$

$v_1 = 0,001053\ m^3/kg$

Se evapora la mitad del líquido $x = 0,5$

$h_2 = h_1 + x(h_{fg}) = 487,01 + (0,5)(2213,1) = \boxed{1593,6\ kJ/kg}$

→ $V = m.v \quad \therefore \quad m = \frac{V_1}{v_1} = \frac{0,005m^3}{0,001053\ m^2} = \boxed{4,731\ kg}$

Retomamos *:

$4,731\ kg\ (1593,6 - 487,01)\ kJ/kg = VI * \Delta t + 400\ kJ$

$VI * \Delta t = 5235,3 - 400 = 4835\ kJ$

$\therefore \quad V = VI * \frac{\Delta t}{t1}$

$V = \frac{4835\ kJ}{(8A)(45)(60)s} * \frac{1000VA}{1\ kJ/s}$

$\boxed{V = 224V}$ ✓

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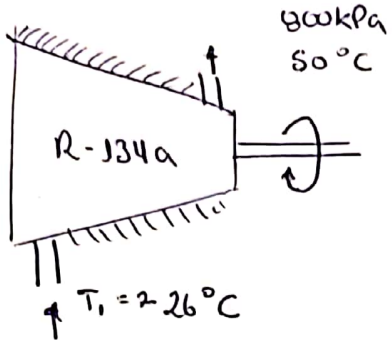
4.



DATOS:

$T_1 = -26°C \quad x_1 = 1 \quad T_0 = 27°C$

$h_1 = 234,68\ kJ/kg \quad s_1 = 0,9514\ kJ/kgK$

$P_2 = 800\ kPa \quad T_2 = 50°C$

$h_2 = 286,69\ kJ/kg \quad s_2 = 0,9802\ kJ/kgK$

$$\dot{m} = \frac{\dot{V}_1}{v_1} = \frac{0,45/60}{0,189465} = 0,03959\ kg/s$$

$$\dot{W} = 0,03959\,(286,69 - 234,68)$$

$$\dot{W} = 2,059\ kW$$

$$\dot{X} = 0,03959\,(800)\,(0,9802 - 0,9814)$$

$$\dot{X} = 0,342$$

$$\dot{W} = 2,059 - 0,342$$

$$\dot{W} = 1,717\ kW$$

$$\therefore \quad \eta = \frac{1,717\ kW}{2,059} \times 100 = 83,39\%$$