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level 6 thermo

marcos

Gonzalez

Three

a)

$$\dot{m}_H = 0.25 \text{ kg/s}$$

$$T_{Hi} = 135^\circ\text{C}$$

$$T_{Ho} = 100^\circ\text{C}$$

$$\dot{V}_c = 8.5 \text{ m}^3/\text{min}$$

$$T_{ci} = 15^\circ\text{C}$$

$$F = 0.93$$

$$T_{co} = ?$$

$$Q = \dot{m} c_p (T_o - T_i)$$

$$\dot{Q}_H = 0.25 \times 1670 \times (100 - 135)$$

$$\dot{Q}_H = -14612.5 \text{ W}$$

$$\dot{Q} = 14.613 \text{ kW}$$

$$\frac{\dot{Q}}{\dot{m} c_p} + T_i = T_o$$

$$\dot{m} = \dot{V} \times \rho$$

$$\dot{V} = 8.5/60 = 0.14167$$

$$\dot{m} = 0.1416 \times 1.255 = 0.178 \text{ kg/s}$$

$$\frac{14612.5}{0.178 \times 1005} + 15 = 96.68^\circ\text{C}$$