

MÁQUINAS TÉRMICAS

Find the second law efficiency of the heat pump in problem 10.18. (Anterior)

The second law efficiency is a ratio of exergies namely what we want out divided by what we have to put in. Exergy from first term on RHS Eq. 10.36

$$\dot{\Phi}_H = \left(1 - \frac{T_o}{T_H}\right) \dot{Q}_H; \quad \dot{Q}_H = \beta \dot{W} = 2 \times 2 \text{ kW} = 4 \text{ kW}$$

$$\eta_{II} = \frac{\dot{\Phi}_H}{\dot{W}} = \left(1 - \frac{T_o}{T_H}\right) \frac{\dot{Q}_H}{\dot{W}} = \left(1 - \frac{298.15}{353.15}\right) \frac{4}{2} = 0.31$$

