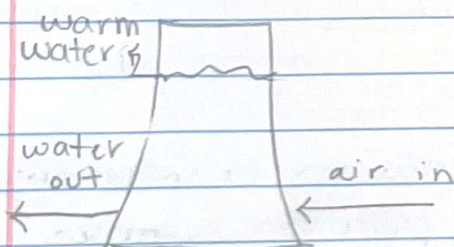


3.

Purpose: To propose a new design for the current vapor-compression cycle that uses water to absorb heat instead of rejecting it.

Drawings and Diagrams



Sources

Module 17: Air Conditioning Processes
Problem 14-114

Design Considerations

- Assuming standard conditions, 25°C , 101.325 kPa
- Assuming $\dot{m}_a = 1 \text{ kg/s}$

Data and Variables

$\Delta T_w = 3^{\circ}\text{F}$ $\phi = 90\%$ $\dot{m}_w = 35.08 \times$ from problem 1 $\dot{m}_a$
 $\Delta T_a = 3^{\circ}\text{F}$ $\rho_{\text{air}} = 1.189$ $C_{p,\text{air}} = 1.005$ $C_{p,\text{water}} = 4.18$

Procedure

- calculate heat absorption by the tower
- calculate $\dot{m}_{\text{air}}$ using Q_{in}
- calculate $\dot{V}$