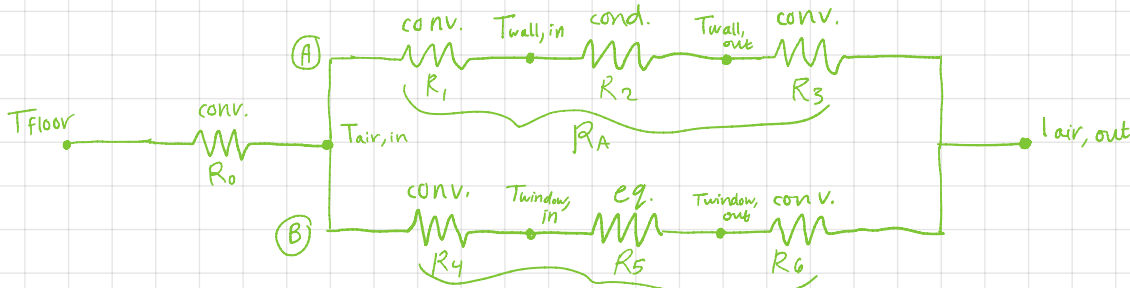


updated equations: Resistor network

$$\underbrace{mc}_{\text{FLOOR}} \frac{dT_F}{dt} = Q_{in} - \left(\frac{T_F - T_{air,out}}{R_{total}} \right)$$



$$R_{conv} = \frac{1}{hA} \quad R_{cond} = \frac{L}{kA} \quad R_B$$

$$R_{A+B} = \frac{1}{\left(\frac{1}{R_1 + R_2 + R_3} \right) + \left(\frac{1}{R_4 + R_5 + R_6} \right)}$$

$$R_{total} = R_0 + R_{A+B} = R_0 + \left(\frac{1}{\left(\frac{1}{R_1 + R_2 + R_3} \right) + \left(\frac{1}{R_4 + R_5 + R_6} \right)} \right)$$

$$R_A = R_1 + R_2 + R_3 \quad R_B = R_4 + R_5 + R_6$$

$$R_0 = \frac{1}{h_{in} A_{floor}}$$

$$R_1 = \frac{1}{h_{in} A_{wall}} \quad \leftarrow \text{see note on wall area above}$$

$$R_2 = \frac{L_{wall}}{k_{wall} A_{wall}}$$

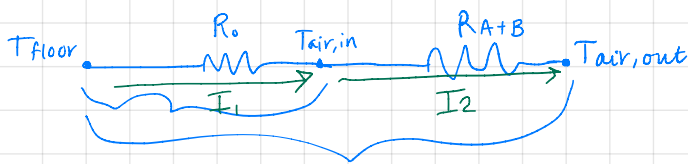
k_{wall} = thermal conductivity of insulation

$$R_3 = \frac{1}{h_{out} A_{wall}}$$

$$R_4 = \frac{1}{h_{in} A_{window}}$$

$$R_5 = \frac{1}{h_{eq} A_{window}}$$

$$R_6 = \frac{1}{h_{out} A_{window}}$$



$$I_1 = I_2$$

$$I = \frac{V}{R} = \frac{\Delta T}{R} = Q$$

$$\frac{T_{floor} - T_{air,in}}{R_0} = \frac{T_{floor} - T_{air,out}}{R_{A+B}}$$

$$T_{floor} - T_{air,in} = R_0 \left(\frac{T_{floor} - T_{air,out}}{R_{A+B}} \right)$$

$$T_{air,in} = T_{floor} - R_0 \left(\frac{T_{floor} - T_{air,out}}{R_{A+B}} \right)$$