

$$C_{e1} \dot{T}_{e1} = (T_a - T_{e1})/R_{e1} + (T_{e2} - T_{e1})/R_{e2} + \dot{Q}_{sol,e}$$

$$C_{e2} \dot{T}_{e2} = (T_{e1} - T_{e2})/R_{e2} + (T_2 - T_{e2})/R_{e3}$$

$$C_i \dot{T}_i = (\langle T_{iw} \rangle - T_i)/R_{i1} + (T_2 - T_i)/R_{i2}$$

$$C_f \dot{T}_f = (T_g - T_f)/R_{f1} + (T_2 - T_f)/R_{f2}$$

$$\begin{aligned} C_2 \dot{T}_2 = & (T_{e2} - T_2)/R_{e3} + (T_i - T_2)/R_{i2} \\ & + (T_f - T_2)/R_{f2} + (T_a - T_2)/R_w \\ & + (T_g - T_2)/R_c + \dot{Q}_{gain} + \dot{Q}_{cool}. \end{aligned}$$

State Equations.