The simplest applicable SDE grey-box model has one state and consists of the system equation

$$dT_{\mathrm{i}} = \Big(\frac{1}{R_{\mathrm{ia}}C_{\mathrm{i}}}(T_{\mathrm{a}} - T_{\mathrm{i}}) + \frac{1}{C_{\mathrm{i}}}g_{\mathrm{A}}\Phi_{\mathrm{s}} + \frac{1}{C_{\mathrm{i}}}\Phi_{\mathrm{h}}\Big)dt + \sigma_{\mathrm{i}}d\omega_{\mathrm{i}} \tag{1}$$

and the measurement equation

$$Y_k = T_{\mathrm{i},k} + \varepsilon_k \tag{2}$$

where k counts the measurements from 1 to N and where the measurement error is assumed to follow a normal distribution with $\epsilon_k \sim N(0, \sigma_\epsilon^2)$. Its RC-diagram is depicted in Figure 1.

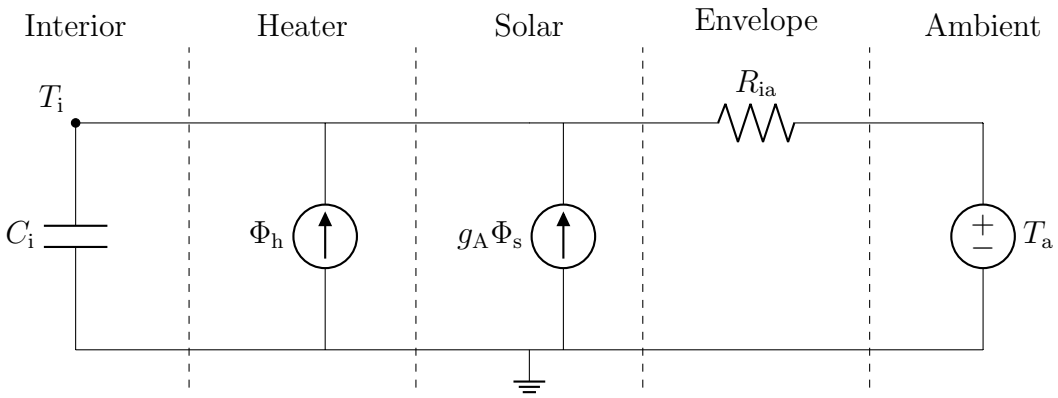

Figure 1: RC-network of the simplest model, *modelTi*.

A two-state model in Figure 2, input from file `modelTiTe.tex`.

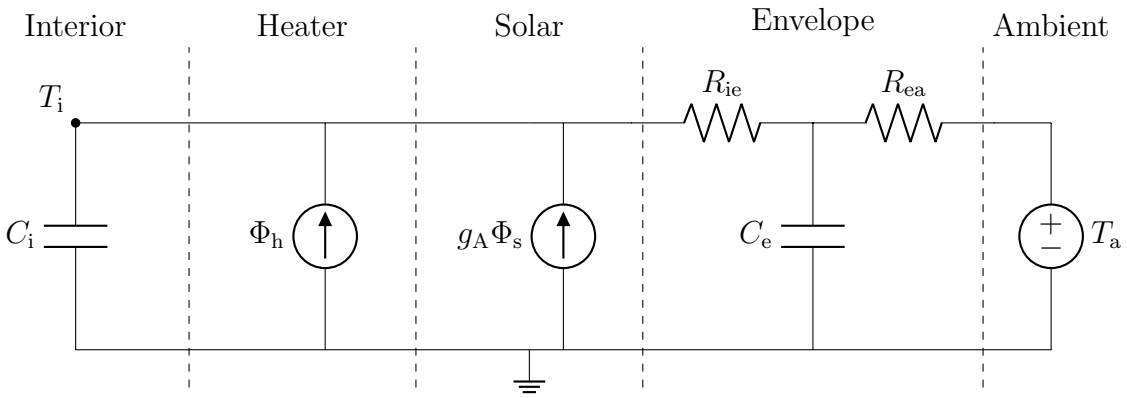

Figure 2: RC-network of *modelTiTe*.