39. We are told $K = 0.27K_C$ where

$$K_C = \frac{T_\mathrm{L}}{T_\mathrm{H} - T_\mathrm{L}} = \frac{294\,\mathrm{K}}{307\,\mathrm{K} - 294\,\mathrm{K}} = 23$$

where the Fahrenheit temperatures have been converted to Kelvins. Expressed on a per unit time basis, Eq. 21-12 leads to

$$\frac{|W|}{t} = \frac{\left(\frac{|Q_\mathrm{L}|}{t}\right)}{K} = \frac{4000\,\mathrm{Btu/h}}{(0.27)(23)} = 643\ \mathrm{Btu/h}\ .$$

Appendix D indicates $1\,\mathrm{But/h} = 0.0003929\,\mathrm{hp}$, so our result may be expressed as $|W|/t = 0.25$ hp.