Polytrope

$$p = \frac{\text{const}}{V^n}$$

$$V = \frac{\text{const}'}{p^{1/n}}$$

$n = 0 \rightarrow p = \text{const} \rightarrow$ isobar

$n = 1 \rightarrow p = \frac{\text{const}}{V} \rightarrow$ isotherm

$n = \varkappa \rightarrow \quad . \quad \rightarrow$ isentrop

$n \rightarrow \infty \rightarrow V \rightarrow \text{const} \rightarrow$ isochor

$$c_v = \frac{R_i}{\varkappa - 1} = \frac{R}{n-1} \cdot \frac{n-1}{\varkappa - 1}$$

Beziehungen für T: $\quad T \cdot V^{n-1} = \text{const} \qquad \frac{p^{n-1}}{T^n} = \text{const}$

$$W_{v12} = \frac{p_1 V_1}{n-1}\left[\left(\frac{V_1}{V_2}\right)^{n-1} - 1\right] = \frac{m R_i}{n-1}(T_2 - T_1) = m c_v \frac{\varkappa - 1}{n-1}(T_2 - T_1) = \frac{\varkappa - 1}{n-1}(U_2 - U_1)$$

$$W_{t12} = n \, W_{v12}$$

$$Q_{12} = -W_{v12} + (U_2 - U_1) = (U_2 - U_1)\left[1 - \frac{\varkappa - 1}{n-1}\right] = W_{v12} \frac{n - \varkappa}{\varkappa - 1}$$

$$= m c_v \frac{n - \varkappa}{n-1}(T_2 - T_1)$$

$1 < n < \varkappa \rightarrow Q_{12} > 0$