Isobare:

$$\frac{V_1}{T_1} = \frac{V_2}{T_2} \quad \text{z.B.} \quad V_2 = \left(\frac{T_2}{T_1}\right) V_1$$

$$Q_{12} = H_2 - H_1 = m \int_{T_1}^{T_2} c_p dT = m \bar{c}_p \Big|_{T_1}^{T_2} (T_2 - T_1)$$

$\frac{pV}{T} = \text{const}$

$H_2 - H_1 = Q_{12} + L_{t12}$

$L_{t12} = 0$

$U_2 - U_1 = Q_{12} + L_{v12}$

$= 0$

Isotherme:

$$p_1 V_1 = p_2 V_2 = m R_i T_1 \quad \Big| \quad V_2 = \left(\frac{p_1}{p_2}\right) V_1$$

$$p \cdot V = m R_i T_1$$

$$p(V) = m R_i T_1 \cdot \frac{1}{V}$$

$$W_{v12} = -\int_{V_1}^{V_2} p\,dV = -m R_i T_1 \int_{V_1}^{V_2} \frac{dV}{V} = -m R_i T_1 \ln V \Big|_{V_1}^{V_2} = -m R_i T_1 (\ln V_2 - \ln V_1)$$

$$= -m R_i T_1 \ln \frac{V_2}{V_1} = m R_i T_1 \ln \frac{V_1}{V_2}$$

$$Q_{12} = -W_{v12}$$

$p_1 V_1 = p_2 V_2$

$$W_{t12} = \int_{p_1}^{p_2} V\,dp = m R_i T_1 \int_{p_1}^{p_2} \frac{dp}{p}$$

$$= m R_i T_1 \ln \frac{p_2}{p_1} = W_{v12}$$