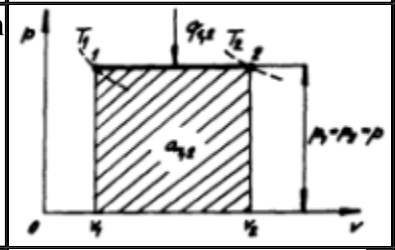
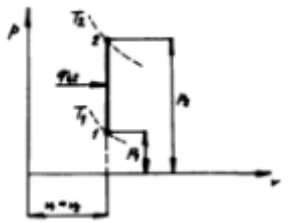
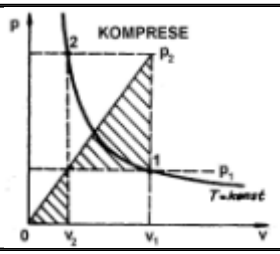
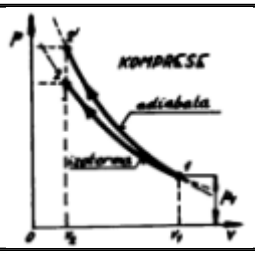
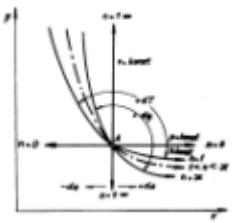
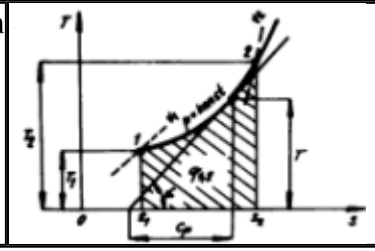
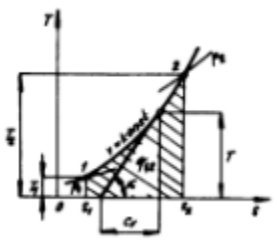
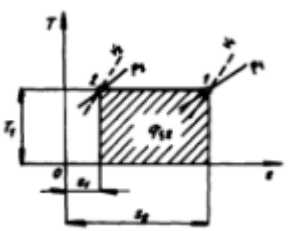
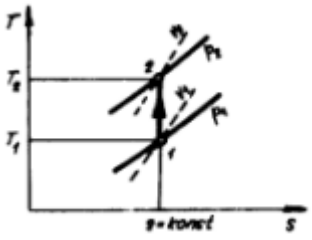
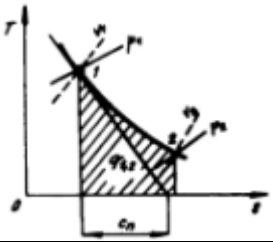
# Tabulka termodynamických dějů pro 1 kg ideálního plynu

| Děj | Izobarický | Izochorický | Izotermický | Adiabatický | Polytropický |
|---|---|---|---|---|---|
| **Definice** | $p_1=p_2=p$ | $v_1=v_2=v$ | $T_1=T_2=T$ | $q_{12}=0$ | $n \in (-\infty,+\infty)$ |
| **Vztah p-v-T** | $\frac{T_1}{v_1}=\frac{T_2}{v_2}=\frac{p}{r}$ | $\frac{T_1}{p_1}=\frac{T_2}{p_2}=\frac{v}{r}$ | $p_1.v_1 = p_2.v_2 = r.T$ | $p_1.v_1^{\kappa} = p_2.v_2^{\kappa}$<br>$\frac{T_2}{T_1}=\left(\frac{p_2}{p_1}\right)^{\frac{\kappa-1}{\kappa}}=\left(\frac{v_1}{v_2}\right)^{\kappa-1}$ | $p_1.v_1^{n} = p_2.v_2^{n}$<br>$\frac{T_2}{T_1}=\left(\frac{p_2}{p_1}\right)^{\frac{n-1}{n}}=\left(\frac{v_1}{v_2}\right)^{n-1}$ |
| **Δu** | $\Delta u = u_2-u_1 = c_v(T_2-T_1)$ | $\Delta u = u_2-u_1 = c_v(T_2-T_1)$ | $\Delta u = 0$ | $\Delta u = u_2-u_1 = c_v(T_2-T_1)$ | $\Delta u = u_2-u_1 = c_v(T_2-T_1)$ |
| **Δi** | $\Delta i = i_2-i_1 = c_p(T_2-T_1)$ | $\Delta i = i_2-i_1 = c_p(T_2-T_1)$ | $\Delta i = 0$ | $\Delta i = i_2-i_1 = c_p(T_2-T_1)$ | $\Delta i = i_2-i_1 = c_p(T_2-T_1)$ |
| **Δs** | $\Delta s = c_p \ln\frac{T_2}{T_1}$ | $\Delta s = c_v \ln\frac{T_2}{T_1}$ | $\Delta s = r\ln\frac{v_2}{v_1} = r\ln\frac{p_1}{p_2}$ | $ds=\frac{dq}{T}=0 \Rightarrow s_2=s_1=konst$ | $\Delta s = c_v\frac{n-\kappa}{n-1}\ln\frac{T_2}{T_1}$ |
| **$q_{12}$** | $q_{12}=i_2-i_1=c_p(T_2-T_1)$<br>$q_{12}=\frac{\kappa}{\kappa-1}p(v_2-v_1)$ | $q_{12}=u_2-u_1=c_v(T_2-T_1)$<br>$q_{12}=\frac{1}{\kappa-1}v(p_2-p_1)$ | $q_{12}=rT.\ln\frac{p_1}{p_2}=p_1v_1\ln\frac{v_2}{v_1}$ | $q_{12}=0$ | $q_{12}=c_v\frac{n-\kappa}{n-1}(T_2-T_1)=c_n(T_2-T_1)$<br>$q_{12}=\frac{\kappa-n}{\kappa-1}a_{12}=\frac{1}{n}\frac{\kappa-n}{\kappa-1}a_{t12}$ |
| **$a_{12}$** | $a_{12}=p(v_2-v_1)=r(T_2-T_1)$<br>$a_{12}=\frac{\kappa-1}{\kappa}q_{12}$ | $a_{12}=0$ | $a_{12}=rT.\ln\frac{p_1}{p_2}=p_1v_1\ln\frac{v_2}{v_1}$<br>$a_{12}=q_{12}$ | $a_{12}=\frac{r}{\kappa-1}(T_1-T_2)=\frac{p_1v_1-p_2v_2}{\kappa-1}$<br>$a_{12}=\frac{p_1v_1}{\kappa-1}\left[1-\left(\frac{p_2}{p_1}\right)^{\frac{\kappa-1}{\kappa}}\right]$ | $a_{12}=\frac{r}{n-1}(T_1-T_2)=\frac{p_1v_1-p_2v_2}{n-1}$<br>$a_{12}=\frac{p_1v_1}{n-1}\left[1-\left(\frac{p_2}{p_1}\right)^{\frac{n-1}{n}}\right]$ |
| **$a_{t12}$** | $a_{t12}=0$ | $a_{t12}=v(p_1-p_2)=r(T_1-T_2)$ | $a_{t12}=rT.\ln\frac{p_1}{p_2}=p_1v_1\ln\frac{v_2}{v_1}$<br>$a_{t12}=a_{12}=q_{12}$ | $a_{t12}=i_1-i_2=\kappa.a_{12}$<br>$a_{t12}=\frac{\kappa}{\kappa-1}p_1v_1\left[1-\left(\frac{p_2}{p_1}\right)^{\frac{\kappa-1}{\kappa}}\right]$ | $a_{t12}=\frac{n.r}{n-1}(T_1-T_2)=n.a_{12}$<br>$a_{t12}=\frac{n}{n-1}p_1v_1\left[1-\left(\frac{p_2}{p_1}\right)^{\frac{n-1}{n}}\right]$ |
| **Diagram p-v** |  |  |   |   |  |
| **Diagram T-s** |  |  |  |   |  |