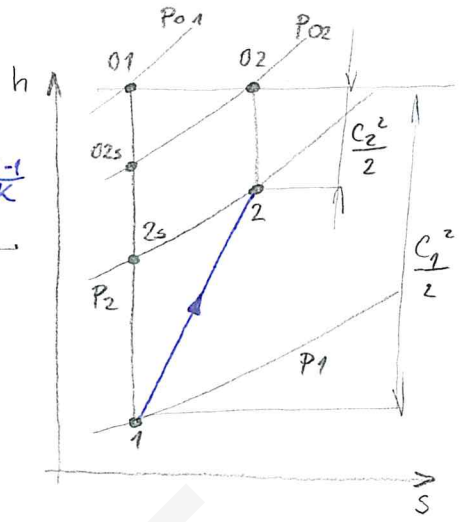
ODVOZENÍ ÚČINNOSTI DIFUZORU



$$\eta_D = \frac{T_{2s} - T_1}{T_2 - T_1} = \frac{\frac{T_{2s}}{T_1} - 1}{\frac{T_2}{T_1} - 1} \quad ; \quad \frac{T_{2s}}{T_1} = \left(\frac{p_2}{p_1}\right)^{\frac{\kappa-1}{\kappa}}$$

$$\frac{T_2}{T_1} = \frac{T_2}{T_{2s}} \cdot \frac{T_{2s}}{T_1}$$

$$\frac{T_2}{T_{2s}} :$$

a) II. Gibbsova rovnice mezi body „01-02"

$$T ds = dh - v dp \; ; \; (h = konst. \Rightarrow dh = 0) \quad ; \quad \frac{p}{\rho} = r \cdot T \Rightarrow T = \frac{p}{\rho \cdot r}$$

$$\frac{p}{\rho \cdot r} ds = -\frac{1}{\rho} dp \Rightarrow \int_{01}^{02} ds = \int_{01}^{02} r \frac{dp}{p}$$

$$\Delta s = -r \cdot (\ln p_{02} - \ln p_{01}) = \boxed{r \cdot \ln \frac{p_{01}}{p_{02}}}$$

b) II. Gibbsova rovnice mezi body „2s-2"

$$T ds = dh - v dp \; ; \; (p = konst. \Rightarrow dp = 0) \quad ; \quad dh = c_p \cdot dT$$

$$T ds = c_p \cdot dT \Rightarrow \int_{2s}^{2} ds = c_p \cdot \int_{2s}^{2} \frac{dT}{T}$$

$$\Delta s = \boxed{c_p \cdot \ln \frac{T_2}{T_{2s}}}$$

a) = b)

$$r \cdot \ln \frac{p_{01}}{p_{02}} = c_p \cdot \ln \frac{T_2}{T_{2s}} \quad / \cdot \frac{1}{r}$$

$$\ln \frac{p_{01}}{p_{02}} = \frac{c_p}{r} \cdot \ln \frac{T_2}{T_{2s}} \quad ; \quad c_p = \frac{\kappa \cdot r}{\kappa - 1} \Rightarrow \frac{c_p}{r} = \frac{\kappa}{\kappa - 1}$$

$$\ln \frac{T_2}{T_{2s}} = \frac{\kappa - 1}{\kappa} \cdot \ln \frac{p_{01}}{p_{02}} \Rightarrow \frac{T_2}{T_{2s}} = \left(\frac{p_{01}}{p_{02}}\right)^{\frac{\kappa-1}{\kappa}}$$

$$\boxed{\eta_D = \frac{\left(\frac{p_2}{p_1}\right)^{\frac{\kappa-1}{\kappa}} - 1}{\left[\left(\frac{p_{01}}{p_{02}}\right) \cdot \left(\frac{p_2}{p_1}\right)\right]^{\frac{\kappa-1}{\kappa}} - 1}}$$