

1.

$\alpha = 0,004$

$R_{20} = 100 \Omega$

$R_{50} = 112 \Omega$

$\text{Prozent} = 12 \%$

$\Delta R = R_{20} * \alpha * \Delta t$

$\Delta R = 12 \Omega$

$R_{50} = R_{20} + \Delta R \quad \Delta t = t_1 - t_2$

$R_{50} = 112 \Omega \quad \Delta t = 30^\circ\text{C}$

$$\begin{array}{ccc} 100 \Omega & \diagdown & 100 \% \\ & & \\ 12 \Omega & \diagup & x \% \end{array}$$

$x = \frac{100 * 112}{100} \quad x = 12 \%$

Um 12 % erhöht.

2.

$\alpha = 0,004$

$U_{20} = 24 \text{ V}$

$I_{20} = 0,2 \text{ A}$

$I_t = 0,15 \text{ A}$

$t = 103,33^\circ\text{C}$

$R_{20} = \frac{U_{20}}{I_{20}}$

$R_{20} = 120 \Omega$

$R_t = \frac{U_{20}}{I_t}$

$R_t = 160 \Omega$

$t = t_{20} + \Delta t$

$t = 103,33^\circ\text{C}$

$\Delta R = R_t - R_{20}$

$\Delta R = 40 \Omega$

$\Delta R = R_{20} * \alpha * \Delta t$

$\Delta t = 83,33^\circ\text{C}$

3.

$\alpha = 0,004$

$R_{15} = 3,8 \Omega$

$R_{\text{voll}} = 4,6 \Omega$

$t = 67,63^\circ\text{C}$

$\Delta R = R_{\text{voll}} - R_{15} \quad t = \Delta t + t_{15}$

$\Delta R = 0,8 \Omega$

$t = 67,63^\circ\text{C}$

$\Delta R = R_{20} * \alpha * \Delta t$

$\Delta t = 52,63^\circ\text{C}$

4.

$\alpha = 0,00015$

$R_{20} = 42 \Omega$

$U = 230 \text{ V}$

$I_{20} = 5,48 \text{ A}$

$I_{200} = 5,33 \text{ A}$

$I_{20} = \frac{U}{R_{20}}$

$I_{20} = 5,48 \text{ A}$

$R_{200} = R_{20} + \Delta R$

$R_{200} = 43,134 \Omega$

$\Delta R = R_{20} * \alpha * \Delta t$

$\Delta R = 1,134 \Omega$

$I_{200} = \frac{U}{R_{200}}$

$I_{200} = 5,33 \text{ A}$

5.

$$\alpha = 0,00385$$

$$\Delta R = R_0 * \alpha * \Delta t$$

$$R_0 = 100 \Omega$$

$$R_t = R_0 + \Delta R$$

t	-10°C	0°C	10°C	20°C	30°C	40°C
R	96,15 Ω	100 Ω	103,85 Ω	107,7 Ω	111,55 Ω	115,4 Ω

6.

$$\alpha = 0,004$$

$$A = \frac{d^2 * \pi}{4}$$

$$R_t = \frac{U}{I}$$

$$d = 0,2 \text{ mm}$$

$$A = 0,03 \text{ mm}^2$$

$$R_t = 33,33 \Omega$$

$$l = 12 * 400 \text{ cm} = 48 \text{ m}$$

$$R_{20} = \frac{l}{\gamma * A}$$

$$\Delta R = R_t - R_{20}$$

$$U = 5V$$

$$R_{20} = 28,57 \Omega$$

$$\Delta R = 4,76 \Omega$$

$$\gamma = 56$$

$$\Delta R = R_{20} * \alpha * \Delta t$$

$$I = 150 \text{ mA} = 0,15 \text{ A}$$

$$\Delta t = \frac{\Delta R}{R_{20} * \alpha}$$

$$t = 61,65^\circ\text{C}$$

$$\Delta t = 41,65^\circ\text{C}$$

$$t = 61,65^\circ\text{C}$$