Sprawozdanie 1

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Nr indeksu: 249011

U(V)	u(U)[V]	I[mA]	u(I)[mA]	R[Ω]	$u_c(R)$[Ω]	$\bar{R}$[Ω]	$u(\bar{R})$[Ω]	R_w[Ω]	$u_c(R_w)$[Ω]
3.29	0.02	18.7	0.2	175.94	$\pm$ 2.16				
4.78	0.02	27.8	0.3	171.94	$\pm$ 1.99				
6.35	0.02	36.1	0.3	175.90	$\pm$ 1.70	175	±0.62		
7.89	0.03	44.9	0.4	175.72	$\pm$ 1.41				
9.50	0.03	54.2	0.4	175.28	$\pm$ 1.51				
12.44	0.04	71.0	0.6	175.21	$\pm$ 1.58				

Przykładowe obliczenia:

$$\Delta u(U) = 0.5\% \cdot rdg + 1 \cdot dgt = \frac{0.5}{100} \cdot 3.29 + 0.01 = 0.0264 \approx 0.03$$

$$u(U) = \frac{\Delta u(U)}{\sqrt{3}} = 0.015 \approx 0.02$$

$$\Delta u(I) = 1.2\% \cdot rdg + 1 \cdot dgt = \frac{1.2}{100} \cdot 18.7 + 0.1 = 0.3244$$

$$u(I) = \frac{\Delta u(I)}{\sqrt{3}} \approx 0.2$$

$$R = \frac{U}{I} = \frac{3.29}{0.0187} \approx 175.94\Omega$$

$$u_c(R) = \sqrt{\sum_{j=1}^{k} \left(\frac{\partial f}{\partial x_j}\right)^2 u^2(x_j)} = \sqrt{\frac{u^2(U)}{I^2} + \frac{U^2 \cdot u^2(I)}{I^4}} = = \sqrt{\frac{\left(\frac{0.02}{1000}\right)^2}{0.0187^2} + \frac{3.29^2 \cdot \left(\frac{0.2}{1000}\right)^2}{0.0187^4}} \approx 2.16$$

$$\bar{R} = \frac{\sum_{i=1}^{n} x_i}{n} = 174.9983333 \approx 175[\Omega]$$

$$u(\bar{R}) = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n(n-1)}} \approx 0.62$$