

Resistance measurement

Student Group

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Resistance measurement

Background Information

Procedure for resistance measurement:

- Set the measuring device to resistance measurement
- Connect the resistance to be measured to the corresponding sockets on the measuring device (the measuring device sockets labeled COM and Ω)
- Read the measured value

There are different types of resistance measurement:

- **direct** resistance measurement
- **indirect** resistance measurement

The resistances can also be determined by measuring the current/voltage.

Ohm's law: In an electrical circuit, the current increases with increasing voltage and decreases with increasing resistance.

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

Experimental Tasks

Direct resistance measurement

Determine the nominal and measured values of the resistance for R_{1} (brown, green, orange), R_{2} (yellow, violet, red), R_{3} (red, violet, red) and the incandescent lamp R_{L} . Also measure the approximate resistance R_{K} of your body from your right to your left hand.



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Tab. 1: Direct resistance measurement

How do you explain the deviation between $R_{\text{L,nominal}}$ and $R_{\text{L,meas}}$?

What consequences can R_{K} have?

Now determine the series and parallel connections of resistors R_{1} , R_{2} and R_{3} .

Specify the formulas used:

$$R_{\text{serial}} =$$

$$R_{\text{parallel}} (= R_a || R_b) =$$



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Tab. 2: Series and parallel connections

Indirect resistance measurement

Build the measuring circuit shown in [figure 1](#) for each of the three resistors and set the voltage on the power supply to $\sim 12 \text{ V}$.



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Fig. 1: Indirect resistance measurement

Measure U_n [V] and I_n [mA]. Calculate R_n [k Ω] from these values.



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Tab. 3: Indirect resistance measurement

Test Questions - Resistors

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