

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.

	R_1	R_2	R_3	R_L	R_K
nominal value					
measured value					

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:

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

$$R_{\text{parallel}} (= R_{\text{a}} || R_{\text{b}}) =$$

	R_1+R_2	R_1+R_3	R_2+R_3	$R_1 R_2$	$R_1 R_3$	$R_2 R_3$
calculated						
measured						

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 $\sim 12\text{ V}$.

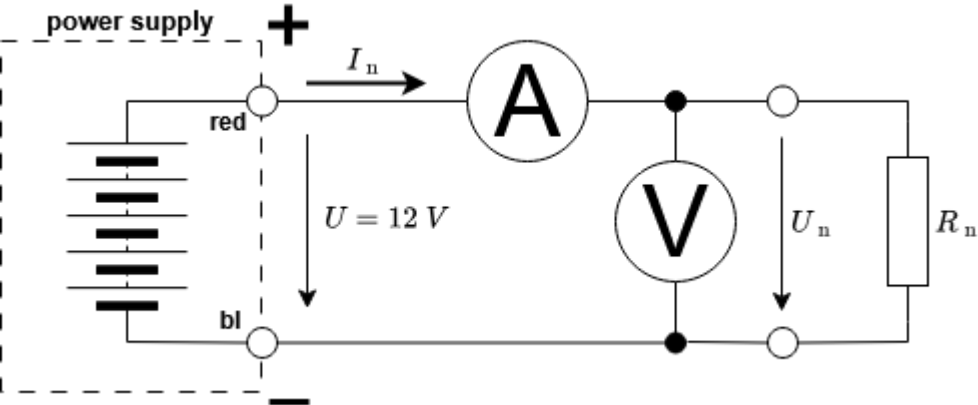


Fig. 1: Indirect resistance measurement Measure U_{n} [V] and I_{n} [mA]. Calculate R_{n} [k Ω]

I_1	U_1	R_1	I_2	U_2	R_2	I_3	U_3	R_3

from these values.

Tab. 3: Indirect resistance measurement

Test Questions - Resistors

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