

Resistance measurement

Student Group

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Resistance measurement

Procedure for resistance measurement:

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

There are different types of resistance measurement:

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

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.



Start drawing by
clicking here

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:

$R_{\text{serial}} =$

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



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Tab. 2: Series and parallel connections

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.

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

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

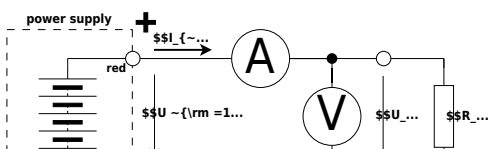


Fig. 1: Indirect resistance measurement

Measure U_{n} [V] and I_{n} [mA]. Calculate R_{n} [k Ω] from these values.

