Resistance measurement

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

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 $R_{\mathrm{L,nominal}}$ and $R_{\mathrm{L,meas}}$?

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_{serial} =

R_{parallel} (= R_{a} || R_{b}) =

	R1+R2	R1+R3	R2+R3	R1 || R2	R1 || R3	R2 || R3
calculated						
measured						

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 $12\ V$.

Fig. 1: Indirect resistance measurement

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

Tab. 3: Indirect resistance measurement