

Experimental Procedure

Part One

1. First, the resistance of the lamp was measured by using an ohmmeter before being connected to the circuit.
2. Then, the circuit's elements which are : DC power supply, ammeter and the lamp were connected in series as shown in figure1.
3. After that, the DC power supply was turned on, set to the nominal voltage of the lamp (12V) and the ammeter was set to measure the direct current (DC).

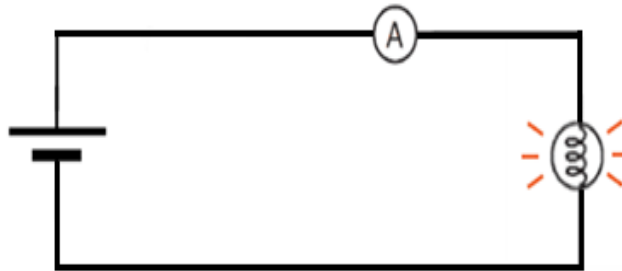


Figure1. The connection of the circuit's elements

Part Two

1. Every increasing in the resistance of the resistance box from 0Ω to 9Ω , decreasing from last reading of increasing (9Ω) to 0Ω was measured by using an ohmmeter and recorded in the table1 (see figure2).

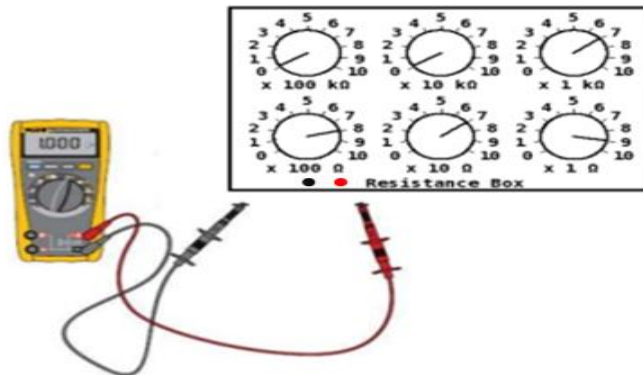


Figure2. Measure the resistance of the resistance box

2. The power supply, resistance box, the ammeter and the lamp were connected in series connection as shown in figure3.

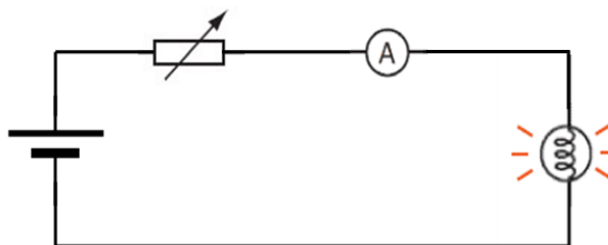


Figure3. The components connected in series

3. At the beginning, the DC power supply was set to 12V and also the ammeter was set to measure the direct current.
4. Then, the voltmeter was connected to the lamp to measure the voltage across it (the lamp) as shown in figure4.
5. After that, ten values of the currents and voltages were recorded in the table1 based on the increasing of the resistance of the resistance box from 0 Ω to 9 Ω .
6. Step 5 was repeated while decreasing the value of the resistance of the resistance box from 9 Ω to 0 Ω .
7. Step 5 and 6 were used to calculate the average and the % error for each reading of the currents and the voltages.
8. Finally, the power and the resistance of the lamp for each readings were calculated by using the values of the currents and voltages which resulted from step 5 and 6.

Important rules:

- The Average = $\frac{\text{Increasing} + \text{decreasing}}{2}$
- The % Error = $\frac{\text{Incrasin} - \text{decreasing}}{\text{Increasing}} \times 100$

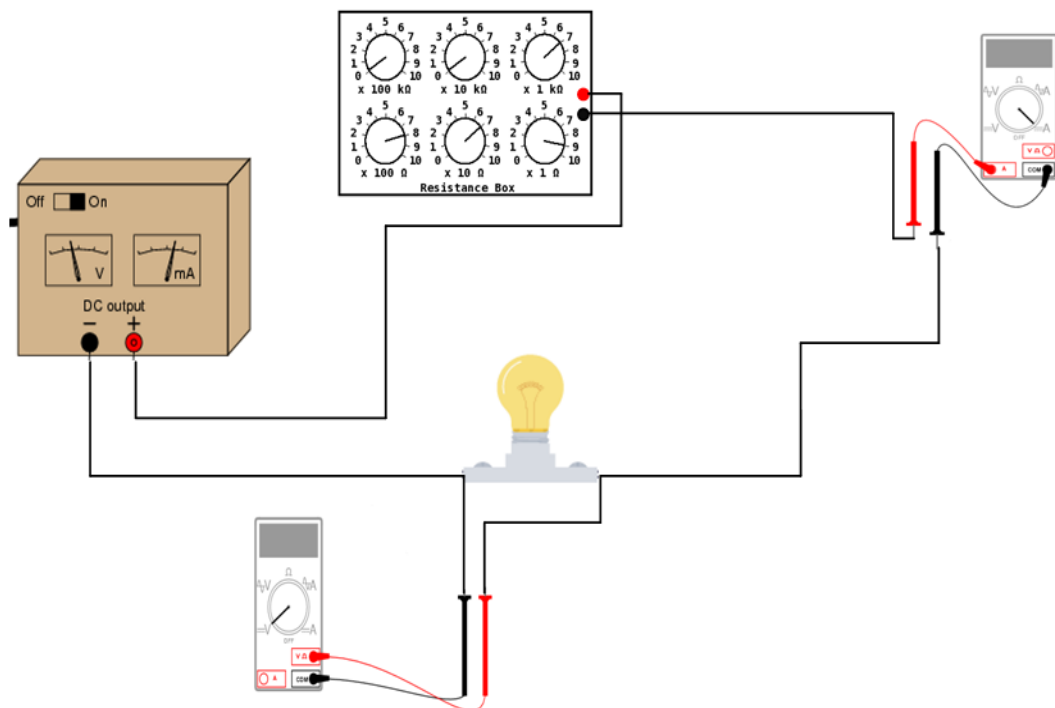


Figure4. The final connection of the circuit