Electricity
Electromagnetic induction

Transformer

Power transmission of a transformer

Description from CASSY Lab 2

For loading examples and settings, please use the CASSY Lab 2 help.
Power transfer of a transformer

Alternatively (without Power-CASSY):

can also be carried out with Pocket-CASSY
Experiment description
This experiment examines the power transfer of a transformer. This is done by simultaneously measuring the RMS values of the primary and secondary voltage as well as the primary and secondary current for a variable load resistor $R = 0-100 \, \Omega$. The experiment also determines the phase shift between the voltage and current on the primary and secondary side. The evaluation determines the primary power $P_1$, the secondary power $P_2$ and the efficiency $\eta = \frac{P_2}{P_1}$ and plots these as a function of the load resistance $R$.

Equipment list

1. **Power-CASSY** 524 011
2. **Sensor-CASSY** 524 010 or 524 013
3. **CASSY Lab 2** 524 220
4. U-core with yoke 562 11
5. Clamping device with spring clip 562 121
6. Coils with 250 turns 562 13
7. Rheostat 100 $\Omega$ 537 34
8. Connecting lead, 25 cm, black 500 414
9. Connecting leads, 100 cm, black 500 444
10. PC with Windows XP/Vista/7

Alternatively (without Power-CASSY)

1. **Sensor-CASSYs** 524 010 or 524 013
2. **CASSY Lab 2** 524 220
3. Variable extra-low voltage transformer S 521 35
4. U-core with yoke 562 11
5. Clamping device with spring clip 562 121
6. Coils with 250 turns 562 13
7. Rheostat 100 $\Omega$ 537 34
8. Connecting leads, 25 cm, black 500 414
9. Connecting leads, 100 cm, black 500 444
10. PC with Windows XP/Vista/7

Experiment setup (see drawing)
The primary side of the transformer is supplied by Power-CASSY or by the variable transformer (approx. 6 V AC). In the latter case, the primary voltage, primary current and phase relation ($\cos \varphi$) must be measured using a second Sensor-CASSY unit.

Sensor-CASSY performs the necessary measurements of the RMS values of voltage, current and their phase relation ($\cos \varphi$) on the secondary side. The transformer is under resistive load ($\cos \varphi = 1$) in the form of a rheostat.

Instead of the demountable transformer, you can use the [transformer for students’ experiments](#).

Carrying out the experiment

Load settings
- Set the rheostat to the minimum position (approx. 0 $\Omega$).
- Start the measurement with ✅.
- Increase the resistance in steps and record measured values for each step with ✅.

Evaluation
The points of maximum power output and maximum efficiency can be easily read from the diagram.

Hint
You can show and hide all measuring instruments simultaneously with ✅.