

Electricity

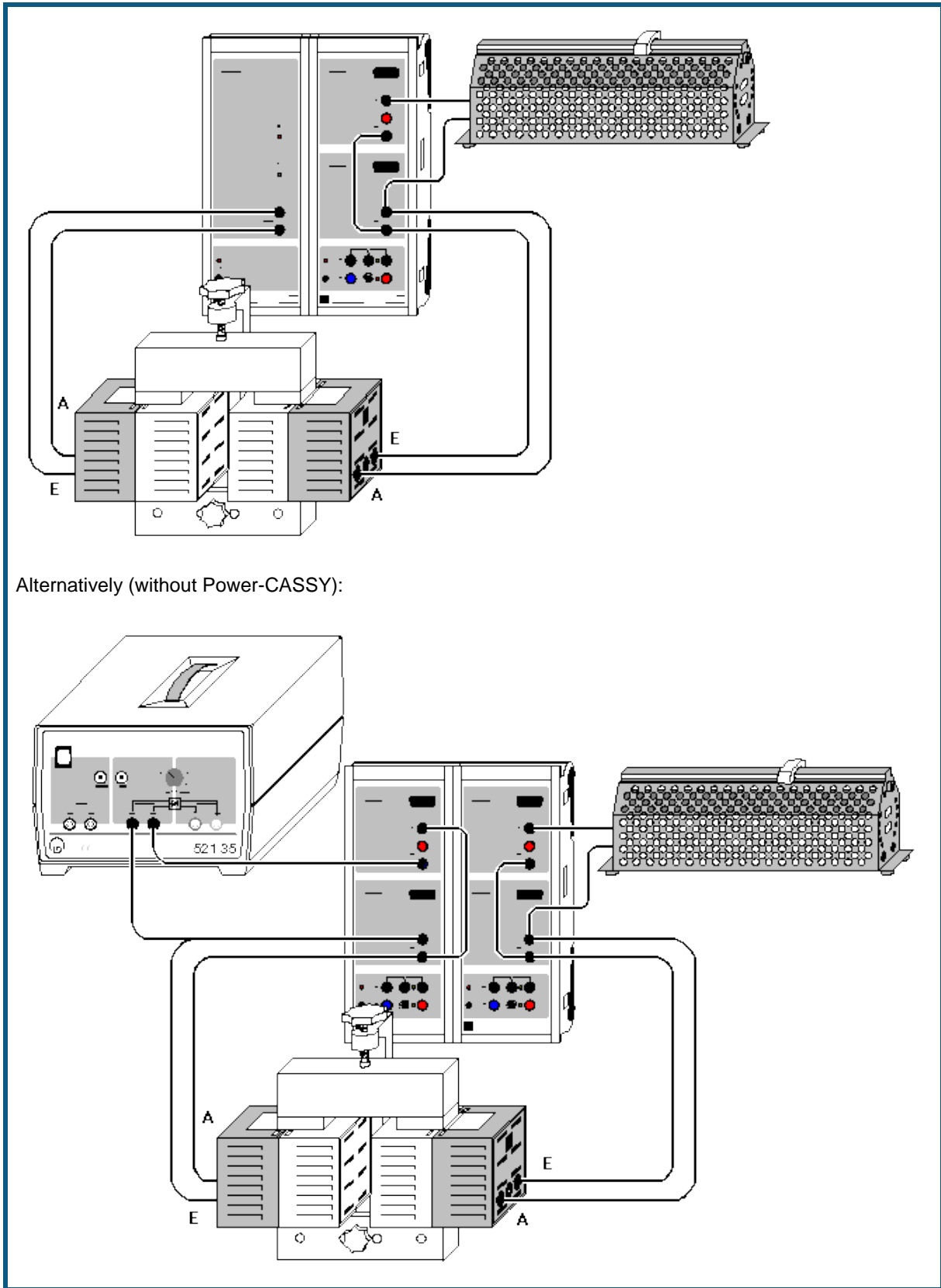
Electromagnetic induction
Transformer

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 $R = 0\text{--}100\ \Omega$. 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 $\eta = P_2/P_1$ and plots these as a function of the load resistance R .

Equipment list

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

Alternatively (without Power-CASSY)

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

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 .