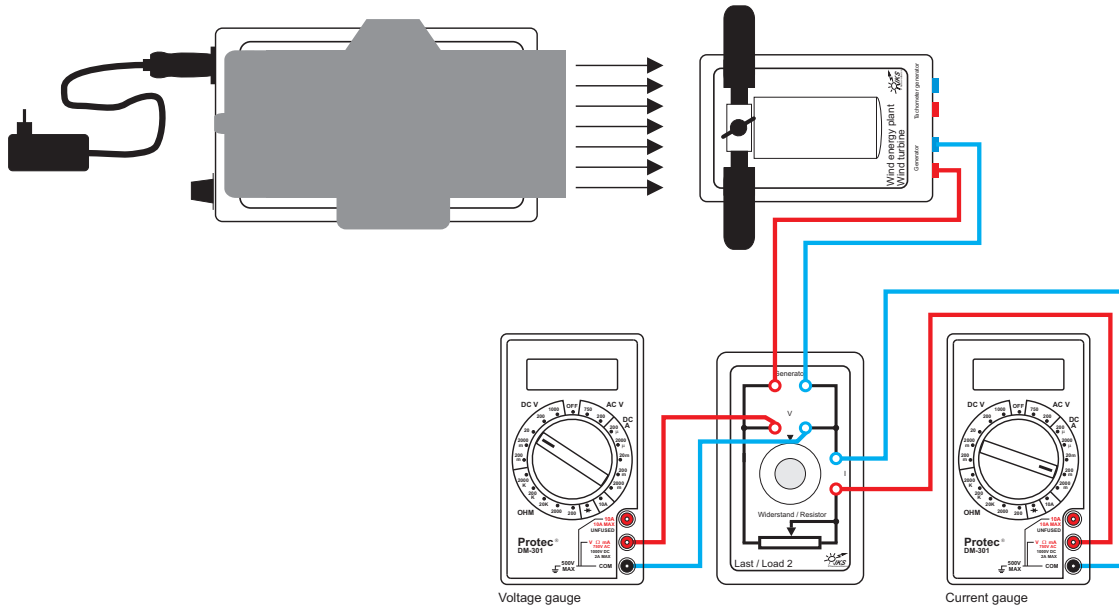
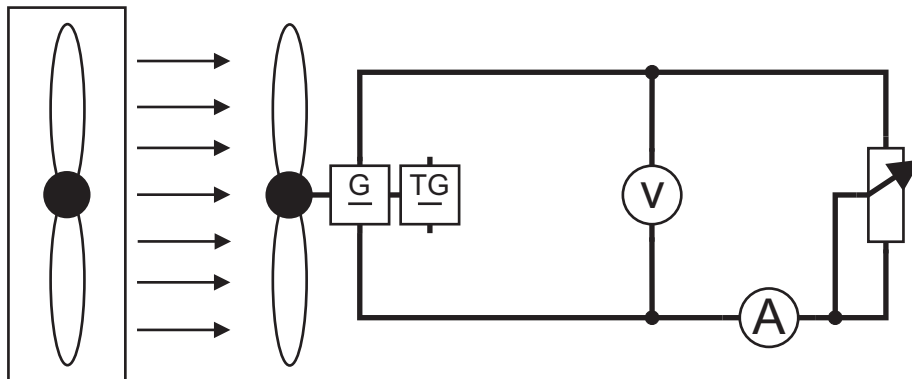


Set-up



Wiring diagram



Information

The level of wind speed is of decisive importance for the yield of a wind energy plant.
 This experiment is intended to examine the output of a wind energy plant depending on the wind speed in a detailed manner.

Assignment

Set up the experiment according to the figure shown above.

The range selector switch of the multimeter voltage must be set to position **DC V 20**, the switch of the multimeter current must be set to position **DCA 200 m**.

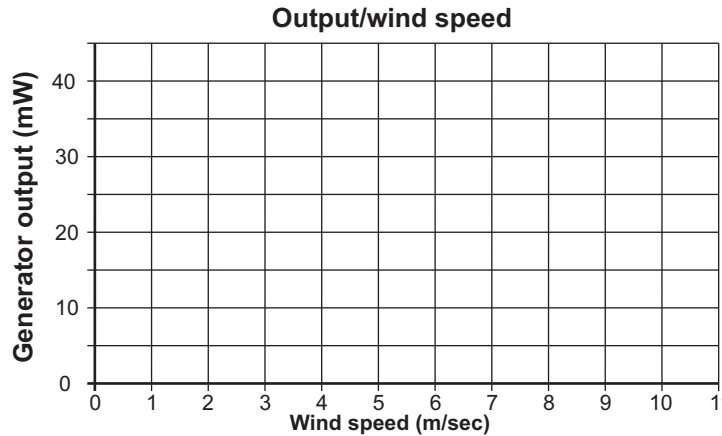
The wind speed is varied by setting the knob of the wind machine between 0 and 10 at intervals of one scale part. The wind speed for each setting results from the graph that was determined within the framework of experiment 2.

Enter the voltages and current intensities measured in each case into the measurement table. Calculate the outputs.

Settings:

- Wind energy plant principle: Uplift
- Number of blades: 3
- Blade shape: level
- Angle of incidence: 45°
- Wind speed: 0-10 scale parts in one division step
- Load resistance: 40 Ω

Scale marking	Windspeed (m/sec)	Voltage (V)	Current (mA)	Output (mW)
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				



1. Enter the measured values into the graph.
2. Map the compensation curve for the measuring points into the graph.
3. The output of the blowing wind increases with the cube of the wind speed (P_{wind} is proportional v^3). Therefore, doubling the wind speed results in the -fold wind power.
4. Complement the tables with values from the graph curve. Calculate the ratio of v_2 / v_1 and P_2 / P_1 in each case and enter the values as well.

v_1 in m/sec	v_2 in m/sec	v_2 / v_1
5	10	2
P_1 in mW	P_2 in mW	P_2 / P_1

5. Does the measured output of the wind energy plant also increase with the cube of the wind speed? Please state reasons for the deviation:

.....

.....

6. What is the importance of the level of wind speed and its fluctuations for the yield of a wind energy plant?

.....

.....

.....