RENEWABLE ENERGIES

MICRO-GRID WIND TURBINE TRAINER

DL WIND-WT

Modular trainer for the theoretical and practical study of the electric energy generation from a wind turbine. With the Micro-Grid Wind Turbine Trainer it is possible to perform experiments to study the conversion from wind energy to electrical energy, and measure the system parameters such as wind speed, turbine speed, electrical power and efficiency on a real wind turbine installed outdoor.

TRAINING OBJECTIVES

- o Identification of wind turbine components
- o Wind turbine installation and testing
- o Anemometer installation and testing
- o Operating the wind turbine and anemometer
- o Operating the Wind Turbine Breaker
- o Measuring wind power
- o Measuring Wind turbine electrical power
- o Wind speed vs rpm
- o Wind speed vs power
- o Calculating Wind turbine power coefficient Cp
- o Using Wind Turbine to Charge the Battery
- o Study of wind turbine with load.

TECHNICAL SPECIFICATIONS

- − Three phase rectifier bridge module
- − Battery 100 Ah complete with battery protection module
- − Wind turbine charge controller with brake
- − Active DC load used in the renewable energies laboratories configurable as constant resistance or constant current.
- − Multifunction measurement module: wind speed (m/s), wind direction (degrees), wind turbine speed (rpm), 2 AC power meters (512Vac, 20Aac, 1000W).
- − AC and DC power meter: (0-750 Vac/dc, 0-20Aac/dc, 0-1000W).
- − Wind turbine (400 W, 12 Vac) with complete kit for permanent outdoor installation.
- − Anemometer with wind direction sensor

The Micro-grid Wind Turbine Trainer is supplied with a software developed in LabVIEW that communicates with the main components of the modular system via RS485 serial communication using Modbus RTU protocol to perform data acquisition and processing.