RENEWABLE ENERGIES

SOLAR/WIND ENERGY MODULAR TRAINER

Modular trainer for the theoretical-practical study of the electrical installations with photovoltaic solar energy and wind energy.

Complete with connecting cables, experiment manual and **software for data acquisition and processing**.

DL SUN-WIND-S

TRAINING OBJECTIVES

- Measuring the load current, voltage and power
- Setting the solar panel to the most irradiated position
- Changing the inclination of the solar panel
- Changing the azimuth of the solar panel
- Covering the solar panel with different materials
- Obtaining the solar irradiation data
- Obtaining the solar panel voltage-irradiation curve
- Calculating the inner resistance of the solar panel
- Obtaining the solar panel current-voltage curve
- Obtaining the solar panel current-power curve
- Overloaded solar panel measurements
- Battery charging
- Supplying DC load
- Supplying AC load
- Identification of wind turbine components
- Wind turbine installation and testing
- Anemometer installation and testing
- Operating the wind turbine and the anemometer
- Braking in the no load operation /open circuit/ free spinning mode
- Braking in the braking mode
- Using the wind turbine to charge the battery
- Supplying AC load with wind power stored in a battery
- Supplying AC load with wind power and a battery
- Supplying AC load with a hybrid system

TECHNICAL SPECIFICATIONS

- A photovoltaic inclinable module, 90W, 12V, complete with a cell for measuring the solar irradiation and with a temperature sensor.
- A wind turbine
  - Wind turbine 12 Vdc, 160 W.
  - Supporting frame 1.5 m.
  - Anemometer and wind direction sensor.
- A set of modules with a supporting frame:
  - A battery control module, 12V, 32A, with battery.
  - A load module with two 12V lamps, dichroic 20W and LED 3W, with independent switches.
  - A load module with two mains voltage lamps, dichroic 35W and LED 3W, with independent switches.
  - An electronic regulation module, with LCD screen.
  - A rheostat.
  - A module for the measurement of: solar irradiation (W/m^2), solar panel temperature (°C), current, voltage and power.
  - A stepper motor kit for indoor use of the wind turbine.
  - A dc to ac converter module, with sinusoidal output at mains voltage. Average power: 300 W.

Approx. packing dimensions: 2.12 x 1.12 x 1.13 m.
Net weight: 104 kg.

OPTION:
DL SIMSUN - module with lamps to provide suitable lighting for the solar panel when used indoor.

ALTERNATIVES:
DL SUN-WIND – DC motor kit instead of stepper motor.
DL SUN-WIND-ST – Stepper motor kit and solar tracking panel instead of the standard solar panel.