

الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليم العالي و البحث العلمي
جامعة قاصدي مرباح – ورقلة
كلية المحروقات و الطاقات المتجددة و علوم الأرض و الكون
قسم الطاقات المتجددة

الأجهزة العلمية لمخبر قسم الطاقات المتجددة

يحتوي قسم الطاقات المتجددة على عدة أجهزة علمية في تخصص الطاقات المتجددة (الطاقة الكهروضوئية, الطاقة الشمسية الحرارية و الطاقة الهوائية), و هذا يساعد الطلبة على تحصيل علمي واسع في هذا التخصص.

Eolic energy unit



The eolic energy unit is developed by EDIBON in order to study the eolic energy and the influence of some factors on this generation. The unit basically consists of:

1. Fan
2. Rotor of six blades.
3. Anemometer.
4. Speed sensor.
5. Voltage probe (Wattmeter).
6. Current probe (Wattmeter).
7. Loads module.
8. Temperature sensor, J type thermocouple.

9. Regulator.
10. Control System (SCADA).

Practice possibilities :

- ✓ Determination of the typical parameters of the Aerogenerator.
- ✓ Determination of the maximum power output of the Aerogenerator.
- ✓ Study of the power generated by the aerogenerator depending on the wind speed.
- ✓ Study of the power generated by the aerogenerator depending on the incident angle of the air.

Thermal Solar Energy Basic Unit



The Thermal Solar Energy Basic Unit is developed by EDIBON in order to study the transform solar energy into thermal energy. This device makes it possible to simulate two different functioning modes, the thermo-siphon mode, the fluid runs due to the temperature differences , that is to say, without pump, and the pumping mode. It consists of the following elements :

1. Thermal solar panel
2. Tank
3. Solar simulator
4. Lamps
5. Pump
6. Temperature sensors (5)
7. Flow sensor

8. Valves equipment to work in thermo-siphon mode or pumping mode

Practice possibilities :

- ✓ Studying how the thermosiphon works.
- ✓ Studying the lamp's luminosity profile.
- ✓ Studying the output of the solar panels
- ✓ Free circulation: influence of the inclination angle in the device's efficiency.
- ✓ Relationship between flow and temperature.
- ✓ Solar panel's energy balance.

Photovoltaic Solar Energy Basic Unit



The Photovoltaic Solar Energy Basic Unit is developed by EDIBON in order to study the transformation of solar power into electric power and is composed of the following components :

1. Solar photovoltaic panels.
2. Solar simulator composed of two panels of solar lamps.
3. Charge regulator.
4. Auxiliary battery charger.
5. Storage battery.
6. DC load module.

7. Electronic console.
8. Sensors (temperature, light radiation, DC current and DC voltage).

Practice possibilities :

- ✓ Determination of solar panel's characteristic parameters.
- ✓ Study of the relationship between generated power and solar radiation power.
- ✓ Study of the solar panel's efficiency.
- ✓ Study of the influence of temperature on the solar panel's open-circuit voltage.
- ✓ Study of the performance of the solar panels connected in parallel and operating at different radiation levels.
- ✓ Study of the performance of the solar panels connected in series and operating at different radiation levels.
- ✓ Study of the solar panel's efficiency depending on the temperature and the solar panels connections.
- ✓ Study of the system functionality without battery and with load connection.
- ✓ Study of system functionality with battery and load connection.
- ✓ Study of the influence of the angle of incidence.