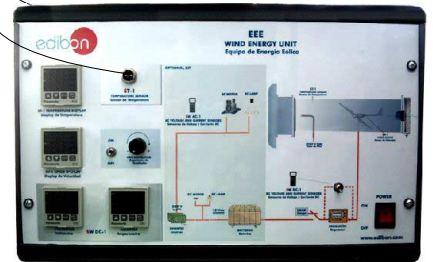


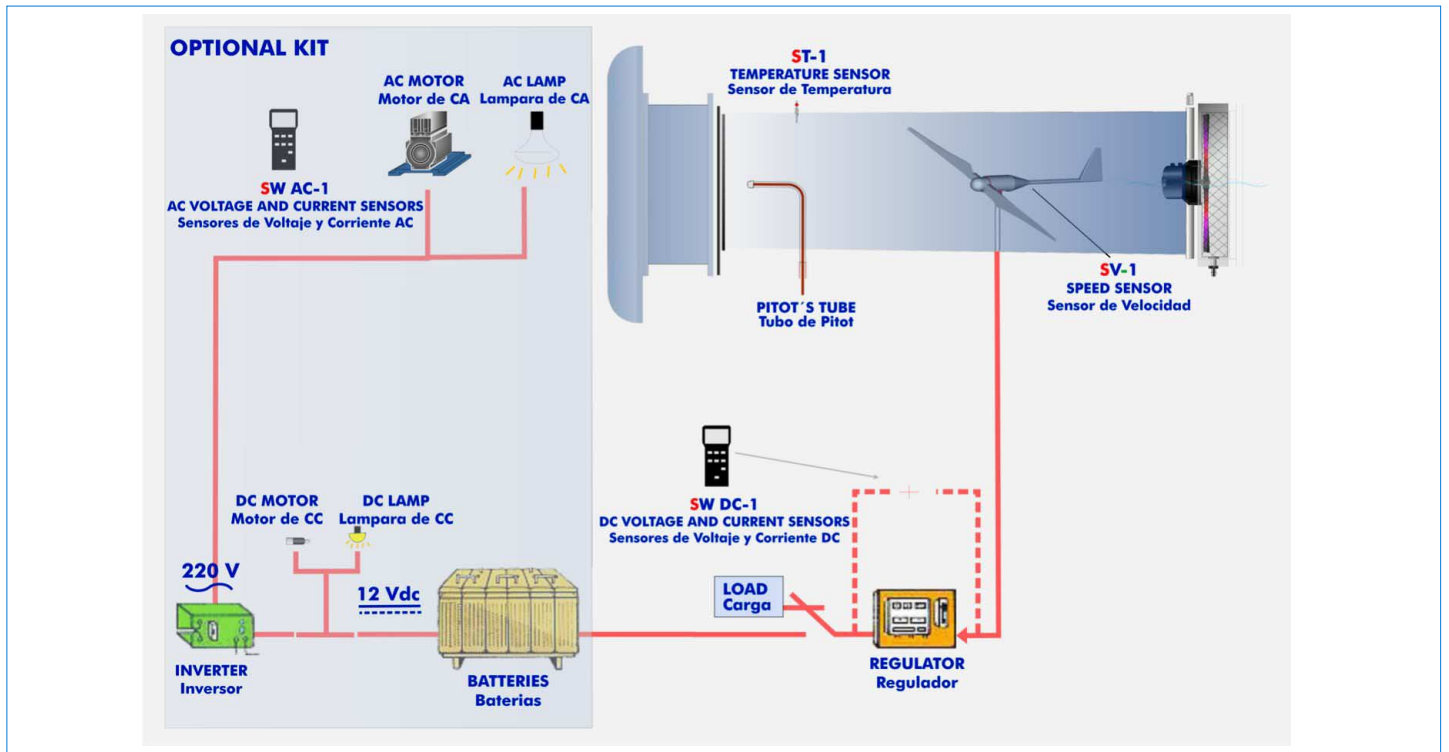
Technical Teaching Equipment



Electronic Console

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### PROCESS DIAGRAM AND ELEMENTS ALLOCATION



ISO:9001-2000 Certificate of Approval. Reg. No. E204034



European Union Certificate



Certificates ISO 14001: 2004 and ECO-Management and Audit Scheme (environmental management)



Worlddidac Quality Charter Certificate Worlddidac Member

## DESCRIPTION

“EEE” is a laboratory-scale unit designed to study the eolic energy and the influence of some factors on this generation.

An axial flux fan introduces air in the tunnel. The Pitot tube let us to measure the air speed in the tunnel. It is possible to know the value of voltage and current given by aerogenerator, measured before and after the regulator. We can know, by means a sensor, the rotational speed of the aerogenerator (r.p.m.).

There is one temperature sensor before the rotor, in order to know the temperature for density calculation.

## SPECIFICATIONS

### Unit:

Anodized aluminium structure.

Main metallic elements in stainless steel.

Diagram in the front panel with similar distribution to the elements in the real unit.

Stainless steel tunnel of 2200 x 700 x 700 mm. approx., which includes two transparent windows of 1100 x 200 mm. approx.

Aerogenerator of 6 blades, power: 60 W, aerogenerator diameter: 510 mm.:

Starting air speed: 2.5 m/s.

Max. power 60W (25.7 m/s.).

Axial fan with speed variation for the wind simulation. 2800 r.p.m., power: 0.37 kW. , flow : 5750 m<sup>3</sup>/h., discharge speed: 15.81 m/s.

Temperature (“J” type) sensor. Sensor range: -40 to 750° C.

Pitot’s tube to measure the air speed in the tunnel.

Speed sensor (aerogenerator).

Voltmeter.

Ammeter.

Load regulator.

Loads module: variable load and fixed load.

### Electronic Console:

Metallic box.

Connection for temperature sensor.

Digital display for temperature sensor.

Digital display for speed sensor.

Voltmeter display.

Ammeter display

Fan speed regulator.

Cables and accessories, for normal operation.

### Manuals:

This unit is **supplied with the following manuals**: Required Services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices Manuals.

### OPTIONAL (not included in the standard supply):

#### EEE-KIT. Kit of charge, conversion and consumption simulation:

Energy accumulation and voltages conversion:

**2 Batteries.**

**Inverter.**

Different loads:

**DC loads: DC lamps of 12V. + Rheostat and DC motor of 24-36V.**

**AC loads: Lamps of 220V-240V, 50-60Hz, 9W, and Fan of 230V.**

## EXERCISES AND PRACTICAL POSSIBILITIES

### Some Practical Possibilities of the Unit:

- 1.- Study of the aerogenerator operation in function of the wind speed variation.
  - 2.- Angle of incidence variation.
  - 3.- Load variation influence on the aerogenerator.
  - 4.- Study of the voltage, power and current.
  - 5.- Study of V, I, W in function of different loads.
  - 6.- Efficiency experimental determination.
  - 7.- Wind energy measurement.
  - 8.- Familiarization with the regulator parameters.
  - 9.- Study of the power generated by the aerogenerator depending on the wind speed.
  - 10.- Study of the power generated by the aerogenerator depending on the air incident angle.
- Practices to be done with the OPTIONAL KIT “EEE-KIT”:
- 11.- Loads connection to direct voltage.
  - 12.- Loads connection to alternating voltage 220V.

## REQUIRED SERVICES

- Electrical supply: 220V/50Hz or 110/60Hz., single phase, 7 KW.

## DIMENSIONS & WEIGHTS

Unit: -Dimensions: 2200 x 700 x 700 mm. approx.

- Weight : 100 Kg. approx.

Electronic Console : -Dimensions: 490 x 330 x 310 mm. approx.

-Weight: 15 Kg. approx.

## OPTIONAL

### - EEE-KIT. Kit of charge, conversion and consumption simulation:

Energy accumulation and voltages conversion:

**2 Batteries.**

**Inverter.**

Different loads:

**DC loads: DC lamps of 12V. + Rheostat and DC motor of 24-36V.**

**AC loads: Lamps of 220V-240V, 50-60Hz, 9W, and Fan of 230V.**

## AVAILABLE VERSIONS

Offered in this catalogue:

-EEE. **Wind Energy Unit.**

Offered in other catalogue:

-EEEC. **Computer Controlled Wind Energy Unit.**

\*Specifications subject to change without previous notice, due to the convenience of improvements of the product.