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Technical Teaching Equipment

Wind Energy Basic Unit

MINI-EEE

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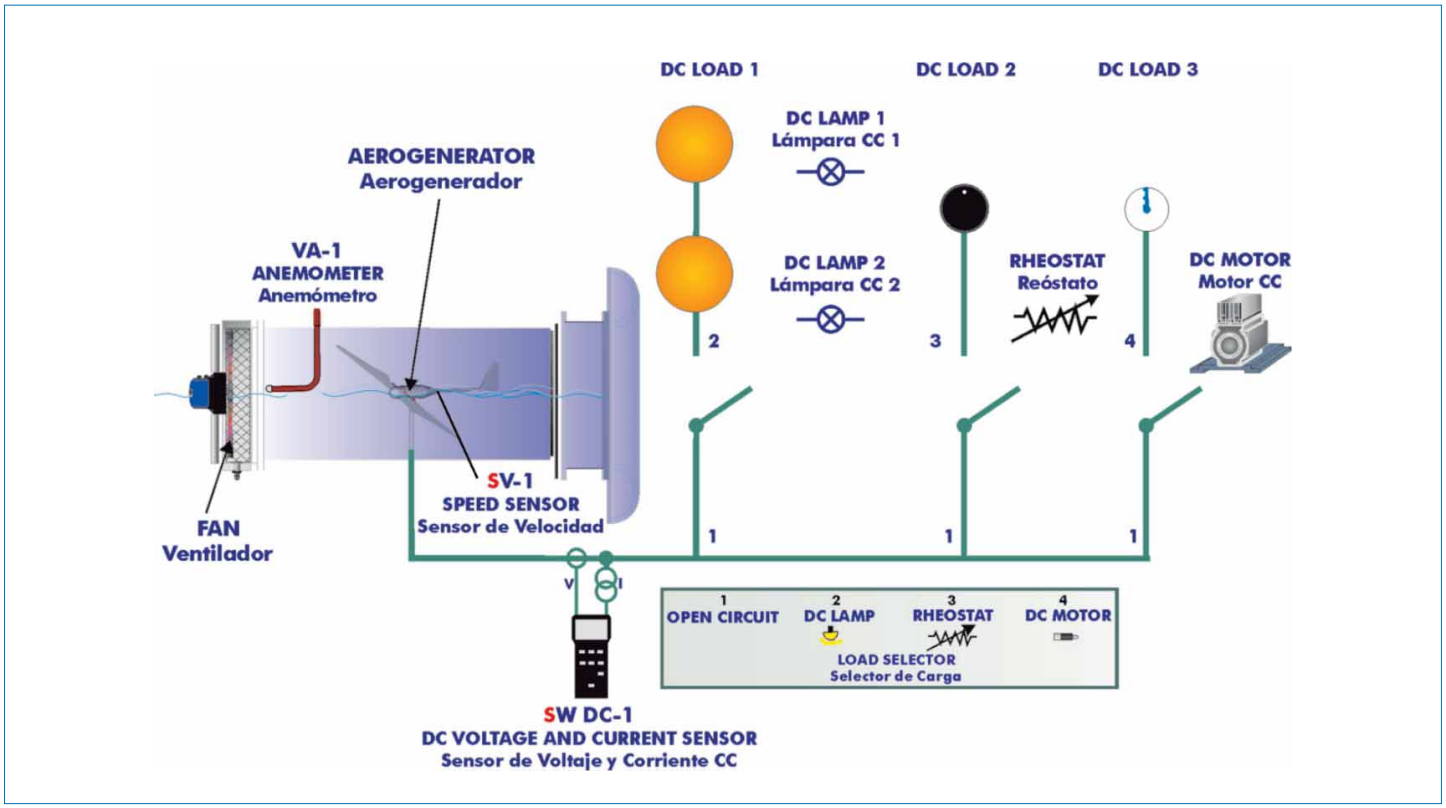
Products
Products range
Units
5.-Energy

Electronic console

PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



ISO 9000: Quality Management
(for Design, Manufacturing, Commercialization and After-sales service)

European Union Certificate
(total safety)

Certificates ISO 14000 and
ECO-Management and Audit Scheme
(environmental management)

Worlddidac Quality Charter Certificate
(Worlddidac Member)

GENERAL DESCRIPTION

The Wind Energy Basic Unit (MINI-EEE) is a unit, at small scale, designed to study the wind energy and the influence of some factors on this generation.

The unit basically consists of:

- Axial fan with variable speed.
- Aerogenerator with rotor of up to six blades. Set of six blades for the aerogenerator.
- Transparent tunnel.
- Anemometer.
- Turning speed sensor for the aerogenerator.
- Voltage and current sensor.
- In the electronic console of the unit is included a DC load module (LEDs, rheostat and DC motor) and several switches to select the type of load:

  Position 1: The aerogenerator operates at open circuit voltage.

  Position 2: The LEDs are directly connected to the aerogenerator.

  Position 3: The rheostat is directly connected to the aerogenerator.

  Position 4: The DC motor is directly connected to the aerogenerator.

The axial flow fan introduces air in the tunnel and the air speed is measured with the anemometer. It is possible to know, in real time, the value of the voltage and the current given by the aerogenerator. Knowing both current and voltage, the power is completely defined.

The turning speed of the aerogenerator (r.p.m) is measured.

SPECIFICATIONS

Bench-top unit.

Anodized aluminum structure and panel in painted steel.

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

Air generator: Axial fan with variable speed (maximum flow of 1473 m^3/h) and finger guard.

Aerogenerator:

The safety turbine is a simple injection model that joins the ends of up to six air blades.

Set of six blades for the aerogenerator.

Power (to a rotor speed of 2000 rpm): 1W.

Outlet voltage (to a rotor speed of 1000 rpm): 5 V DC.

Outlet current (to a rotor speed of 1000 rpm): 50 mA DC.

Minimum speed of the wind required to generate electricity: 2 m/s.

Air tunnel, made of methacrylate, of 500mm. long and 300mm. of diameter approximately.

Anemometer that allows to measure speeds below 20m/s.

Turning speed sensor for the aerogenerator, range: 0-2000 rpm.

Voltage and current sensor.

Electronic console:

Metallic box.

Connector for the DC current and voltage sensor. Digital display for the current (DC). Digital display for the voltage (DC).

Connector for the turning speed sensor for the aerogenerator. Digital display for the turning speed.

Switch for the axial fan.

Regulator for the speed of axial fan.

This electronic console includes a DC load module (LEDs, rheostat and DC motor) and several switches to select the type of load:

Switch for the LED of DC load module.

Switch for the rheostat of DC load module.

Switch for the DC motor of DC load module.

Cables and Accessories, for normal operation.

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

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Study of the aerogenerator operation depending on the wind speed variation.

2.- Determination of the aerogenerator characteristic parameters.

3.- Study of the differences in the operation by using the three available blade's configurations (aerogenerator with 6, 3 or 2 blades).

4.- Study of the influence of the load variation in the aerogenerator.

5.- Study of voltage, power and current.

6.- Experimental determination of efficiency.

7.- Study of the power generated by the aerogenerator depending on the wind speed.

8.- Study of the power generated by the aerogenerator depending on the number of blades.

9.- Determination of the wind energy measurement.

10.-Study of the characteristic curve of the aerogenerator at constant wind speed.

11.-Study of the characteristic curve of the aerogenerator at constant revolutions.

12.-Study of the DC loads connection.

REQUIRED SERVICES

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

DIMENSIONS & WEIGHT

MINI-EEE:

Unit:	-Dimensions:	600 x 400 x 500 mm. approx. (23.62 x 15.75 x 19.68 inches approx.)
	-Weight:	20 Kg. approx. (44 pounds approx.)
Electronic console:	-Dimensions:	490 x 330 x 310 mm. approx. (19.29x12.99x12.20 inches approx.)
	-Weight:	10 Kg. approx. (22 pounds approx.)

AVAILABLE VERSIONS

Offered in this catalogue:

-MINI-EEE. Wind Energy Basic Unit.

Offered in other catalogue:

-MINI-EEEC. Computer Controlled Wind Energy Basic Unit.

OTHER WIND ENERGY UNITS

-EEEC. Computer Controlled Wind Energy Unit.

-EEE. Wind Energy Unit.

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

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