



With the equipment EN 04.2, we emulate the behaviour of a wind turbine in a practical and educational way. An electric motor operates as the turbine on a windmill moving a three-phase synchronous permanent magnet generator, which converts the transmitted mechanical energy to electric energy. The generated electricity is alternating current three-phase, having to be transformed into direct current to feed the inverter, which transforms it into alternating current at an appropriate frequency, and other necessary features to connect to the network.

The equipment is designed for a very visual and intuitive operation, quickly understand the functioning of the whole system, not just knowing the elements that compose the unit, but also having to connect them through the supplied cables for this purpose. This is achieved by the provision of equipment in modular panels. It also has a computer from which to control the operation of the equipment and get all the necessary variables for system analysis.

LEARNING OBJECTIVES

- Study of the operation and components of a wind generation system connected to the mains.
- Plotting of the characteristic curves of the generator:
 - Three phase voltage according to the rotation speed.
 - Continuous voltage according to the rotation speed.
 - Torque according to the generated current.
 - Three phase active power according to the rotation speed.
 - DC power according to the rotation speed.
 - Three phase reactive power according to the rotation speed.
- Calculation of the "constant torque / current" and "voltage / generator rotational speed".
- Rectifier efficiency.
- Performance curves calculation: "Electrical power to the mains / mechanical power".
- Determination of optimum operating points under changing wind conditions.
- Drawing the "power / wind speed" curve.
- Analysis of the energy fed into the mains.

TECHNICAL DATA

CHARACTERISTICS:

- Anodized aluminium structure
- Phase network analyzer indicating active, reactive and apparent current, voltage, frequency, power factor, etc.
- Three-phase permanent magnet synchronous generator.
- 1.5 kW asynchronous motor.
- Networks connected Inverter 500 W (for 230V / 50Hz., this can change depending on the country).
- 1.5 kW inverter.
- Protection module for connection to the mains.
- Data acquisition module.
- Computer with touch screen attached to the main control panel.
- The system is controlled with the computer (not only data acquisition).
- The unit is supplied with a comprehensive workbook.

DIMENSIONS:

- Generator-motor structure: 790x450x80 mm.
- Modular panel structure: 1080x510x1150 mm.

REQUIREMENTS

- Input 230V / 50Hz.
- * Other electrical characteristics available.