

RW-130 PERMANENT MAGNET SYNC GENERATOR SYSTEM

EXPERIMENT SET



This test bench makes it possible to experimentally examine the transformation of wind energy. electricity through a wind generator. The equipment is constructed using real components that are configured to operate in isolated mode and are commercially available.

The Wind Energy Application with Permanent Magnet Synchronous Generator is an application designed by Redlab to train students in the main operations of wind turbines.

The system is used for experimenting conversion of wind energy into electricity by means of a wind power generator which is a stand-alone unit. The system is used to train on design and initial operation of a small wind power generator, operation with fluctuation wind force in off-line operation, generation of AC voltage in an off-grid system, how energy is stored and overall optimisation.

The system enable for simulation of the energy generation from small wind power plant with components and provided software solutions.

System Components:

- Mobile metallic carriage trolley table, stands and racks for mounting and carrying the overall system and below modules:
- Synchronous three-phase generator 12V or 24V for small wind power plant with permanent magnets.
- Power inverter
- Halogen and regular light bulb lamp modules
- Load unit for solar module with resistor
- Charge Controller and battery
- Universal power supply
- Wind turbine mounted over a mast and mobile carriage with a power output of min 200W
- Connections for data acquisition
- Softwares and PC for monitoring, adjusting and simultaneous display of system components
- Other auxiliary connections, wirings, modules and cabling if needed for operation of the equipment.

Motor speed controller have a voltage of 230 VAC and power of 0,3 kW.

Speed of synchronous three-phase generator is 800 rpm with a voltage of 12V or 24V. The nominal power is 300W.

There are charge controller and battery voltage is 12V and capacity of 5Ah.

Output voltage connections are in three phase. The controller is include 1kOhm, 400W variable resistor, potentiometer for the induction motor control speed and appropriate input terminals. The controller provide setting and visualization of the system parameters and have appropriate connection terminals of 4 mm safety sockets.

Inverter have power of 300 W, efficiency of 90%. Inverter is able to cut out for excess battery voltage and have over temperature, overload protection, short-circuit and pole reversal protection.

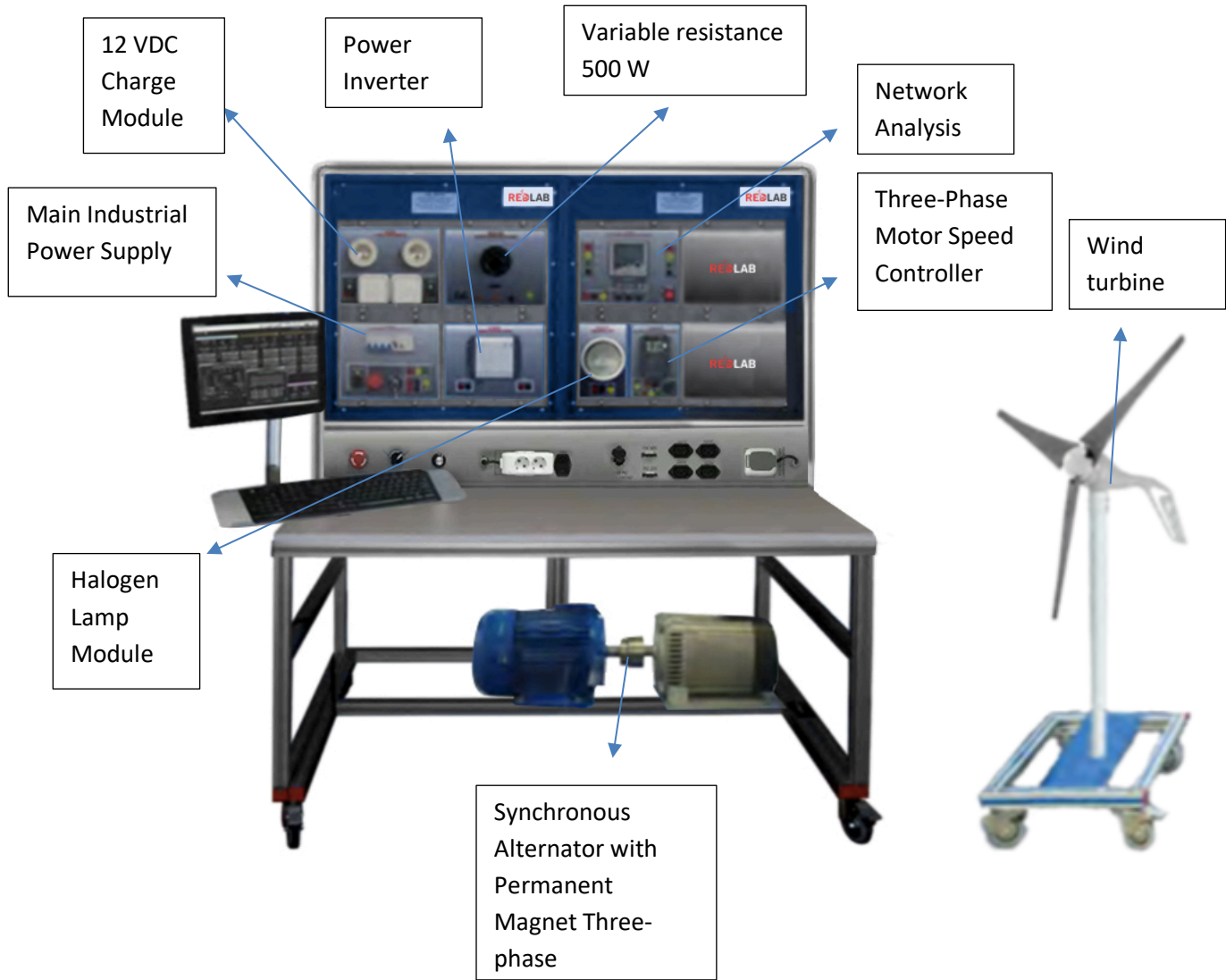
12V lamp board include two regular light bulb lamps and switches. In addition there is one energy saving lamp. Operating Voltage is 230V/ 50/60Hz

There is a separate wind turbine having 3 adjustable blades (similar to the pitch adjustment) mounted over a mast and carried by a mobile trolley unit. The rotor diameter is 1m and the wind turbine have an output of 200W. The unit have a wind-vane/tail at the back. The nominal wind speed is 11m/s.

The mast set allow the wind turbine set to be used outdoors as well. It have an extension to the supplied mast along with guy cables, bracing and anchoring for attaching to the ground.

There is a dust cover for the separate wind turbine.

The software ensures simultaneous display of measured and calculated values. The recorded/stored variables can be recalled for observation and comparison. The system ensure that the user can control parameters involved in the process in real time.



This set includes the following modules:

- Industrial main power supply.
- Synchronous Three Phase Permanent Magnet Generator.
- Three Phase Asynchronous Motor with Squirrel Cage.
- AC Motor Speed Controller.
- Battery.
- Electronic Voltage Regulator (300 W).
- Network Analyzer.
- Power Inverter (300 W).
- 500 W variable resistor
- Halogen Lamp Module.
- 12 VDC Charging Module.

There is an additional software solution for an interactive teaching for theoretical concepts about the systems. It include practical exercises, evaluation methods and assessment tools. Software ensure to create, edit and carry out practical exercises, tests, exams and calculations.

All cables, modules, data acquisition system, software and related accessories required for fully operation of the system are provided. The components are integrated to each other over the carriage trolley and monitored via software.

Coloured safety measurement cables with 4mm safety plugs and coupling guard mechanism are provided.

The system comply with CE Marking and conformity declarations are provided

Symbols for the relevant equipment or circuit diagrams conforming to latest DIN/ISO standards are screen-printed on the front panel of the modules. If necessary, front panels are supplemented with colour graphics or photographs at applicable locations on the panels/modules.