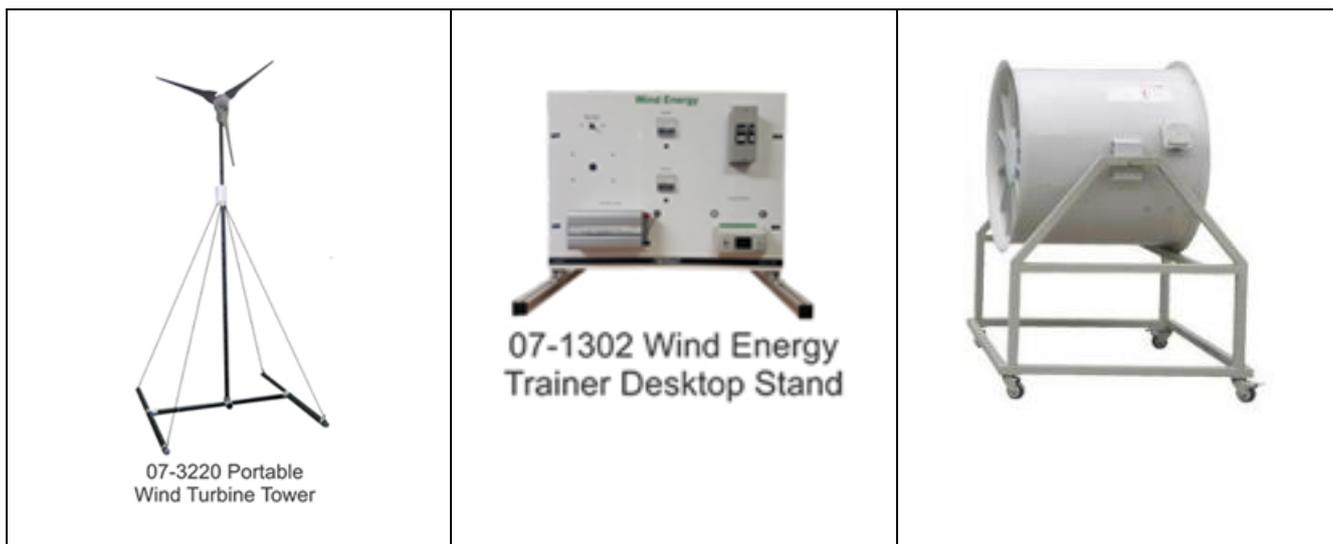


WIND ENERGY GENERATION LAB TRAINER KIT

MODEL: ELS-WIND-20



a) INTRODUCTION

The ELS-WIND-20 Wind Energy Generation Lab Trainer Kit demonstrates how wind turbines are beginning to transform the way the world is powered.

In the Wind Energy module, students learn about one of today's major forms of alternative energy and how technology is used to convert and transmit this energy. They explore wind as an energy source that can be used to help reduce dependence on exhaustible, non-renewable fuel sources. Students will gain a global perspective when they understand the economics, efficiency, and low environmental impact of producing energy from non-polluting, renewable sources.

The Wind Energy module includes everything required to function as a "turn-key" learning station; lesson plan, student guide, training station with fault insertion and energy producing equipment. The module provides student instruction, in teams of two, for up to 20 hours.

The Lesson Plan includes an Instructor's Guide which provides instructions for installing, setting up, and implementing the module. It also includes learning outcomes, testing and evaluation procedures, answer keys, student skills response and inventory list.

The Student Activity manual guides students through 10 multi-disciplinary activities using the tools, and equipment included with the module package. It also contains optional enrichment and career exploration activities, daily activity response sheets and activity notes.



ELS ENERGY AND LAB SOLUTIONS SDN BHD (Co. No. 1255110-D)

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b) MONITORING

This monitoring system that display the voltages and currents for the wind turbine, battery and inverter. It is a versatile, powerful and yet cost effective monitoring system with high resolution and speed. It is a high performance and high connectivity equipment and yet easy to configure and operate. Standard optional sensors for wind speed, direction, temperature, humidity are available.

c) CURRICULUM

Upon the completion of the Wind Energy module, students should be able to:

- Describe the various alternative energy solutions.
- Understand the hazards associated with the wind energy module.
- Explain the pros and cons of wind energy.
- Describe the basic history of wind energy.
- Explain how a wind turbine works.
- Use digital volt and ammeters to monitor system activities.
- Explain the difference between batteries connected in series, parallel and series-parallel.
- Explain the effects on voltage and current output when the system is loaded.
- Draw a graph showing a wind generators power curves.
- Discuss the effects of circuit loading on wind generators.
- Explain the purpose of a voltage regulator.
- Understand the procedures necessary to properly site a wind turbine.
- Apply math to calculate Power in watts produced by the wind turbine.
- Use a computer interfaced system to monitor the input voltage and current.
- Explain how the energy produced is converted into energy we use.
- Use basic 5 steps troubleshooting techniques to solve system faults.
- Describe some of the employment opportunities involving alternate energy.
- Identify various methods of storage devices.
- Explain how a deep cycle battery operates.
- Use the internet to explore the various types of renewable energy.
- Solve a problem based on information accumulated to date.

d) TECHNICAL DETAILS

- Dimensions (approx.): 1250 x 1100 x 800 mm (W x H x D)
- Weight (approx.): 95 kg
- Electrical Connection: 240V/50Hz AC (single phase)

e) WARRANTY

- 1 year



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