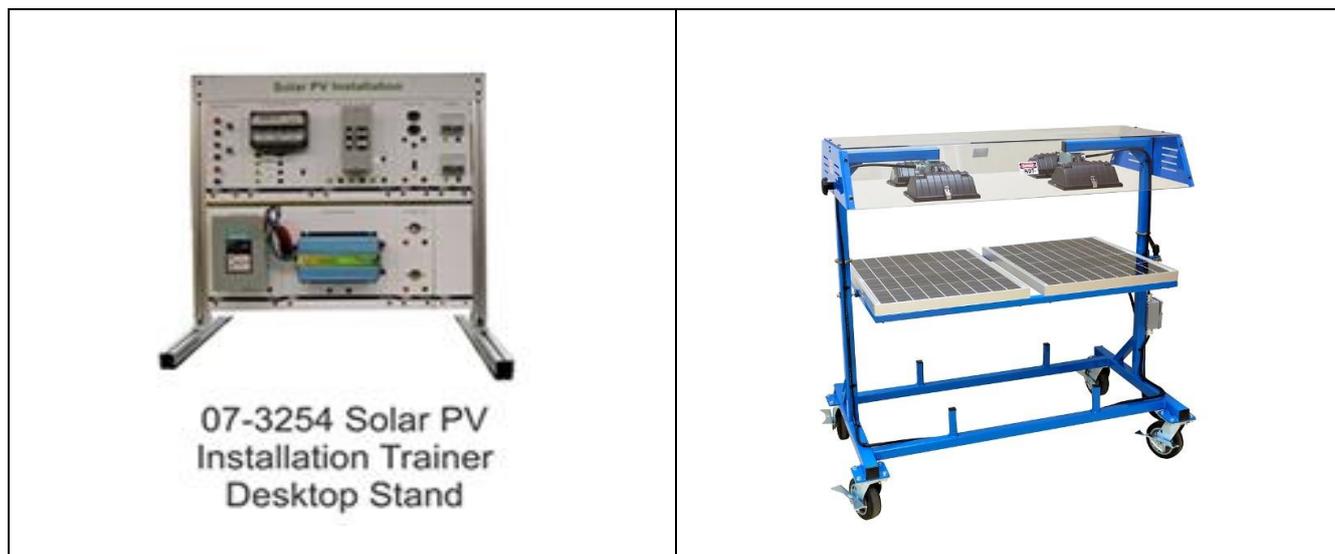


SOLAR ENERGY GENERATION LAB TRAINER KIT

MODEL: ELS-SOLAR-20



a) INTRODUCTION

The ELS-SOLAR-20 Solar Energy Generation Lab Trainer Kit demonstrates how solar cells are beginning to transform the way how the world is powered.

In the Solar 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 solar 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 economical, efficiency, and how low environmental impact of producing energy from non-polluting, renewable sources.

Everything are including in the Solar Energy module such 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 is also containing 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

Monitoring system that display the voltage 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 connectivity equipment and yet easy to configure and operate. Standard optional sensors for wind speed, direction, temperature and humidity are available.

c) CURRICULUM

Upon the completion of the Solar Energy Student Activity Manual, students should be able to:

- Describe the various alternative energy solutions.
- Understand the hazards associated with the solar energy module.
- Explain the pros and cons of solar energy.
- Test solar cells to determine their voltage and current outputs.
- Explain how a photovoltaic cell 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.
- Understand the procedures necessary to properly site a solar array.
- Draw a graph showing a solar cell's power curves.
- Discuss the effects of circuit loading on solar cells.
- Explain the purpose of a voltage regulator.
- Apply math to calculate Power in watts produced by the photovoltaic cells.
- 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.): 1300 x 1150 x 850 mm (W x H x D)
- Weight (approx.): 135 kg
- Electrical Connection: 240V/50Hz AC (single phase)

e) WARRANTY

- 1 year



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