



DEGEM
SYSTEMS

Tech-Prep

Solar energy training system

Wind energy training system

Solar water heating energy
training system

Polar robot & robotics principles
training system

Conveyors & sorting machines
training system

Cartesian robot & computerized
storage training system

CNC lathe machine training
system

CNC milling machine training
system

Process control training system

Basic electronics training system

Basic communications systems

Basic pneumatics training system

Basic hydraulics training system

Basic mechanics training system

Pressure forming & inflation
training system

Bending & vacuum forming
training system

TP-3701

Solar Energy Training System

Objectives

This course introduces the student to the green energy source – the sun. It exposes the student to solar energy, its concepts, practical applications and uses, and the ecological benefits of utilizing solar energy. The student is introduced to issues relating to energy derivation, conversion and storage, with emphasis on solar generated energy.

The system courseware and experiments will enhance the students' interest and curiosity. They also establish an awareness of the technologies involved in the subject discussed, and the interaction between scientific phenomena, these technologies and common applications relating to solar energy.

Description

The system includes a lamp that simulates the sun and solar cell that is used to convert the solar energy to electric energy. This electric energy is then actually used to operate different “consumers” – a lamp, an audio source and a mechanical lift.

The lamp is located on a mechanical arm that can be rotated. The solar cell is mounted on a rotating base, which allows it to automatically track the light source as it is rotated. The dependence of generated electrical energy by the solar cell on light intensity produced by the lamp and the solar cell is illustrated by varying the voltage applied to the lamp and also by varying the angle of incident light. A digital voltmeter and a digital ammeter are used to measure the level of electrical power generated.



Specifications

LEARNING PROGRAM

- Tech Prep pedagogical guidelines
- Concept of work, power, energy and efficiency
- Different forms of energy
- Energy conservation
- Green energy
- Introduction to solar energy
- Using the TP-3701 training system
- Solar cell voltage and the effect of light intensity and incident light angle
- Solar energy conversion
 - Light
 - Sound
 - Mechanical energy
- Energy storage and operation of various loads
- Efficiency
- Solar cell effectivity - effect of temperature on output voltage

TECHNICAL CHARACTERISTICS

- Light source
- Light power (50 Watts)
- Light voltage (12V DC)
- Light house range (0-60°)
- Lamp dimmer (5 positions)
- Solar cell motor
- Solar cell
- Electric generator
- Battery voltage
- Light load (LED)
- Mechanical load motor
- Buzzer sound load
- Voltmeter and ammeter with common digital display
- Operating voltage 110 - 230 VAC (external switching supply)
- General dimensions (610 x 420 x 480 mm)
- Emergency stop button
- Main power switch

The courseware or e-book contains the essential theory and detailed procedures for each hands-on activity.

SUPPLIED ACCESSORIES

The learning unit is supplied with the following accessories:

- Set of banana wires
- Mechanical load weight
- Universal AC power cable (European standard)
- External DC power supply
- Courseware or soft copy electronic book for MS Windows PC

OPTIONAL ACCESSORY

Personal computer with MS Windows (not included)

SAFETY FEATURES

The following safety features are provided by the learning unit:

- 'Emergency Stop' pushbutton that cuts off all electricity to the unit when pressed.
- The lamp is covered with a insulating material to prevent touching the lamp when hot.
- The lamp has a handle to afford safe handling and movement when hot.