



Renewable and Energy Generation (wind Panel Kit Trainer)

Category: New & Renewable Energy · Model reference: MZM-5006



SPECIFICATIONS

DESCRIPTION:

The energy module shall teach student about a major form of alternative energy, and how technology is use to convert and transmit this energy. Student shall explore wind as an energy source, and how it is used to help reduce dependence on exhaustible, non-renewable fuel sources. Students will gain a global perspective as they learn the economics, efficacy and low environmental impact of producing energy from non-polluting, renewable sources

The wind energy trainer shall include everything required to function as a "turn-key" learning station; lesson plan, student guide, DVD video, training station with fault insertion and energy producing equipment

Curriculum:

The wind energy curriculum and hardware shall provide student instruction, in term or two, for up to 20 hours. Student activity manual must provide a minimum of 15 multi-disciplinary activities with a minimum of 5 enrichment activities. The wind energy curriculum must include alternate power sources, renewable energy DVD, instructor guide, and instructor print CD.

Curriculum must be provide in print and/or multimedia must provide the same course structure. Multimedia to be installed on a single seat entire classroom or hosted on the schools site and tracked through an open source LMS like Moodle or blackboard. Curriculum shall be authored in a SCROM authoring tool.

Student outcomes shall be:

1. Describe the various alternate energy solution..
2. Understand the hazard associated with the wind energy module.
3. Explain the prose and con of wind energy.
4. Describe the basic history of wind alternate energy.
5. Explain how a wind turbine works
6. Test wind generator to determine their voltage and current output
7. Use analog volt and ammeter to monitor system activities
8. Explain the difference between batteries connected in series, parallel and series-parallel.
9. Explain the effect on voltage and current output when the system is loaded
10. Draw a graph showing a wind generator power curves.
11. Discuss the effects off circuit loading on wind generator.
12. Explain the purpose of a voltage regulator
13. Understand the procedures necessary to properly site a wind turbine.
14. Apply math to calculate power in watts produced by the wind turbine.
15. Use a computer interfaced system to monitor the Input voltage and current.
16. Explain how the energy produced is converted Into energy we use.
17. Use basic 5 step troubleshooting techniques to solve system faults.
18. Design bask hybrid renewable energy system

19. Describe some of the employment opportunities involving alternate energy

20. Identify various methods of storage device

21. Explain how a deep cycle battery operates

22. Use the internet to explore the various type of renewable energy

23. Solve a problem based on information accumulated to date.

Activities:

1. Pre- Test/introduction/ Safety Precautions
2. Renewable Energy Basics
3. Wind Energy
4. Wind Siting
5. Storage Devices and Monitoring
6. Voltage Regulation and Monitoring
7. Energy Conversion and Distribution
8. System Design
9. System Troubleshooting
10. Post-test and Wrap up
11. History Research
12. Careers In Renewable Energy.
13. Design your own Hybrid System
14. Internet Research
15. Problem Scenario - Build your own wind turbine

Training System shall Include the following:

All components used on the Wind Energy Training System must be typical of commercial systems of this size.

- **Wind Generator** : Must deliver a minimum of 400W of power at wind speeds of 45km/hi Carbon fiber composite blade J sophisticated Internal charge regulator

- **Power inverter** : Must be able to convert 12V DC battery power to 120V AC solid state control circuit provide a maximum 100W of power and 2000W of surge capacity

- **Training Board** : The main component panel must be made from powder coated steel with silk-screened labeling. 28"w x 25" h x 15"d. extruded aluminium 1" square legs for support. End caps and foot pads Junction box for wind and battery connections using 5 way binding post. Components mounted on the bade of the board must be connected to welded Stand-off screws to ensure a clean front panel. All electronic component on the rear of the board to be covered and protected by plexi glass to enable students clearly see all components and not a black box.

- **System protection** : Sized to sult system; 50A main power breaker, 30A wind turbine breaker; appropriate fuse and component protection for each device

- **12V renewable Energy Deep Cycle Battery** : Must be a renewable energy deep cycle battery, 12V sealed deep cycle lead acid battery. Minimum of 100 ah at 100 hour rates.

- **Load Device** : A variable load device must be able to provide up to 160 watt maximum load to 40 watt stepped intervals. A compact fluorescent bulb must be included to demonstrate conservation, 4 light receptacles and 4 on/off toggle switch must control the amount of load. 8" x 10" x 2" powder coated and silk-screened, steel chassis with foot pads. Fused power receptacle and 6' cord.

- **Fault Insertion** : To Include four non destructive faults behind i1 key locked door to strengthen troubleshooting skills to component level In the troubleshooting exercise faults to be Inserted through relay contact devices to ensure a safe Introduction of the fault.

- **Wind Mounting - Wind Turbine Mount (Inside)** : Include AC motor with variable speed PIO controller for driving the wind turbine when operating Indoors

- **Emergency stop on/off** : In-Class Wind Turbine station - must Include a 1.5ph AC motor coupled to an Emerson PID controller for driving the wind turbine when operating Indoors; PID controller phase shifts Input voltage to enable 120Vac GO/50Hz operation; coupling between motor and wind turbine; preprogrammed, enclosed, AC PID motor controller; desk-top design; wind turbine blades, PID controller fault switch light, On/Off switch, On/Off Indicator light, emergency pushbutton, Fused 6' electrical cord, mounted on a steel painted panel with chrome handle> for easy handling 5-way binding posts used to connect to wind energy training system panel. Two control line ensure safe operation of the wind turbine assembly.

Send Enquiry **Your Name**

Your Email

Tele Phone



MZFIRSTMOTION SDN BHD · Reg No. 1137962-V · No 53, Lorong 1/SS3, Bandar Tasek Mutiara, 14120 Simpang Ampat, Pulau PinangT: +604-505 7422 · E: sales@mzfirstmotion.com · <https://www.mzfirstmotion.com>