

WIND ENERGY TRAINER (Model : XPO-WET)



WIND TUNNEL



CONTROL UNIT

SALIENT FEATURES

- ◆ Table top wind tunnel with transparent acrylic & protection cage to identification of components of windmill.
- ◆ Axial fan with continuously variable speed to simulate wind.
- ◆ Renewable energy basics, energy conservation, charge controller, storage system, alternating current & inverter (optional).
- ◆ Converting kinetic wind energy into electrical energy in laboratory.
- ◆ Accumulator for storing the electrical energy.
- ◆ Pitching and yawing provision provided.
- ◆ Set of Instructor Guide & Student Workbook.

TECHNICAL SPECIFICATIONS

A) Wind mill setup

Consist of table top wind tunnel with transparent acrylic structure,
Size:- 650(H) x 800(W) x 550(D) holding various parts & Net Wt.:-

- ◆ **Generator - 1 No.**
 - Max O/P wattage- 100W
 - Max O/P voltage- 24V
 - Max O/P current- 4A
- ◆ **Blades - 6 No.**
 - Diameter:- 740mm
 - Spring return arrangement with screw for pitching
 - Yawing arrangement similarly spring return
- ◆ **Axial fan - 1 No.**
 - To generate air flow.
- ◆ **Digital anemometer - 1 No.**
 - To measure wind velocity.

B) Main rack/ Control unit

Consists of table top aluminium profile rack (45x45) in 4x2 matrix holding various panels

- ◆ **Charge controller Panel (WT1) - 1 No.**
 - Rated voltage- 24Vdc, Max current- 6A
 - Max generator voltage- 25V
 - Min generator voltage- 20V

- ◆ **Stand alone battery bank - 1 No.**

- Rated voltage- 12V, Capacity- 7Ah Or optionally
- Rated voltage- 12V, Capacity- 100Ah
- Battery type- Lead acid

- ◆ **Stand-alone Inverter - 1 No.**

- I/P DC voltage- 10-15Vdc, O/P AC voltage- 230Vac
- O/P power rating- 600VA/ 1KVA

- ◆ **DC voltmeter & DC ammeter panel (EMT68) - 1 No.**

- DC voltmeter (0-100V)
- DC ammeter (0-5A) with polarity protection diode.

- ◆ **Dimmer panel (HIT5)- 1 No.**

- Dimmer 1 No. to vary the speed of axial fan.

- ◆ **Lamp load panel (EMT7) - 1 No.**

- 230V/15/40/60/100W x 3 bulbs with individual ON/OFF using 6A toggle switches.

List of experiments

- 1) Identification of the components.
- 2) To evaluate performance of horizontal axis wind turbine.
- 3) To analyze effect of pitching (blade angles) on performance of wind turbine.
- 4) To analyze effect of yawing on performance of wind turbine.
- 5) To study charging & discharging of battery.

- ◆ **Mechanical Dimensions (mm):-** 545(H) x 960(W) x 300(D)

- ◆ **Weight (Kg):-** Net Wt.- 35Kg, Gross Wt.- 45Kg