

Educational Wind Energy Power Plant Training Unit (EDC-WP-20)

EXPERIMENTAL DATA:

- Function and design of a stand-alone system with a wind power plant
- Conversion of kinetic wind energy into electrical energy
- Determining the power coefficient as a function of speed ratio
- Determining the efficiency of a wind power plant
- Wind energy measurement
- Characteristic curve of wind generator at constant wind speed
- Characteristic curve of wind generator at constant axial fan speed
- Wind generator power characteristics using different number of blades
- Wind speed relation to the output power
- Study of DC load
- Study of DC voltage, current and power under different DC loads
- Experimental efficiency

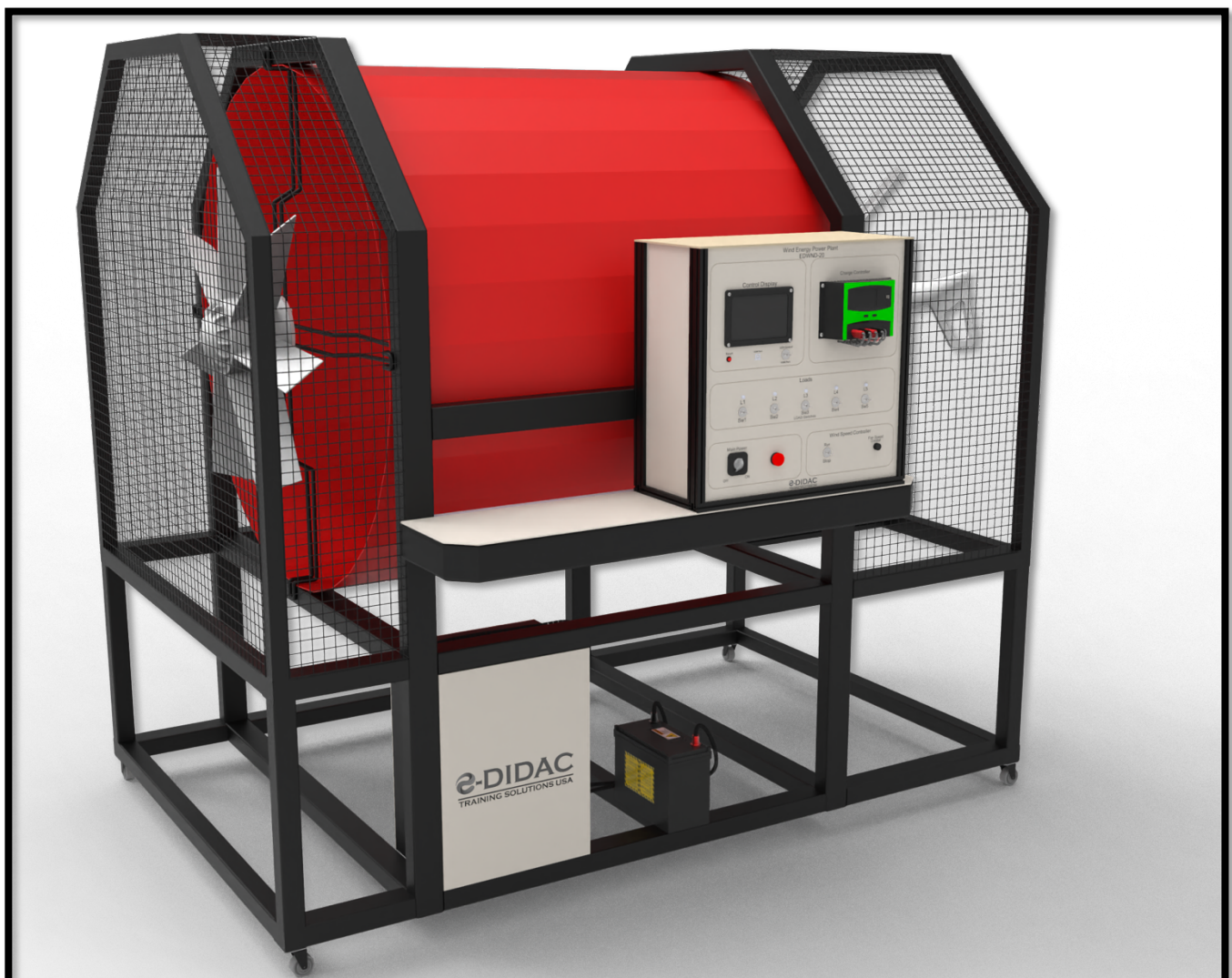


DESCRIPTION:

The Unit consists of a wind tunnel and a control unit. The wind tunnel contains a wind power plant in laboratory-scale and an axial fan. A rotor and a generator are the core elements of a wind power plant. The control unit includes the Standalone LCD with touch panel, Electrical load, Fan speed controller etc. Touch LCD will display the air flow, rotor speed, output voltage and current, load control and other parameters on the process schematic diagram.

The axial fan generates the air flow required to set the rotor of the wind power plant in rotational motion. A flow straightener ensures the flow is consistent and low in turbulence. A generator converts the rotor's kinetic energy into electrical energy. The electrical energy is fed into a stand-alone system that is not connected to the mains grid. A charge controller in an accumulator provides intermediate storage of the electrical energy. The electrical energy can be used by means of an electrical load. The wind velocity is varied by changing the rotational speed of the fan.

A PC data acquisition (EDSM-20S) is also available (Optional).



TECHNICAL DATA:

- **Axial fan**
- Max. volumetric flow rate: 5m³/s
- Max. power: 1.5kW
- Rotor Casing Dia: 500mm
- Wind Speed Control using Inverter
- **Wind Generator**
- Max. output: 120W
- Voltage: 24VDC
- Load module Electrical Bulbs
- Turbine Speed: 4400rpm
- Survival Wind speed: 50m/s
- Set of 3 and 5 blades
- Adjustable blade angle
- Digital Sensor: Turbine rpm, voltage, current, torque and output power
- Mechanical Dynamometer

Load Unit

- Resistive Load Unit
- Digital display of voltage, current and power
- Current and Voltage sensor
- Switches for Load control
- Self-contained HMI software with Touch LCD. This LCD controls the functions of the equipment. It also displays the data of the sensors installed in the equipment. This eliminates the need of expensive PC to interface with the equipment.

A PC data acquisition (EDSM-20S) is also available (Optional).

DIMENSIONS AND WEIGHT:

L x W x H (mm):1800 x 1500 x 1200

Weight: 120 kg

SCOPE OF DELIVERY:

- 1 x EDC-WP-20
- 1 x Instructional Manual

