

STUDY OF A WIND TURBINE - SIMULATION WITH A WIND TUNNEL



Experimental capabilities

- **Study of different wind turbines.**
- **Measurement of the velocity profile in the test tube**
- **Efforts measurement on the wind turbine**
- **Study of a power generation system by wind turbine**
- **Measure on the energy dissipation**

ERL300



Operating principle

It consists of a fan AXALU and two electrical cabinets.

Supervision module and Data Acquisition (optional) allowing to view: wind speed, wind rotation speed, AC and DC electrical analysis, vibration analysis.

The wind turbine is provided and a fastening system allows for easy adaptation of these models

The air circulation speed is 17m/s.

2 sets two blades: 1 standard +1 with modification of the inclination

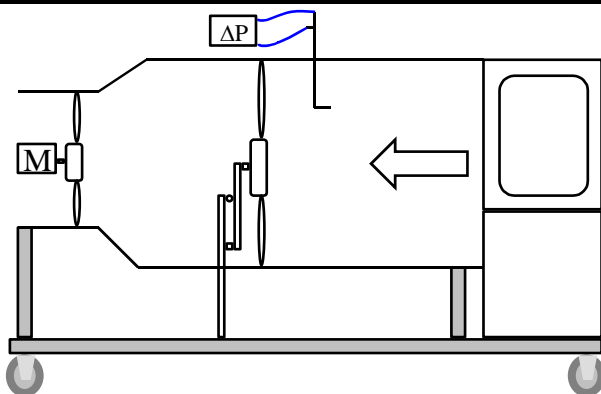
The storage of the energy produced is made on a GEL battery 12 volt 80 Ah. The robust design of this device makes it suitable for use in schools.

The equipment is set up on an Anodized aluminium frame on casters wheels. This gives it great strength and a flexibility of integration into your premises.

The manufacture of this equipment complies with the European standard for machinery manufacturing.

This equipment can be used alone or with other compatible equipment from our range (see last section of this document).

Illustrations



Instrumentation :

- air speed by Pitot tube.
- force exerted on the wind turbine.
- pressure static upstream and downstream of the turbine.
- rotational speed of the wind turbine.
- electric analysis: ammeter and voltmeter on the production, and the storage.
- force on the mast.
- vibrational analysis

Technical details

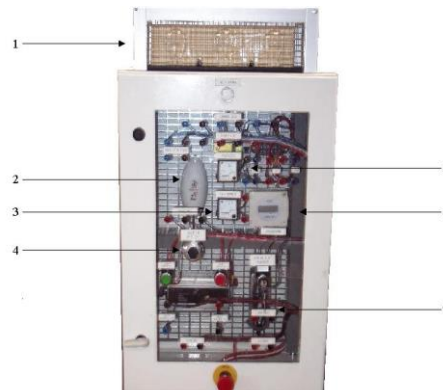
Testing sheath diameter 1500mm with reduction for the fan at 1250mm.

The wind turbine is located downstream of the fan, the speed measurement is done by a long pitot tube 1000mm. It is connected to a sensor with a digital display that directly indicates the value in m / s. A force sensor allows to measure the force exerted on the wind turbine.

The bench is equipped with two cabinets. The first contains the energy converters, the measuring elements ... The second contains the electrical power elements.

Test section :

Plexiglas section lg: 1500mm diam: 1500mm and then steel reduction



Details of the measurement cabinet:

1. 12V and 230V Transmitters
2. Network injection Inverter
3. 230V Voltmeter.
4. Adjustment potentiometer of the fan speed.
5. Ammeter 230 V.
6. Speed indicator
7. Battery charger

Services required

- Electrical supply : 400VAC Triphased+neutral+earth - 50 Hz - 63 A
- Dimensions: (LxWxH mm): 3000 x 1700 x 2100
- weight (Kg): 200

Note : if the equipment installation is operated by our staff, all supplies and exhaust connections required must stand at less than 2m from the machine

Documentation

- User's manual
- Technical documentation of the components
- Lab exercises
- Certificate of conformity CE

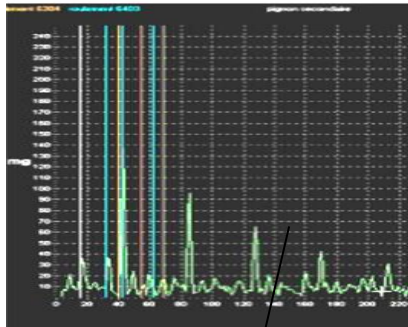
DIDATEC– Zone d'activité du parc – 42490 FRAISSES- FRANCE
Tél. +33(0)4.77.10.10.10 – Fax+33(0)4.77.61.56.49 – www.didatec-technologie.com
email : service_commercial@didatec-technologie.com

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As part of the continuous improvement of our products, this technical specification may be modified without previous notifying

Options

- Présentation vibration analysis



Visualization of demodulated spectra on software as well as "objects" monitored



Inputs / outputs for connection

Vibration monitoring module

Description of components

- 1 **continuous vibration monitoring module** with accelerometer and integrated memory

- **Inputs:**

- Pulses for rotation frequency information
- Parameterizing of the system from PC (PC not provided / cable provided)

- **Outputs:**

- Export of data and measurements towards PC

- **Software** allowing:

- The **definition of control parameters** (number of spectral lines to be monitored, frequency of these lines, types of bearings, reductions reports ...)

- The **loading of these parameters** towards the vibration monitoring module

- **Exploitation** of **measurement** and **analysis** of the spectrum demodulated of the sensor on the PC

Recommended equipment

- Supervision module par PLC

- Ref : AUT 100