# EN 04.1 - WINDMILL TEST-BENCH


The Windmill Test-bench (EN 04.1), is configured like a wind tunnel of 2 meters length designed to work with windmills of less or equal to 600mm diameter. The equipment has a 600 mm windmill included, which has a torque and rotation speed measurement system connected to the computer, to see real time, the behavior of it.

The wind tunnel has a transparent part, so a complete sight of the windmill working is allowed. That part, can also be opened, to facilitate the access and manipulation of the system.

The tunnel has a built-in system for the measurement of the speed of the air by means of electronic pressure transducers, to monitor in real time the speed of the air that the windmill is put under.

All the system, is monitored and controlled through a computer system with touch screen (computer included).

DIKOIN Ingeniería S.L.
Tlf: +034 946 55 15 35 / Fax: +034 946 56 55 15
www.dikoin.com / info@dikoin.com

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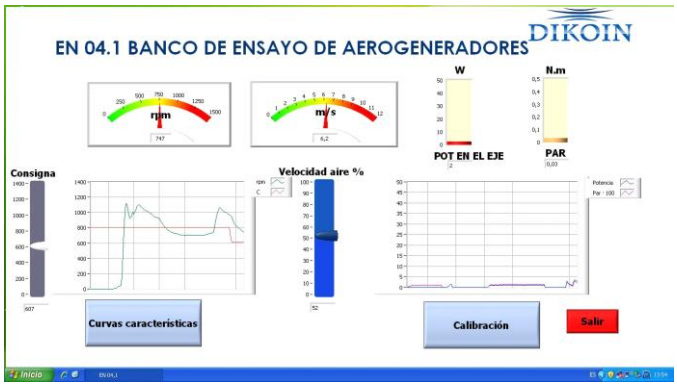
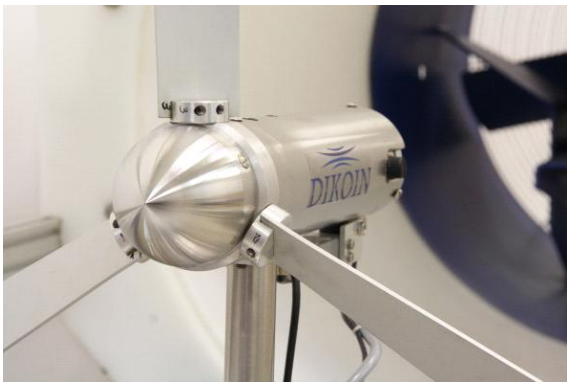
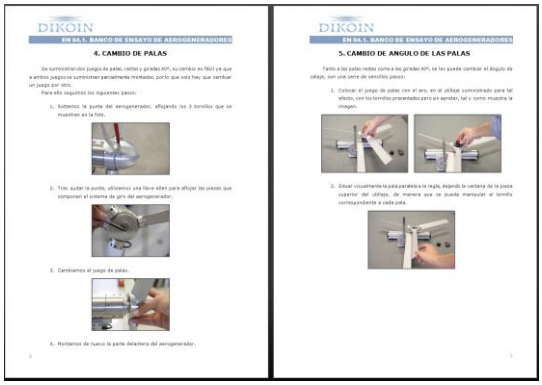


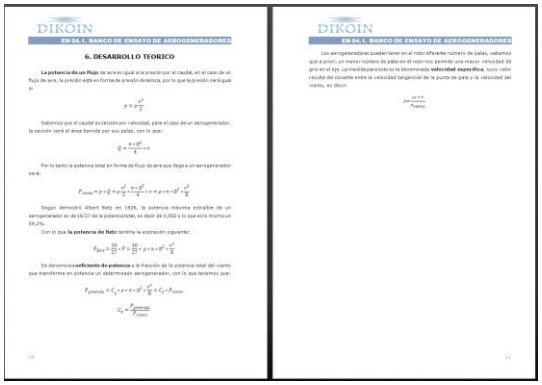

Detail of the main screen of the control software.



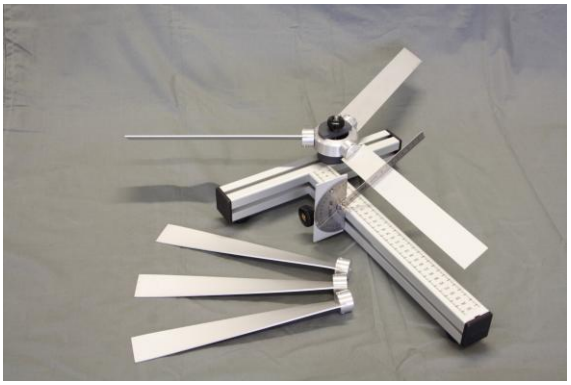

The turbine is fully developed and manufactured by DIKOIN, and has electronic speed and torque measurement systems.



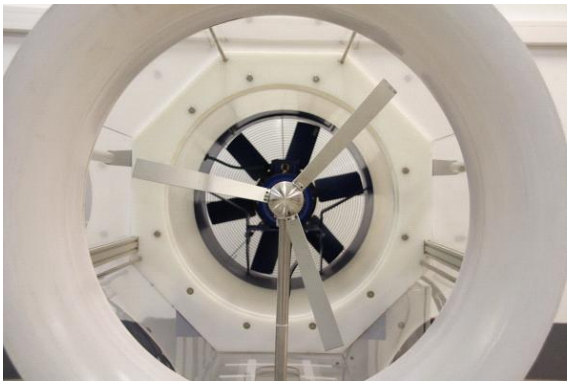

The manual clearly shows how the turbine blades are changed, as well as their placement at a precise angle.




The practical manual shows and explains all the theoretical foundations, as well as the mathematical formulas used for the realization of all the experimentation.



Blades and utility of placement and measurement of angle.



If you want to carry out parameterized tests with your own blade designs, do not hesitate to contact us. We will put at your disposal to our engineering department to support you in the manufacture.

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# EN 04.1 - WINDMILL TEST-BENCH

## COMPUTER SYSTEM WITH TOUCH SCREEN

The windmill test-bench (EN 04.1) is equipped with a complete computer system with touch screen, with which the work of test or practices is made much more easy.

The system is able to control and register all the variables of the equipment.

Manual or automatic tests can be done, with only indicating the required variables and indicating how many points we want in the graph of results. This way we don't lose time writing the results and drawing the graphs by hand.

## LEARNING OBJETIVES AND TESTS

- Measurement of the power taken by the windmill.
- Determination of the characteristic curves of the power recovered by the windmill based on the wind speed.
- Determination of the coefficient of power of the windmill.
- Determination of the coefficient of power based on the specific speed.
- Obtaining of the coefficient of power based on the angle of pitch of the profile.
- Interchange of the blades of the windmill, for analysis of the variations based on the aerofoil profile.

## TECHNICAL DATA OF THE TUNNEL

- Approximate length of the tunnel: 2 meters.
- Maximum diameter of the windmill: 600mm.
- Wind speed in the tunnel, adjustable from 0 to 15m/s.
- Structure made of anodized aluminum.
- Vertically adjustable Legs for a correct level of the equipment.
- Legs equipped with rubber sole for absorption of the vibrations.
- Wheels for easy displacement of the equipment.
- Transparent polycarbonate part in the tunnel, with opening for access to the windmill.

## TECHNICAL DATA OF THE WINDMILL

- Diameter of the rotor: 600mm.
- Electronic sensor for measurement of rotation speed.
- Load sensor for measurement of mechanical torque.
- The pitch of the blades can be changed.
- The blades can be replaced for different ones.
- Exclusively made in aluminum and stainless steel.

## SECURITY

- Security system that avoids the fan to start if the defense is open.
- Protective grate in the suction bell, that avoids the frontal access (not shown).
- Protective grate in the exit of air.

## STANDARD CHARACTERISTIC

- The windmill has a speed sensor to accurately measure the turn speed of the rotor.
- The windmill has a system of measurement of torque, which provides the torque of the turbine to the computer in real time.
- The construction of the rotor allows the variation of the angle of the blades, as well as the change of them, to prove different types of aerofoil profiles.
- All the system is monitored from the touch screen computer, provided with the equipment.
- Manual or automatic tests can be done, where the following values can be controlled and registered:
    - Wind speed.
    - Turn speed of the turbine.
    - Torque of the turbine.
    - etc.

## OPTIONAL CHARACTERISTICS

- The windmill can be equipped with a system of measurement of the forces generated in its base, to monitor the opposition force to the wind, with which the force and the transmitted torque can be measured.
- New blades can be made according to design of the client.

## REQUIREMENTS

- Input: 230V/50Hz.

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