Automated Wind Tunnel



Overview

The automated wind tunnel has been designed based on the Flotek or Aerolab wind tunnels. It can be used as a research bench as well as an educational laboratory.

The test bench is controlled by software developed in NI LabVIEW graphical programming environment. It can be used for the study of methods for determination of basic aerodynamic characteristics of the studied models, aerodynamic profiles and geometric figures.

The wind tunnel is equipped with multifunctional hardware and data acquisition system, 24 channel pressure sensors array and single or triaxial strain measurement sensor. During operation of the wind tunnel it is possible to change the air velocity in the test section.

During the operation the following measurements and observations are carried out:

- Control and measurement of air speed in the test section
- Pressure measurement in 24 channels
- Direct force measurement acting on the model in the test section
- Fan RPM speed measurement





Hands-on Works

- 1. Wind tunnel design and operation.
- 2. Investigating the properties of air.
- 3. Measuring wind speed in the test section using Bernoulli's principle.
- 4. Determining the dependence of wind speed on fan speed.
- 5. Measuring the longitudinal force affecting a geometric shape depending on wind speed.

6. Measuring the longitudinal force affecting a geometric shape depending on the shape's geometry.

- 7. Measuring the longitudinal force affecting an airfoil depending on angle of attack.
- 8. Pressure distribution on the surface of airfoil depending on angle of attack.
- 9. Calculating of Mach number.







