

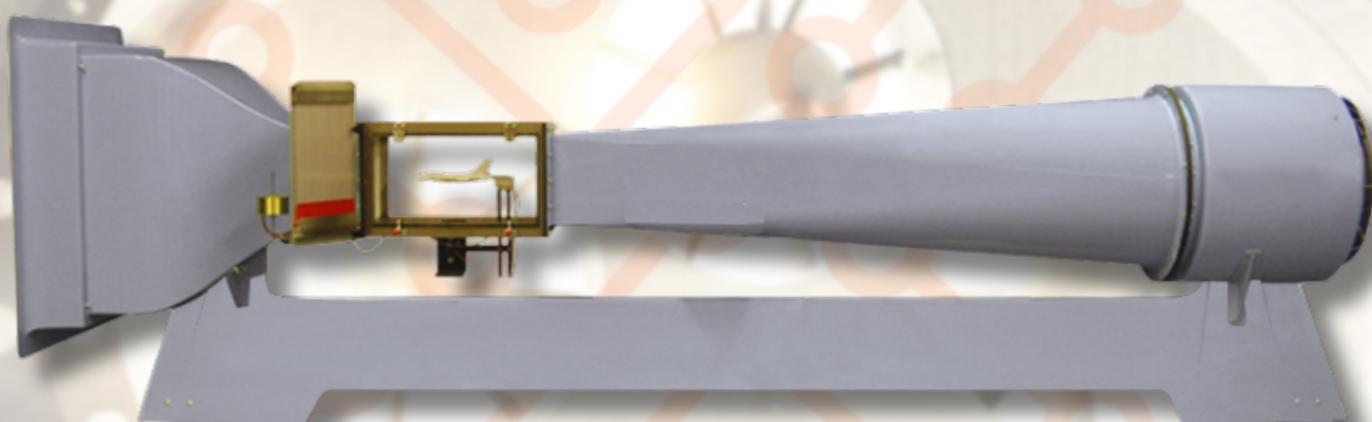


INSTRUMAX

AIX.810.M1

SUBSONIC WIND TUNNEL

(900mm x 900mm)



*Actual product appearance may differ from the image displayed

OVERVIEW

The **Instrumax Computer-Controlled Open-Circuit Subsonic Wind Tunnel** is a state-of-the-art platform designed for **aerodynamic research, hands-on experimentation, and educational demonstrations**. With a spacious **900 mm × 900 mm** test section, it provides ample working area for model testing, flow visualization, and detailed aerodynamic studies.

This advanced system enables **precise control of airflow** and facilitates **accurate measurements** across a wide range of practical Reynolds numbers, supporting both academic investigations and industrial development. The integrated **computer control system** ensures reliable operation, real-time data acquisition, and seamless experiment management—making it an essential tool for modern aerodynamic laboratories.

Engineered with **durability and precision** in mind, the wind tunnel features robust construction, **low-turbulence airflow**, and high-quality instrumentation for dependable, repeatable results. Its **modular design** allows easy integration of optional accessories such as **smoke generator, multi-component force balances, and pressure measurement panels**, enabling a wide variety of experimental setups. Combined with Instrumax's commitment to **innovation** and **educational excellence**, this wind tunnel provides students, researchers, and engineers with a powerful tool to **explore complex aerodynamic phenomena, validate computational models, and drive advances in both teaching and industrial applications**.

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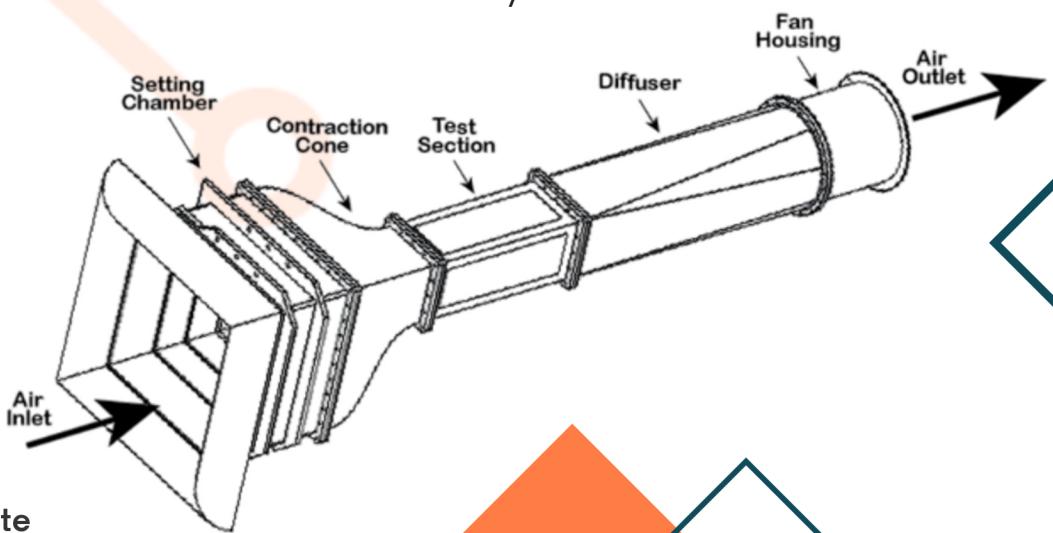


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KEY FEATURES

Key Features

- **Operates at meaningful Reynolds numbers** to support accurate, real-world aerodynamic studies across a wide range of flow conditions.
- **Safe open-circuit suction airflow design**, ensuring smooth, low-turbulence airflow for reliable and repeatable results.
- **Precision-controlled airflow management** delivers stable, consistent velocities to meet the most demanding experimental requirements.
- **Six-component sting balance** enables comprehensive measurement of forces and moments for detailed model performance evaluation.
- **Model angle feedback display** provides precise, real-time angular positioning information to enhance test accuracy.
- **Multi channel pressure measurement capability** allows thorough pressure distribution analysis across models and flow fields.
- **Integrated Pitot tube** for real-time velocity measurement and dynamic pressure monitoring.
- **Compatible with projector and electronic whiteboard systems**, ideal for instructional use and group demonstrations.
- **Wi-Fi-enabled control interface** allows the wind tunnel to be operated remotely via wireless devices for added flexibility.
- **Stand-alone instrumentation and control console** for ergonomic operation and convenient access to all system controls.



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SPECIFICATIONS

Working Section

The wind tunnel features a **square cross-section measuring 900 mm x 900 mm**, providing ample space for diverse aerodynamic studies.

- **Transparent side panel**, hinged and removable for easy access and clear flow visualization
- **Robust metal support frame** ensuring stability and precision alignment
- **Integrated model holders** for secure and accurate placement of test models
- **Embedded Pitot tube** for velocity measurement and airflow characterization
- **Wake analysis assembly** enabling detailed investigation of downstream flow patterns

Instrumentation

The system is equipped with comprehensive instrumentation designed for precise data capture and analysis:

- **Computer-controlled data acquisition system** with user-friendly, intuitive software for real-time monitoring and recording
- **Inclined multi-tube manometer panel** for accurate static and dynamic pressure measurements
- **Model positioning system** for fine adjustment and repeatable model alignment
- **NACA profile** for airfoil testing and lift/drag studies
- **Cylinder resistance model** for fundamental aerodynamic experiments
- **Drag sphere model** complete with force measurement assembly
- **Smoke generator** for clear and effective airflow visualization

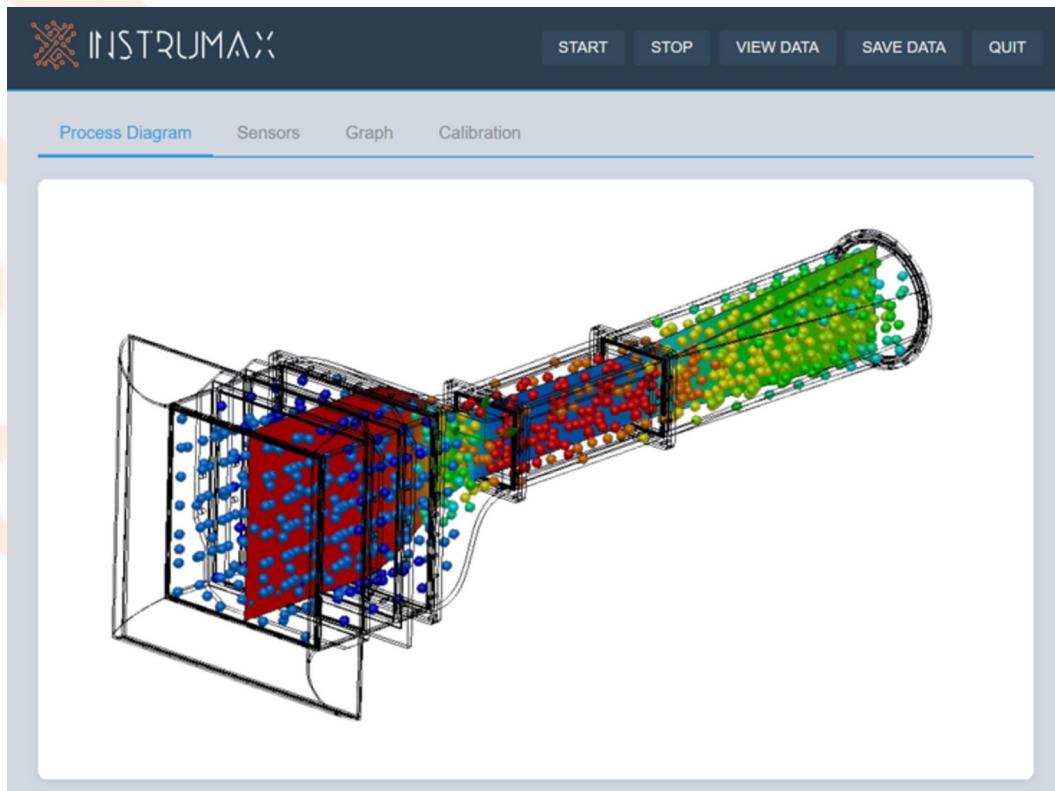


SOFTWARE & DAQ

Data Acquisition System

The wind tunnel is equipped with a **computer-controlled data acquisition system** designed for precise, real-time data capture, monitoring, and visualization.

- **Real-time data acquisition** ensures accurate and immediate measurement of key parameters during experiments.
- Supports both **automated and manual recording modes** for flexible operation tailored to user preferences.
- Provides **digital and analog real-time displays** for comprehensive, on-the-spot data interpretation.
- Includes **powerful data export and analysis tools** for seamless post-experiment processing and reporting.



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SOFTWARE & DAQ

Software Features

The integrated software suite combines advanced capabilities with ease of use to enhance experimental workflow:

- **Real-time data capture and display** for instant observation and analysis of sensor outputs.
- **Graphing tools** for dynamic plotting of multiple data sets, featuring customizable axes for detailed visual interpretation.
- **User-friendly graphical interface (GUI)** designed for intuitive navigation and efficient operation.
- **Data logging and export functions** enabling reliable storage of results with export options in CSV and Excel formats.
- **Optional IoT integration**, offering cloud-based connectivity for remote monitoring, visualization, and extended data analysis.
- **Customizable data presentations** (optional), allowing tailored reports that suit specific research and instructional needs.



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ACCESSORIES

Standard Supplied Accessories

The wind tunnel comes complete with a comprehensive set of models and instrumentation, enabling a wide range of aerodynamic experiments right out of the box:

- **Sphere drag model** for fundamental studies of drag coefficient, flow separation, and wake formation.
- **Hemisphere drag model** for analysis of asymmetric flow patterns, separation behavior, and pressure distribution around hemispherical bodies.
- **Circular plate drag model** used for flat plate drag analysis, aiding in understanding boundary layer development and form drag.
- **Square plate drag model** designed for experiments involving bluff body aerodynamics and angular flow separation characteristics.
- **Cylinder drag model** essential for studies of vortex shedding, wake dynamics, and base pressure effects in cylindrical geometries.
- **Streamlined body model** represents an aerodynamic shape with reduced form drag, enabling comparison with bluff body models.
- **Dimpled sphere drag model** supplied to demonstrate the impact of surface texturing on drag and flow separation, similar to golf ball aerodynamics.
- **Pitot tube** integrated for accurate measurement of static and dynamic pressures, supporting velocity and flow calculations.
- **Inclined manometric tube panel**, a multi-tube manometer panel for detailed static and dynamic pressure measurements at multiple points in the flow field.



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ACCESSORIES

Optional Accessories

A wide range of optional accessories is available to extend the experimental capabilities of the wind tunnel. These accessories support advanced studies and customized research applications:

- **Wake survey assembly** for detailed wake flow investigations and downstream flow analysis
- **Internal sting balance** for precise force and moment measurement within the test section
- **External pyramidal balance** for external force and moment measurement on various models
- **Wing models**, including **NACA series profiles** (customized as per user requirements) for airfoil studies
- **Automotive models**, such as **car and lorry models**, for ground vehicle aerodynamic testing
- **Aircraft and jet models** for fixed-wing and jet flow investigations
- **Boundary layer measurement accessory** for profiling velocity gradients near surfaces
- **Smoke generator** provides clear and effective visualization of airflow patterns, boundary layers, and wake structures.

Note: Optional accessories are provided separately upon request to suit specific experimental requirements.



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APPLICATIONS

Experimental Applications

The wind tunnel supports a wide range of aerodynamic investigations and educational demonstrations, enabling both fundamental and advanced studies:

- **Flow analysis around bluff and streamlined bodies:** Investigate flow separation, wake formation, and drag characteristics of various shapes.
- **Boundary layer and wake studies:** Analyze velocity profiles, boundary layer development, and wake dynamics behind test models.
- **Pressure distribution on cylinders and aerofoils:** Measure and map surface pressure patterns to understand aerodynamic loading and flow behavior.
- **Lift, drag, and moment measurements and analyses:** Perform detailed force and moment analysis on models to evaluate aerodynamic performance.
- **Comprehensive flow visualization and instructional demonstrations:** Visualize airflow patterns, vortices, and separation points for research and teaching purposes.

Additional Information:

The Instrumax wind tunnel has been engineered to enhance teaching and research effectiveness. Its computer-controlled open-circuit suction design guarantees user safety, precision, and operational convenience. Comprehensive instrumentation, coupled with robust software solutions, facilitates accurate data acquisition and efficient analysis, making this system ideal for both detailed research projects and interactive educational demonstrations. Modular design ensures easy maintenance and system upgrades, supporting long-term operational success.

Package includes a comprehensive user manual for streamlined setup and effective operation.



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INSTRUMAX



44 Danaher Dr, South Morang VIC 3752, Australia

+61 435 148 069

instrumax@instrumax.com.au

www.instrumax.com.au



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