

**HM 170**

**EDUCATIONAL WIND TUNNEL**



- **Open wind tunnel for experiments in aerodynamics and fluid mechanics**
- **Homogeneous flow through flow rectifier and specially shaped nozzle**
- **measurement section visible on all sides**
- **Smooth inner surface**



**Technical description**

The educational wind tunnel HM 170 is a so-called "Eiffel type" of open subsonic wind tunnel. With this type of tunnel the air is taken from the atmosphere and returned to the atmosphere. A carefully designed nozzle shape guarantees the constant distribution of velocity within the closed measurement section. Velocities of around 100km/h are reached. A flow rectifier at the inlet ensures a low degree of turbulence. The wind tunnel consists of the following components: inlet hopper with flow rectifier, nozzle, measurement section, diffuser and fan. The nozzle, inlet hopper and the measurement section are mounted on a guide rail and can be moved in order to access the measurement section. An axial fan with guide wheel is used which is characterised by its low noise level and high efficiency. The fan is mounted on rubber elements to minimise vibration during operation. It is driven by a speed-controlled motor with frequency converter. The fan is connected permanently with the

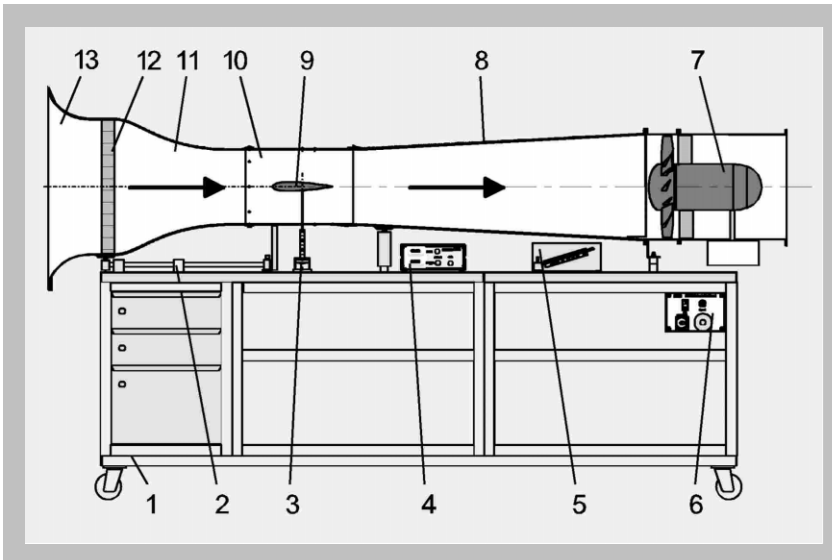
diffuser. An electronic 2-component force transducer permits the measurement of resistance and buoyant forces at various objects. The measured values are displayed on a measuring amplifier. It is also possible to process the data via PC-data acquisition (available as an accessory). A slanted tube manometer is used to display the current air velocity at the inlet into the measurement section.

**Experiments**

The extensive range of accessories permit a number of experiments:

- **Methods of measuring velocity and pressure**
- **Determination of drag coefficients of various objects**
- **Measurement of lift and resistance on various wing sections**
- **Examination of aerodynamic lifting aids such as slats or flaps**
- **Examination of pressure distribution on flushed objects**
- **Examination of boundary layers**

## HM 170 EDUCATIONAL WIND TUNNEL



1 laboratory trolley, 2 guide rail for adjustable nozzle, 3 electronic force transducer, 4 measuring amplifier for force transducer, 5 slanted tube manometer, 6 switch box, 7 axial fan, 8 diffuser, 9 measurement object, 10 measurement section, 11 nozzle, 12 flow rectifier, 13 inlet hopper

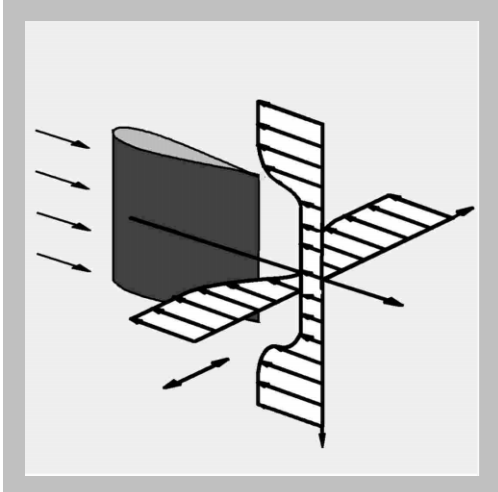


Illustration: Determination of resistance by measuring the pulse drop in the wake of the wing

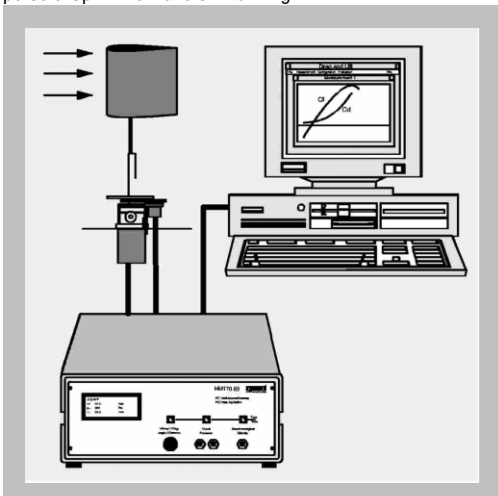


Illustration: Experiment layout with PC-data acquisition, lift and resistance via setting angle

### Specification

- [1] Open wind tunnel on mobile carriage
- [2] Experimental set-up l<sub>x</sub>w<sub>x</sub>h  
2890x860x1670mm, 250kg
- [3] 450mm Plexiglas measurement section,  
cross-section of flow 292x292mm
- [4] Inlet hopper, nozzle and diffuser made of FRP
- [5] Speed-controlled fan motor with frequency  
converter
- [6] Electron. 2-components force transducer  
with measuring amplifier and digital display
- [7] Flow rectifier

### Technical data

- measurement section
- Cross-section w<sub>x</sub>h: 292x292mm
- Length: 450mm
- Max. wind velocity: 28m/s
- Fan
- Pressure difference: 500Pa
- Max. volumetric flow: 9000m<sup>3</sup>/h
- Motor output: 2.25kW
- Max. rotational speed: 2850rpm
- 2-component force transducer
- Measuring range: 0...5N and 0...10N
- Slanted tube manometer
- 0...500Pa

### Dimensions and weight

- l<sub>x</sub>w<sub>x</sub>h : 2890 x 860 x 1670 mm
- Weight : approx. 250 kg

### Connections

- 230V, ~50Hz

### Scope of delivery

- 1 wind tunnel, complete with fan and motor,
- 1 force transducer, 1 measuring amplifier,
- 1 slanted tube manometer, 1 instruction manual

### Order details

070.1700 HM 170 Educational Wind Tunnel

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### Available Accessories

Product no.	Ordertext
070.17001	HM 170.01 Drag Model "Sphere"
070.17002	HM 170.02 Drag Model "Hemisphere"
070.17003	HM 170.03 Drag Model "Circular Disc"
070.17004	HM 170.04 Drag Model "Circular Ring"
070.17005	HM 170.05 Drag Model "Square Plate"
070.17006	HM 170.06 Drag Model "Vane"
070.17007	HM 170.07 Drag Model "Cylinder"
070.17008	HM 170.08 Drag Model "Streamlined Shape"
070.17009	HM 170.09 Drag Model "Aero Foil"
070.17020	HM 170.20 Flutter Wing Model
070.17021	HM 170.21 Aero Foil with Flap and Slot
070.17022	HM 170.22 Pressure Wing
070.17023	HM 170.23 Pressure Cylinder
070.17024	HM 170.24 Boundary Layer Plate with Probe
070.17025	HM 170.25 Bernoulli's Equation
070.17031	HM 170.31 Pitot-Probe
070.17032	HM 170.32 Small Pitot-Probe
070.17033	HM 170.33 Prandtl-Probe
070.17034	HM 170.34 Static Pressure Probe
070.17050	HM 170.50 Multi-Tube Manometer Panel / 600 mm
070.17051	HM 170.51 Multi Tube Manometer 16-fold, 1500 mm
070.17052	HM 170.52 Fog Generator