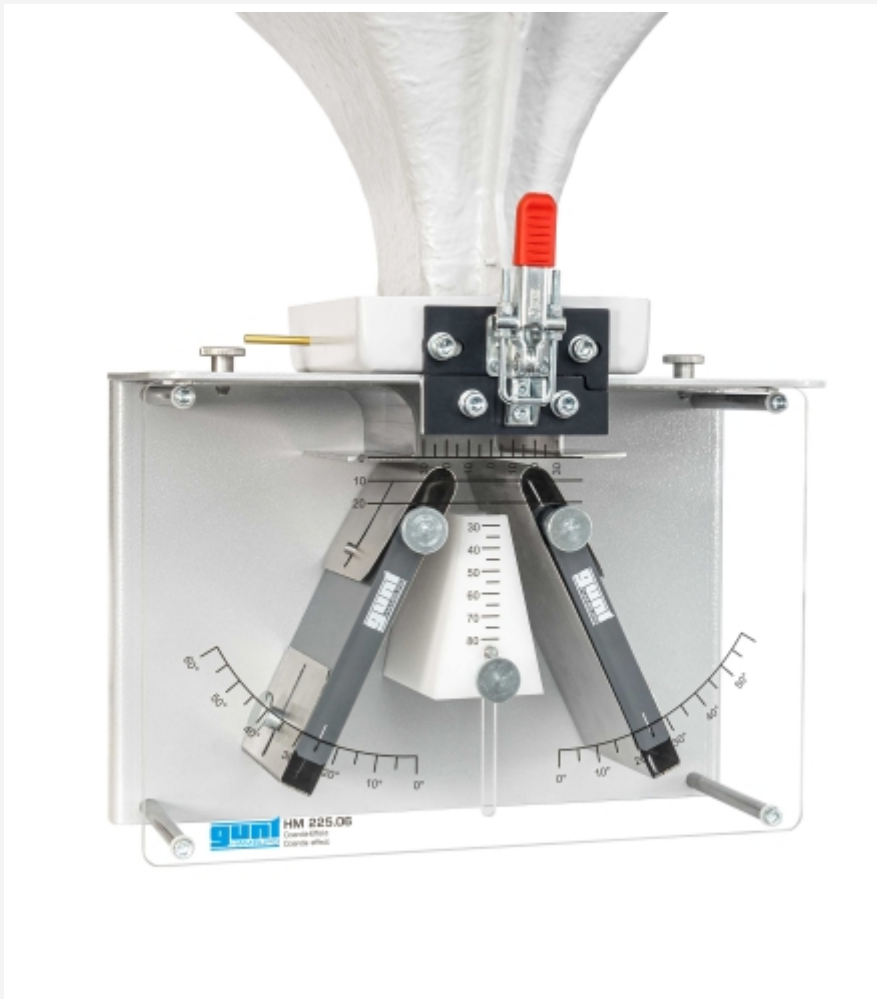


HM 225.06

Coanda effect



Learning objectives/experiments

- investigation of wall-guided air flow (Coanda effect)
- familiarisation with the principle of pneumatic logic elements
- study amplification effect in pneumatic elements

Description

- **demonstration of the Coanda effect at a pneumatic logic element**
- **accessories for aerodynamics trainer HM 225**

The Coanda effect refers to the characteristic of flowing fluids to follow the curvature of a convex surface instead of continuing in the original direction of flow. Nowadays this effect is applied in various fields of engineering, e.g. to increase lift in air travel, to control the air flow in air conditioning or as a pneumatic logic element in industrial control systems.

Pneumatic logic elements have the advantage that they do not wear out, they work reliably and are resistant to heat, ionising radiation and vibration.

The direction of flow in pneumatic logic elements is switched with a turbulent free jet (control jet), which for example, emerges from a nozzle and entrains the fluid from the environment (boundary layer). Since the control jet is usually weaker than the jet to be deflected, we refer to the amplification effect.

The HM 225.06 experimental unit – used in the aerodynamics trainer HM 225 – allows the demonstration of the Coanda effect on a pneumatic logic element.

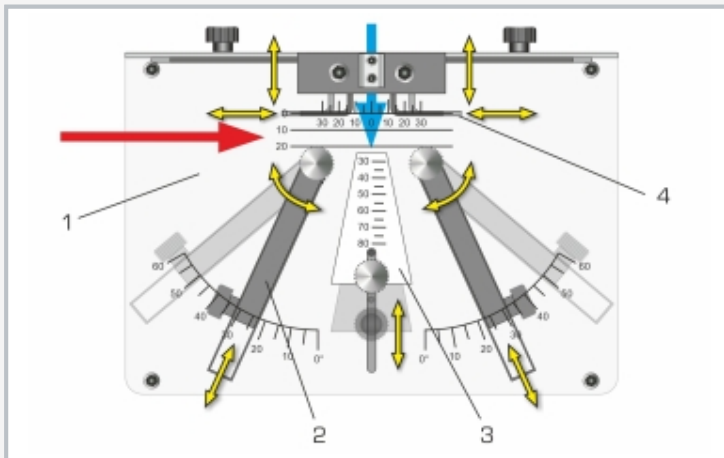
The air flows through a Y-shaped channel with two outlets. The lateral inflow of air into the channel (control jet) can switch the air flow between the two outlets.

The contour of the channel is varied via pivoting and adjustable elements, so as to study how the switchover works. Scales allow precise adjustment of the elements.

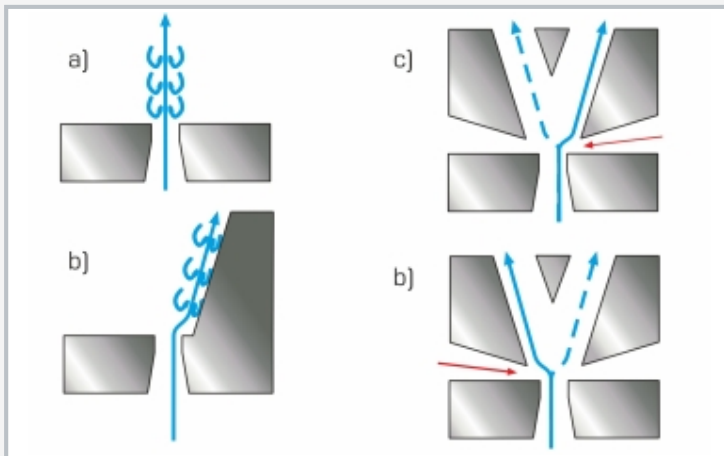
The experimental unit is attached to the HM 225 trainer, simply and precisely with quick release fasteners.

HM 225.06

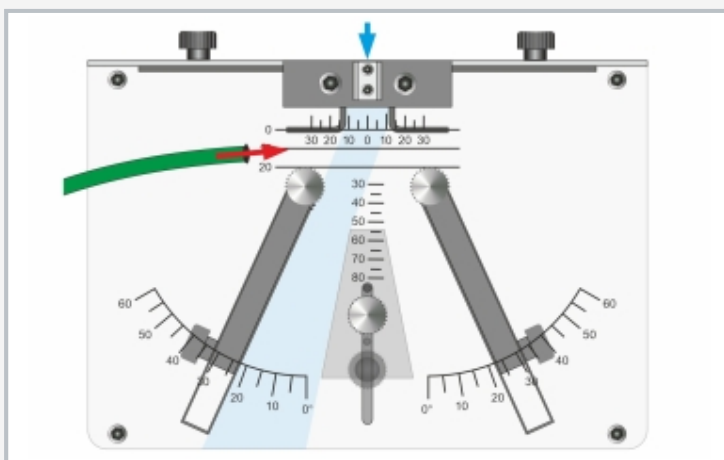
Coanda effect



1 transparent plate with different scales, 2 guide plates pivoting and adjustable in length, 3 wedge with vertically adjustable position, 4 nozzle plates adjustable horizontally/vertically, blue arrow: air intake, red arrow: control jet



Controlled guidance of air flow in wall elements
a: freely escaping jet of air
b: guidance of the air flow on a wall
c, d: flow direction is switched to another direction with a turbulent free jet (control jet)
blue: air flow, red: control jet



Generate control jet

Specification

- [1] demonstration of the Coanda effect in pneumatic logic elements
- [2] accessories for HM 225 Aerodynamics Trainer
- [3] transparent plate with vertical, horizontal and radial scales
- [4] Y-channel for adjusting different contours with 2 nozzle plates adjustable horizontally/vertically, 2 guide plates pivoting and adjustable in length, 1 wedge with vertically adjustable position
- [5] flow direction is switched with a turbulent free jet [control jet]
- [6] adjustable contours for varying the air flow

Technical data

Adjustable elements

- 2 nozzle plates
 - ▶ horizontal: 0..60mm
 - ▶ vertical: 0..20mm
- 2 guide plates
 - ▶ pivoting: 0..60°
 - ▶ adjustable length
- 1 wedge, vertical position: 0..50mm

LxWxH: 300x230x230mm

Weight: approx. 6kg

Scope of delivery

- 1 experimental unit
- 1 set of instructional material

HM 225.06

Coanda effect

Required accessories

070.22500 HM 225 Aerodynamics trainer