

HM 240.04

Pressure distribution on a cylinder



Description

- **pressure distribution on the cylinder in transverse incident flow**
- **record pressure distribution in the wake of the cylinder in conjunction with HM 240.03**
- **demonstrate flow separation and wake depression**
- **accessory for HM 240**

In order to examine the pressure distribution at bodies under incident flow, simple models such as semi-spherical shells, streamlined bodies or cylinders are used in fundamental experiments. Incident flow of 'blunt' models may lead to flow separation.

Used in conjunction with HM 240, the HM 240.04 accessory makes it possible to record the pressure distribution around a cylinder under transverse incident flow. The cylinder is attached inside the intake pipe of HM 240. The cylinder is fitted with a radial hole for pressure measurement and can be rotated around its axis. This means the pressure on the cylinder can be measured depending on the angle adjustment. The angle adjustment is detected electronically. The measured values are analysed using the HM 240 software.

In addition, a total pressure sensor (HM 240.03) that can be moved transverse to the direction of flow makes it possible to record the velocity profile downstream of the cylinder and thus to measure the wake.

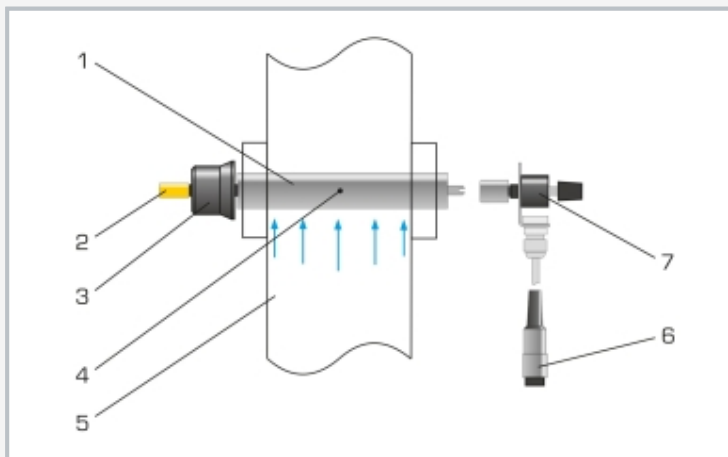
HM 240.04 is part of a series that allows experiments on the principles of incompressible air flow. The software for data acquisition and visualisation makes the experiments especially clear and enables fast execution of experiments with reliable results.

Learning objectives/experiments

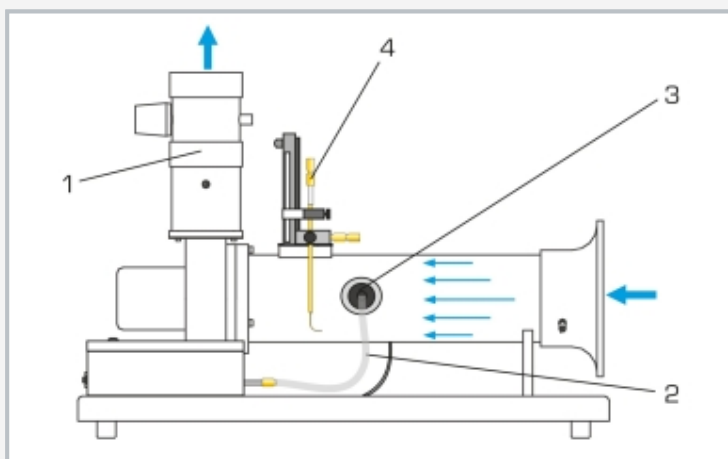
- in conjunction with HM 240
 - ▶ measurement of the pressure distribution around a cylinder subject to transverse incident flow
- in conjunction with total pressure sensor HM 240.03
 - ▶ measurement of the total pressure in the wake of a cylinder
 - ▶ determine drag coefficient from the pressure distribution in the wake of a cylinder
 - ▶ demonstrate wake depression

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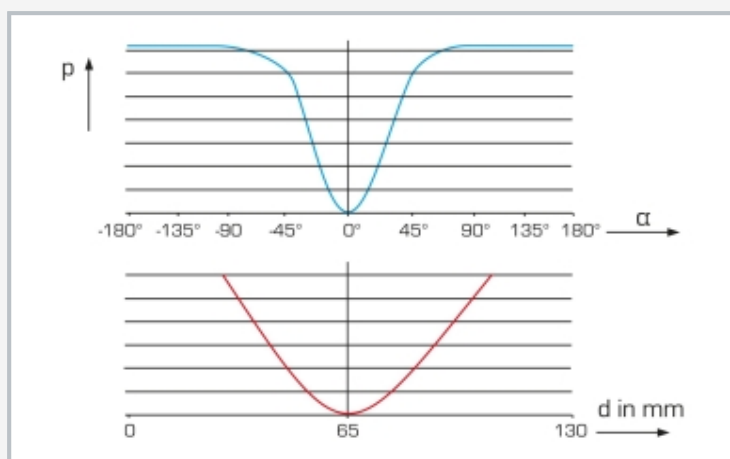
Pressure distribution on a cylinder



1 rotatable cylinder, 2 measuring point for pressure, 3 angle adjustment with scale, 4 measuring point for pressure, 5 HM 240, 6 connection to HM 240, 7 potentiometer



Experimental setup with HM 240 and HM 240.03
1 HM 240, 2 connection to HM 240, 3 HM 240.04, 4 total pressure sensor HM 240.03



blue: pressure distribution on the cylinder in transverse flow, red: wake depression downstream of the cylinder under flow, recorded using the total pressure sensor HM 240.03;
p pressure, α angle adjustment, d pipe diameter

Specification

- [1] pressure distribution around a cylinder subject to transverse incident flow
- [2] accessory for HM 240
- [3] cylinder with radial hole for pressure measurement
- [4] rotatable cylinder for pressure measurement at any angle adjustment
- [5] scale for angle adjustment
- [6] electronic detection of the angle
- [7] in conjunction with total pressure sensor HM 240.03 measurement of the total pressure in the wake of a cylinder
- [8] display and analysis of the measured values using the software in HM 240

Technical data

Cylinder

- outer diameter: 25mm
- inner diameter: 21mm

LxWxH: 280x85x42mm

Weight: approx. 1kg

Scope of delivery

- 1 cylinder
- 1 set of instructional material

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Pressure distribution on a cylinder

Required accessories

HM 240

Principles of air flow