

HM 282

Experiments with an axial fan



Description

- illustrative model of an axial fan
- transparent delivery pipe and intake pipe
- GUNT software for data acquisition, visualisation and operation
- part of the GUNT-Labline fluid energy machines

Axial fans are used to transport gases. The medium to be transported is drawn in axially to the drive shaft of the axial fan by the rotation of the rotor. The medium flows through the rotor and is discharged axially behind the rotor.

The experimental unit provides the basic experiments to get to know the operating behaviour and the important characteristic variables of axial fans.

HM 282 features an axial fan with variable speed via an integrated controller, an intake pipe and a delivery pipe. The transparent intake and delivery pipes are fitted with guide plates for flow guidance.

A flow straightener in the intake pipe serves to calm the air. This enables precise measurements even with heavily reduced operation. The air flow is adjusted by a throttle valve at the end of the delivery pipe.

The experimental unit is fitted with sensors for pressure and temperature. The flow rate is determined via differential pressure measurement on the intake nozzle. The microprocessor-based measuring technique is well protected in the housing. The measured values are transmitted directly to a PC via USB where they can be analysed using the software included.

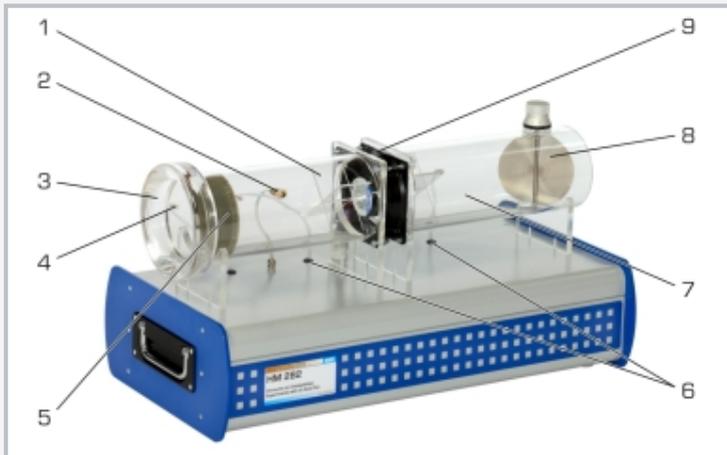
All the advantages of software-supported experiments with operation and evaluation are offered by the GUNT software and the microprocessor.

Learning objectives/experiments

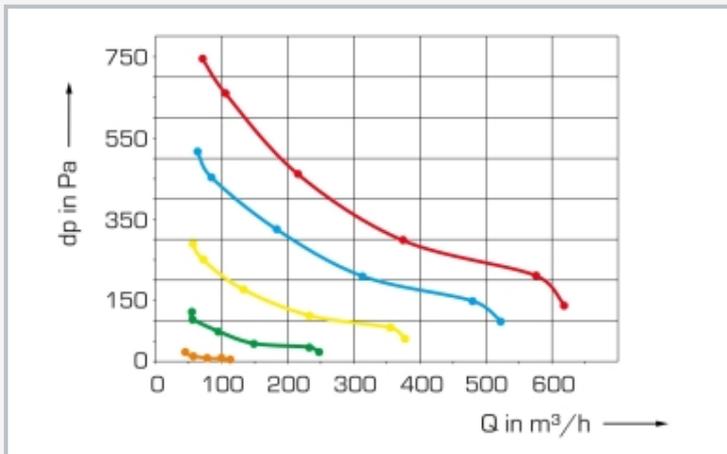
- operating behaviour and characteristic variables of an axial fan
- recording the fan characteristic (differential pressure as a function of the flow rate)
- effect of the rotor speed on the pressure
- effect of the rotor speed on the flow rate
- stall
- determination of hydraulic power output and efficiencies

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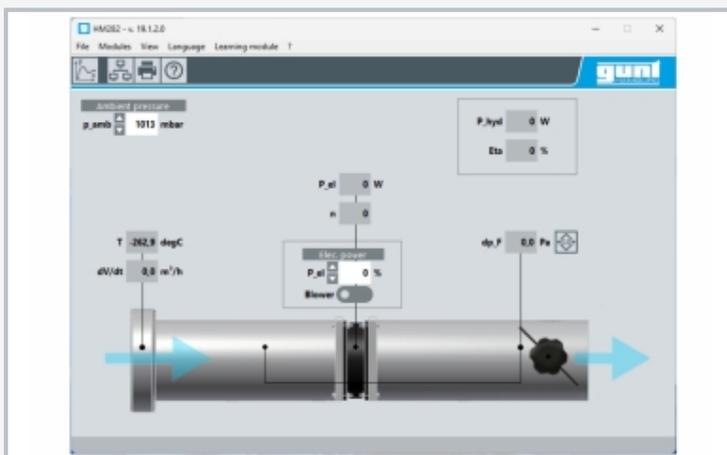
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1 guide plates for flow guidance, 2 measuring point for temperature, 3 intake nozzle at intake pipe, 4 measuring point for pressure (to determine the flow rate), 5 flow straightener, 6 measuring points for pressure, 7 delivery pipe, 8 throttle valve, 9 axial fan



Characteristic curves for an axial fan: differential pressure dependent on the flow rate at different speeds; pd differential pressure, Q flow rate



Operating interface of the powerful software

Specification

- [1] functioning and operating behaviour of an axial fan
- [2] axial fan with electronically commutated drive motor
- [3] variable speed via integrated controller
- [4] transparent intake and delivery pipes
- [5] throttle valve to adjust the air flow in the delivery pipe
- [6] determination of flow rate via intake nozzle
- [7] display of differential pressure, flow rate, speed, electrical power consumption and hydraulical power output, temperature and efficiency
- [8] due to integrated microprocessor-based instrumentation no additional devices with error-prone wiring are required
- [9] display and evaluation of the measured values as well as operation of the unit via software
- [10] GUNT software with control functions and data acquisition via USB under Windows 10

Technical data

Intake pipe

- inner diameter: 110mm
- length: 275mm

Delivery pipe

- inner diameter: 110mm
- length: 310mm

Axial fan

- power consumption: 90W
- nominal speed: 9500min⁻¹
- max. volumetric flow rate: approx. 600m³/h
- max. pressure difference: approx. 700Pa

Measuring ranges

- differential pressure: 0...1800Pa
- flow rate: 0...1000m³/h
- temperature: 0...100°C
- speed: 0...9999min⁻¹
- power consumption: 0...500W

230V, 50Hz, 1 phase
 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase
 UL/CSA optional
 LxWxH: 670x340x370mm
 Weight: approx. 15kg

Required for operation

PC with Windows

Scope of delivery

- 1 experimental unit
- 1 GUNT software + USB cable
- 1 set of instructional material

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Optional accessories

WP 300.09 Laboratory trolley