

HM 215 Two-stage axial fan

Axial fans are often used in practice in building services engineering for air conditioning and ventilation systems. In order to increase the supply pressure axial fans can be connected in series. In this case they are known as two-stage fans.

With HM 215 GUNT offers experiments on a two-stage axial fan. In addition, the trainer allows the investigation of a fan in stand-alone operation. Theory and practice can be compared in a simple way.

The device is equipped with sensors for temperature and differential pressure. The flow rate is determined by differential pressure in the inlet nozzle.

Learning objectives

- determining the fan characteristic
- stand-alone or series configuration of axial fans
- determining the energy balance
- determining the pressure and velocity distribution on rotor and guide vane by means of a probe
- effect of rotating blade position



Measuring device with 3-hole probe for determining the differential pressure on rotor and guide vane



A carefully designed nozzle contour and a flow straightener at the air inlet ensure turbulence-free flow of the blades



The experimental unit is equipped with two high-power axial fans



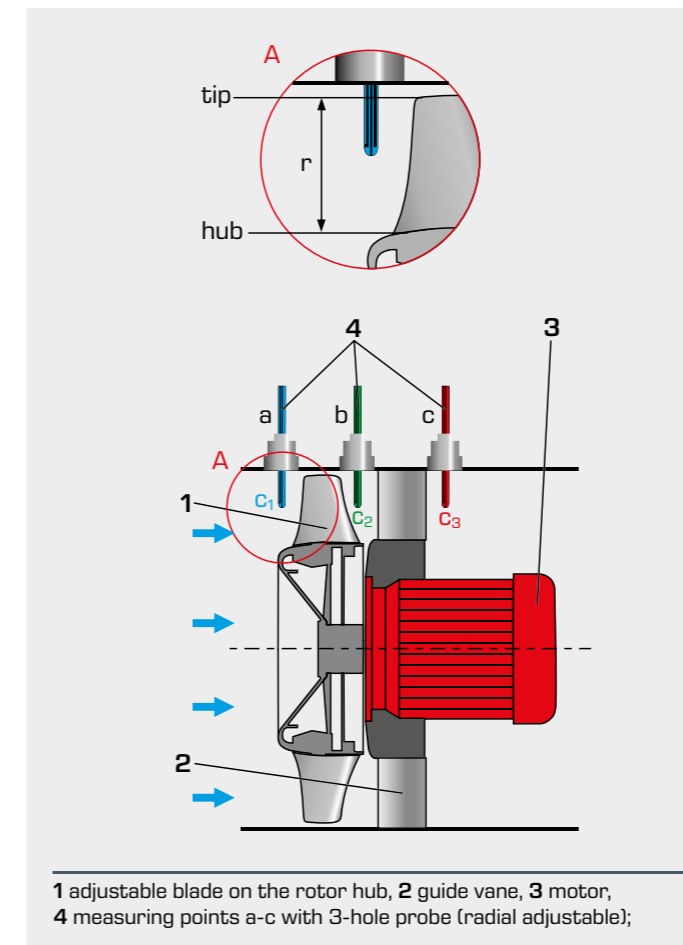
Throttle valve at the end of the measuring section for adjusting the volumetric flow rate



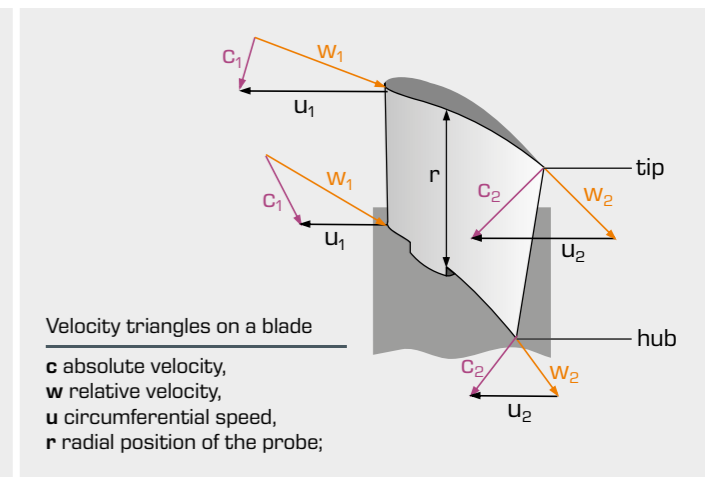
Adjustable blade on the rotor hub

The angle of attack and exit angle, as well as the pressure of the air can be measured with an adjustable measuring probe along the blade radius. Adjusting the blades alters the angle of

attack. The GUNT software simplifies measurements with the measuring device and enables the processing and visualisation of measured data.

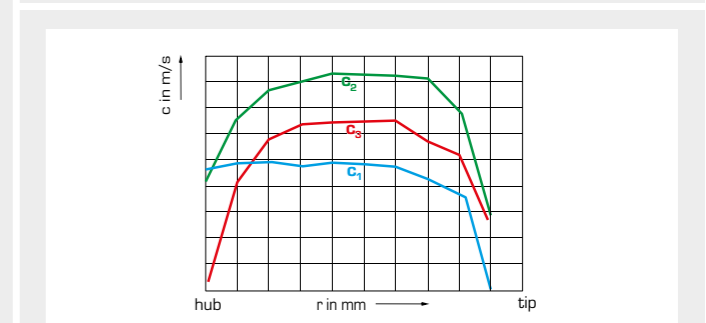


1 adjustable blade on the rotor hub, 2 guide vane, 3 motor, 4 measuring points a-c with 3-hole probe (radial adjustable);



Velocity triangles on a blade

c absolute velocity,
w relative velocity,
u circumferential speed,
r radial position of the probe;



Velocity distribution

■ pos. a upstream of rotor, c_1 ,
■ pos. b downstream of rotor, c_2 ,
■ pos. c downstream of guide vane, c_3



Software

The GUNT software clearly displays the measurements on the PC and allows easy analysis of the measuring results. For example, the pressure curve in the measuring section can be clearly shown for different operating states.