



EXPERIMENTS WITH RADIAL FAN



INTRODUCTION

Radial fans are designed for the conveyance of gases under moderate pressure differentials. The working medium is drawn axially into the radial fan along the drive shaft and, due to the rotation of the impeller, is deflected by 90° and discharged in the radial direction.

The experimental unit enables fundamental investigations into the operating characteristics and key performance parameters of radial fans.

The system consists of a radial fan with speed control via a frequency converter, an intake duct, and a delivery duct. The transparent intake duct is equipped with guide vanes for controlled flow guidance as well as a flow straightener to stabilize the airflow.

This configuration allows accurate measurements even under significantly reduced operating conditions. Airflow regulation is achieved by means of a throttle valve located at the outlet of the delivery duct.

To illustrate the influence of different blade geometries, the unit is supplied with two interchangeable impellers: one with forward-curved blades and one with backward-curved blades. The impellers can be exchanged quickly and easily.



With this equipment, the following practical activities can be performed (these practices are intended to provide hands-on experience, allowing users to apply concepts in a practical environment and become familiar with the operation and capabilities of the equipment).

- Investigation of the operating principles and performance characteristics of a radial fan.
- Radial fan driven by a three-phase AC motor.
- Variable speed control via frequency converter.
- Transparent intake and delivery ducts.
- Throttle valve for airflow adjustment in the delivery duct.
- Interchangeable impellers:
 - 1 impeller with forward-curved blades.
 - 1 impeller with backward-curved blades.
- Flow rate determination.
- Measurement and display of differential pressure, flow rate, rotational speed, electrical power consumption, hydraulic power output, temperature, and efficiency.
- Integrated microprocessor-based instrumentation eliminates the need for external measuring devices and reduces wiring-related measurement error.

Technical Data

- **Intake duct:** Inner diameter: 90 mm, Length: 430 mm.
- **Delivery duct:** Inner diameter: 100 mm, Length: 530 mm.
- **Radial fan:**
 - Power consumption: 110 W.
 - Nominal speed: 2800 min⁻¹.
 - Maximum volumetric flow rate: 480 m³/h.
 - Maximum pressure difference: 300 Pa.
- **Measuring Ranges:**
 - Differential pressure: 0 ... 1800 Pa.
 - Flow rate: 0 ... 1000 m³/h.
 - Temperature: 0 ... 100 °C.
 - Rotational speed: 0 ... 3300 min⁻¹.
 - Electrical power consumption: 0 ... 250 W.

Power Supply

- Single-phase from the mains, 50/60 Hz.

Required for Operation

- PC with Windows operating system.