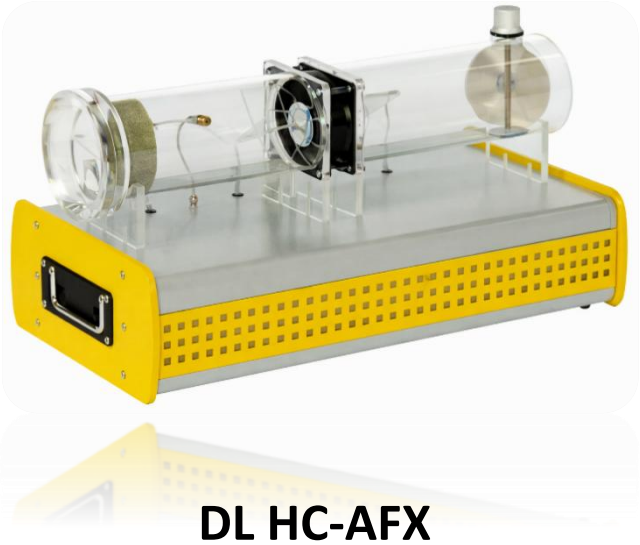
# EXPERIMENTS WITH AN AXIAL FAN



## DL HC-AFX

### INTRODUCTION

The medium to be conveyed is drawn axially into the axial fan by the rotation of the rotor. As the rotor rotates, the medium passes through the impeller and is discharged axially downstream of the rotor.

The experimental unit is designed to support fundamental experiments for the analysis of the operating behavior and the key characteristic parameters of axial fans.

The system consists of an axial fan with variable speed control via an integrated controller, an intake duct, and a delivery duct. The transparent intake and delivery ducts are equipped with a guide to ensure controlled flow guidance. A flow straightener installed in the intake duct reduces turbulence and stabilizes the airflow. The airflow rate is regulated by means of a throttle valve located at the end of the delivery duct.

With this equipment, the following practical activities can be performed (they 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 characteristics and performance behavior of an axial fan.
- Design Features.
- Axial fan with electronically commutated drive motor.
- Variable speed control via integrated electronic controller.
- Transparent intake and delivery ducts.
- Throttle valve for airflow adjustment in the delivery duct.
- 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, eliminating the need for external measuring devices and minimizing wiring-related errors.

# FLUID MECHANICS

**Technical Data**

- **Intake Duct:**
  Inner diameter: 110 mm, Length: 275 mm.
- **Delivery Duct:**
  Inner diameter: 110 mm, Length: 310 mm.
- **Axial Fan:**
  Power consumption: 90 W.
  Nominal speed: 9,500 $min^{-1}$.
  Maximum volumetric flow rate: approx. 600 $m^3/h$.
  Maximum pressure difference: approx. 700 Pa.
- **Measuring Ranges:**
  Differential pressure: 0 … 1,800 Pa.
  Flow rate: 0 … 1,000 $m^3/h$.
  Temperature: 0 … 100 °C.
  Rotational speed: 0 … 9,999 $min^{-1}$.
  Power consumption: 0 … 500 W.

**Power Supply**

- single-phase from the mains, 50/60 Hz,

**Required for Operation**

- PC with Windows operating system.