

Product Name :
Astra Scientific Free and Force Convection Apparatus

Product Code :
HeatMassLab0010



Description :

Astra Scientific Free and Force Convection Apparatus

Technical Specification :

The Offers basic experiments for targeted teaching on the topic of free and forced convection on various heating elements. At the heart of the experimental unit is a vertical air duct into which various heating elements are inserted. An axial fan is located on top of the air duct. The fan draws in ambient air and guides it through the air duct. The air flows past a heating element and absorbs heat. Four heating elements with different geometries are available to be selected. In order to investigate free convection, two of the four heating elements can be operated outside of the air duct. The heating elements are designed in such a way to release heat only at their surface. The compact design ensures rapid heating and a short time for experiments.

The experimental unit is equipped with temperature sensors at the inlet and outlet of the air duct. The air velocity is measured to determine the airflow rate. Heating power and flow rate are adjusted and displayed via the software.

The microprocessor-based instrumentation is well protected in the housing. The software consists of a software for system operation and for data acquisition and an educational software. is connected to the PC

via USB.

FEATURES:

- Free and forced convection
- Calculation of convective heat transfer at different geometries
 - o Flat plate
 - o Cylinder
 - o Tube bundle
- Experimental determination of the Nusselt number
- Calculation of typical characteristic variables of heat transfer
 - o Nusselt number
 - o Reynolds number
- Investigation of the relationship between flow formation and heat transfer during experiments
- Description of transient heating process
- Functions of the GUNTsoftware: educational software, data acquisition, system operation

SPECIFICATION:

- Air duct

Flow cross-section: 120x120mm

Height: approx. 0,6m

Heating elements, temperature limitation: 90°C

- Tube bundle

Number of tubes: 23

One tube in variable position is heated

Heating power: 20W

Heat transfer area: 0,001m²

- Cylinder with an even temperature at the surface

Heating power: 20W

Heat transfer area: 0,0112m²

- Plate

Heating power: 40W

Heat transfer area: 2x 0,01m²

- Cylinder with heating foil to investigate the local heat transfer

Heating power: 40W

Heat transfer area: 0,0112m²

- Axial fan

Max. Flow rate: 500m³/h

Max. Pressure difference: approx. 950Pa

Power consumption: 90W

- Measuring ranges

Air velocity: 0...10m/s

Temperature: 4x 0...325°C

Heating power: 0...50W

- Required for Operation

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase



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