Tubular heat exchangers are often used for heating or cooling gaseous media, such as air coolers for internal combustion engines. Hot water flows in the tubes, which are surrounded by a flowing gaseous medium, e.g. cold air. The hot medium emits some of its thermal energy to the cold medium.

The tubes are fitted with fins in order to increase the heat transfer surface and thus improve the convective heat transfer.

Tesca Finned Tube Heat Exchanger is used for quantitative investigations on a finned-tube heat exchanger using the media hot water and cold air. The core element of the trainer is an air duct with fan, in which a finned-tube heat exchanger is installed.

A streamlined inlet element and a flow straightener in the air duct provide a homogeneous flow for carrying out the experiment. The volumetric flow rate is adjusted via a throttle valve at the fan outlet and measured by a measuring nozzle at the inlet into the fan.

The trainer has a closed hot water circuit consisting of: water tank with heater, pump, adjustable flow rate, electromagnetic flow rate sensor and finned-tube heat exchanger. The flow rate can be adjusted via a valve.

Energy balances can be established by measuring the inlet and outlet temperatures and the flow rates. In addition, a pressure sensor in the water circuit makes it possible to plot a pump characteristic. Optionally measured values are read from digital displays and can be transmitted simultaneously via USB directly to a PC, where they can be analyzed using the software included.

Specifications

- Finned-tube heat exchanger to study convective heat transfer between water and air
- Function of the heat exchanger as an air heater or water cooler
- Closed hot water circuit with electric heater, thermostat, water tank and pump
- Adjustable water and air flow
- Determination of the air volumetric flow rate by differential pressure at measuring nozzle
- Digital display of temperatures, flow rates and pressure
- Optional software for data acquisition via USB

Technical Specifications

- ▪ Finned-tube heat exchanger
  - Material: Cu/Al
  - Average transfer surface: 2,80m2 (air side)
  - Output: 2kW
  - Water temperature: 70°C
- Pump
  - Power consumption: 470W
  - Max. flow rate: 4,2m3/h
  - Max. head: 20,5m
- Fan
  - Power consumption: 0,25kW
  - Max. flow rate: 13m3/min
  - Max. pressure difference: 430Pa
  - Water tank: 28L
  - Heater: 2kW
  - Thermostat: max. 80°C
- Measuring ranges
  - Temperature: 4x 0...100°C
  - Flow rate: water 0...6m3/h
  - Pressure: water 0...4bar abs.
  - Mass flow rate: air 0...250g/s

Service Required

- 220V/230V/240V.A.C. stabilized supply with proper earth termination.
- Floor space - 1 m X 1.5m at working height.
- Water supply at the rate of 2 LPM at constant head.

Note: Specifications are subject to change.

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