

WL 900

Heat conduction trainer



Learning objectives/experiments

- steady-state heat conduction
- non-steady-state heat conduction
- temperature-time curves
- determination of the thermal conductivity k
- thermal conductivities k of different metals (steel, copper, aluminium, brass)

Description

- non-steady-state heat conduction in metals
- 12 temperature measuring points
- data acquisition
- heat source with temperature control

This unit is used to investigate steady-state and non-steady-state heat conduction processes. An interchangeable cylindrical specimen is fitted between a heat source and a heat sink. The specimen is prefitted with twelve thermocouples distributed along its length. The electrical heat source is controlled electronically. The heat sink is water-cooled.

The temperatures of the heat source, cooling water and specimen are indicated. There are also displays for heating power and cooling water flow rate. The thermal conductivity can be calculated using the measured data. In addition, it is possible to transfer the measured data to a computer via USB and display the data on the computer. The software is included.

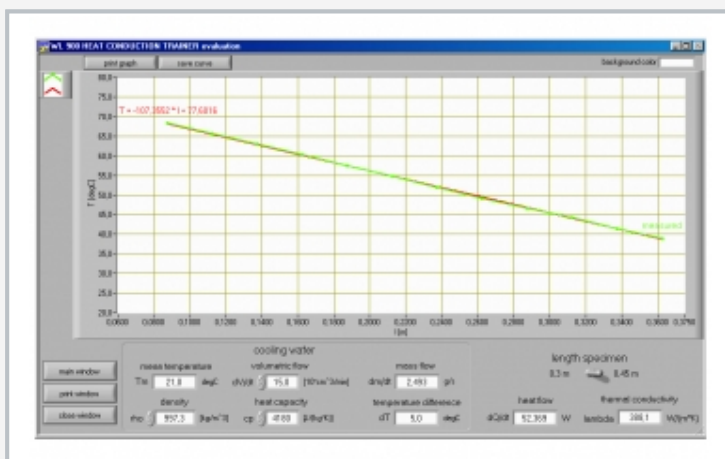
A temperature step can be generated by adjusting the flow of cooling water. With the aid of the PC the non-steady-state temperature distribution in the specimen can be displayed against position and time.

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Heat conduction trainer



1 raised tank for constant initial pressure, 2 heat source, heater, 3 specimen, 4 water-cooled heat sink, 5 switch cabinet with controller and displays



Software screenshot: temperature distribution in Cu

Specification

- [1] trainer to determinate the steady state and non-steady state thermal conductivities λ
- [2] water-filled heat source and heat sink
- [3] raised tank with overflow to generate a constant initial pressure
- [4] temperature and flow rate measurement for cooling water
- [5] electric heater with PID controller
- [6] digital displays: heating power, temperatures
- [7] GUNT software for data acquisition via USB under Windows 7, 8.1, 10

Technical data

Heater

- power: 800W
- temperature: 20...80°C

Specimen

- Cu, Al, brass; Dxl: 40x450mm
- steel, Dxl: 40x300mm
- VA, Dxl: 40x300mm

Heating tank: 5L

Cooling tank: 0.5L

Raised tank: approx. 6L

14 temperature sensors

- 12x along the specimen
- 2x in cooling water circuit

Measuring ranges

- temperature: 14x 0...100°C
- power: 0...1000W
- flow rate: 0,01...1L/min

230V, 50Hz, 1 phase

230V, 60Hz, 1 phase

120V, 60Hz, 1 phase

UL/CSA optional

LxWxH: 1240x800x1670mm

Weight: approx. 150kg

Required for operation

water connection, drain

PC with Windows recommended

Scope of delivery

- 1 trainer
- 5 specimens
- 1 set of accessories
- 1 GUNT software CD + USB cable
- 1 manual