

Aluminium Thermal Conduction Bar 1017331

Copper Thermal Conduction Bar 1017330

Instruction manual

10/15 ALF



1. Description

The thermal conduction bars are for investigation of heat conduction in conjunction with the thermal conduction equipment set (1017329) or for investigating electrical conduction by means of four-terminal sensing.

2. Technical data

Material:	
1017330:	Copper
1017331:	Aluminium
Length:	500 mm
Cross-sectional area:	490 mm ²
Number of measuring points:	13
Separation of measuring points:	40 mm
Specific thermal conductivity (Cu):	240 - 380 Wm ⁻¹ K ⁻¹
Specific thermal conductivity (Al):	236 Wm ⁻¹ K ⁻¹

3. Operation

3.1 Measurement of heat conduction along metal bars

- See the detailed description in the instruction manual for the thermal conduction equipment set (1017329).

3.2 Determination of electrical conductivity

The following additional equipment is required to carry out the experiment:

1 DC power supply, 32 V, 20 A (230 V)	1012857
or	
1 DC power supply, 32 V, 20 A (115 V)	1012858
1 Microvoltmeter (230 V)	1001016
or	
1 Microvoltmeter (115 V)	1001015
1 Digital multimeter E	1006809
Experiment leads	

- Place the metal bar on an insulating surface.
- Connect up the power supply and ammeter as in Fig. 1. The metal bars have additional holes for connecting electricity next to the second and twelfth measuring positions.
- Use two measuring probes to measure the voltage drop between pairs of measurement points along the bar.

Note: Measuring points at 40-mm intervals are suitable for use as tapping points for voltage dividers in order to demonstrate linearity.

Thermo-electric voltages at the measuring points may limit the accuracy of the measurements (especially if there is a temperature gradient between the two measuring points).

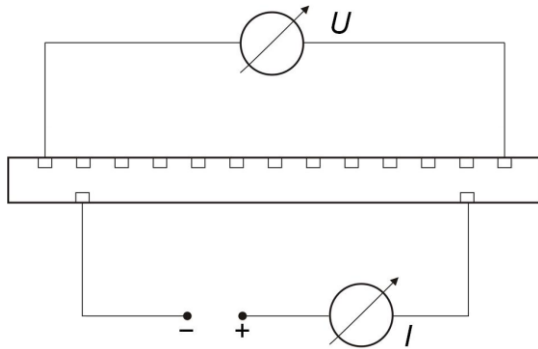


Fig. 1 Schematic illustrating four-terminal sensing

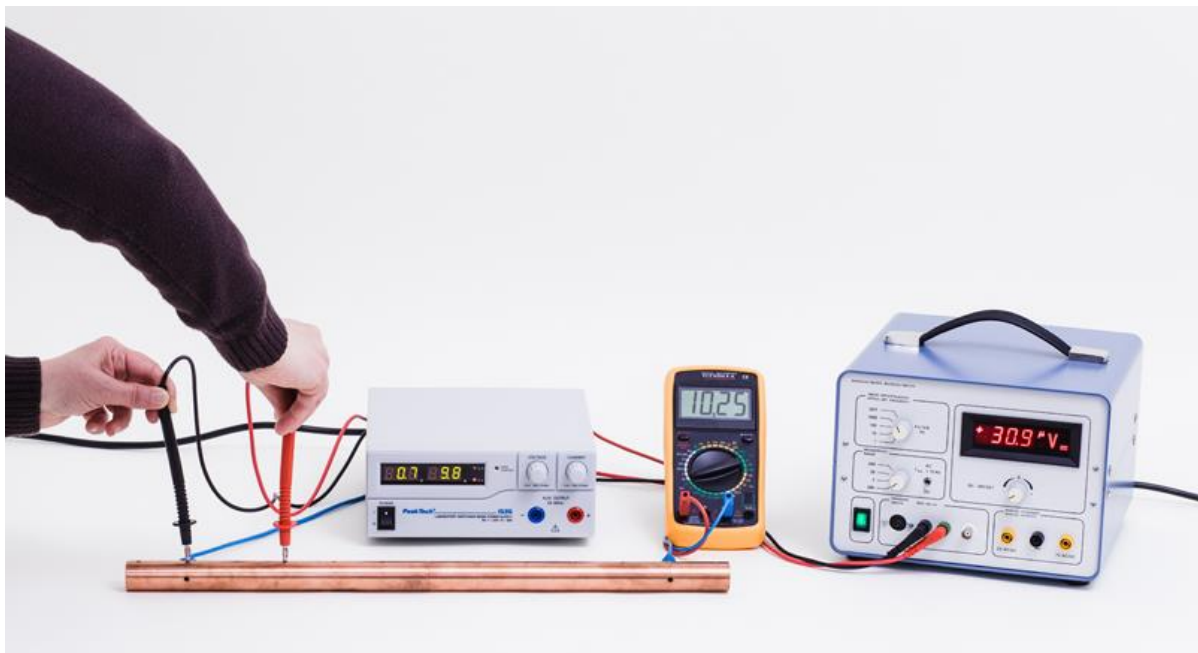


Fig. 2 Experiment set-up for determining the electrical conductivity of copper