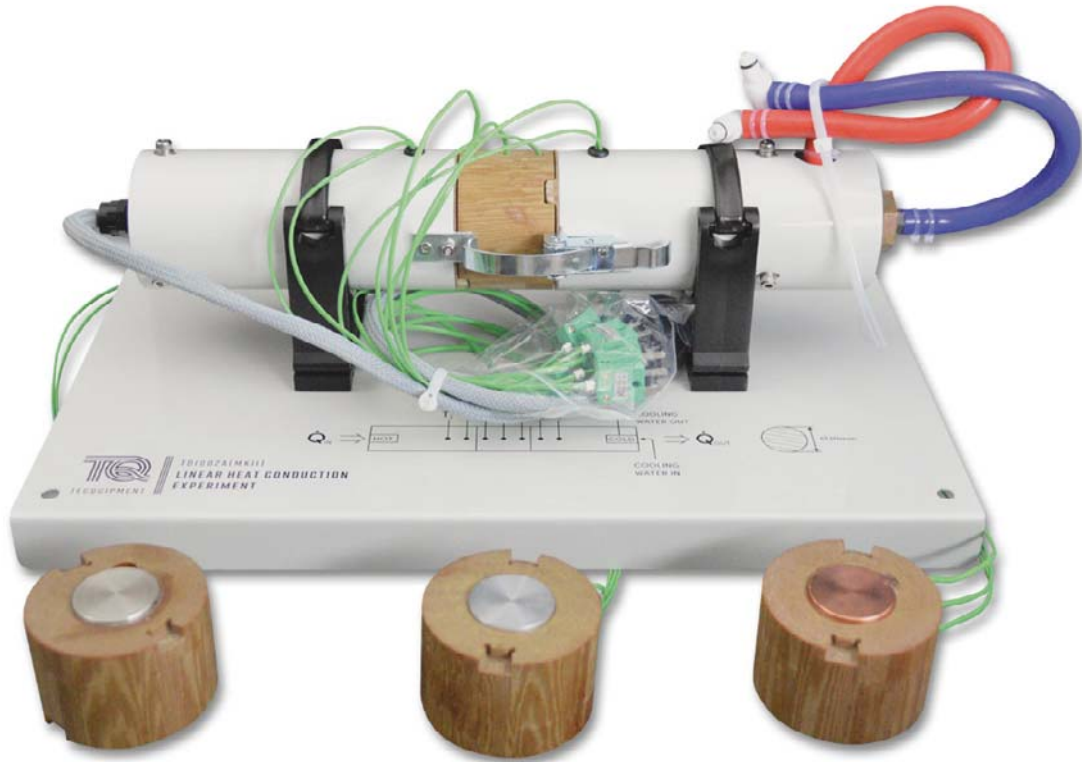




TD1002A [MKII]

LINEAR HEAT CONDUCTION EXPERIMENT

Experiment that introduces the principles of linear heat conduction and thermal conductivity. Fits onto the Heat Transfer Experiments Base Unit.



KEY FEATURES

- One of four optional experiments for the Heat Transfer Experiments Base Unit (TD1002)
- Fits quickly and easily onto the Heat Transfer Experiments Base Unit and water connections have self-sealing quick connectors – needs no tools
- Shows the principles of linear heat conduction along a rod of uniform diameter
- Clear schematic printed on the baseplate aids student understanding
- Allows the thermal conductivity of various materials to be measured
- Safe, low-voltage heater with over-temperature cut-out

LINEAR HEAT CONDUCTION EXPERIMENT

DESCRIPTION

This experiment has a solid brass bar of circular cross-section, made in two sections with an interchangeable middle section. It mounts on a base plate with a clear schematic of the experiment layout. The first brass section includes two thermocouples and the electric heater (heat source). The second brass section includes a small water-cooled chamber (heat sink) and two more thermocouples. The interchangeable middle sections (supplied) are of different metals:

- Brass – so the bar becomes one length of brass
- Aluminium
- Stainless steel
- Copper

Each middle section has three thermocouples to enable the calculation of thermal conductivity of specimens using two different methods:

- The absolute method
- The comparative cut-bar method

The electric heater and thermocouples connect to sockets on the Heat Transfer Experiments Base Unit, which also supplies the cold water feed and drain for the heat sink. Students turn on the cooling water flow and adjust the heater power until the experiment reaches equilibrium they then record the temperatures as the heat conducts along the bar. Insulation around the bar reduces heat loss by convection and radiation, so that the results should be close to the theory for simple linear conduction only. (Heat loss can also be simply estimated using a pre-determined TecQuipment chart and table).

STANDARD FEATURES

- Five-year warranty
- Made in accordance with the latest European Union directives
- ISO9001 certified manufacturer

LEARNING OUTCOMES

- Demonstration and calculations of linear heat conduction
- Calculation of the thermal conductivity (k value)
- Demonstration of the effectiveness of thermal paste
- Demonstration and calculations of thermal resistances (R value) in series
- Demonstration of 'thermal lag'

ESSENTIAL BASE UNIT

- Heat Transfer Experiments Base Unit (TD1002)

OPERATING CONDITIONS

OPERATING ENVIRONMENT:

Laboratory

STORAGE TEMPERATURE RANGE:

-25°C to +55°C (when packed for transport)

OPERATING TEMPERATURE RANGE:

+5°C to +40°C

OPERATING RELATIVE HUMIDITY RANGE:

80% at temperatures < 31°C decreasing linearly to 50% at 40°C

SOUND LEVELS

Less than 70 dB(A)

SPECIFICATIONS

TecQuipment is committed to a programme of continuous improvement; hence we reserve the right to alter the design and product specification without prior notice.

NETT DIMENSIONS AND WEIGHTS:

Linear Heat Conduction Experiment (TD1002a):
390 mm x 280 mm x 130 mm high and 4 kg

PACKED DIMENSIONS AND WEIGHT:

0.03m³, 5kg