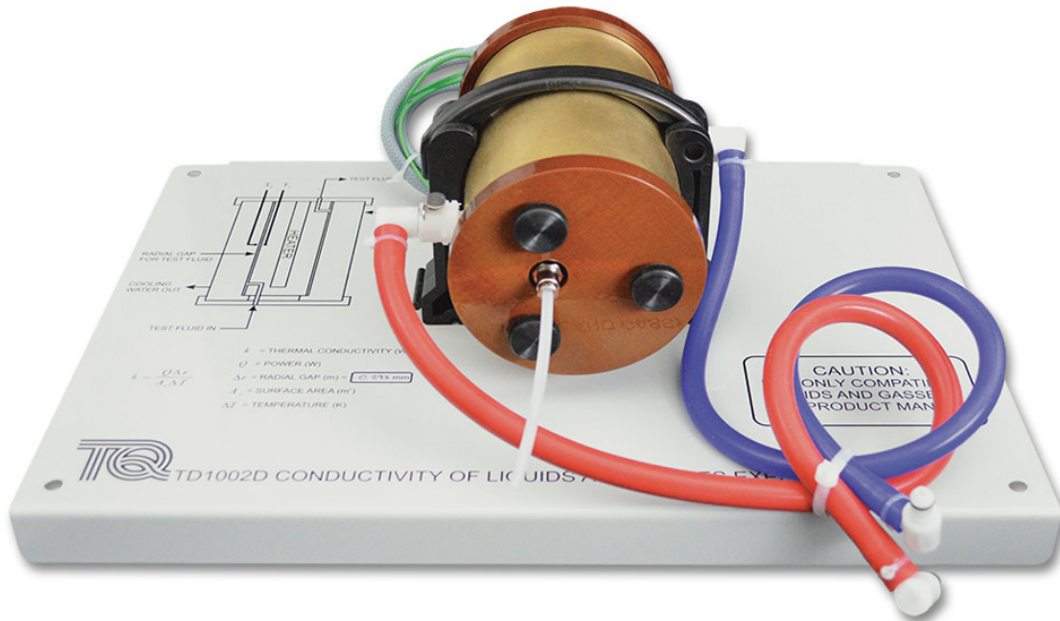


# ≡ CONDUCTIVITY OF LIQUIDS AND GASES EXPERIMENT

TD1002D

Experiment that allows the testing of various fluids to find their 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 needing no tools
- Allows students to measure the thermal conductivity of various compatible liquids and gasses
- Clear schematic printed on the baseplate aids student understanding
- Easy to disassemble and clean
- Safe, low-voltage heater with over-temperature cut-out

# ≡ CONDUCTIVITY OF LIQUIDS AND GASES EXPERIMENT

TD1002D

## DESCRIPTION

This experiment has three concentric cylinders. The inner cylinder contains an electric heater (the heat source). The test liquid or gas forms a second, thin cylinder around the heat source. The third cylinder cooled by water surrounds them both to make a heat sink. The whole assembly is mounted on a base plate with a clear schematic of the experiment layout.

Heat passes by conduction from the heat source, through the test liquid or gas, to the heat sink. Thermocouples measure the temperature on the inside and outside edges of the cylinder of test liquid or gas.

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

Caps of thermally-insulating material at the ends of the cylinders reduce heat loss, but students do an initial experiment to calibrate the equipment to allow for heat losses and improve experiment accuracy. One end cap is removable to allow the unit to be easily cleaned when changing from one fluid to another.

Students turn on the cooling water and the heater and measure the temperatures at each side of the test gas or liquid. They then compare their results with those predicted from theory for conduction in liquids and gasses.

**NOTE:** The TD1002d equipment is made of brass, aluminium, tufnol, nylon and nickel-plated parts. For safety reasons and to avoid damage to the equipment, only use test fluids that will not damage or react with the materials used to make the TD1002d. TecQuipment does not supply and cannot be held responsible for the test fluids that you use.

Suitable test fluids include:

- Normal, dry air
- Carbon dioxide
- Castor oil

## STANDARD FEATURES

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

## LEARNING OUTCOMES

- Calibration of the unit using air as the known medium
- Finding the thermal conductivity ( $k$ ) of various liquids and gasses and comparing them to typical published values

## 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:

Conductivity of Liquids and Gasses Experiment (TD1002d):  
430 mm x 280 mm x 150 mm high and 6 kg

### PACKED DIMENSIONS AND WEIGHT:

450 mm x 300 mm x 250 mm and 7 kg