

## EXTENDED SURFACE HEAT TRANSFER MODULE H112E



**Year 1**  
study

### Description

A small scale bench top accessory designed to measure the temperature profile and heat transfer along a horizontal extended surface (cylindrical pin). A small diameter uniform rod is heated at one end and heat flowing along the rod by conduction is lost to the surroundings by a combination of natural convection and radiation. The resulting heat transfer gives a temperature profile that may be investigated and predicted by conventional analysis. The apparatus consists of a solid cylindrical matt black brass bar supported in a frame and heated at one end. At intervals from the heated end are eight thermocouples recording the surface temperature so that a temperature profile along the bar may be developed. An additional thermocouple records the ambient temperature. The heater is located inside an insulated cylinder at one end of the apparatus. The heater input power is controlled through the variable 240v ac supply from the Heat Transfer Service Unit H112 and is designed to operate at up to 20 Watts. All instrumentation and power supplies plug directly into the Heat Transfer Service Unit H112 and readings are displayed on digital panel meters.

### Related Laws/Applications

- Mechanical Engineering
- Nuclear Engineering
- Chemical Engineering
- Control and Instrumentation
- Plant and Process Engineering
- Building Services
- Engineering Physics
- Refrigeration
- Marine Engineering

### Learning capabilities

- Measuring the temperature distribution along an extended surface and comparing the result with a theoretical analysis.
- Calculating the heat transfer from an extended surface resulting from the combined modes of free convection and radiation heat transfer and comparing the result with a theoretical analysis.
- Determining the constant of proportionality (the thermal conductivity  $k$ ) of the rod material.

**Technical Specification**

- Cylindrical Bar: Brass, Ø10mm x 350mm (L)
- 8 x Thermocouples: 50mm intervals

**Essential Ancillaries**

- H112

**What's in the Box?**

- 1 x H112E
- Instruction manual
- Packing List
- Test sheet

**Weights & Dimensions**

- Weight: 3.85 kg
- Length: 500mm
- Width: 150mm
- Height: 150mm

**Essential Services**

- H112

**Ordering information**

To order this product, please call PA Hilton quoting the following code:  
H112E

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