RADIAL HEAT CONDUCTION MODULE

H112B

Year 1
study

Description

A small-scale accessory designed to experimentally investigate the basic principles of radial heat conduction and to allow the thermal conductivity of the solid metal disc to be determined. An insulated, 110mm diameter brass disc 3.2mm thick is heated in its centre by a nominal 100W heater (operating at 240v ac maximum) which is fitted with a high temperature limit switch. The power supplied to the heater is controlled and measured by the H112, Heat Transfer Service Unit. The periphery of the disc is cooled by water passing through a copper tube bonded to the disc. Six type K thermocouples are positioned at 10mm radial increments from the heated centre to the periphery. All six thermocouples plug directly into the H112, Heat Transfer Service Unit and temperatures are displayed on its digital panel meter. You may also be interested in: H112A: Linear Heat Conduction Module H112E: Extended Surface Heat Transfer Module H112D: Combined Convection and Radiation Module H112H: Thermal Conductivity of Liquid and Gases Module

Related Laws/Applications

- Fourier Rate
- Radial Energy Flow
- Thermal Conductivity

Learning capabilities

- To measure the temperature distribution for steady state conduction of heat energy through the wall of a thick cylinder (Radial energy flow) and demonstrate the effect of a change in heat flow.
- To understand the use of the Fourier Rate Equation in determining rate of heat flow for steady state conduction of heat energy through the wall of a thick cylinder (Radial energy flow) and using the equation to determine the constant of proportionality (the thermal conductivity k) of the disc material.
- To observe unsteady state conduction of heat and to use this in observation of the time to reach stable conditions.

Technical Specification

- Heated Disc. Material: Brass, Ø110mm.
- Brass Core: Ø14mm.
- Disc Thickness: 3.2mm.
- Radial interval of Thermocouples: 10mm

Essential Ancillaries

- H112: Heat Transfer Service Unit

What’s in the Box?

- 1 x H112B
- 6m PVC hose
- Hose clips
- Instruction manual
- Packing List
- Test sheet

You might also like

- H112A: Linear Heat Conduction Module
- H112E: Extended Surface Heat Transfer Module
- H112D: Combined Convection and Radiation Module
- H112H: Thermal Conductivity Of Liquid And Gases Module

Weights & Dimensions

- Unit: 190(L) x 190(W) x 155(H)mm
- Nett Weight: 2.7 kg
- Gross Weight: 4.55 kg
- Packing Case Volume: 0.16 m^3

Essential Services

- H112: Heat Transfer Service Unit

Operational Conditions

- Storage temperature: -10°C to +70°C
- Operating temperature range: +10°C to +50°C
- Operating relative humidity range: 0 to 95%, noncondensing

Ordering information

To order this product, please call PA Hilton quoting the following code:
H112B