



COMBINED CONVECTION and RADIATION MODULE H112D



Year 1
study

Description

Bench mounted accessory that allows experimental investigation of both natural and forced convection from a heated cylinder in a cross-flow configuration. The surface temperature of a duct mounted, matt black cylinder may be varied over a wide range; thereby allowing the increasing effects of radiant heat transfer to be investigated as the temperature is increased.

A variable velocity airflow within the small diameter circular duct is provided by an integral centrifugal fan and allows the effects on convective heat transfer from the cylinder to be investigated.

An integral thermocouple on the surface of the electrically heated cylinder allows surface temperature to be measured at all operating conditions. This combined with a duct-mounted thermocouple, heater input power measurement and in duct air velocity measurement

allows all of the relevant parameters to be recorded. The heater power supply and temperature sensors connect to the Heat transfer service unit H112 while velocity is recorded on auxiliary instrumentation supplied as part of the H112D demonstration unit.

Related laws

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

Learning capabilities

- Determination of the combined (radiation and convection) heat transfer ($Q_r + Q_c$) from a horizontal cylinder in natural convection over a wide range of power input and corresponding surface temperature.
- Measuring the domination of the convective heat transfer coefficient h_c at low surface temperatures and the domination of the radiation heat transfer coefficient h_r at high surface temperatures.
- Determination of the effect of forced convection on the heat transfer from the cylinder at varying air velocities.
- Determination of the local heat transfer coefficient around the cylinder.

Technical Specification

- Matt black cylinder: $\varnothing 10\text{mm}$ black plate (Near 1.0 emissivity)
- Heater input power: 100W @ 240Vac
- Recommended cylinder operating temperature: 500°C
- Air velocity: 0...8 m/s

Essential Ancillaries

- H112 Base Unit

What's in the Box?

- 1 x H112D
- 1 x Power Cable
- Instruction manual
- Packing List
- Test sheet
- Wiring Diagram

Weights & Dimensions

- Weight: 17.2 kg
- Length: 350mm
- Width: 300mm
- Height: 1200mm

Essential Services

- H112 Base Unit

Ordering information

To order this product, please call PA Hilton quoting the

following code:

H112D - COMBINED CONVECTION AND RADIATION
MODULE

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