

## FLUIDISATION and FLUID BED HEAT TRANSFER UNIT H694



Year 1  
study

### Features

- Safe and Suitable For Unsupervised Student Operation
- Responds Rapidly to Control Changes
- Negligible Operating and Maintenance Costs
- Optional Computerised Data Acquisition Upgrade.

### Description

The Hilton H694 Fluidisation & Fluid Bed Heat Transfer Unit has been designed to provide visual and quantitative results related to the flow of air through both a packed and fluidised bed of granular material contained in a vertical glass cylinder. At the lower end of this is a distribution chamber and air distributor which supports the bed when defluidised. Probes for temperature and pressure measurement, and a horizontal cylindrical heater, can all be moved vertically to any level in the bed chamber. Air from a local compressed air supply is

delivered through a filter/pressure regulator, an air flow meter fitted with a control valve and an orifice plate (to measure higher flow rates), to the distribution chamber.

When in use, the heat transfer rate from the heater is adjusted by a manual electronic control, and digitally displayed. Two thermocouples are embedded in the surface of the element. One of these indicates the surface temperature, and the other, in conjunction with a controller, prevents the heater surface temperature exceeding a set value (up to 200°C). A digital temperature indicator with a selector displays the temperatures of the element, the air supplied to the distributor, and the moveable probe in the bed chamber.

Two liquid filled manometers are fitted. One displays the pressure of the air at any level in the bed chamber, and the other displays the orifice differential pressure, from which the higher air flow rates can be determined. Four

grades of Fused Alumina (Aluminium Oxide) Loose Grain are supplied with the unit and these are suitable for a wide range of fluidisation and heat transfer experiments.

An important feature of this unit is the ease with which the bed material may be changed. The unit can be in operation again in two or three minutes.

#### Related laws

- Chemical Engineers
- Energy Managers
- Plant and Process Engineers
- Mechanical Engineers
- Mining Engineers

#### Learning capabilities

- Observation of the behaviour in fluidised bed of a wide range of granular materials, from onset of fluidisation to entrainment.
- Measurement of air flow and pressure drop through a variety of granular materials, as packed and as fluidised beds.
- Investigation of the effect of distributor design on bed behaviour.
- Investigation of the effect of Superficial velocity; depth of immersion; particle size on the surface heat transfer coefficient for a hot surface in a fluidised bed.
- Demonstration of separation by particle size and density.

#### Technical Specification

- Granula Material: Fused Alumina
- Four Grades of granules supplied
- Bed Chamber: Ø105 x 220mm long
- Panel: High quality impact resistant plastic on which the following components are mounted:
- Electronic Control to adjust the heater power input.
- Digital Wattmeter to indicate the heater power input. Range 0 to 1000W (Heater power nominally 400W)
- Flow Meters to measure air flow through bed. Range 0.15 to 3.5 litres/sec.
- Digital Thermometer to indicate the temperatures of heater surface, air inlet and probe. Resolution 1°C.

- Manometer to measure pressure drop through bed.
- Safety Features include overload cut out and grounding of all components and heater temperature controller.

#### What's in the Box?

- 1 x H694
- 1 x Transformer (115V only)
- 1 x Dispenser
- 1 x Power Lead
- 3 x Granule Tubs
- 1 x Compact Lamp
- 2 x Spare fuse
- 1 x Spare Air filter
- 1 x Spare manometer fluid
- Instruction manual
- Packing List
- Test Sheet

#### You might also like

- F300E - Fluidisation and Fluid Bed Heat Transfer Module

#### Weights & Dimensions

- Weight: 28 kg
- Weight: 32 kg (115V only)
- Length: 710mm
- Width: 240mm
- Height: 710mm

#### Essential Services

- 250 W Single Phase, 220-240 Volts, 50Hz (With earth/ground).
- 250 W Single Phase, 110-120 Volts, 60Hz (With earth/ground).

#### Ordering information

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

H694/230  
H694/115  
H694/230/HC

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H694/115/HC

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