

## HM 120 FLUIDIZATION AND HEAT TRANSFER



### GENERAL DESCRIPTION

This bench top equipment is for studying the behavior of a fluidized bed and heat transfer coefficient of a hot surface in a fluidized bed.

The unit consists of a glass cylinder with a bottom chamber and a top assembly. The bottom chamber has as a built-in air distributor. The distributor can be replaced by a locally designed one for students and other investigations. The top assembly consists of an air filter and a heating element, temperature probes and a pressure probe. The glass cylinder assembly is attached to a panel through the top assembly and can be easily removed and installed.

The glass cylinder is partially filled with granular bed material. Air is supplied to the bottom chamber. The air fluidizes the bed material and escapes to the atmosphere through the top filter.

A small air compressor is provided. The air flow rate is measured by a rotameter. A heating element is provided in the glass cylinder. Temperature probes are provided for measurement of heating element surface, fluidized bed and air inlet to the bottom chamber. A water manometer measures pressure drop in the fluidized bed. The heating element, temperature probes and pressure probe can move up and down at any position in the glass cylinder.

Safety features include overheating and overpressure. A second temperature probe on the heating element limits heating element maximum temperature by a controller. A pressure relief valve is provided at inlet airline to limit maximum pressure in the glass cylinder due to blocked filter.

Instruction manual is also included.

### EXPERIMENT CAPABILITIES

- To study the behavior of a fluidized bed for various types of granular materials.
- To study changes in pressure drop vs air flow for various granular materials, both pack and fluidized beds.
- To study the effect of superficial velocity, depth of immersion, and granular size on the surface heat transfer coefficient by a hot surface in a fluidized bed.
- To investigate the effect of distributor design on the bed behavior.
- To demonstrate separation by particle size and density.

### TECHNICAL DATA

- Glass cylinder : Borosilicate.
- Air distributor : Porous materials
- Heater : 180 W with power control
- Heating surface temperature control
- Measuring instruments
  - Pressure : Water manometer,
  - Air flow : Rotameter
  - Sensors with digital display : Temperatures for fluidized bed and inlet air
- Granular bed material : Aluminium oxide
  - Size : 4 ea.
  - Quantity : 1 L ea.
- Pressure relief valve
- Software for data display and analysis by computer (separately supplied)
- Power supply : 220V, 1 Ph, 50 Hz. Other power supply is available on request.

### OPTIONAL EQUIPMENT

- Differential pressure digital display instead of water manometer.
- Air flow digital display instead of rotameter.
- Air compressor

**Net (unpacked) Shipping Dimensions WxLxH** : 75 x 50 x 90 cm  
**Net Weight** : Approx. 40 kg