BOILING HEAT TRANSFER UNIT

H656

Year 1
study

Features

- Three Modes of Pool Boiling Observed Easily
- Allows Safe Investigation into the Normally Dangerous condition of Film Boiling
- Safe and Suitable For Unsupervised Student Operation
- Ozone Friendly, Low Pressure, Non-toxic Working Fluid
- Responds Rapidly to Control Changes
- Negligible Operating and Maintenance Costs
- Optional Computerised Data Acquisition Available

Description

A rigid panel supports a vertical glass cylinder containing a horizontally mounted heating element immersed in the liquid. The heat input can be varied to control the heat flux and hence the mode of boiling. At the top of the cylinder is a coil through which cooling water flows. This condenses the vapour produced by the heat input and the liquid formed returns to the bottom of the cylinder for re-evaporation. Control of the cooling water flow maintains a constant pressure during an experiment. The standard instrumentation consists of a surface temperature thermocouple plus four glass thermometers, wattmeter, pressure gauge and water flowmeter. These enable all relevant heat transfer calculations to be made. For student safety, the unit is fitted with both overload and residual current circuit breakers. A high pressure cut out and internal safety valve prevents a safe pressure being exceeded. The heating element is protected by a high temperature switch.

Related Laws/Applications

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

Learning capabilities

- Visual demonstration of convective, nucleate and film boiling.
- Study of the heat flux and surface heat transfer coefficient at constant pressure.
- Investigation of the effect of pressure on critical heat flux.
- Study of filmwise condensation and condenser overall heat transfer coefficient.
- Investigation of the pressure- temperature relationship of a pure substance, and the effect of air in a condenser.
- Demonstration of Liquid carry over or priming in boilers.
- Demonstration of Law of partial pressures.

Technical Specification

- Heating Surface: 42mm effective length x Ø12.7mm
- Maximum permitted surface temperature: 220°C
- Heater cut out temperature: 160°C
- Glass chamber: Ø80 internal x 300mm (L)

What's in the Box?

- 1 x H656
- 1 x Transformer (115V only)
- 1 x 3m Reinforced tube
- 1 x 3m PVC drain tube
- 1 x Charging Line and valve
- 4 x Thermometer
- 1 x tin of light oil
- 1 x Compact lamp
- 1 x SES36 Refrigerant Can spare
- 1 Power Lead
- Instruction manual
- Packing List
- Test Sheet

Weights & Dimensions

- Weight: 39 kg
- Length: 760mm
- Width: 485mm
- Height: 760mm

Essential Services

- 220-240 Volts, Single Phase, 50Hz, (With earth/ground).
- Line current up to 3.0A at 230V.
- 110-120 Volts, Single Phase, 50Hz, (With earth/ground).
- Line current up to 6.0A at 110V.

Ordering information

To order this product, please call PA Hilton quoting the following codes:
H656/230 - Boiling Heat Transfer Unit
H656/115 - Boiling Heat Transfer Unit
H656/230/HC - Boiling Heat Transfer Unit, Computer Linked
H656/115/HC - Boiling Heat Transfer Unit, Computer Linked