Product name:	Product code:
Saturation Pressure	TLI0003



Description

Saturation Pressure

Technical specification

- Measurement of the relationship between temperature and pressure of the saturated vapour in the loop
- Convenient control of heat input to the boiler using variable power control
- Sight glass in the boiler allows observation of the boiling patterns in the water
- Safe operation with pressure relief valve and permanent indication of system pressure
- Pressure and temperatures measured can be logged using a PC (optional teaching software available)

Description:

A bench top unit designed to introduce students to the characteristics of saturated water vapour.

The apparatus consists of a rectangular pipe loop incorporating a cylindrical boiler in one vertical limb. Pure water in the boiler is heated to its boiling point using a pair of cartridge heaters with variable power control. A sight glass on the front of the boiler allows the internal processes to be observed, namely boiling patterns at the surface of the water, and also allows the water level in the boiler to be monitored. Saturated steam leaving the top of the boiler passes around the pipe loop before condensing and returning to the base of the boiler for re-heating. The operating range of the boiler and loop is 0 to 7 bar gauge. The top limb of the pipe loop incorporates a PRT temperature sensor and an electronic pressure sensor to measure the properties of the saturated steam. A filling point on the top limb allows the loop to be filled with pure water and allows all air to be vented safely before sealing the loop for pressurised measurements. A vapour off take, with isolating valve, allows steam from within the loop to be passed through a throttling calorimeter, the purpose of which is to demonstrate how the dryness fraction of the saturated steam in the loop can be determined. The steam expands to atmospheric pressure as it is throttled and a second PRT temperature sensor measures the temperature of the steam following expansion

Saturation Pressure

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- A bench top unit comprising a boiler vessel and pipe loop with a pressure relief valve to limit the operating pressure to 8 bar gauge. A sight glass on the front of the boiler allows the boiling patterns to be observed and a Bourdon type gauge indicates the pressure in the apparatus pipe lines for safe operation.
- A throttling calorimeter mounted adjacent to the pipe loop allows the condition of the saturated steam to be determined by measuring the temperature of the steam following throttling to atmospheric pressure. Temperatures in the pipe loop and inside the throttling calorimeter are measured using PRT sensors and pressure in the loop is measured using an electronic pressure sensor.
- An electrical console houses the necessary electronics with current protection devices and an RCD for operator protection. A digital meter with selector switch displays all sensor measurements. Corresponding signals are routed to an I/O port for connection to a PC. An optional interface device and educational software package is available.
- The boiler is heated by a pair of 500 W electric heating elements with variable power control and over-temperature protection.
- A comprehensive instruction manual is included with a range of fully detailed Laboratory Teaching Exercises.

Key Features: